Reem Khamis
Amina Buallay *Editors*

AI in Business: Opportunities and Limitations

Volume 1

Springer

Studies in Systems, Decision and Control

Volume 515

Series Editor

Janusz Kacprzyk, Systems Research Institute, Polish Academy of Sciences,
Warsaw, Poland

The series "Studies in Systems, Decision and Control" (SSDC) covers both new developments and advances, as well as the state of the art, in the various areas of broadly perceived systems, decision making and control–quickly, up to date and with a high quality. The intent is to cover the theory, applications, and perspectives on the state of the art and future developments relevant to systems, decision making, control, complex processes and related areas, as embedded in the fields of engineering, computer science, physics, economics, social and life sciences, as well as the paradigms and methodologies behind them. The series contains monographs, textbooks, lecture notes and edited volumes in systems, decision making and control spanning the areas of Cyber-Physical Systems, Autonomous Systems, Sensor Networks, Control Systems, Energy Systems, Automotive Systems, Biological Systems, Vehicular Networking and Connected Vehicles, Aerospace Systems, Automation, Manufacturing, Smart Grids, Nonlinear Systems, Power Systems, Robotics, Social Systems, Economic Systems and other. Of particular value to both the contributors and the readership are the short publication timeframe and the world-wide distribution and exposure which enable both a wide and rapid dissemination of research output.

Indexed by SCOPUS, DBLP, WTI Frankfurt eG, zbMATH, SCImago.

All books published in the series are submitted for consideration in Web of Science.

Reem Khamis · Amina Buallay

Editors

AI in Business: Opportunities and Limitations

Volume 1

Springer

Editors
Reem Khamis
Brunel University London
Uxbridge, Middlesex, UK

Amina Buallay
Brunel University London
Uxbridge, Middlesex, UK

University College of Bahrain
Janabiyah, Bahrain

Preface

In the rapidly evolving landscape of modern business, artificial intelligence (AI) has emerged as a transformative force with the potential to revolutionize industries and redefine the way we work. The integration of AI technologies into various aspects of business operations has opened up new horizons, presenting both opportunities and limitations that demand careful exploration and understanding.

This book is a comprehensive compilation of knowledge and insights gathered from leading experts in the field. The selection of the 55 chapters included in this volume was meticulously conducted through a rigorous evaluation process. Each chapter underwent peer-review evaluation by at least two reviewers, in addition to thorough scrutiny by our team of editors. This meticulous approach ensures that the content presented within these pages is of the highest quality and represents the cutting-edge advancements in AI and its impact on business.

The book is divided into five parts, each focusing on a distinct aspect of AI's influence on business:

Part One: AI and Business Growth
Part Two: Finance, Technology, and Sustainability
Part Three: CSR, Technology, and Empowerment
Part Four: ICT, Technology, and Business
Part Five: Logistics Technology and Quality Management

This book holds great significance for both the academic and professional spheres. For academics, it provides a comprehensive reference that consolidates the latest research and insights on AI in business. The diverse range of topics covered in the book ensures that scholars and researchers can delve into specific areas of interest and gain a deeper understanding of the complexities surrounding AI's integration into business practices.

Professionals, on the other hand, will find this book to be a resource for navigating the ever-evolving landscape of AI in business. The chapters offer practical insights, real-world examples, and strategic frameworks that can guide decision-making, implementation, and innovation within organizations. Executives, managers,

and entrepreneurs will find the book to be an essential companion in their journey to harness the potential of AI and maximize its benefits while mitigating its limitations.

May this book inspire and empower readers to navigate the intricate landscape of AI, seize the opportunities it presents, and overcome the limitations it imposes in order to shape a prosperous and sustainable future for businesses worldwide.

Uxbridge, UK/Janabiyah, Bahrain   Dr. Reem Khamis
Uxbridge, UK   Dr. Ameena Buallay
February 2024

Contents

Finance, Technology and Sustainability

CSR, Technology and Empowerment

Logistics Technology and Quality Management

AI and Business Growth

A Study on Usage of Selective Health App in Bangalore City During Post Pandemic Period

S. J. G. Preethi and Tinto Tom

1 Introduction

The Covid-19 has opened up the door for many sectors. Education & health has been faced many challenges at the same time Online classes, online collaborative academic environment, video conferencing methods gave a new structure to the Educational sector. At the same time, Health care system has been restructured by introducing and extending the e health care services. However, telemedicine process started in India. Although telemedicine-related initiatives began in India in 1999, the government only began to acknowledge its potential in 2000. Indian Space research Organization launched pilot project of Telemedicine industry in 2001.This is the first step taken by Indian Government towards Telemedicine with the collaboration of Apollo Hospital. In 2005 Ministry of Health and Family Welfare introduced National Telemedicine Taskforce and followed by that in 2006 Planning commission approved the budget for e-health services. The Nationwide Cancer Network (ONCONET), the National Rural Telemedicine Network and Digital medical institutions set up with the primary goal of e learning, are further national projects in India. Later in 2017, the National Health Policy (NHP) highlighted the objectives for building an integrated health information system for all parties involved in the health system, with the purpose of improving effectiveness, transparency, and citizen experience. A detailed architectural framework for a "Federated National Health Information System" is proposes to build network with private and public health provider organizations across primary, secondary, and tertiary care value chains in order to provide efficient health care services.

In India, there were no formal telemedicine regulations until 2019. In 2019 COVID-19 has significantly increased the use of telemedicine in India. A number of electronic programmer (e-applications) for healthcare consultations, including

S. J. G. Preethi (✉) · T. Tom
Kristujayanti College, Banagalore, Karnataka 560077, India
e-mail: preethi.s@kristujayanti.com

Amwell, Doctor on demand, MDlive, and Babylon, have flourished globally due to the demand for risk-free contactless contacts between doctors and patients. E-applications like Practo, 1 mg, and PharmEasy have become very popular in India. The Indian government has also begun offering its eSanjeevani telemedicine service with the support of National Teleconsultation Service and Ministry of Health and Family Welfare. The primary national teleconsultation website for the Indian government is called eSanjeevani. The administration launched eSanjeevani OPD on April 13, 2020, during the initial lockdown (Press Information Bureau, Government of India, 2021). A "Digital Health Card" consist of all the details on each Indian citizen's health issues, diagnoses, and pertinent reports will be provided under the aegis of the National Digital Health Mission, introduced by the Indian Government on August 15, 2020 in accordance with the 74th celebrations of Indian Independence Day.

Health apps are easily accessible, less expensive in nature, helps the users to track the health information in a systematic way. It is an evidence based and user-friendly platform. Present Study focusing the consumer perception of using selective health apps in India.

2   Literature Review

Bokolo [1] discussed the application of telemedicine and eHealth and describe this as a proactive measure to improve clinical care using data from the existing literature. The findings of the study demonstrate the value of telemedicine and the modern applications used during the pandemic. More importantly, the results show how telemedicine and eHealth can be used in clinical services. Additionally, policies launched globally to support management of COVID-19 are discussed. Accordingly, this study suggests that both of the elements can be used as a practical, secure, scalable, efficient, and environmentally friendly means of delivering clinical care during health emergencies.

Monaghesh and Hajizadeh [2] conducted a systematic review based on current evidence on the study about Outbreak of Covid-19 can be monitored through Telehealth. This study focused the contribution of telehealth towards the prevention. Diagnosis, treatment and management of during covid-19 pandemic. Study highlights the advantage of telemedicine such as reducing risk of health workers and patients those who isolated and it leads to low morbidity currently, telemedicine is unquestionably acceptable in reducing the risk of COVID-19 transmission among healthcare workers and patients who isolate themselves. This approach may be used to avoid any kind of direct physical contact, offer ongoing care to the neighbourhood, and ultimately lower morbidity and mortality rates during the COVID-19 outbreak.

Kustwar and Ray [3] provides an overview of the eHealth and telemedicine landscape in India with a focus on addressing the healthcare needs of the population. The study explores the intersection of technology and healthcare, examining the potential benefits and challenges of eHealth and telemedicine solutions in the Indian context. The primary objective of the study is to provide an understanding of the role of

eHealth and telemedicine in addressing healthcare needs in India. The author's likely aim to shed light on the benefits, challenges, and implications of implementing these technologies within the Indian healthcare system. The studies emphasize that potential of eHealth and telemedicine to bridge healthcare gaps in India, offering innovative solutions to overcome geographical and infrastructural barriers. The authors might also discuss the need for continued efforts to ensure the effective implementation of these technologies, taking into account various challenges and considerations.

Acharya and Rai [4] examine the study titled "An Evaluation of Telemedicine Services at Apollo Tele Health: A Cross-Sectional Study" contributes valuable insights to the evolving discourse on telemedicine's potential in healthcare. The study's emphasis on patient and provider satisfaction, cost-effectiveness, and challenges provides a foundation for further research and policymaking in the realm of digital health services. As telemedicine continues to reshape healthcare delivery, this study offers a timely exploration of its impact on patient care and medical practice.

Mishra et al. [5] the authors provide an insightful overview of the state of telemedicine networks in India at the time and discuss potential future developments. The paper starts by highlighting the increasing importance of telemedicine in addressing healthcare challenges in a vast and diverse country like India. It emphasizes the potentiality of telemedicine to serve the urban and rural health care services, making medical expertise more accessible to underserved populations. The authors discuss the various technological and infrastructural advancements that have facilitated the growth of telemedicine networks in India.

The authors provides a comprehensive analysis of the key players, both governmental and private, who have contributed to the establishment and expansion of telemedicine services. The paper underscores the significance of partnerships and collaborations between different stakeholders, including medical institutions, technology providers, and policy makers, in shaping the telemedicine landscape.

Furthermore, the paper outlines the challenges faced by the Indian telemedicine sector, such as limited connectivity in remote areas, regulatory issues, and the need for standardized protocols. The authors also discuss the role of telemedicine in specific healthcare domains like tele-radiology, tele-pathology, and tele-ophthalmology.

In terms of the future perspective, the authors offer valuable insights into the potential growth trajectory of telemedicine in India. They highlight the need for continued investment in technological infrastructure, including high-speed internet connectivity and mobile networks, to enable seamless telemedicine services across the country.

Yang et al. [6] used a longitudinal approach in an empirical study to assess the efficacy of online healthcare platforms. Study examined over 75,000 records of online doctor-patient consultations analysed several time periods and found that patients' subsequent consultation behaviour is greatly influenced by their initial contacts.

Mathur et al. [7] gave an overview of the role of telemedicine in Health care Delivery in India. In this study, researchers highlighted the importance of telemedicine to reduce the health disparities in underserved areas of India.

Study by Ganapathy and Ravindra [8] discussed about Telemedicine in India: The Apollo Story. Telemedicine and e-Health presents a case study of Apollo Hospitals' telemedicine initiative. The study discusses the implementation of telemedicine services within the Apollo Hospitals network in India, focusing on expanding healthcare access to underserved regions. The paper highlights the positive impact of telemedicine on patient access to specialists, reduced travel time, and increased medical services in remote areas. It also addresses challenges faced during implementation and offers lessons for other healthcare providers considering telemedicine solutions. The study concludes by emphasizing the pioneering role of Apollo Hospitals' telemedicine initiative in bridging healthcare gaps and serving as a potential model for other institutions.

3   Research Objectives

- To identify the factors determining the perception about health app usage.
- To examine the factors which determines the Health app benefits of Users.
- To analyse the factors motivating the ease of using health apps.

3.1   Factors Determine the Usage of Selective Health Apps

See Fig. 1.

4   Results and Discussion

Factors influencing selective health app were examined in terms of perception, benefits and ease of using. Factors analysis using SPSS identified by using Eigen value. It suggests that factors with an Eigen value of greater than 1.0 Principal component analysis and varimax.

The Table 1 explains KMO value of 0.712 is greater than 0.50, which represents the significance of factor analysis in existing data. Since P value is less than 0.01, the hypothesis is rejected.

The Table 2 explains the extraction of three factors, which determine the perception, benefits and ease of using health apps with sub factors. In the above table Cumulative, percentage variance is discussing 78.62% of total variance from the 28 original variable. The above table explains the Factor I explains 31.21% of variables in the factor. Followed by the factor II and Factor III Explained respectively.
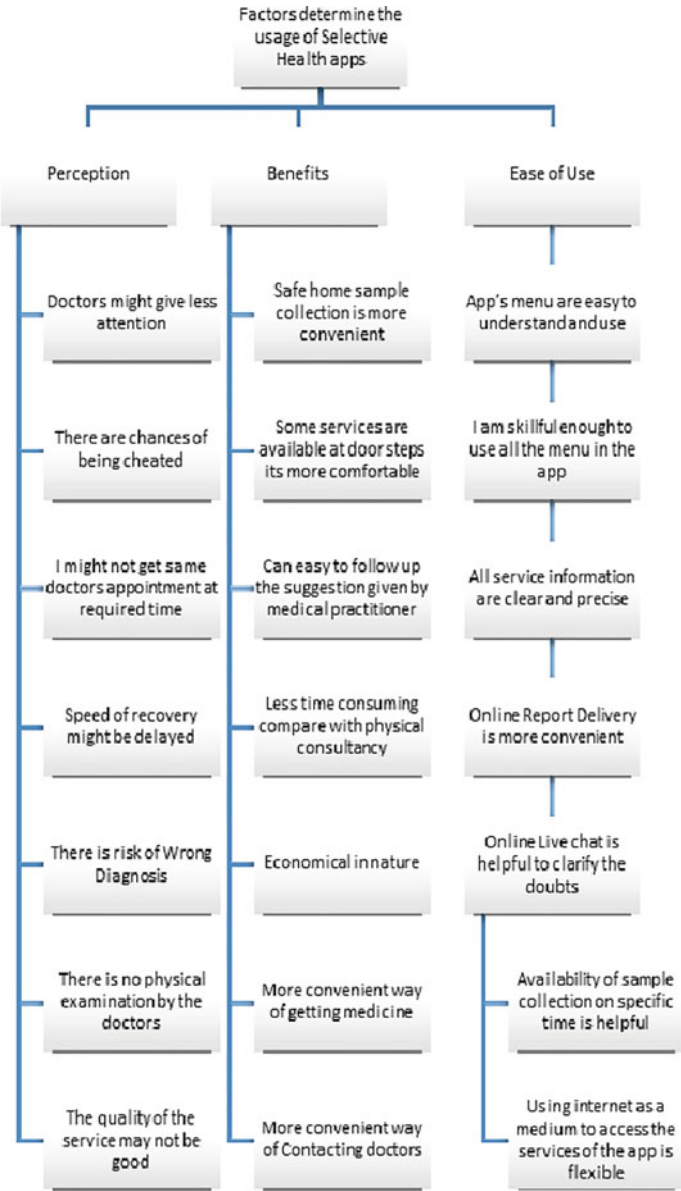
Fig. 1 Factors determine the usage of selective health apps

Table 1 KMO and Bartlett's Test

Kaiser–Meyer–Olkin measure of sampling adequacy		0.712
Bartlett's test of sphericity	Chi-square value	1342.232
	P value	< 0.001**

Note ** Denotes significant at 1% level

5 Findings and Conclusion

The above analysis stating that there are many factors determine the usage of health among those the perception among people playing a very important role 31.21% explained through this principle component compare with other variable which comes under benefit and ease of use the app.

The pandemic has been a boost to the health app usage in India with more people turning to online platforms for medical consultation. The ease of use and convenience of these platforms have made them popular among patients and doctors alike. E Health system in India is still in its early developmental stages, with a lot of potential for growth. The industry faces some challenges, such as lack of awareness, infrastructure, and skilled personnel. However, the government is supportive of the industry and is taking steps to promote its growth.

5.1 Future Research Direction

Present study identify the major factors causing the usage of health app. Research identify that perception among the people about health app playing a major role in the usage of it. Recent study proves that majority of app users preferring fitness related health app than others. Though health apps are used by urban population, in future it is bridge the gap between Urban and rural communities. Further, it will increase the health care accessibility of rural population.

Table 2 Output of principle component method

Factor	Statement for challenges of organised retailers	Factor loading	Eigen values	% of variance	Cumulative %
I	The quality of the service may not be good	0.712	3.342	31.21	31.21
	There is no physical examination by the doctors	0.701			
	There is risk of wrong diagnosis	0.654			
	Speed of recovery might be delayed	0.573			
	I might not get same doctor's appointment at required time	0.572			
	There are chances of being cheated	0.545			
	Doctors might give less attention	0.534			
II	More convenient way of contacting doctors	0.786	3.123	24.71	55.93
	More convenient way of getting medicine	0.747			
	Economical in nature	-0.673			
	Less time consuming compare with physical consultancy	0.581			
	Can easy to follow up the suggestion given by medical practitioner	-0.514			
	Some services are available at door steps its more comfortable	0.438			
	Safe home sample collection is more convenient	0.724			
	Quality of services from health app service providers has lot of problems	0.332			
III	App's menu are easy to Understand and use	0.852	2.267	22.7	78.62
	I am skilful enough to use all the menu in the app	0.719			
	All service information are clear and precise	0.617			
	Using internet as a medium to access the services of the app is flexible	0.516			
	Sample delivery to lab	0.546			
	Online report delivery is more convenient	0.746			

References

1. Bokolo, A. J.: Exploring the adoption of telemedicine and virtual software for care of outpatients during and after COVID-19 pandemic. Irish J. Med. Sci. **190**(1):1–10 (2021)
2. Monaghesh, E., Hajizadeh, A.: The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. BMC Public Health **20**, 1–9 (2020)
3. Kishor Kustwar, R., Ray, S.: eHealth and telemedicine in India: an overview on the health care need of the people. J. Multidisciplin. Res. Healthcare 6(2):25–36 (2020)
4. Acharya, R.V., Rai, J.J.: Evaluation of patient and doctor perception toward the use of telemedicine in apollo tele health services, India. J. Fam. Med. Prim. Care **5**(4), 798 (2016)
5. Mishra, S.K., Singh, I.P., Chand, R.D.: Current Status of telemedicine network in India and future perspective. Proceed. Asia-Pacific Adv. Netw. **32**(1), 151–163 (2012)
6. Yang, Y., Zhang, X., Lee, P. K. C.: Improving the effectiveness of online healthcare platforms: an empirical study with multi-period patient-doctor consultation data. Int. J. Product. Econ. **207**:70–80 (2019)
7. Mathur, P., Srivastava, S., Lalch, A., Mehta, J.L.: Evolving role of telemedicine in health care delivery in India. Prim. Health Care Open Access **7**(1), 1–6 (2017)
8. Ganapathy, K., Ravindra, A.: Telemedicine in India: the Apollo story. Telemed. E-Health **15**(6), 576–585 (2009)

Predictive Analytics of Bitcoin Cryptocurrency Price Prediction: A Recurrent Neural Network Approach

Anandhavalli Muniasamy [ORCID]**, Salma Abdulaziz Saeed Alquhtani, and Linda Elzubair Gasim Alsid**

1 Introduction

Bitcoin is a secure digital currency that uses cryptography and is not subject to government or financial regulation. Bitcoin can operate independently of central banks and spread rapidly around the world. It is popular as a barter and a store of value [1]. Its value has fluctuated over the years, reaching $1.2 trillion in November 2021 and reaching $68,000 per coin in November 2021.

Bitcoin is extremely valuable as a result of a major price change. Products, stores of value, and payment exchange are queried. While maintaining the security and distribution advantages, it has become difficult to understand Bitcoin's movement and mitigate Bitcoin's volatility risk. Some researchers have tried to understand bitcoin trends by assessing the relationship between bitcoin price and prices of other commodities.

Due to the complexity of the Bitcoin product and the volatility of its value over time, there are only a few algorithms that will accurately predict the value of the Bitcoin cryptocurrency. The historical price change of Bitcoin [2] is shown in Fig. 1. Therefore, it becomes very important to accurately predict the price of Bitcoin (the most used cryptocurrency) to be useful in today's investment options. Deep learning methods and neural network models can be taken into account when estimating value from physical data.

The most effective and well-known RNN method for finding patterns in periodic data such as time series data, financial markets, and government agencies is the LSTM and GRN architectures. Other neural networks, as opposed to GRNs and LSTMs, incorporate a temporal component and consider the time and sequences. In general, LSTMs and bidirectional LSTMs (Bi-LSTM) tend to be more effective at tasks that require the network to store and access long-term dependencies. On the other hand,

A. Muniasamy (✉) · S. A. S. Alquhtani · L. E. G. Alsid
College of Computer Science, King Khalid University, Abha, Saudi Arabia
e-mail: anandhavalli.dr@gmail.com
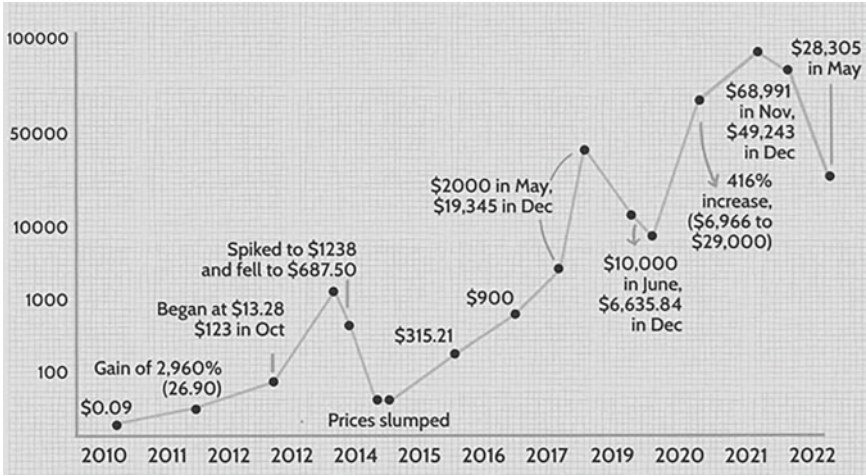
Fig. 1 Bitcoin historical price fluctuations [2010–2022]

GRUs are more effective for tasks that require the network to learn quickly and adapt to new inputs. In general, it is wise to test both Bi-LSTM s and GRUs to determine which is more effective for a particular purpose [20].

Owing to Bitcoin's extreme price volatility, investors cannot avoid risk by simply anticipating future price increases or decreases. However, it is better to have a precise Bitcoin price to use as a benchmark.

Creating price prediction models that cryptocurrency investors and experts can rely on historical data is the main goal of the proposed RNN models. The remainder of the article is organized as follows: Sections 2 and 3 describe the literature review and methodology, Chapter 4 presents the conclusions and discussion, and Chapter 5 concludes the training.

2 Literature Review

In this section, we briefly discuss early research on deep learning-based Bitcoin price prediction. Researchers [3] developed a hybrid cryptocurrency forecasting method based on LSTM and GRU for Litecoin and Monero only. The findings show the applicability of the concept for various price predictions of Bitcoin as well as the accuracy of price predictions. The authors of [4] developed two RNN and LSTM based Bitcoin price prediction models and compared them to the Autoregressive Integrated Moving Average (ARIMA) model. RNN and LSTM models outperform ARIMA models [4].

The authors of [5] developed and implemented a deep feed-forward neural network (DFFNN) to model and predict bitcoin price data. The authors of this study evaluated the accuracy of DFFNN compared to the Levenberg–Marquardt algorithm and robustness methods. The simulation results showed that DFFNN trained by Levenberg–Marquardt method outperformed DFFNN trained by dynamic method and DFFNN trained by Powell-Beale restart method. As powerful tools accelerate, business and online training can benefit from their use. The growth rate and machine learning investment method presented in [6] predicted the three most popular cryptocurrencies, Bitcoin, Ethereum, and Litecoin, with 80 and 91.35% accuracy respectively.

Research [7] on Bitcoin research related to various sources (books, journals, etc. easy access information) as well as predictions, methods, strategies, and tools for understanding the product. Although the RMSE of the forecast output is very high, this study demonstrates how to use LSTM to build a forecasting model for the Bitcoin exchange. researchers evaluated the effectiveness of MLP and RNN models in predicting the Bitcoin exchange rate [8]. Long-term cost estimates outperform short-term cost estimates in both MLPs and RNNs. The model that performed best in this test had Accuracy, Precision and Recall values of 81.3, 81 and 94.7%, for the range between 3 and 200 epochs, respectively.

To promote the development of intelligent systems, [9] created an optimization technique for processing hidden layer features to anticipate stock price measurement. Using stable neural network design and parameters, the researchers in this study found that AANNs performed better when the number of neurons used in the hidden process increased.

This study [10] used a regression model to analyze various factors that affect the value of the Indian rupee, such as foreign direct investment, foreign exchange, crude oil imports and price hike prices, adjusting the measures taken by the government to control its value. currency unit and create a model that predicts future exchange rates based on specified conditions.

The study in [11] fed statistical features derived from historical benchmark price data into a deep learning model, and their method outperformed competing methods and achieved good accuracy. They investigated how 1D-CNN and LSTM accuracy rates were impacted by feature extraction using PCA. This study showed that despite the 1D-CNN model performing well in terms of computational complexity during training, LSTM with PCA outperformed the dataset. The authors [12] used the LSTM model for Bitcoin data from 2016 to February 2022 to compare with other studies [4, 8] and found accuracy (95%). This study [13] used the LSTM and random regression model to analyze three US stock market indices and concluded that the model's prediction accuracy of both models will decrease as the number of histories increases.

However, this study uses Bidirectional Long-Term Memory (Bi-LSTM) and Gated Repetitive Unit (GRU) RNN methods to predict the price of Bitcoin cryptocurrency even using the previous dataset standard and hyperparameters for real-time data. This method was motivated by the precise results and superior performance of previous studies. The proposed model was thoroughly compared to previously reported models.

3 Methodology

The research methodology of this study is shown in Fig. 2.

3.1 Dataset

The BTC-USD dataset was collected from [14]. The specifications of the applied parameters are presented in Table 1. The dataset contains 3248 rows and six columns.

3.2 Data Preprocessing

The features 'Date' and 'Close', which can indicate daily fluctuations in Bitcoin price, are employed in this forecasting model. To enable a faster and more accurate fit of the model, the min–max scaler was used for the normalization of the "close" feature. The associations between the original data values were preserved by min–max normalization. If the input for future normalization is outside the original data range of feature A, an out of bounds error will be encountered. Equation 1 contains the following formula:
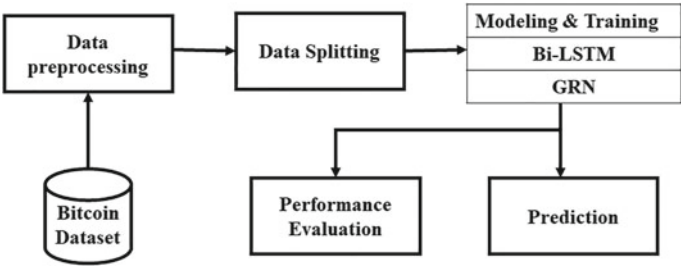
Fig. 2 Research methodology

Table 1 Description of the dataset [14]

Data features	Description
Date	Date of the observation
Open	Daily open price of bitcoin
High	Daily high price of bitcoin
Low	Daily low price of bitcoin
Close	Daily close price of bitcoin
Volume	Daily trading volume of bitcoin

$$V' = V - \min(A)/\max(A) - \min(A)$$
$$* [new - \max(A) - new - \min(A) + new - \min(A)] \tag{1}$$

where min, max = feature range; new-max = 1; new-min = 0; A is the feature data; and V = new data.

3.3 Data Splitting

The data is divided into three parts: training (70%), testing (20%), and validation (10%).

3.4 Modeling & Training

Recurrent Neural Network (RNN) is a type of neural network that processes continuous data such as text, audio, or time data. They are designed to remember or "store" information from previous input. This allows them to use the context and dependencies between time steps. This makes them useful for time estimation.

Long Short-Term Memory (LSTM)

The LSTM model uses an RNN subtype to store and output data. Gates in the LSTM network are controlled by sigmoid (σ) and tanh activation, and the output value is between 0 and 1 for a given data A. In summary, the LSTM architecture consists of multiple memory blocks interconnected by a series of connected cells. The memory block of the network performs two functions: controlling the flow of data between units and storing the state of the network over time [15].

Gated Recurrent Network

GRU is the gate mechanism in RNN [16]. Instead of the three gates used in LSTMs, they use an "update gate" to control the flow of data into the memory cell. This makes GRUs easier to train and operate faster than LSTMs.

3.5 Performance Metrics

Evaluating the performance of LSTM and GRN models Probability of Mean Error (MAPE) and Root Mean Squared Error (RMSE) are the most commonly used performance indicators to evaluate the model. The formulas for RMSE and MAPE are given in Eqs. 2 and 3, respectively.

$$RMSE = \left(1/n\right) * \sum (actual - prediction)^2 \tag{2}$$

$$MAPE = (1/n) * \sum (|actual - prediction|/|actual|) * 100 \qquad (3)$$

where Σ—the symbol represents "sum"; n—sample size; actual—the real data value; prediction—the estimated data value.

The performance of the prediction model increases as the RMSE or MAPE value decreases.

4   Results and Discussion

Data for the RNN models should be in the form of X- and Y-sequences. In this model, X stands for the prices from the previous 60 days and Y for the prices from the following day, or the 31st day. Because of the neural network foundation of the Bi-LSTM and GRN algorithms, normalizing or standardizing the data is necessary for a quicker and more precise fit. Sklearn, Keras, and Tensorflow are a few Python libraries that were utilized by the proposed deep learning models.

The parameters used for Bi-LSTM and GRN models are given in Table 2.

4.1   Results for LSTM

The LSTM model has three input layers with bidirectional flow, which allows for training sequence data in both forward and backward directions. It also has a dense output system with a linear activation function. The model's loss values are shown in Fig. 3.

The model shows the values: training loss = 0.000098 and validation loss = 0.001124. Figure 4 shows the accuracy of the Bi-LSTM model in predicting the price of Bitcoin.

For RMSE and MAPE, accuracy of the Bi-LSTM model is 16.524 and 0.0044%, respectively.

Table 2 Parameters and training options for GRN

Hyper parameters	Values
Sequence length	60 days
Dropout	0.2
Batch-size	256
Epochs	100
Loss	Mean square error
Optimizer	Adam
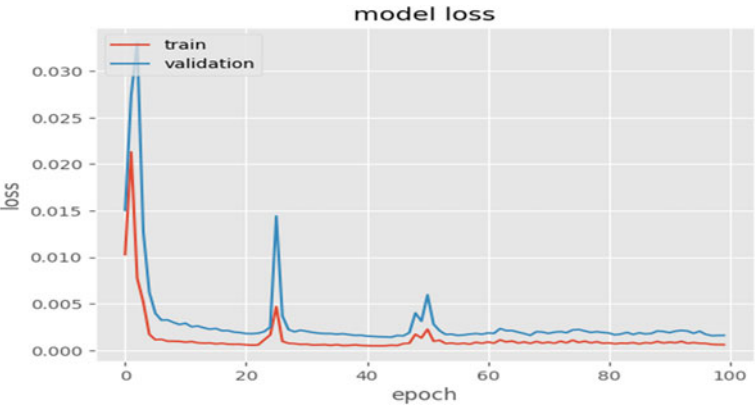
Fig. 3 Model loss from the Bi-LSTM prediction model

Fig. 4 BTC price prediction from Bi-LSTM prediction model

	Data Test	Prediction Results
0	62227.964844	58784.062500
1	61888.832031	60730.417969
2	61318.957031	61707.820312
3	61004.406250	61301.414062
4	63226.402344	60818.800781
...	...	...
644	29074.091797	28921.025391
645	29042.126953	28906.083984
646	29041.855469	28824.769531
647	29180.578125	28802.929688

4.2 Result of GRN Model

The GRU model has three input layers with a tanh activation function and one dense output layer. The model has been compiled with RMSE and MAPE loss functions.
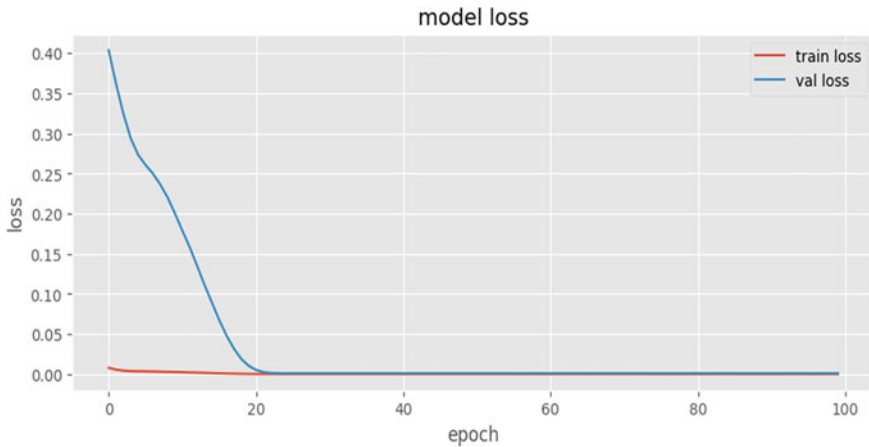
Fig. 5 Model loss from the GRN prediction model

The model's loss values are shown in Fig. 5. The model shows the values: training loss = 0.000101 and validation loss = 0.001135.

Figure 6 shows the daily price forecast for BTC using the GRN model. The RMSE prediction accuracy of the GRN model is 16.283% and the MAPE prediction accuracy is 0.0043%. In the end, the performance of the Bi-LSTM and GRU techniques is compared to other models in the literature [17–19] for predicting the future value of Bitcoin. The studies cited in Table 3 were compared with the RMSE and MAPE results. Figures 4 and 6 compare the estimated value of the BTC currency with the actual value, showing that the estimated value is generally close to the true value, although there is some difference between the two. The model with the smallest error values is therefore considered to be the best. In comparison to other methods in the literature, the Bi-LSTM and GRU algorithms exhibit good performance. The MAPE value found in this study shows that the GRU outperforms other models in estimating the value of the chosen cryptocurrency Bitcoin.

Table 3 shows that the GRU model performs best in predicting the BTC prices, as it has the lowest RMSE values and only 0.001 percentage variations in MAPE values. The findings show that, despite slightly different metrics (RMSE and MAPE values), the GRU model outperforms the Bi-LSTM model in predicting BTC trends.

Fig. 6 BTC price prediction from the GRN prediction model

	Data Test	Prediction Results
0	61004.406250	61455.378906
1	63226.402344	60971.675781
2	62970.046875	61443.585938
3	61452.230469	62870.980469
4	61125.675781	62229.589844
...	...	...
643	29041.855469	28916.519531
644	29180.578125	28894.484375
645	29765.492188	28937.781250
646	29561.494141	29216.402344
647	29478.511719	29554.167969

Table 3 Relative comparison with similar studies of bitcoin cryptocurrency

Related study	Model	RMSE	MAPE
[17]	Bi-LSTM	2222.74	0.0038
	GRU	1777.31	0.0035
[18]	Bi-LSTM	147.85	0.0060
	GRU	151.62	0.0057
[19]	Bi-LSTM	1029.362	0.0036
	GRU	1274.171	0.0057
Proposed model	Bi-LSTM	16.524	0.0044
	GRU	16.283	0.0042

5 Conclusion

This study uses two distinct RNN-based deep learning methods, GRU and Bi-LSTM, to predict the market price based on the price of Bitcoin cryptocurrency. The performance of the model is measured using two scores: RMSE and MAPE. According to the research result, the GRU model and the Bi-LSTM model provided the most accurate predictions. The study found that the GRU model outperformed the Bi-LSTM model in prediction time as it was more efficient with fewer gates. Also, the GRU

model has the lowest RMSE value and there is a 0.001% change in MAPE values compared to previous studies. Future research should explore different determinants of digital outcomes. Specifically, it aims to use appropriate deep learning algorithms to analyze how individual tweets affect the value of cryptocurrency.

References

1. Baur, D.G., Dimpfl, T.: The volatility of bitcoin and its role as a medium of exchange and a store of value. Empiric. Econ. **61**, 2663–2683 (2021)
2. Report 2022. https://www.bitstamp.net/crypto-pulse/. Accessed 2023/8/5
3. Patel, M.M., Tanwar, S., Gupta, R., Kumar, N.: A deep learning-based cryptocurrency price prediction scheme for financial institutions. J. Inf. Secur. Appl. **55**, 102583 (2020)
4. McNally, S., Jason, R., Simon, C.: Predicting the price of bitcoin using machine learning. In: 26th Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP) on Proceedings, pp. 339–43. Cambridge, UK (2018)
5. Lahmiri, S., Bekiros, S.: Cryptocurrency forecasting with deep learning chaotic neural networks. Chaos Solit. Fract. **118**, 35–40 (2019)
6. Sebastião, H., Pedro, G.: Forecasting and trading cryptocurrencies with machine learning under changing market conditions. Financ. Innov. **7**:1–30 (2021)
7. Ferdiansyah Othman, S. H., Zahilah Raja Md Radzi, R., Stiawan, D., Sazaki, Y., Ependi, U.: A LSTMMethod for bitcoin price prediction: a case study yahoo finance stock market. In 3rd International Conference on Electrical Engineering and Computer Science on Proceedings, pp. 206–210 (2019)
8. Albariqi, R., Winarko, E.: Prediction of bitcoin price change using neural networks. In: International Conference on Smart Technology and Applications: Empowering Industrial IoT by Implementing Green Technology for Sustainable Development on Proceedings, pp. 1–4 (2020).
9. Alkaya, A.: Neuron optimization of evolutionary artificial neural networks for stock price index prediction. Int. J. Econ. Finan. Stud. **5**(1), 12–21 (2013)
10. Philip, B., Bajaj, K., Pareek, W.: Indian rupee: is it unpredictable? a regression model to predict the value of the Indian rupee. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023)
11. Raşo, H., Demirci, M.: Predicting the Turkish stock market BIST 30 index using deep learning. Int. J. Eng. Res. Develop. **11**(1), 253–265 (2019)
12. Wardak, A.B., Rasheed, J.: Bitcoin cryptocurrency price prediction using long short-term memory recurrent neural network. Euro. J. Sci. Technol. **38**, 47–53 (2022)
13. Wardak, A.B., Rasheed, J.: Bitcoin cryptocurrency price prediction using long short-term memory recurrent neural network. Euro. J. Sci. Technol. **38**, 47–53 (2022)
14. Chen, J.: Analysis of bitcoin price prediction using machine learning. J. Risk Financial Manag. **16**, 51 (2023)
15. Yahoo Finance. https://finance.yahoo.com/. Accessed 2023/9/8
16. Hochreiter, S., Schmidhuber, J.: Long short-term memory. Neural Comput. **9**, 1735–1780 (1997)
17. Essai Ali, M. H., Rabeh, M. L., Hekal, S., Abbas, A. N.: Deep learning gated recurrent neural network-based channel state estimator for OFDM wireless communication systems. In: IEEE Access, vol. 10, pp. 69312–69322 (2022)
18. Hansun, S., Wicaksana, A., Khaliq, A.Q.: Multivariate cryptocurrency prediction: comparative analysis of three recurrent neural networks approaches. J. Big Data **9**, 1–15 (2022)

19. Ozturk Birim, S.: An Analysis for cryptocurrency price prediction using lstm, gru, and the bi- directional implications. In: Cömert, M., Şimşek, A.E. (eds.) Developments in Financial and Economic Fields at the National and Global Scale, pp. 377–392, Gazi Kitabevi, Ankara, Türkiye (2022)
20. Seabe, P.L., Moutsinga, C.R.B., Pindza, E.: Forecasting cryptocurrency Prices Using LSTM, GRU, and Bi-Directional LSTM: a deep learning approach. Fract. Fract. **7**(2), 203 (2023)

ChatGPT and Halal Travel: An Overview of Current Trends and Future Research Directions

Mohamed Battour [iD]**, Mohamed Salaheldeen** [iD]**, Khalid Mady** [iD]**, and Ririn Tri Ratnasari**

1 Introduction

Various cutting-edge technologies such as Artificial intelligence (AI), Robotic Process Automation (RPA), Machine learning/deep learning are transforming every aspect of our society at an unprecedented pace [1–3]. As a result, the widespread incorporation of these cutting-edge technologies has led to the surge in popularity of smart services, which leverage AI and other advanced technologies, particularly in the hospitality and tourism sectors [4]. Among the many AI-powered solutions, ChatGPT stands out as a critical factor in reshaping customer interactions and experiences in the H&T industry [5]. ChatGPT is predicted to have a big impact on the whole H&T industry by altering how customers acquire information to make decisions and how businesses produce, develop, and provide customized hospitality and tourism services and experiences [6]. ChatGPT will considerably boost user enjoyment and ease by immediately and effectively delivering essential information or services from any location at any time [7]. ChatGPT has the ability to totally alter

M. Battour
College of Business Administration, A'Sharqiyah University, Ibra, Oman
e-mail: mohamedbator@gmail.com

M. Salaheldeen
Faculty of Commerce, Menoufia University, Menoufia, Egypt
e-mail: m_salah6000@yahoo.com

K. Mady (✉)
Faculty of Commerce, Kafrelsheikh University, Kafrelsheikh, Egypt
e-mail: madykhalid2014@gmail.com

R. T. Ratnasari
Center for Halal Industri and Digitalization, Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia
e-mail: ririnsari@feb.unair.ac.id

the travel industry by providing travelers with access to a wealth of data and information at their fingertips and a high degree of individualized, accurate, and timely support in planning and managing their trip experiences [8].

According to the State of the Global Islamic Economy Report (2018/2019), travel expenditure of the Muslim population worldwide amounted to a staggering $177 billion USD in 2017, excluding expenses incurred during Umrah and Hajj journeys. By 2021, it is anticipated that Muslims would spend $274 billion on travel. The Muslim tourism market is the second largest internationally, just behind China ($168 billion), when compared to other tourist demographics. Muslim-friendly online travel agencies are luring capital, enabling tour operators to meet rising demand worldwide. HolidayMe earned $12 million in funding, the Umrah and Hajj booking app received $1 million in early capital, and HalalBooking.com is aiming for $10 million. All these figures underscore the immense potential of the Islamic travel market and its impact on the global tourism industry. As a result, places should take advantage of the promising Halal tourist sector. Consequently, the Halal tourism market is conceived as a significant opportunity destination should leverage. Destinations should also offer creative solutions to Muslim visitors in order to meet their requirements and expectations [9, 10].

Despite the rapid growth and uptake of AI-enabled technologies across various industries, little is known about how these technologies, such as ChatGPT, affect customer experience [11–13]. In addition, according to Pillai et al. [14], relatively few research have specifically examined the factors that improve customer experience using AI-based chatbots (ChatGPT is more sophisticated). Moreover, there is a lack of study on ChatGPT's potential to enhance customer experience in the hospitality and tourism sectors, particularly in the case of Halal-friendly travel [15]. From the viewpoint of Muslim travel, a discussion of ChatGPT's influence on Muslims' travel experiences is vital [16]. Investigating the potential of GPT, its benefits and drawbacks in designing and offering service experiences and how GPT use may affect the future direction of Muslim friendly products and services are important tasks in the context of halal tourism. In order to fill this vacuum, this study provides a full conceptual analysis of the benefits, challenges, and risks related to adopting ChatGPT in Halal tourism. Additionally, it provides a research agenda for analyzing any possible impacts of ChatGPT on Halal travel and the hospitality industry.

The paper starts with an introduction on ChatGPT in Halal tourism, followed by a section that explores its application in assisting Muslim tourists throughout their journey, including the pre-trip, staying, and post-trip phases. The third section discusses the benefits and challenges of using ChatGPT in the context of Halal tourism. The paper then delves into future research directions. Finally, it concludes with a summary of the key research implications.

2 ChatGPT and Halal Tourism and Hospitality Industry

There is a growing body of research highlighting the significant value that chatbots offer in streamlining the travel process. As Tussyadiah [12] suggested, from pre-trip planning to in-flight assistance and post-trip support, chatbots and other AI-based software have proven to be indispensable tools in assisting travelers at every stage of their journeys. We think it is vital to discuss the role ChatGPT could play in Halal tourism. ChatGPT applications could aid Muslim travelers in making more informed decisions that are Muslim-friendly and effectively managing their journeys as follows.

2.1 Pre-Trip Phase

Travel planning has grown to be a time-consuming activity due to the volume and variety of this information [17, 18]. AI-based systems like social media analytics and travel recommendation systems offer practical solutions for information overload [19]. By using ChatGPT, tourists can also get immediate information and help [20]. Moreover, without the requirement for a search query, ChatGPT is a clear example of an AI-enabled system created to offer consumers active and customized recommendations [19].

Tourist recommendations have become increasingly accurate and personalized due to the rapid evolution of mobile computing, web technologies, social media platforms, and wireless networking, allowing for a more effective and respectful approach to individual preferences [21]. ChatGPT is a prime example of an AI-powered technology that delivers proactive and personalized recommendations to users without even requiring a search query [19]. Muslim travellers who may have distinct travel needs from other visitors in terms of a variety of things, such as food, attractions, lodging, and destinations, will find ChatGPT to be very helpful [22–24]. To provide Muslim travellers with choices that are appropriate for their profiles, ChatGPT might be essential. Furthermore, Chatbots have a number of benefits, according to Hsu et al. [25], including time savings, creating customers' emotional bonds with businesses, and fostering social relationships with customers. Moreover, chatbots may book tickets, make appointments, send reminders, and provide traffic and weather reports, among other useful functions [26].

According to Ukpabi et al. [26], chatbot can be used to improve the pre-travel experience by enabling users to make bookings for hotels and other services like spas, airline tickets, and food. According to Pillai and Sivathanu [14], Chatbots are mostly used to organize trips, support clients, offer advice, and provide solutions to customers addressing travel-related concerns. ChatGPT offers invaluable support to Muslim tourists in preparing for their trip, allowing them to easily access important information such as the location of the nearest halal restaurant, availability of

halal food, prayer timings, Halal entertainment options, and even booking Halal-friendly airlines [15]. ChatGPT furnishes valuable opportunities to Muslim travelers for conducting pre-trip research on Muslim-friendly tourism-related merchandise and amenities in a designated region [27].

2.2 Staying Phase

Recent advances in technology have made it easier for destination organizations, service providers, and visitors to engage with one another for improved tourism during their stay [28]. A real-time feedback loop and information to help travelers explore their destination are provided by tourism chatbots, which can offer travel advice around-the-clock [12, 14]. Customers can use chatbots to manage restaurant reservations by viewing photos, menus, prices, and available tables in restaurants as well as making changes to or cancelling reservations [29]. Machine learning and AI technology have enabled smart services like GPT to provide personalized assistance to Muslim travelers, such as suggesting Halal restaurants or recommending TV shows that align with their preferences. By leveraging these advanced technologies, travel service providers can offer customized experiences, enhancing customer satisfaction and loyalty. Muslim travellers' queries can be quickly addressed by chatbots at any time of day or night. Therefore, Muslim travellers can access destination information and do a variety of tasks in real-time with the aid of Intelligent Personal Assistants (IPA). Accordingly, ChatGPT makes it simple to find Halal eateries and prayer facilities at airports [15].

Due to a lack of Halal certification, it might be difficult for Muslim tourists in some countries to verify Halal assurances [9, 23]. Muslim tourists may need to determine for themselves whether a product or service is Halal or Muslim-friendly. ChatGPT can be used to evaluate whether ingredients, products, and restaurants are Halal. ChatGPT can provide digital information about the Halal status in real-time for particular restaurants, supermarkets, and hotels. For Muslims in the staying stage, ChatGPT is likely to offer pertinent knowledge, simulation, and rapid access [15]. In this stage, ChatGPT are also anticipated to enhance the overall consumption experience. Through online and offline interactions, ChatGPT will improve the omnichannel experiences for Muslim tourists [27].

2.3 Post-Trip Phase

The post-trip phase of the tourism experience is a vital opportunity to reinforce the positive impression formed in prior stages of the journey. During this phase, tourists reflect upon their entire trip and decide whether to revisit in the future, based on how satisfied they were with their experience. As Nicolau and Más [30] asserted, visitors' emotional reactions serve as a clear indicator of their overall satisfaction with the

services they utilized during their travels. As a result, Chatbots can gather multiple types of valuable information for analysis and use in providing personalized services such as tourist feedback, demographic information, and behavioral patterns [31], and assist in sharing the entire experience by gathering reviews about the trip and helping to plan for future trips [12, 32]. Hoyer et al. [11] stated that during the post-transaction phase, virtual assistants might provide feedback and make relevant feedback. In the post-trip phase, ChatGPT is essential for assisting with map understanding and route planning. To sum up, employing ChatGPT might assist Muslim visitors in sharing their MFTX and enhancing the perception of halal-friendly destinations [15, 27].

3 ChatGPT in Halal Tourism: Opportunities and Challenges

With the increasing demand for halal tourism services globally, ChatGPT as AI-powered tool has the potential to significantly elevate the Halal tourism experience for both customers and service providers alike [15]. ChatGPT can bring multiple benefits and opportunities to the Muslim-friendly tourism such as real-time information and personalized recommendation for Halal-friendly tourist services. However, while ChatGPT can bring significant advantages, it's important to consider potential challenges and concerns that may arise [8]. Both Muslim tourists and Muslim-friendly destinations must consider issues such as data privacy and security to ensure a safe and trustworthy experience that fully meets the needs and expectations of Halal tourism.

3.1 Benefits and Opportunities of ChatGPT in Halal Travel

ChatGPT has played a crucial role in revolutionizing the Halal tourism industry by offering a multitude of benefits to Muslim travelers worldwide [6]. ChatGPT can provide Muslim traveler with four main benefits. First, ChatGPT serves as a reliable platform that provides real-time and cost-effective information to its users so Muslim traveler can use the information generated by chatGPT in multiple ways to cater to their specific needs. ChatGPT is conceived a powerful tool in providing valuable information entailed in planning Muslim-friendly itinerary [8, 29]. The availability of halal eateries and prayer spaces is a paramount concern for Muslim travelers when choosing their travel destinations [33]. With its extensive knowledge base, ChatGPT can suggest locations that are suited to the particular requirements and preferences of Muslim tourists, enabling them to visit locations that are consistent with their religious practices and values. In addition, ChatGPT can also deliver timely updates and information about important holidays and regional celebrations taking place in the places they go to thanks to its vast data access [34].

Second, ChatGPT can be customized to cater to the needs of individual travelers based on their specific requirements and preferences. For instance, it can take into account the dietary restrictions of Muslim travelers and suggest restaurants or food options that are halal [35]. Similarly, it can provide information about mosques or prayer rooms that are easily accessible and provide other practical tips for Muslim travelers. Third, ChatGPT enables Halal tourism service providers to connect with potential customers globally and expand their reach. Fourth, ChatGPT can also be helpful for Muslim travelers who face language barriers in a variety of ways. For instance, ChatGPT can help to translate common phrases, directions, and questions that a Muslim traveler may need when interacting with locals. Moreover, ChatGPT can provide advice to Muslim travelers on how to navigate communication barriers. With dealing with different languages and cultures, ChatGPT can provide Muslim travers with information about Cultural norms.

3.2   Challenges and Threats of ChatGPT in Halal Travel

Whereas there are many benefits of using ChatGPT in tourism, there are some challenges might face travelers when use it as a guide for some issues. ChatGPT may lack cultural awareness and sensitivity [8, 36]. ChatGPT may misinterpret or provide incorrect explanations of Halal terms or concepts, leading to potential misunderstandings or misinformation for Muslim travelers. Furthermore, ChatGPT's understanding of Halal requirements may not encompass the diverse interpretations within the Muslim community, leading to conflicting or inconsistent advice for Halal travel. ChatGPT's proficiency in certain languages may be limited, making it challenging for non-English or non-Arabic speaking Muslim travelers to access accurate and relevant Halal-related information. Finally, relying solely on ChatGPT for real-time safety and security updates related to Halal travel may pose risks, as the system may not have access to the latest developments, potentially exposing travelers to unsafe situations.

4   Future Research Directions

Customer experience with ChatGPT in Halal Tourism needs more research. Extensive research is needed to understand more about how ChatGPT, an AI-based chatbot, impacts the entire customer experience in the context of Halal tourism. Moreover, there is avenue to examine how Muslim visitors perceive and utilise ChatGPT, and determine the effect on customer satisfaction, retention, and trust in halal-friendly services. In addition, there is a need for study to examine ChatGPT's potential to provide Muslim tourists with customized experiences in the Halal travel sector. Moreover, Muslim user Awareness about GPT needs an investigation; Analyse how well-known and understood ChatGPT is among Muslim travellers. The moral implications

of using ChatGPT in Halal tourism are one of future research recommendations, giving special attention to issues of cultural sensitivity, privacy, and data security.

There is a growing need to investigate ChatGPT's multilingual integration capabilities to cater to the diverse linguistic requirements of Muslim travellers. Therefore, it is essential to examine ChatGPT's proficiency in understanding and responding to various languages used by Muslim visitors. Additionally, it is crucial to evaluate the factors that can aid customers in developing trust in AI-driven services in the context of halal travel. An in-depth analysis of ChatGPT's compatibility with already-established Halal-friendly travel websites and services should also be conducted. Finally, it is recommended to evaluate the compatibility and synergies between AI-driven chatbots and human-operated services to ensure the best possible experience for Muslim travellers.

5   Conclusion

Muslim travelers' entire travel experiences could be greatly improved by the integration of ChatGPT into the halal-friendly tourism industry. With its AI capabilities and natural language processing, ChatGPT can cater to the particular needs and preferences of Muslim tourists by delivering Halal recommendations, locating nearby mosques, providing cultural insights, and assuring adherence to religious practices. ChatGPT may help with educated decision-making by providing individualized and accurate information, enabling Muslim travellers to explore new places with confidence and while preserving their faith and cultural values. Breaking down language barriers, delivering personalized information, making Halal suggestions, assisting visitors while they are there, and assisting with post-trip experiences are just a few of the many advantages of ChatGPT in Halal tourism. For Muslim visitors, ChatGPT can create a smooth and immersive travel experience that encourages cultural awareness, spiritual fulfillment, and a greater sense of belonging. However, there are obstacles to take into account, such as sensitivity to cultural differences, language barriers, privacy issues, and the requirement for precise and current safety information. Further research in the domain should focus on examining the user experience with ChatGPT in Halal tourism, ensuring personalization and customization, addressing ethical and cultural considerations, offering multilingual support, establishing trust and credibility, raising user awareness, and investigating the integration of ChatGPT with currently offered Halal tourism services.

References

1. Battour, M., Salaheldeen, M., Mady, K., Papastathopoulos, A.: Conceptualizing a model for the effect of entrepreneurial digital competencies and innovation capability on the tourism

entrepreneurship performance in UAE BT. In: International Conference on Information Systems and Intelligent Applications, pp. 541–550 (2023)

2. Elmashtawy, A., Salaheldeen, M.: Big data and business analytics: evidence from Egypt. In: International Conference on Information Systems and Intelligent Applications, pp. 503–512 (2022)

3. Mady, K., Elsotouhy, M., Battour, M.: The role of digital platforms in alleviating the fear of entrepreneurial failure: a new conceptual framework. In: January, M., Al-Emran, M. A., Al-Sharafi, M. N., Al-Kabi, N., Shaalan, K. (eds.) Lecture Notes in Networks and Systems, vol. 322, pp. 837–847, Springer International Publishing (2022)

4. Gill, S.S., et al.: Transformative effects of IoT, Blockchain and artificial intelligence on cloud computing: evolution, vision, trends and open challenges. Int. Things **8**, 100118 (2019)

5. Gursoy, D., Li, Y., Song, H.: ChatGPT and the hospitality and tourism industry: an overview of current trends and future research directions. J. Hosp. Market. Manag. **32**(5), 579–592 (2023). https://doi.org/10.1080/19368623.2023.2211993

6. Dwivedi, Y.K., Pandey, N., Currie, W., Micu, A.: Leveraging ChatGPT and other generative artificial intelligence (AI)-based applications in the hospitality and tourism industry: practices, challenges and research agenda. Int. J. Contemp. Hosp. Manag. (2023). https://doi.org/10.1108/IJCHM-05-2023-0686

7. Uzir, M.U.H., et al.: Applied artificial intelligence and user satisfaction: smartwatch usage for healthcare in Bangladesh during COVID-19. Technol. Soc. **67**, 101780 (2021)

8. Carvalho, I., Ivanov, S.: ChatGPT for tourism: applications, benefits and risks. Tour. Rev. (2023). https://doi.org/10.1108/TR-02-2023-0088

9. Battour, M., Salaheldeen, M., Mady, K.: Halal tourism: exploring innovative marketing opportunities for entrepreneurs. J. Islamic Market. **13**(4), 887–897 (2022). https://doi.org/10.1108/JIMA-06-2020-0191

10. Battour, M., Salaheldeen, M., Mady, K., Elsotouhy, M.: Halal tourism: what is next for sustainability? J. Islam. Tour. **1**, 80–91 (2021)

11. Hoyer, W.D., Kroschke, M., Schmitt, B., Kraume, K., Shankar, V.: Transforming the customer experience through new technologies. J. Interact. Mark. **51**(1), 57–71 (2020)

12. Tussyadiah, I.: A review of research into automation in tourism: launching the annals of tourism research curated collection on artificial intelligence and robotics in tourism. Ann. Tour. Res. **81**, 102883 (2020)

13. Ayedh, A., Echchabi, A., Battour, M., Omar, M.: Malaysian Muslim investors' behaviour towards the blockchain-based Bitcoin cryptocurrency market. J. Islam. Market. (2020). https://doi.org/10.1108/JIMA-04-2019-0081

14. Pillai, R., Sivathanu, B.: Adoption of AI-based chatbots for hospitality and tourism. Int. J. Contemp. Hosp. Manag. **32**(10), 3199–3226 (2020)

15. Battour, M., Mady, K., Salaheldeen, M., Elsotouhy, M., Elbendary, I., Boğan, E.: AI-enabled technologies to assist Muslim tourists in Halal-friendly tourism. J. Islam. Market. 2103030423 (2022). https://doi.org/10.1108/JIMA-01-2022-0001

16. Ratthinan, S.P., Selamat, N.H.: Negotiating travel constraints via technology: a study of Malay Muslim women through a hierarchical constraint model perspective. Asian J. Bus. Res. **9**(2), 55 (2019)

17. Kbaier, M. E. B. H., Masri, H., Krichen, S.: A personalized hybrid tourism recommender system. In: 2017 IEEE/ACS 14th International Conference on Computer Systems and Applications (AICCSA), pp. 244–250 (2017)

18. Pinheiro, A. B., Pinto, A. S., Abreu, A., Costa, E., Borges, I.: The impact of artificial intelligence on the tourism industry: a systematic review. In: Advances in Tourism, Technology and Systems: Selected Papers from ICOTTS20, vol. 1, pp. 458–469 (2021)

19. Nilashi, M., Ibrahim, O., Ahmadi, H., Shahmoradi, L.: A knowledge-based system for breast cancer classification using fuzzy logic method. Telemat. Inform. **34**(4), 133–144 (2017)

20. Ivanov, S., Webster, C.: Perceived appropriateness and intention to use service robots in tourism. In: Information and Communication Technologies in Tourism 2019: Proceedings of the International Conference in Nicosia, Cyprus, pp. 237–248 (2019)

21. Gavalas, D., Konstantopoulos, C., Mastakas, K., Pantziou, G.: Mobile recommender systems in tourism. J. Netw. Comput. Appl. **39**, 319–333 (2014)
22. Battour, M., Ismail, M.N.: Halal tourism: concepts, practises, challenges and future. Tour. Manage. Perspect. **19**, 150–154 (2016). https://doi.org/10.1016/j.tmp.2015.12.008
23. Boğan, E., Sarıışık, M.: Halal tourism: conceptual and practical challenges. J. Islam. Market. **10**(1), 87–96 (2019)
24. Moshin, A., Brochado, A., Rodrigues, H.: Halal tourism is traveling fast: community perceptions and implications. J. Destin. Mark. Manag. **18**, 100503 (2020)
25. Hsu, P., Zhao, J., Liao, K., Liu, T., Wang, C.: AllergyBot: A Chatbot technology intervention for young adults with food allergies dining out. In: Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems, pp. 74–79 (2017)
26. Ukpabi, D., Karjaluoto, H., Olaleye, S., Mogaji, E.: Influence of offline activities and customer value creation on online travel community continuance usage intention. In: Information and Communication Technologies in Tourism 2019: Proceedings of the International Conference in Nicosia, Cyprus, January 30–February 1, 2019, pp. 450–460 (2019)
27. Battour, M., Mady, K., Elsotouhy, M., Salaheldeen, M., Elbendary, I., Marie, M., Elhabony, I.: Artificial intelligence applications in halal tourism to assist Muslim tourist journey BT. In: Proceedings of International Conference on Emerging Technologies and Intelligent Systems, pp. 861–872 (2022)
28. Neuhofer, B., Buhalis, D.: Issues, challenges and trends for technology enhanced tourism experiences. In: The Routledge Handbook of Tourism Marketing (2014)
29. Ukpabi, D. C., Aslam, B., Karjaluoto, H.: Chatbot adoption in tourism services: a conceptual exploration. In: Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality, pp. 105–121. Emerald Publishing Limited (2019)
30. Nicolau, J.L., Más, F.J.: Sequential choice behavior: going on vacation and type of destination. Tour. Manage. **29**(5), 1023–1034 (2008)
31. Androutsopoulou, A., Karacapilidis, N., Loukis, E., Charalabidis, Y.: Transforming the communication between citizens and government through AI-guided chatbots. Gov. Inf. Q. **36**(2), 358–367 (2019)
32. Gajdošík, T., Marciš, M.: Artificial intelligence tools for smart tourism development. In: *Artificial Intelligence Methods in Intelligent Algorithms: Proceedings of 8th Computer Science On-line Conference 2019*, vol. 2, pp. 392–402 (2019)
33. Battour, M., Ismail, M.N., Battor, M.: The impact of destination attributes on Muslim tourist's choice. Int. J. Tour. Res. **13**(6), 527–540 (2011). https://doi.org/10.1002/jtr.824
34. AlAfnan, M.A., Dishari, S., Jovic, M., Lomidze, K.: Chatgpt as an educational tool: Opportunities, challenges, and recommendations for communication, business writing, and composition courses. J. Artific. Intell. Technol. **3**(2), 60–68 (2023)
35. Battour, M.M., Ismail, M.N., Battor, M.: Toward a halal tourism market. Tour. Anal. **15**(4), 461–470 (2010). https://doi.org/10.3727/108354210X12864727453304
36. Ray, P. P.: 'ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. Int. Things Cyber-Physic. Syst. (2023)

A Study on Opportunities and Challenges of Fashion Products via Social Commerce Amongst Young Adults in Bangalore with Reference to Social Media Influencers

M. Shashi Kumar , **L. Glady Agnes** , **Lydia Jemima** ,
Kenneth Wilson Bavachan , **and R. Muthusubramanian**

1 Introduction

Social media is a big part of modern lifestyle. Statistics shows that worldwide there is about 4.62 billion social media users [9], which is about 58.4% of the global population. This indicates an increase in the use of social media platforms. Widely used to read the latest news and learn about the latest trends, social media has evolved into an interactive medium along with interacting with friends and family.

As there is no direct financial fee for using these social networks, also social media platforms generate revenue by displaying targeted advertisements to their audiences, in return for which they receive payment only from advertisers increase. Social media sites also make money by showing ads to consumers. Social networking platforms often offer a large number of user data points and information. This study primarily focuses on opportunities and challenges for fashion products via social commerce, particularly young people. This chapter describes how social commerce (s-commerce) is currently being used in the industry and its future potential, and

M. Shashi Kumar (✉) · L. Glady Agnes · L. Jemima · K. W. Bavachan
Deparment of Commerce, Kristu Jayanti College, Bengaluru, India
e-mail: shashikumar@kristujayani.com

L. Glady Agnes
e-mail: glady.a@kristujayanti.com

L. Jemima
e-mail: lydia@kristujayanti.com

K. W. Bavachan
e-mail: kenneth@kristujayanti.com

R. Muthusubramanian
Deparment of Economics, Ambai Arts College, Ambasamudram, India

summarizes the main themes of the book. Explore the challenges of s-commerce and what technology can bring to the future. Awareness in S-commerce has increased significantly over the last decade, both in academia and industry. This is due to advances in Web 2.0 capabilities and social media sites. This makes both electronic commerce (e-commerce) platforms and social media sites more reachable and sophisticated than ever before. The relatively recent incorporation of s-commerce capabilities into Facebook and Instagram has added a new dimension to outdated social media marketing by making it easier for people to procurement products through social media.

Media inspired by lifestyle images and the convenience that accompanies them. In fact, shopping is becoming more social, constantly creating new ways to entertain and engage consumers. This is forcing millennials to place more value on experiences and time with friends and family (BoF, 2017), retailers to respond, and more social spaces (both online and offline). So it is especially important for retailers in the current situation active on their website. As a result, the purchasing power of millennials has increased, and the shopping behavior of majorly focusing on the millennials who grew up with the internet differs from previous generations (Bilgihan, 2016).

E-commerce and mobile commerce are growing exponentially in both developed and developing countries. As the number of smartphone users around the world increases, so does the use of social media platforms. A BI Intelligence study found that in 2013, 75% of sales came from social networks such as Facebook, Twitter and Pinterest. The study also identified that 39% of his Facebook users follow their favorite brands and search for products. It also claims that up to 74% of customers use social media to navigate their purchases. Rather than restricting brick-and-mortar expansion, apparel retailers are open to implementing different channels to maximize sales. Social media platforms play a huge role in today's times when it comes to doing business and generating income. According to Ecommerce Trends, a study conducted on Shopify stores found that nearly two-thirds of all social media traffic comes from Facebook. Pinterest and Twitter followed. Other networks such as YouTube, Instagram, Google + and Vine are popular media used by clothing brands to increase sales.

2   Objectives

1   To examine the opportunities of fashion products via Social commerce.
2   To analyze the impact of internet community for fashion products amongst adults.
3   To find out the impact of social media influencers on end users buying behavior.

3 Hypothesis

H_o	There is no significant relationship between internet community and social commerce for fashion products
H_1	There is significant relationship between internet community and social commerce for fashion products

4 Review of Literature

Kwon et al. [1] individuals can feel associated when they share similar ideas and opinions on social media sites because of this reason, Due to the sense of connectedness among social media users, individuals will find shopping via social media easy, convenient, and enjoyable.

For example, when customers are socially connected through social media, they interact with other type of customer by sharing information that helps them shop, such as product quality and seller credibility. Sharing this information enhances consumers' pragmatic shopping experiences by providing information that influences consumers' perceptions of usability and usefulness in social commerce shopping experiences. In addition, consumers can have a pleasurable experience, such as having fun and receiving compliments, by wearing the products at events. This shared information not only helps reduce risk for other customers in shopping, but also contributes to entertainment and enjoyment. When customers feel socially connected, they interact more with other users on social media platforms [2].

Social ties are the "belongings and ties based on quantitative and qualitative social appraisals and relational meanings" [3], p. 2. In the online environment, the use of social media creates social connections (Grieve et al. 2013). Especially for individuals who use social networks to participate and find information, form friendships, and connect with others [4].

5 Research Gap

Regarding the above literature review, many researchers focus on the influence of social media on various products available in the market. The study also focuses on fashion products via social commerce and the important role social media influencers play in staying connected and buying different products online.

5.1 Theoretical Frame Work

Differences between E-commerce and social commerce		
	E-commerce	Social commerce
Trading scope	The global trading scope	The limited trading scope
Monitoring	E-commerce doesn't need daily monitoring	Social commerce needs daily monitoring
Communication	It includes one-way communication	It includes two-way communication
Time	E-commerce is more time-consuming	Social commerce is less time-consuming
Customer engagement	Less comprehensive customer engagement comparatively	Social commerce is more comprehensive customer engagement
Trust	E-commerce is more trustworthy	Social commerce is less trustworthy
Offered by	Amazon, Flipkart, Alibaba, etc	Facebook, Instagram, Pinterest, etc

Fashion in early 80 s and recent 20 s		
	Early 80 s	20 s
Preferences	Emphasis on the cheap clothes and fashion accessories and very big poofy hair	Punk Fashion began as a reaction against both the past decades' hippie movement and the current decade's materialist values
Apparel	To be very bright and Vivid in appearance with less emphasis on the accessories	The Minimalist Fashion, mainstream adoption of tattoos, body piercings aside from ear piercing, and, to a much lesser extent, other forms of body modification such as branding
Jewellery	The Earrings became a mainstream fashion for male teenagers. Jelly or thin metal bracelets (also known as bangles) were very popular in the 1980s	People are influenced by popular culture, including athletes, musicians, movie stars, social media, and royalty. They also pay attention to what people wear in popular films, television shows, online videos, books, and music. We also are influenced by the fashion industry's advertising

5.2 What Is Social Commerce?

Social commerce is a one of the main forms of marketing and retail in which brands promote and sell their products through personal blogs and social media platforms such as Facebook, Instagram, Pinterest, Snapchat and TikTok. Online marketplaces

on social commerce platforms such as Instagram and Facebook Shop allow brands to share shoppable posts that reach potential consumers around the world browsing their favourite social media sites. Developing a social commerce strategy allows brands to streamline their online shopping experience and target consumers with products tailored to their specific tastes. Social selling enables brands to build brand loyalty, customer loyalty, and direct customer relationships. This allows customers to buy more products and share your brand on their own social channels.

5.3   How Does Social Commerce Work?

Social commerce works by enabling brands to showcase their products and services with social content that allows users to scroll and interact with their favourite social media networks. Social commerce differs from an e-commerce platform (which refers to a brand's standalone shopping site), but is often a brand-dedicated e-commerce site for customers to purchase products. Some social shopping strategies rely specifically on storefronts hosted on specific social media platforms. This strategy often provides higher conversion rates (or purchases) than brands see in dedicated online stores. Social shopping ensures a quick and easy purchasing process and encourages urgent purchase decisions on the part of customers.

5.4   Types of Social Commerce

Below are just some of the ways brands engage social media users through social commerce.

1. Buy Now Links: the Brands can share products in posts or stories with Buy Now buttons, swipe functionality, or checkout functionality. This encourages users to purchase products featured on the brand's social media product pages or e-commerce sites. Product Pins on Pinterest allow brands to buy using product images and online shopping links. Users can share and purchase these items by pinning them to their personal boards.
2. Videos: Using videos on Instagram, TikTok, or Facebook allows brands to highlight product features and showcase items in their product catalog in a more native and relevant way. This allows you to encourage your customers to purchase your product.
3. Influencer Marketing: Brands can partner with influencers who share their products and services on their social his media platform and bring consumers to his website for the brand. This form of "word of mouth" marketing allows brands to leverage the credibility of customer and influencer connections to promote their products.

4. User Generated Content: Brands may encourage users to create their own content about their products and services as a marketing strategy. They often launch user-generated content (UGC) "challenges" with hashtags, giveaways, or surveys that encourage customers to answer questions about discounts. When users create and share brand-related content, it increases brand awareness. It also allows brands to gather valuable data about their customer base so they can tailor product discovery suggestions to subsets of their audience.

5. Affiliate Marketing: Affiliate marketing is a rapidly growing marketing strategy where companies use third parties to promote their products and pay them on a commission basis. Brands hire bloggers and influencers to promote or review their products in dedicated blog posts and embed links in their copy to drive sales. receive some.

6 Methodology

The study is empirical in nature and the researchers used both primary and secondary data. Primary data collected through structured questionnaire from 100 respondent who use social media to buy products in Bangalore. Secondary data are collected from a variety of sources including published books, newspapers, magazines, published and unpublished articles, and various websites. Researchers used a convenient sampling method for data collection. Factor analysis, regression models and ranking were used by researchers for data analysis and interpretation.

7 Data Analysis and Interpretation

Factor Analysis

Here, KMO = 0.687 > 0.6 and Bartlett's sphericity test rejects the null hypothesis that the variables are not significantly correlated. Therefore, it makes sense to perform a factor analysis. Common values for all factors are greater than 0.4. This means that all factors contribute significantly to the data. Extracted factors are Likes, Textures, Custom Extraction, Ease of Use, Time Sensitive, and Budget Sensitive. Factors are determined using eigenvalues to account for total deviation. The total variance explains 72,569 (>60) and the eigenvalues of these factors are greater than 1 (Table 1).

For form factor analysis, the extracted variables are preference, type, customized extraction, usability, time sensitivity, and budget sensitivity. The impact of social media influencers on consumer purchasing behaviour. It shows that most respondents are influenced by social media buying behaviour (Table 2).

The R Square value 0.536 implies, the percent variation in internet community for fashion products amongst adults by the model is 53.6%. Since the value is <0.6,

Table 1 KMO and Bartlett's test

Kaiser–Meyer–Olkin measure of sampling adequacy		0.687
Bartlett's Test of Sphericity	Approx. Chi-square	2072.511
	df	210
	Sig	0.000

Table 2 Rotated component matrix

Extracted component	Particular	1	2	3	4	5	6
Preference	Brand influencer	0.905					
	Convenience	0.787					
	Quality	0.749					
	Sustainability of product	0.723					
	Quantity	0.582					
Nature	Reliability		0.887				
	Direct contact		0.788				
	Brand		0.618				
	Durability		0.611				
	Diversification		0.608				
Customized	Return policy			0.705			
	Personalized products			0.645			
	Ease to use			0.629			
Ease operation	User friendly website				0.72		
	Accessibility product				0.637		
Time oriented	Availability of products					0.618	
	Timely delivery					0.493	
Budget oriented	Discounts						0.6
	Pricing policy						0.54
	Package						0.533
	Refund policy						0.566
	Extraction method: principal component analysis						
	a. 6 components extracted						

it cannot be accepted as a suitable model but theirs a moderate level of impact. The significance of R Square is tested by ANOVA (Table 3).

Null hypothesis: H_0: $R^2 = 0.002$, i.e., R^2 is not significant, or the model is not suitable for the data (Table 4).

F = 91.6 with p- value 0.002 < 0.05; hence reject the null hypothesis.

Table 3 Model summary[a]

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.536[a]	0.356	−0.005	0.30228

Superscript letter 'a' denotes extracted dependent variable

Table 4 ANOVA[a]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	0.502	6	0.084	0.916	0.002[a]
	Residual	8.498	93	0.091		
	Total	9.000	99			

Superscript letter 'a' denotes extracted dependent variable

H_0	There is no significant relationship between internet community and social commerce for fashion products	Reject
H_a	There is a significant relationship between internet community and social commerce for fashion products	Accept

Also, a scatterplot of the residuals with the dependent variable is drawn to see if there is a correlation between the residuals and the variables. Must be a random pattern. Graphic is shown in (Fig. 1).
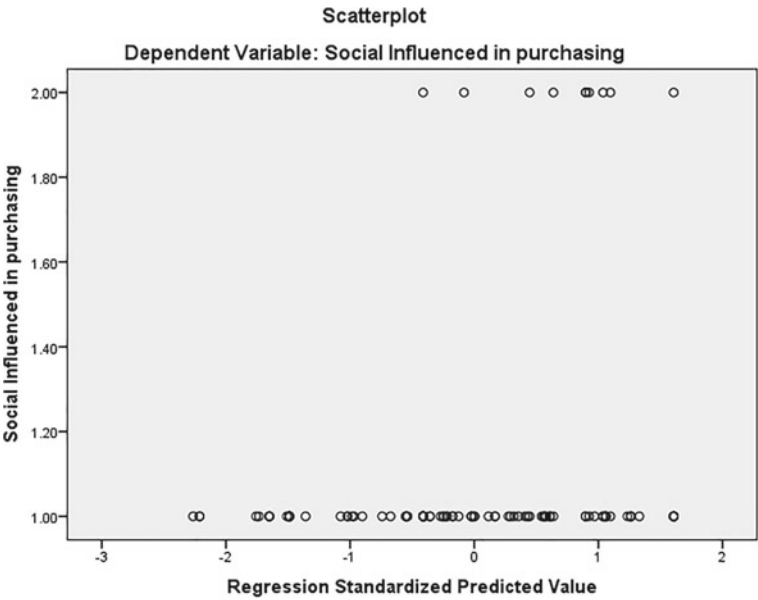
Fig. 1 Scatterplot

Table 5 Rank analysis for buying behaviour on fashion products

Particulars	SDA	DA	N	A	SA	WAS	WA	Rank
Apparel	5	15	5	35	40	390	3.9	III
Footware	35	10	5	35	15	285	2.85	VIII
Sportswear	0	12	5	55	28	399	3.99	II
Traditional wear	43	23	10	24	0	215	2.15	X
Formal wear	5	7	11	67	10	370	3.7	IV
Accessories	2	3	15	42	38	411	4.11	I
Watches & jewellery	22	23	43	6	6	251	2.51	IX
Cosmetics	13	33	5	9	40	330	3.3	V
Costumes	11	33	13	30	13	301	3.01	VI
Textiles	20	23	17	25	15	292	2.92	VII
Vintage	68	19	0	13	0	158	1.58	XI

SDA Strongly Disagree, *DA* Disagree, *N* Neutral, *A* Agree, *SA* Strongly Agree, *WAS* Weighted average system, *WA* Weighted Average.

The pattern is in the scatterplot doesn't seem to be random. Therefore, we admit that the fitted model is not a good model for predicting fashion products in the adult Internet community.

The above Shown table explains the preference of Respondents of towards the fashion products buying behaviours of Individuals, it clearly shows that Accessories ranked first and Sportswear ranked second, Apparel ranked third and Vintage are ranked as the least form their preferred by the respondents (Table 5).

8 Conclusion

The studies honestly defines the have an impact on of Social trade on Fashion Industry. The maximum favoured shopping for product online as consistent with the look at is Accessories. There is a big undertaking of commercial enterprise via social trade. People select shopping for merchandise on line however they appearance out for merchandise which might be inexpensive than the real market. Most of the clients are searching out for merchandise simply at a click on of a button however additionally for pleasant merchandise at a lesser charge brand. People are extraordinarily motivated through social trade structures along with Instagram, the problem lies with faux profiles and the dropping of cash as maximum the social trade structures do now no longer have a utility to document the charge problems as such and operates immediately from the commercial enterprise profile. The entire concept of buying is modified with inside the current instances simply through the use of a social media platform someone can save many things. But the hype of buying through social trade is handiest among teenagers elderly 18–30 years and now no longer amongst

past due 40 s. The studies honestly defines that there's a big undertaking for the commercial enterprise via social trade because the opposition is excessive and nice degree of the clients is excessive and among the more youthful technology the urge to shop for is extra however the worry of dropping cash and compromising over the pleasant is likewise excessive. Though the more youthful populace's shopping behaviour is excessive as consistent with the studies carried out clients nonetheless hesitate shopping via social media.

References

1. Kwon, S.J., Park, E., Kim, K.J.: What drives successful social networking services? a comparative analysis of user acceptance of Facebook and Twitter. Soc. Sci. J. **51**(4), 534–544 (2014)
2. Liang, T.P., Ho, Y.T., Li, Y.W., Turban, E.: What drives social commerce: the role of social support and relationship quality. Int. J. Electron. Commer. **16**(2), 69–90 (2011)
3. Van Bel, D.T., Smolders, K.C.H.J., Ijsselsteijn, W.A., de Kort, Y.: Social connectedness: concept and measurement. Intell. Environ. **2**, 67–74 (2009)
4. Bonds-Raacke, J., Raacke, J.: MySpace and Facebook: identifying dimensions of uses and gratifications for friend networking sites. Individ. Differ. Res. **8**(1), 27–33 (2010)
5. Ganapathy, D., Deepak, S.: A study on reskilling and networking on Linkedin on employee recruitment success and career advancement. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_29(2023)
6. More, A. B.: Implementing digital age experience marketing to make customer relations more sustainable. In: Nayyar, A., Naved, M., Rameshwar, R. (eds.) New Horizons for Industry 4.0 in Modern Business. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Cham. https://doi.org/10.1007/978-3-031-20443-2_5(2023)
7. Prasanna Kumar, U., Arthi, R.: A study on utility and feasibility of digital marketing tools with lead acquisition, lead nurturing and client engagement. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_24(2023)
8. Shashi Kumar, M.: Progressive structure: e-commerce business in Bangalore over a Decade—OLA and UBER Service. Empiric. Econ. Lett. 167–175 (2023)
9. Clement, J.: Number of global social network user (2017–2025) (2020). https://www.statista.com/statistics/278414/number-of-worldwide-social-network-users/.

A Study on Factors Influencing the Consumers' Perception Towards Electric Vehicle in Chennai City

P. Kumarasamy and M. Krishnamoorthi

1 Introduction

The price of fuel, which is required to run an automobile, is an issue that has an impact on people's day-to-day life. Carbon emissions affect the environment and contribute significantly to global warming, which raises temperatures and affects a country's output. As a result, one of the key reasons for lifestyle modifications is the usage of gasoline-powered vehicles. A challenging task in our life is reducing the cost of car maintenance. Rising gasoline costs, heightened awareness of carbon emissions, ecologically friendly automobiles, global warming, social obligations, and changes in governmental rules are among the issues cited as motivating people to purchase electric vehicles. This study tries to pinpoint the factors influencing consumers' perceptions about purchasing e-vehicles.

This study seeks to investigate consumers' perceptions of vehicle characteristics (colour, weight, lifetime, warranty, price, resale, recharging centers, accessory availability, speed, controlling systems, and so on) as well as analyze overall consumers' perceptions of electric vehicle purchasing decisions.

Consumers have been moving towards e-vehicles in recent years with the aim of preserving the cost of transportation, traveling, and environmental protection. The nation's government promotes the adoption of electric and environmentally friendly vehicles in order to safeguard the environment. There are numerous elements that impact and deter consumers' perceptions toward the purchase of electric vehicles in Chennai City.

P. Kumarasamy (✉) · M. Krishnamoorthi
Department of Commerce (UG), Kristu Jayanti College (Autonomous), Bengaluru,
Karnataka 560077, India
e-mail: kumarasamy@kristujayanti.com

M. Krishnamoorthi
e-mail: krishnamoorthi@kristujayanti.com

2   Review of Literature

Adhikary et al. [1] the study 'Consumers' Perceptions about electric vehicles' addressed the need for long-range miles, which other petrol vehicles lack, and examined the need for e-vehicles. The majority of individuals encounter issues like this, which include decreased range, prolonged recharging periods, and several variances from conventional automobiles.

Acharya [2] study 'Consumers' perception towards Electric Vehicle Industry- a Study on the Role of Electrical Vehicles in Environmental Sustainability' states that the general public's comprehension of e-vehicles is lagging. The average person knows very little about e-vehicles due to a lack of knowledge. To reach the audience, it is advisable to concentrate on advertising. One of the major concerns is that the government's policies do not stimulate the purchasing of electric automobiles. The government can make the necessary measures to encourage people and businesses to use electric vehicles.

Bhatia et al. [3] the research study 'Factors Influencing Consumers' Behaviour towards Electric Two-wheelers in Gujarat' State that the majority of the respondents are against charging safety, but marketers can address these issues in the future to increase sales and draw in more clients. Consumers' perceptions of the electric car may change positively as a result of the changes made to its characteristics, influencing their choice to acquire one.

Tiwari et al. [4] the research study 'Perception of Consumers on E—Vehicles in Bengaluru' state that to increase the use of electric vehicles, officials should encourage the purchase of electric vehicles and invest in research and development to update battery technology. Leaders in the sector are also expected to focus on producing electric vehicles that can compete with traditional autos in terms of speed and dependability. Finally, stakeholders must work together to increase awareness of the benefits of electric vehicles and urge more people to use them.

Parmar and Pradhan [5] the article titled 'Consumers' Perception towards E-Vehicle in Vadodara City' states that the majority of consumers place a high value on pricing, environmental consequences, low noise, and new usage trends. However, they believe that switching to an electric vehicle will be slightly more expensive. When comparing electric vehicles to traditional vehicles, people are divided on their comfort, travel efficiency, maintenance, and durability.

Muthukrishnan et al. [6] the article titled 'Consumers' perception towards Electric Vehicles' stated that Indian consumers' perceptions have begun to shift towards technology advancements in which electric vehicles have an advantage over traditional vehicles. The study's findings demonstrated that there is a favorable attitude toward purchasing an electric vehicle. One of the reasons limiting EV purchases was buyers' lack of understanding about electric vehicles.

3 Research Methodology

In order to conduct this study, primary and secondary data were used to uncover customer perceptions. To collect data from 120 respondents in the study area of Chennai City, a practical sampling strategy was utilized. The research is descriptive in nature. In order to investigate consumer impressions of their purchasing decisions for electric vehicles, the data was examined using the percentage approach, chi-square, and ANOVA.

3.1 Statement of the Problem

Since environmental issues have a significant negative impact on India's natural ecosystem, people there are shocked to realize the importance of environmental conservation. The continual change in fuel prices, which significantly affects how much it costs to live, is another important issue. An alternate method for preserving the environment and saving money is the use of electric automobiles. Despite the fact that people are moving towards electric vehicles, they are still not entirely in favour of their use due to a lack of information, the availability of features in cars, and other considerations. This study was undertaken to ascertain both positive and negative consumers' views surrounding decisions regarding buying electric vehicles.

3.2 Objectives of the Research

- To determine how buyers in Chennai feel about electric vehicles.
- To investigate consumer awareness of electric vehicles in Chennai City
- To examine the factors that encourage buyers to purchase electric vehicles in Chennai City.
- To examine the factors that discourage buyers of electric vehicles in Chennai City.

3.3 Statement of Hypothesis

(1) There is no association between consumers' gender and perception on electrical vehicles purchase decisions
(2) There is no association between consumers' age and perception on electrical vehicles purchase decisions
(3) There is no association between consumers' income and perception on electrical vehicle purchase decisions
(4) There is no association between awareness and perceptions on electrical vehicle purchase decisions

(5) There is no association between its features and perception on electric vehicle purchase decisions

4 Data Analysis and Interpretation

4.1 Frequency Analysis of Demographical Factors Towards Electric Vehicle in Chennai City

As shown in the Table1 above, there were 35% women and 85% men among the responders, according to the demographic data table. Male responders provide the vast bulk of responses. The majority of the responders are between the ages of 23 and 30 when we look at their ages. Professional jobs make up the bulk of the respondents' occupations. Lastly, the family income of the research's respondents is between 3 and 5 lakhs per year.

4.2 Frequency Analysis of Perception Towards Electric Vehicle in Chennai City

As shown in the Table2 above, Awareness about the e-vehicle was only 42% strongly agreed and 32% agreed. Convenient of the vehicle was 66% strongly agreed as well as 25% agreed but regarding battery chargeable time 69% strongly disagreed & 31% agreed. Further about the resale value, there were 76% strongly disagreed and 30% agreed.

4.3 ANOVA Test for Socio-Demographical Factor of Gender and Consumers' Perception Towards e-vehicle

Null Hypothesis: H0: There is no association between gender and consumers' perception of electrical vehicle purchase decisions.

Alternative Hypothesis: H0: There is an association between gender and consumers' perception of electrical vehicle purchase decisions.

As shown in the Table3 above, based on the result generated in the SPSS 20.0, the significant value of all variables related to the consumers' perception towards electric vehicles is greater than the p-value 0.05, Null hypothesis is accepted in all cases. Hence there is no association of the Gender of the respondents with the consumers' perception towards the electric vehicle in Chennai city. As a result of the table, the Gender of the respondents does not have a relationship with the factors

Table 1 Frequency of demographical factors towards electric vehicle in Chennai city

Description		Frequency	Percent	Cumulative percent
Age of the respondents	Below 20 years	18	15.0	15.0
	Between 20 and 30 years	62	51.7	66.7
	Between 30 and 40 years	25	20.8	87.5
	Between 40 and 50 years	10	8.3	95.8
	Above 50 years	5	4.2	100.0
	Total	120	100.0	
Gender of the respondents	Male	85	70.8	70.8
	Female	35	29.2	100.0
	Total	120	100.0	
Occupation of the respondents	Self employed	16	13.3	13.3
	Salaried employees	21	17.5	30.8
	Professionals	34	28.3	59.2
	Professional	49	40.8	100.0
	Total	120	100.0	
Annual income of the respondents	Less than 2 lakhs	20	16.7	16.7
	Between 2 and 3 lakhs	27	22.5	39.2
	Between 3 and 5 lakhs	48	40.0	79.2
	Above 5 lakhs	25	20.8	100.0
	Total	120	100.0	

of vehicle speed, convenience of the vehicle, and resale value towards consumers' perception of electric vehicles in Chennai city.

4.4 ANOVA Test for Socio-Demographical Factor of Age and Consumers' Perception Towards E-Vehicle

Null Hypothesis: H0: There is no association between Age and consumers' perception of electrical vehicle purchase decisions.

Alternative Hypothesis: H0: There is an association between Age and consumers' perception of electrical vehicle purchase decisions.

As shown in the Table4 above, based on the result generated in the SPSS 20.0, the significant value of all variables related to the consumers' perception towards electric vehicles is greater than the p-value 0.05, Null hypothesis is accepted in all cases.

Table 2 Analysis of perception towards electric vehicle in Chennai city

Description		Frequency	Percent	Cumulative percent
Awareness about e-vehicle	Strongly agree	44	36.7	36.7
	Agree	32	26.7	63.3
	Neither agree nor disagree	7	5.8	69.2
	Disagree	10	8.3	77.5
	Strongly disagree	26	21.7	99.2
	Total	120	100.0	
Expensive	Strongly agree	72	60.0	60.0
	Agree	19	15.8	75.8
	Neither agree nor disagree	5	4.2	80.0
	Disagree	15	12.5	92.5
	Strongly disagree	9	7.5	100.0
	Total	120	100.0	
Vehicle speed	Strongly agree	9	7.5	7.5
	Agree	9	7.5	15.0
	Neither agree nor disagree	2	1.7	16.7
	Disagree	19	15.8	32.5
	Strongly disagree	81	67.5	100.0
	Total	120	100.0	
Convenient of the vehicle	Strongly agree	66	55.0	55.0
	Agree	25	20.8	75.8
	Neither agree nor disagree	5	4.2	80.0
	Disagree	15	12.5	92.5
	Strongly disagree	9	7.5	100.0
	Total	120	100.0	
Battery chargeable time	Strongly agree	7	5.8	5.8
	Agree	7	5.8	11.7
	Neither agree nor disagree	6	5.0	16.7
	Disagree	31	25.8	42.5
	Strongly disagree	69	57.5	100.0
	Total	120	100.0	
Resale value	Strongly agree	7	5.8	5.8
	Agree	5	4.2	10.0

(continued)

Table 2 (continued)

Description		Frequency	Percent	Cumulative percent
	Neither agree nor disagree	2	1.7	11.7
	Disagree	30	25.0	36.7
	Strongly disagree	76	63.3	100.0
	Total	120	100.0	

Table 3 ANOVA test—gender and consumers' perception towards e-vehicle

Description		Sum of squares	df	Mean square	F	Sig.
Awareness about e-vehicle	Between groups	3.482	1	3.482	1.083	0.300
	Within groups	379.509	118	3.216		
	Total	382.992	119			
Expensive	Between groups	0.175	1	0.175	0.095	0.758
	Within groups	216.992	118	1.839		
	Total	217.167	119			
Vehicle speed	Between groups	0.047	1	0.047	0.029	0.864
	Within groups	190.319	118	1.613		
	Total	190.367	119			
Convenient of the vehicle	Between groups	0.324	1	0.324	0.181	0.672
	Within groups	211.543	118	1.793		
	Total	211.867	119			
Battery chargeable time	Between groups	0.593	1	0.593	0.440	0.508
	Within groups	158.874	118	1.346		
	Total	159.467	119			
Resale value	Between groups	0.008	1	0.008	0.007	0.934
	Within groups	145.583	118	1.234		
	Total	145.592	119			

Hence there is no association of Age with the consumers' perception of the electric vehicle in Chennai city. As a result of the table, the Age of the respondents does not have a relationship with the factors of vehicle speed, convenience of the vehicle, and resale value towards consumers' perception of electric vehicles in Chennai city.

Table 4 ANOVA test—age and consumers' perception towards e-vehicle

Description		Sum of squares	df	Mean square	F	Sig
Awareness about e-vehicle	Between groups	28.438	4	7.110	2.306	0.062
	Within groups	354.554	115	3.083		
	Total	382.992	119			
Expensive	Between groups	4.128	4	1.032	0.557	0.694
	Within groups	213.039	115	1.853		
	Total	217.167	119			
vehicle speed	Between groups	3.568	4	0.892	0.549	0.700
	Within groups	186.799	115	1.624		
	Total	190.367	119			
Convenient of the vehicle	Between groups	5.170	4	1.292	0.719	0.581
	Within groups	206.697	115	1.797		
	Total	211.867	119			
Battery chargeable time	Between groups	4.303	4	1.076	0.797	0.529
	Within groups	155.164	115	1.349		
	Total	159.467	119			
Resale value	Between groups	3.669	4	0.917	0.743	0.565
	Within groups	141.923	115	1.234		
	Total	145.592	119			

4.5 ANOVA Test for Socio-Demographical Factor of Education and Consumers' Perception Towards E-Vehicle

Null Hypothesis: H0: There is no association between education and consumers' perception of electrical vehicle purchase decisions.

Alternative Hypothesis: H0: There is an association between education and consumers' perception of electrical vehicle purchase decisions.

As shown in the Table5 above, based on the result generated in the SPSS 20.0, the significant value of all variables related to the consumers' perception towards electric vehicles is greater than the p-value 0.05 (except Battery Chargeable Time), Null hypothesis is accepted in all cases. Hence there is no association of Education with the consumers' perception towards the electric vehicle in Chennai city. As a result of the table, the Education of the respondents does not have a relationship with the factors of vehicle speed, convenience of the vehicle, and resale value (except Battery chargeable time) towards consumers' perception of electric vehicles in Chennai city.

Table 5 ANOVA test—education and consumers' perception towards e-vehicle

Description		Sum of squares	df	Mean square	F	Sig.
Awareness about e-vehicle	Between groups	2.374	3	0.791	0.241	0.867
	Within groups	380.618	116	3.281		
	Total	382.992	119			
Expensive	Between groups	6.782	3	2.261	1.246	0.296
	Within groups	210.385	116	1.814		
	Total	217.167	119			
Vehicle speed	Between groups	7.785	3	2.595	1.649	0.182
	Within groups	182.581	116	1.574		
	Total	190.367	119			
Convenient of the vehicle	Between groups	5.323	3	1.774	0.997	0.397
	Within groups	206.543	116	1.781		
	Total	211.867	119			
Battery chargeable time	Between groups	13.913	3	4.638	3.696	0.014
	Within groups	145.554	116	1.255		
	Total	159.467	119			
Resale value	Between groups	7.968	3	2.656	2.239	0.087
	Within groups	137.624	116	1.186		
	Total	145.592	119			

4.6 ANOVA Test for Socio-Demographical Factor of Occupation and Consumers' Perception Towards E-Vehicle

Null Hypothesis: H0: There is no association between Occupation and consumers' perception of electrical vehicle purchase decisions.

Alternative Hypothesis: H0: There is an association between Occupation and consumers' perception of electrical vehicle purchase decisions.

As shown in the Table 6 above, based on the result generated in the SPSS 20.0, the significant value of all variables related to the consumers' perception towards electric vehicles is greater than the p-value 0.05, Null hypothesis is accepted in all cases. Hence there is no association of Occupation with the consumers' perception towards the electric vehicle in Chennai city. As a result of the table, the Occupation of the respondents does not have a relationship with the factors of vehicle speed, convenience of the vehicle, Battery chargeable time, and resale value towards consumers' perception of electric vehicles in Chennai city.

Table 6 ANOVA test—occupation and consumers' perception towards e-vehicle

Description		Sum of squares	df	Mean square	F	Sig.
Awareness about e-vehicle	Between groups	3.108	3	1.036	0.316	0.814
	Within groups	379.884	116	3.275		
	Total	382.992	119			
Expensive	Between groups	4.602	3	1.534	0.837	0.476
	Within groups	212.565	116	1.832		
	Total	217.167	119			
Vehicle speed	Between groups	1.289	3	0.430	0.264	0.851
	Within groups	189.078	116	1.630		
	Total	190.367	119			
Convenient of the vehicle	Between groups	5.653	3	1.884	1.060	0.369
	Within groups	206.213	116	1.778		
	Total	211.867	119			
Battery chargeable time	Between groups	1.569	3	0.523	0.384	0.765
	Within groups	157.897	116	1.361		
	Total	159.467	119			
Resale value	Between groups	1.986	3	0.662	0.535	0.659
	Within groups	143.606	116	1.238		
	Total	145.592	119			

4.7 ANOVA Test for Socio-Demographical Factor of Family Annual Income and Consumers' Perception Towards e-vehicle

Null Hypothesis: H0: There is no association between Family Annual Income and consumers' perception of electrical vehicle purchase decisions.

Alternative Hypothesis: H0: There is an association between Family Annual Income and consumers' perception of electrical vehicle purchase decisions.

As shown in the Table 7 above, based on the result generated in the SPSS 20.0, the significant value of all variables related to the consumers' perception towards electric vehicles is greater than the p-value 0.05, Null hypothesis is accepted in all cases. Hence there is no association of family annual income with the consumers' perception towards the electric vehicle in Chennai city. As a result of the table, the family annual income of the respondents does not have a relationship with the factors of vehicle speed, convenience of the vehicle, Battery chargeable time, and resale value towards consumers' perception of electric vehicles in Chennai city.

Findings and Suggestions

- Awareness about electric vehicles should be improved as the maximum of respondents who agreed strongly is 42% only.
- Regarding the cost of the electric vehicle concerned, a maximum of respondents (72%) agreed strongly. So respondents compare the features with the cost of the vehicle and they perceive that the cost of the vehicle is more than traditional vehicle.
- Most of the respondents (81%) agree that vehicle speed is not adequate compared to the traditional vehicle. Vehicle speed decreases when the weight increase or battery charges decrease.
- Only 57% of the respondents strongly agreed about the other features of the electric vehicle (weight, brake system, colour, lights, etc.)
- Most of the respondents about Battery Charge time (69%) and Resale Value (72%) disagreed strongly. So the industry of electric vehicles must focus on Battery Power, Perception of the respondents regarding the Resale value of the vehicle is not good compared to the traditional vehicle.

5 Conclusion

From the research, in Chennai city also, awareness about the electric vehicle is not enough when compared with the other traditional vehicle, Perception of the electric vehicle about battery charge time, speed of the vehicle, and mileage, can be improved to maintain the resale value and perception on an electrical vehicle do not differ based on the demographical factors but differ based on the features of the vehicle. A further cost of the vehicle can be reduced to attract the consumers to make the perception

Table 7 ANOVA test—family annual income and consumers' perception towards e-vehicle

Description		Sum of squares	df	Mean square	F	Sig.
Awareness about e-vehicle	Between groups	18.382	3	6.127	1.949	0.126
	Within groups	364.610	116	3.143		
	Total	382.992	119			
Expensive	Between groups	4.940	3	1.647	0.900	0.444
	Within groups	212.227	116	1.830		
	Total	217.167	119			
Vehicle speed	Between groups	3.923	3	1.308	0.814	0.489
	Within groups	186.443	116	1.607		
	Total	190.367	119			
Convenient of the vehicle	Between groups	4.327	3	1.442	0.806	0.493
	Within groups	207.540	116	1.789		
	Total	211.867	119			
Battery chargeable time	Between groups	4.908	3	1.636	1.228	0.303
	Within groups	154.559	116	1.332		
	Total	159.467	119			
Resale value	Between groups	3.380	3	1.127	0.919	0.434
	Within groups	142.212	116	1.226		
	Total	145.592	119			

towards the electric vehicles in the positive trends. Overall the perception of the features of vehicles is average compared with the cost and features of traditional vehicles in the research area.

References

1. Adhikary, S., Jalan, N., Anute, N.: Consumers' perception of electric vehicles. J. Manage. Res. Analy. **9**(3), 144–149 (2022)

2. Acharya, S.: Consumers' perception towards electric vehicle industry- a study on the role of electrical vehicles in environmental sustainability. J. Emerg. Technol. Innov. Res. (JETIR) **6**(5), 77–102 (2019)
3. Bhatia, M., Chauhan, H.A., Kumar, D.: Study of factors influencing consumers' behaviour towards electric two-wheelers in Gujarat. Soc. Sci. Res. Netw. (SSRN) **19**, 89–99 (2021)
4. Tiwari, R., Gupta, V., Ganna, P., Jain, K., Bohra, J., Kumar, S., Gupta, A.P.: A study on perception of consumers on e-vehicles in Bengaluru. J. Res. Appl. Sci. Eng. Technol. (IJRASET) **2**(4), 2497–2510 (2023)
5. Parmar, A., Pradhan, T.: A study on consumers' perception towards e-vehicle in Vadodara City. Int. J. Creat. Res. Thoughts (IJCRT) **9**(5), f484–f494 (2021)
6. Muthukrishnan, R., Perezhil Prakash, R., Naveen Rajkumar, M., Ranjithvel, A., Akhil, C.: Consumers' perception towards Electric Vehicles. Eur. Chem. Bull (ECB) **12**(4), 4576–4588 (2023)

The Future of Luxury Brand Management: A Study on the Impact of New Technology and Relationship Marketing

Vandana Gupta, Junaid Hushain, and Abhilasha Mathur

1 Introduction

The digital age has brought rapid technical breakthroughs that have changed numerous sectors. Luxury products, generally associated with timelessness, provide a unique blend of history and innovation amid this upheaval. This market, known for its artistry and uniqueness, must balance its heritage with the digital world.

Statistics from [1] illuminate the luxury scene. The luxury goods business is booming, earning US$355 billion in 2023. The projected growth rate from 2023 to 2028 is 3.38%, also remarkable. Luxury Fashion dominates categories with US$112 billion in 2023. The US led the industry with US$75,690 million in sales in 2023. This makes each person contribute US$46.18. Online sales are expected to account for 22.4% of luxury industry income by 2023 [1].

> "To understand luxury, one must look past mere statistics and growth curves. As expressed by Bernard Arnault, the founder and CEO of LVMH, luxury is about fulfilling dreams. Such items might not address practical needs but they cater to human aspirations. This perspective underscores the unique potential of luxury to provide substantial margins."

1.1 Delving into the World of Luxury and Luxury Brands

Luxury is an experience, an ideal, and a representation of perfect artistry and legacy, not just a commodity. Luxury businesses embody this experience through physical goods, dreams, histories, and quality claims [2]. These brands blend old and new effortlessly, creating a magnetic atmosphere that draws generations [3].

V. Gupta (✉) · A. Mathur
LM College of Science & Technology, Jodhpur, India
e-mail: falsevandanag20@gmail.com

J. Hushain
JNV University, Jodhpur, India

1.2 A Glimpse into Luxury Brand Management

Art and strategy are needed to manage such famous businesses. Luxury brand management is the key to maintaining the company's image in a crowded market. Brand managers must carefully mix the brand's history with current needs to keep it relevant and aspirational [4].

1.3 Emergence of New Technology and the Imperative of Relationship Marketing

Today's digital integration mandate provides luxury firms with a demanding but rewarding conundrum. While incorporating cutting-edge technologies is necessary, these firms must also strengthen consumer relationships. Relationship marketing—based on trust and authentic connections—is crucial in this scenario [5]. Navigating this complex ecosystem defines premium brands' digital challenges and potential. Our research deciphers the mystical realm of luxury brand management in the digital era, highlighting legendary luxury firms' complex techniques to retain and increase their appeal.

2 Purpose of the Study and Research Objectives

This study examines the impact of technology and relationship marketing on luxury brand management. We are focusing on the shift from traditional to modern branding, emphasizing the role of digital tools like VR/AR and AI. Understanding how brands foster loyalty and how technology enhances this relationship is central to our research. Our findings highlight current challenges and opportunities while providing strategic guidance for luxury brands, drawing insights from current trends and case studies.

3 Literature Review

3.1 Definition and Evolution of Luxury Brand Management

Consumer habits, marketing tactics, and brand perceptions interact intricately in luxury brand management. Numerous study avenues have made essential contributions to our understanding of the various features of this dynamic topic. We give a succinct summary of the most critical conclusions from significant research papers that, taken together, advance our understanding of luxury brand management (Table 1).

Table 1 Key findings in luxury brand research

Research area	Key findings
Experiential needs in luxury [6]	Experiential needs influence luxury attitudes; materialism does not.
Pricing in luxury [7]	Luxury price perceptions vary globally; adjust for consumer-product dynamics.
Price display impact [8]	Displays enhance brand perception via uniqueness.
Market segmentation [9]	Consistent segments like "information seekers" exist globally in luxury fashion.
Gender in segmentation [10]	Women value luxury brands more, focusing on quality and uniqueness.
Social media in luxury [11]	Entertainment and customization are essential for effective campaigns.
Social media & materialism [12]	Arab users show more materialism; social media predicts luxury buying intentions.
Social media advertising [13]	Positive attitudes towards ads boost luxury purchase intentions.

3.2 Evolution of Luxury Brand Management

Luxury brand management emphasizes enhancing marketability and exclusivity, underpinned by unparalleled quality and distinct brand persona. Historically, brands like Louis Vuitton and Hermès laid the groundwork, associating luxury with quality, exclusivity, and distinct logos signifying prestige. The twentieth century brought globalization to luxury brands, challenging them to keep brand uniformity across diverse markets while adapting to the digital era's need for online presence yet preserving exclusivity. Contemporary luxury brand strategies focus on experiential and ethical facets, valuing customization, personalization, well-being, and fostering meaningful connections. In essence, luxury brands artfully merge their rich heritage with modern advancements, ensuring enduring prominence amidst evolving consumer tastes and societal norms.

3.3 Role of Technology in Luxury Branding

Digitalization of Luxury Experience

Technology's integration into luxury branding has transformed the customer-brand relationship. AR and VR tools, like virtual try-ons, amplify customer experiences [14]. Big data analytics tailors luxury marketing and product offerings [15], while social media, e-commerce, and omnichannel approaches maintain exclusivity with broader reach [2, 16]. Blockchain ensures ethical manufacturing [17], and 3D printing accentuates personalization [18].

In luxury retail, VR and AR foster immersive experiences, such as rich virtual showrooms and try-ons, elevating engagement [14, 19]. AI in luxury marketing drives personalization and efficiency. Harnessing AI's potential, brands provide tailored products and narratives, enhancing loyalty [20] and enabling targeted marketing [21]. AI tools, like chatbots, elevate real-time engagement. In essence, VR, AR, and AI are now central to luxury branding, meeting modern consumers' refined expectations.

3.4 Relationship Marketing for Luxury Brands

Relationship Marketing in Luxury Firms

Relationship marketing aims to foster enduring, emotionally-charged connections, moving beyond mere transactions to build profound relationships with customers in luxury firms.

Establishing Emotional Bonds with Customers

Luxury businesses focus on creating deep emotional ties with clients, aligning with their unique lifestyles and aspirations. This alignment fosters a bond beyond mere product attraction [22]. Through personalized communication, exclusive events, and brand storytelling [23], brands cement these emotional bonds, which form the foundation of true brand loyalty.

Customer Loyalty and Advocacy

Loyalty is pivotal for luxury brands as it transforms singular transactions into lasting connections [24]. Customers deeply connected to a brand do not just make repeat purchases,they become brand champions. Strategies like loyalty programs, exclusive offers, and unparalleled customer service [6] ensure repeat business and potent word-of-mouth recommendations.

Influencer Marketing in the Luxury Sector

In the digital age, influencer marketing has emerged as a powerhouse for luxury branding. Partnering with influencers aligned with a brand's ethos significantly broadens reach [25, 26]. Influencers infuse authenticity and relatability into the brand through content creation and endorsements, bridging gaps that conventional advertising may miss [27]. At last, relationship marketing in luxury sectors transcends mere sales, focusing on forging a community, crafting unique experiences, and nurturing enduring connections. Luxury firms cultivate unparalleled relationships rooted in exclusivity, genuineness, and mutual respect by championing these principles.

3.5 Previous Studies and Findings on Technology and Relationship Marketing in Luxury Brands

See Table 2.

Table 2 Studies and findings on technology and relationship marketing in luxury brands

Aspect	Key findings
Personalization	Tech-driven personalized experiences strengthen customer-brand connections [11]
E-commerce Engagement	Brand-aligned online shopping deepens engagement [28]
VR and AR Marketing	Immersive tech fosters a deeper brand relationship [14]
Influencer Marketing	A prime strategy for audience engagement on social media [25, 26]
CRM in Luxury	CRM enhances marketing personalization and loyalty [16, 29]
Blockchain Authenticity	Boosts product trust and appreciation [30]
Multimedia E-commerce	Strengthens brand loyalty and connection [19]

4 Impact of New Technology on Luxury Brand Management

The luxury brand industry has experienced significant shifts in the evolving digital age. Luxury firms aim to sustain their allure and exclusivity in a more connected era by merging their once-exclusive offerings with the latest technologies.

4.1 Virtual Try-On and Shopping Experiences

The luxury retail arena is undergoing shifts with the advent of AR and VR, providing personalized digital interactions and signifying the brands' commitment to individualized experiences. This tech-reliance became crucial during events like the COVID-19 outbreak [31]. Concurrently, with the spike in online shopping, luxury e-commerce is on the rise. Luxury entities collaborate with tech companies, tapping into their expansive reach and data. They integrate omnichannel approaches, maintaining uniform brand storytelling across various touchpoints [32].

4.2 Embracing Customization and Personalization in Luxury Branding

Modern consumers demand experiences tailored to their identities and values. Addressing this, luxury brands are leaning into AI-driven personalization, offering specific product recommendations based on complex data analysis [20]. This increased focus on customization and co-creation enhances brand loyalty and underscores the unique craftsmanship inherent in luxury products [16].

4.3   Maintaining Brand Exclusivity in the Digital Age

The vast digital expansion challenges luxury brands, particularly in retaining their exclusivity. Actively managing their online reputation, brands adopt advanced digital strategies to control their narrative and monitor discussions across platforms. To combat the rise of counterfeit products in this digital era, brands are turning to technologies like blockchain, RFID chips, and QR codes, ensuring product authenticity and strengthening consumer trust [33].

4.4   Pioneering Technological Integration: Brand Examples

In the digital age, luxury brands utilize modern technologies to improve customer experience and stand out. By doing so, they meet the changing desires of their elite clientele and strengthen their standing in the luxury sector. Table 3 showcases how leading luxury brands have adeptly integrated these technologies into their operations.

Table 3 indicates that luxury brands rapidly adopt advanced technology, reflecting the sector's adaptability to evolving customer tastes and tech progress. While strategies differ, the primary goal is to offer unique, tailored experiences. As technology advances, it will be intriguing to see how these brands further innovate and reshape luxury for future consumers.

Table 3 Luxury brands' tech integration

Luxury brand	Technology implementation
Burberry	• AR shopping tool via google search • Digital store experience with interactive mirrors
Gucci	• Virtual shoe "try-on" using AR • 3D Printed Runway Outfits
Dior	• Exclusive AR filters on Instagram for hats and accessories
Louis Vuitton	• Blockchain authentication • LV Pass mobile app with AR content
Moncler	• Gamification on its Chinese website
Rolex	• Interactive digital catalogues with 3D models
TAG Heuer	• Virtual Showroom
Cartier	• WeChat Mini-Program offering e-commerce, customer support, and AR-based try-ons
Montblanc	• Luxury smartwatches combining traditional craftsmanship with digital functionalities
Yoox Net-a-Porter	• Al-Powered Private Label based on customer preferences

5   Role of Relationship Marketing in Luxury Brands

5.1   Forming Emotional Ties with Consumers

Luxury brands employ relationship marketing to foster enduring ties with consumers. Hermès, for instance, leverages its storied history, creating narratives based on tradition and mastery that deeply appeal to customers [2]. Further, luxury brands offer immersive experiences beyond mere products. Louis Vuitton's pop-ups and exhibitions, such as runway shows, encapsulate customers in a comprehensive brand experience rather than just showcasing items.

5.2   Nurturing Allegiance and Customer Endorsement

In the luxury sector, building consumer loyalty is crucial. Chanel and Gucci, for instance, provide VIP perks such as bespoke shopping experiences and private product unveilings, ensuring their top-tier customers feel valued [34]. Beyond the sale, brands like Rolex emphasize the importance of the ongoing relationship, evidenced by their comprehensive post-purchase services.

5.3   Tapping into the Potential of Influencer-Driven Marketing in Luxury Domain

In today's luxury market, influencers hold substantial sway. Brands such as Dior align with digital figures, including Chiara Ferragni, to showcase products, resonating notably with younger demographics [25, 26]. Furthermore, given the considerable resources allocated to influencer collaborations, luxury brands employ advanced tools to gauge the success of such campaigns [35].

5.4   Case Studies of Luxury Brands Utilizing Relationship Marketing Strategies

Luxury brands seamlessly combine traditional values with contemporary strategies to stay relevant. Burberry embraced digital transformation, promoting user engagement with its 'The Art of the Trench' campaign [36]. Tiffany & Co. prioritized authentic love tales in "What Makes Love True", establishing an emotional connection. Gucci's 'Gucci Garden' in Florence offers an immersive brand experience, blending a store, museum, and café [37]. Rolex showcases its dedication to quality and client rapport

with comprehensive post-sale services [38]. Louis Vuitton leverages the impact of celebrity affiliations, collaborating with icons like Jeff Koons and Selena Gomez [39]. These examples underscore the significance of adaptability, genuine interaction, and continuous innovation in the luxury domain.

6 The Synergy Between Technology and Relationship Marketing

Technology integration has significantly enhanced relationship marketing strategies, fostering deeper connections with consumers in the digital age.

6.1 Integrating Technology in Relationship Building

Brands are harnessing technology and digital platforms for enhanced personalization and engagement. Utilizing AI and data analytics, Sephora, for instance, provides customized experiences with programs like "Beauty Insider," which suggests products based on buying patterns [40]. Meanwhile, brands like Chanel use social media for direct customer interaction, as evidenced by the #TheChanelGabrielle bag campaign that solicited user narratives [41].

6.2 Fostering Emotional Engagement with Technology

AI chatbots capable of recognizing human emotions enhance online user experiences, with Kia employing such technologies for improved website interactions [42]. Concurrently, AR and VR offer immersive brand events, exemplified by Balenciaga's Fall 2021 VR collection showcase [43]. Essentially, the blend of technology and relationship marketing provides brands the capability to offer emotionally-rich, tailor-made digital interactions.

6.3 Successful Examples of Technology-Driven Relationship Marketing in Luxury Brands

Luxury companies are adopting digital marketing strategies due to technology's widespread influence and changing consumer behaviours. Table 4 showcases key digital initiatives by leading luxury brands.

Table 4 Digital initiatives by luxury brands

Brand	Initiative	Description	References
Burberry	Art of the Trench	Launched a website for users to upload photos in the brand's trench coats, turning them into brand ambassadors	[36]
Dior	VR Backstage	Dior Eyes" VR headset gave a behind-the-scenes look at Dior shows	[20]
Louis Vuitton	Chatbot	AI chatbot on its website for tailored product recommendations	[44]
Gucci	AR Try-On	AR feature on its app for users to " try on" shoes	[37]
Cartier	WeChat Campaign	WeChat campaign for users to send custom digital bracelets	[45]

Table 4 highlights luxury firms' digital strategies to enhance customer engagement. This includes Burberry's user-generated content, Dior's VR backstage, and Louis Vuitton's AI chatbot. By integrating social media and augmented reality, these brands offer memorable experiences. The evolving digital landscape promises further innovations in luxury marketing.

7 Challenges and Opportunities for Luxury Brand Management

Modern luxury brand management grapples with technology-driven challenges, which can be turned into opportunities through inventive strategies. The growing digital integration intensifies concerns over data privacy, yet brands can bolster trust through tools like blockchain, ensuring superior data safety [46]. The widespread use of digital mediums risks eroding the exclusivity luxury brands have built, but this can be mitigated by adopting unique digital spaces and engaging niche influencers [47]. Contemporary consumers favor luxury brands with sustainable and ethical values, prompting these brands to emphasize eco-friendly practices and ethical material sourcing [48]. The rise of startups and DTC models threatens established luxury paradigms, yet offers chances for partnerships and acquisitions, allowing luxury brands to deepen consumer relationships [49].

8 Conclusion

Core Reflections from the Study

In the contemporary digital age, luxury brands, regardless of their illustrious past and revered heritage, find themselves at a pivotal juncture. They are thrust

into a realm where innovation is desirable and imperative. Brands with a storied history, such as Burberry and Louis Vuitton, are a testament to this paradigm shift. They have successfully manoeuvred their strategies to include today's digital-centric consumers while ensuring they do not dilute their esteemed lineage. This blending of the traditional with the contemporary underlines the importance of being flexible and forward-looking without losing sight of one's roots.

Ramifications and Prospects in the World of Luxury Branding

The internet world is a vast, ever-changing landmine and gold mine for luxury businesses. Ensuring customer data security and privacy is their top priority. In a world of plentiful and accessible information, luxury brands' mystique and exclusivity are even more important. This huge digital environment is full of opportunity as well as challenges. Digital tools help luxury brands build deeper, more tailored customer interactions. Luxury shoppers today value quality and ethical and sustainable brands. This allows luxury brands to rise by associating with these principles. Additionally, nimble companies and direct-to-consumer strategies provide a new perspective. To stay current and interesting, premium brands might collaborate or embrace more nimble tactics.

References

1. Statista.: Luxury Goods Market Analysis. Statista Research Report (2023)
2. Kapferer, J. N., & Bastien, V.: The Luxury Strategy: Break the Rules of Marketing to Build Luxury Brands Hardcove*r* (3rd ed) p. 2. Kogan Page Publishers (2012)
3. Chevalier, M., Mazzalovo, G.: Luxury Brand Management: A World of Privilege. John Wiley & Sons (2008)
4. Tungate, M.: Luxury World: The Past, Present, and Future of Luxury Brands. Kogan Page Publishers (2012)
5. Keller, K. L.: Strategic Brand Management: Building, Measuring, and Managing Brand Equity. Pearson Education (2013)
6. Kim, A.J., Ko, E.: Do social media marketing activities enhance customer equity? an empirical study of luxury fashion brands. J. Bus. Res. **65**(10), 1480–1486 (2012). https://doi.org/10.1016/j.jbusres.2011.10.014
7. Kapferer, J.N., Laurent, G.: Where do consumers think luxury begins? A study of perceived minimum price for 21 luxury goods in 7 countries. J. Bus. Res. **69**(1), 332–340 (2016). https://doi.org/10.1016/j.jbusres.2015.08.005
8. Parguel, B., Delécolle, T., Valette-Florence, P.: How price display influences consumer luxury perceptions. J. Bus. Res. **69**(1), 341–348 (2016). https://doi.org/10.1016/j.jbusres.2015.08.006
9. Ko, E., Kim, E., Taylor, C.R., Hoon Kim, K., Jeong Kang, I.: Cross-national market segmentation in the fashion industry: a study of European, Korean, and US consumers. Int. Market. Rev. **24**(5), 629–651 (2007). https://doi.org/10.1108/02651330710828022
10. Stokburger-Sauer, N.E., Teichmann, K.: Is luxury just a female thing? the role of gender in luxury brand consumption. J. Bus. Res. **66**(7), 889–896 (2013). https://doi.org/10.1016/j.jbusres.2011.12.007
11. Kim, A.J., Ko, E.: Impacts of luxury fashion brand's social media marketing on customer relationship and purchase intention. J. Glob. Fash. Market. **1**(3), 164–171 (2010). https://doi.org/10.1080/20932685.2010.10593068

12. Kamal, S., Chu, S.C., Pedram, M.: Materialism, attitudes, and social media usage and their impact on purchase intention of luxury fashion goods among American and Arab young generations. J. Interact. Advert. **13**(1), 27–40 (2013)
13. Chu, S., Kamal, S., Kim, Y.: Understanding consumers' responses towards social media advertising and purchase intention towards luxury products. J. Glob. Fash. Market. **4**(3), 158–174 (2013). https://doi.org/10.1080/20932685.2013.790709
14. Pantano, E., Rese, A., Baier, D.: Enhancing the online decision-making process by using augmented reality: a two country comparison of youth markets. J. Retail. Consum. Serv. **38**, 81–95 (2017). https://doi.org/10.1016/j.jretconser.2017.05.011
15. Verhoef, P.C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J.Q., Fabian, N., Haenlein, M.: Digital transformation: a multidisciplinary reflection and research agenda. J. Bus. Res. **122**, 889–901 (2021). https://doi.org/10.1016/j.jbusres.2019.09.022
16. Tynan, C., McKechnie, S., Chhuon, C.: Co-creating value for luxury brands. J. Bus. Res. **63**(11), 1156–1163 (2010). https://doi.org/10.1016/j.jbusres.2009.10.012
17. Saberi, S., Kouhizadeh, M., Sarkis, J., Shen, L.: Blockchain technology and its relationships to sustainable supply chain management. Int. J. Prod. Res. **57**(7), 2117–2135 (2019). https://doi.org/10.1080/00207543.2018.1533261
18. Rayna, T., Striukova, L.: From rapid prototyping to home fabrication: How 3D printing is changing business model innovation. Technol. Forecast. Soc. Chang. **102**, 214–224 (2016). https://doi.org/10.1016/j.techfore.2015.07.023
19. Grewal, D., Roggeveen, A.L., Nordfält, J.: The future of retailing. J. Retail. **93**(1), 1–6 (2017). https://doi.org/10.1016/j.jretai.2016.12.008
20. Huang, M.H., Rust, R.T.: Artificial intelligence in service. J. Serv. Res. **21**(2), 155–172 (2018). https://doi.org/10.1177/1094670517752459
21. Li, S., Karahanna, E.: Online recommendation systems in a B2C e-commerce context: a review and future directions. J. Assoc. Inform. Syst. **16**(2):72–107 (2015). https://doi.org/10.17705/1jais.00389
22. Fournier, S.: Consumers and their brands: Developing relationship theory in consumer research. J. Consum. Res. **24**(4), 343–353 (1998). https://doi.org/10.1086/209515
23. Schmitt, B.: The consumer psychology of brands. J. Consum. Psychol. **22**(1), 7–17 (2012). https://doi.org/10.1016/j.jcps.2011.09.005
24. Oliver, R. L.: Whence consumer loyalty? J. Market. **63**(4_suppl1), 33–44 (1999). https://doi.org/10.1177/00222429990634s105
25. Freberg, K., Graham, K., McGaughey, K., Freberg, L.A.: The rise of digital influencers: A study on personality perceptions and engagement metrics. Public Relat. Rev. **37**(1), 120–125 (2011)
26. Freberg, K., Graham, K., McGaughey, K., Freberg, L.A.: Who are the social media influencers? a study of public perceptions of personality. Public Relat. Rev. **37**(1), 90–92 (2011). https://doi.org/10.1016/j.pubrev.2010.11.001
27. Djafarova, E., Rushworth, C.: Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users. Comput. Hum. Behav. **68**, 1–7 (2017). https://doi.org/10.1016/j.chb.2016.11.009
28. Dauriz, L., Remy, N., Tochtermann, T.: A multifaceted future: the jewelry industry in 2020. McKinsey & Company (2014)
29. Payne, A., Frow, P.: A strategic framework for customer relationship management. J. Mark. **69**(4), 167–176 (2005). https://doi.org/10.1509/jmkg.2005.69.4.167
30. Fuentes, C.: Blockchain and luxury brands. J. Brand Manag. **26**(1), 97–104 (2019)
31. Wang, Z., Yuan, R., Luo, J., Liu, M.J.: Redefining "masstige" luxury consumption in the post-COVID era. J. Bus. Res. **143**, 239–254 (2022). https://doi.org/10.1016/j.jbusres.2022.01.057
32. Verhoef, P.C., Kannan, P.K., Inman, J.J.: From multi-channel retailing to omni-channel retailing: Introduction to the special issue on multi-channel retailing. J. Retail. **91**(2), 174–181 (2015)

33. Avery, J., Steenburgh, T.J., Deighton, J., Caravella, M.: Adding bricks to clicks: predicting the patterns of cross-channel elasticities over time. J. Mark. **76**(3), 96–111 (2012). https://doi.org/10.1509/jm.09.0081

34. Das, G.: Impacts of retail brand personality and self-congruity on store loyalty: the moderating role of gender. J. Retail. Consum. Serv. **21**(3), 130–138 (2014). https://doi.org/10.1016/j.jretconser.2013.07.011

35. De Veirman, M., Cauberghe, V., Hudders, L.: Marketing through Instagram influencers: The impact of number of followers and product divergence on brand attitude. Int. J. Advert. **36**(5), 798–828 (2017). https://doi.org/10.1080/02650487.2017.1348035

36. Okonkwo, U.: Luxury Fashion Branding: Trends, Tactics, Techniques. Palgrave Macmillan (2007)

37. Manlow, V.: Designing Clothes: Culture and Organization of the Fashion Industry. Transaction Publishing (2009)

38. Kapferer, J. N., Bastien, V.: The Luxury Strategy: Break the Rules of Marketing to Build Luxury Brands. Kogan Page Publishers (2009)

39. Phau, I., Prendergast, G.: Consuming luxury brands: the relevance of the "rarity principle." J. Brand Manag. **8**(2), 122–138 (2000). https://doi.org/10.1057/palgrave.bm.2540013

40. Kumar, V., Reinartz, W.: Creating enduring customer value. J. Mark. **80**(6), 36–68 (2016). https://doi.org/10.1509/jm.15.0414

41. Labrecque, L.I., Vor Dem Esche, J., Mathwick, C., Novak, T.P., Hofacker, C.F.: Consumer power: Evolution in the digital age. J. Interact. Mark. **27**(4), 257–269 (2013). https://doi.org/10.1016/j.intmar.2013.09.002

42. Ischen, C., Araujo, T., Voorveld, H., van Noort, G., Smit, E.: Privacy concerns in chatbot interactions. In: Chatbot Research and Design [Third international workshop]. Conversations 2019, Revised Selected Papers 3 (pp. 34–48). Amsterdam, The Netherlands, *November 19–20, 2019*. Springer International Publishing (2020)

43. Scholz, J., Duffy, K.: We are at home: how augmented reality reshapes mobile marketing and consumer-brand relationships. J. Retail. Consum. Serv. **44**, 11–23 (2018). https://doi.org/10.1016/j.jretconser.2018.05.004

44. Godey, B., Manthiou, A., Pederzoli, D., Rokka, J., Aiello, G., Donvito, R., Singh, R.: Social media marketing efforts of luxury brands: Influence on brand equity and consumer behavior. J. Bus. Res. **69**(12), 5833–5841 (2016). https://doi.org/10.1016/j.jbusres.2016.04.181

45. Chaffey, D., Ellis-Chadwick, F.: Digital Marketing. Pearson (2019)

46. Martin, K.: Ethical implications of location tracking. Bus. Horiz. **61**(3), 423–431 (2018)

47. Phan, M., Thomas, R., Heine, K.: Social media and luxury brand management: the case of Burberry. J. Glob. Fash. Market. **2**(4), 213–222 (2011). https://doi.org/10.1080/20932685.2011.10593099

48. Joy, A., Sherry, J.F., Jr., Venkatesh, A., Wang, J., Chan, R.: Fast fashion, sustainability, and the ethical appeal of luxury brands. Fash. Theory **16**(3), 273–295 (2012). https://doi.org/10.2752/175174112X13340749707123

49. Bucklin, R.E., Sismeiro, C.: A model of web site browsing behavior estimated on clickstream data. J. Mark. Res. **40**(3), 249–267 (2003). https://doi.org/10.1509/jmkr.40.3.249.19241

An Analytical Study on the Self-Help Group Through Financial Inclusion Scheme in India

V. Saravanan, D. K. Baranitharan, M. Thenkovan, and K. Sivasubramanian ⓘ

1 Introduction

According to the survey, 47% of the population depends on agriculture for a living, while 65% of the population resides in rural areas as of 2021 figures. Therefore, it is crucial that the government concentrate on rural development. In order to promote more inclusive and equitable development, the government has placed a strong emphasis on raising the standard of living in rural areas. "Transforming people's lives and livelihoods via proactive socioeconomic diversity, integration, and empowering of India" has been the stated goal of the government's involvement in the rural economy [1]. The survey makes use of data from the National Family Health Survey for the years 2019–21, which shows a significant improvement over the period of 2015–16 in a number of indicators related to the standard of living in rural areas, including, among other things, access to electricity, the presence of better sources of drinking water, protection under medical insurance programmes, etc. Women's empowerment is also gaining momentum, as evidenced by the increase in female involvement in household decision-making, bank account ownership, and mobile phone use [2]. Most health-related indicators for remote women and children are now better. These outcome-focused statistics demonstrate measurable mid-term improvement in rural quality of life, made possible by the policy emphasis on essential utilities and effective programme execution [3].

V. Saravanan
Department of Business Administration, Guru Nanak College, Chennai, India

D. K. Baranitharan
Department of Commerce, Sri Muthukumaran Arts and Science College, Chennai, India

M. Thenkovan
Department of Economics, Guru Nanak College, Chennai, India

K. Sivasubramanian (✉)
Department of Economics, Kristu Jayanti College, Bangalore, India
e-mail: sivasubramanian16@gmail.com

1.1 Structure of the Paper

This paper has been structured as follows, Introduction or background of the study, literature reviews from various existing research works, objectives of the study, methodology applied, data analysis and interpretation and finally, major findings and conclusion.

2 Literature Review

India is having trouble sustaining the SHG trend, especially in SBLP, and consolidating it. To do this, the obstructions must be recognised, and suitable solutions must be created to get through them. The government's promotion efforts need to be reinforced with knowledge gained from the experiences of other states as well as unbiased evaluations and observations of the country's SHG institutions as they stand at the moment [4]. In India right now, ensuring financial access through technical advancements is the only goal of financial inclusion. There could be different levels of inclusion. The "super-included," or individuals who are aggressively attracted by the finance sector, can be found at one extreme, and those who are financially omitted, who are refused possession of the simplest of financial products, can be found at the other [5, 6]. Women continue to belong to some of the poorest communities in the world despite several socioeconomic advancements, as they are unable to take advantage of resources on an equal basis with males. Women's empowerment thus becomes a key component of sustainable development. MFIs want to strengthen women by encouraging them to save more money. The government is making consistent efforts to formalise the SHG system and provide it with extra financial assistance by consistently trying to connect the financial sector and SHGs. Technology and creativity are also necessary to help women become financially literate. Without their participation in raising awareness about financial inclusion, women cannot be empowered [7]. For the purposes of this article, it is crucial to address the issue of Indian traditional microfinance institutions' inability to draw in the lowest of the poor among Muslims. This study investigates a Shari'ah-compliant microfinance system that will level the playing field in terms of the poor's financial inclusion [8, 9]. According to survey analysis, the general population of India, particularly those from the impoverished minority community and the lower middle class, is in a terrible financial state. IMF can be a crucial part of delivering people from financial enslavement [10]. Regardless of participation status, female economic and social empowerment improved in programme regions, indicating positive externalities. New participants saw a greater nutritional advantage than members of the established groups. Indicators showing increased consumption by participants, but not increased income or asset creation, point to the program's major economic effects at the time of the survey being consumption smoothing and income diversification rather than the exploitation

of new revenue sources. Such programmes' impact can be evaluated in a variety of ways, which can provide highly useful insights for policymakers [11].

3   Objectives

To identify the role of self-help groups in generating employment and economic empowerment in India.

To analyse the impact of financial inclusion programmes through self-help groups-bank linkage programmes.

4   Methodology

This paper follows the descriptive method of research study to analyse the data and interpret it. Data has been collected from various secondary-level open sources published from the Reserve Bank of India, and Government data. The collected data has been tabulated and graphically represented to establish their significance related to the study and inferred as well.

5   Data Analysis and Interpretation

Self Help Groups (SHGs) have the power to transform communities for the better, as demonstrated by their crucial role in the local response to Covid-19. SHGs have also been the driving force behind rural development by empowering women. About 1.2 crore SHGs exist in India, 88% of which are run entirely by women. The largest microfinance scheme in the world, the SHG Bank Linkage Scheme (SHG-BLP), was first introduced in 1992. By way of 119 lakh SHGs having savings deposits totalling Rs. 47,240.5 crores and 67 lakhs groups with outstanding collateral-free loans totalling Rs. 1,51,051.3 crores as of 31 March 2022, the SHG-BLP serves 14.2 crore families. The number of SHGs that are credit connected has increased over the past ten decades (FY13 to FY22) at a CAGR of 10.8%. Women's economic SHGs have a favourable, statistically significant impact on their ability to exercise social, political, and economic power. These favourable effects on empowerment can be attained in a number of ways, including through asset ownership, financial decision-making, enhanced social networks, and familiarity with managing money [12]. A recent evaluation of the DAY-National Rural Livelihood mission found that both subjects and functionaries thought the programme had high impacts on women's empowerment, self-esteem improvement, personality development, and the reduction of social evils,

as well as medium impacts on better education, greater involvement in village institutions, and easier access to government programmes. SHGs were active during Covid-19, encouraging women to band together, get beyond their group identities, and work together to manage crises. They quickly established themselves as key participants in crisis management, taking the initiative to produce masks, Sanitizers and protective clothing, raise knowledge of the pandemic, distribute necessities, operate community kitchens, assist farm livelihoods, etc. A notable contribution has been the fabrication of masks by SHGs, allowing communities in isolated rural areas to obtain and use masks while also providing essential protection from the Covid-19 virus. As of January 4th, 2023, SHGs working under the DAY-NRLM programme have produced over 16.9 crore masks [13, 14]. Figure 1 reveals the state-wise total number of established self-help groups in India. The regions like Andaman & Nicobar, Bihar, Kerala, Manipur, Pondicherry, Tamil Nadu and Uttarakhand has significantly contributed to the formation of self-help group. Women in rural areas are getting involved in the economy more and more. According to the survey, RLFPR increased noticeably from 19.7% in 2018–19 to 27.7% in 2020–21. The survey characterises this increase in the FLFPR as a good trend on the gender component of employment, which may be related to high agricultural expansion over time and improving rural utilities that free up women's time. The poll also notes that India's female LFPR is probably undervalued and that in order to more truly reflect working women's realities, survey layout and material modifications are necessary.

Figure 2 emphasises the region-wise SHGs savings amount. The women-led self-help organisations (SHG), which disburse billions of rupees annually, are specifically mentioned in the economic report for 2022–2023, which was delivered by the Union's finance minister to Congress on January 31. India boasts 12 million SHGs, 88% of
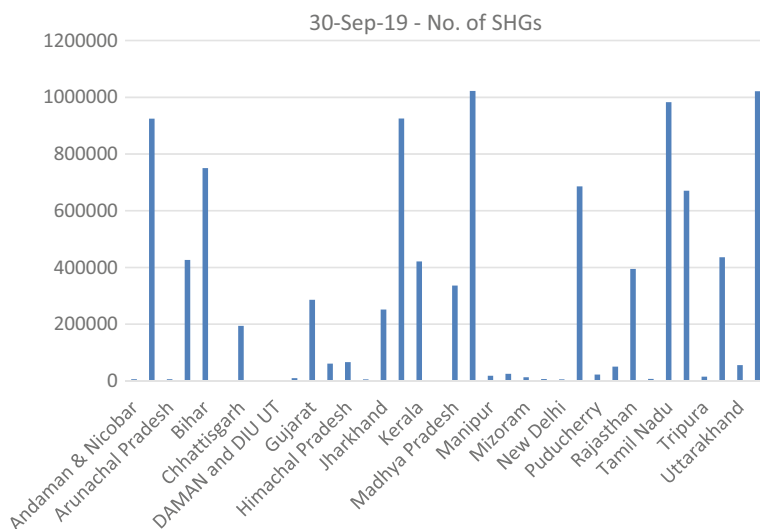
Fig. 1 Number of SHGs as of 30th september 2019. *Source* data.gov.in (Open source data)
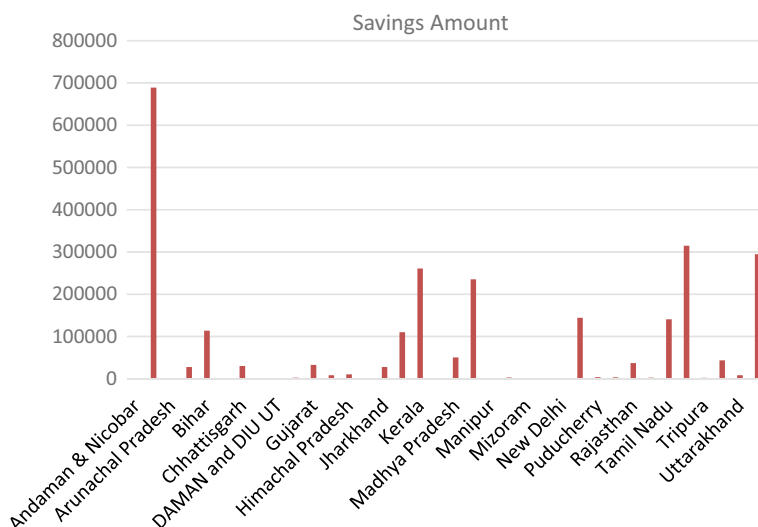
Fig. 2 Amount of savings in SHG linked account. *Source* data.gov.in (Open source data)

which are made up entirely of women. These teams often have 20 to 25 members, the majority of whom are village dwellers. As part of the SHG Banking Linkage Project, or SHG-BLP, these organisations were connected to banks in 1992 to receive small loans for pursuing livelihood opportunities like raising cattle or establishing a tailoring business.

Figure 3 indicates the total number of SHGs established across the states and union territories in India. In this, West Bengal, Telangana, Karnataka, Bihar, Andaman & Nicobar play a pivotal role in transforming the economy through SHGs.

Table 1 depicts the total number of digitalised SHGs through E-Shakti initiation during 2016–2022.

Under Project E-Shakti, about 1.27 million self-help organisations (SHGs) were digitalized during the fiscal year 2022. This was a small improvement over the prior year. The idea of Project E-Shakti was to digitise both financial and non-financial information on self-help organisations. The National Bank for Rural and Agricultural Development, or NABARD, created the SHG-BLP to offer financial products and services to the underprivileged and unattended. Banks were permitted to set up accounts for savings for self-help groups under this programme. Self-help groups are officially recognised or overlooked organisations with 15 to 20 members, mostly women from low-income households [15].

The information on the ratio of local gross domestic product to SCB credit by region is shown in Fig. 5. In 2006, the bank credit-to-GDP ratio varied by region, ranging from 13.2% in the North-Eastern Area to 76.6 in the Western Region. The credit-deposit ratio varied significantly among regions as well. The Western Region (92%) and the Southern Region (84.4%) had the greatest credit-deposit ratios, respectively. However, when compared to other regions, the Southern Region was clearly in

Number of SHGs

West Bengal — 676408
11712
Uttar Pradesh — 134174
4200
Telangana — 644917
376704
Sikkim — 1469
85334
Punjab — 6914
6855
Odisha — 294279
288
Nagaland — 805
2245
Meghalaya — 3019
2338
Maharashtra — 229994
96203
LAKSHADWEEP UT — 3
237549
Karnataka — 622653
91962
Jammu and Kashmir — 3085
11697
Haryana — 15928
47338
Goa — 1576
128
Chhattisgarh — 71266
64
Bihar — 636651
90764
Arunachal Pradesh — 230
807585
Andaman & Nicobar — 1041

0   200000   400000   600000   800000
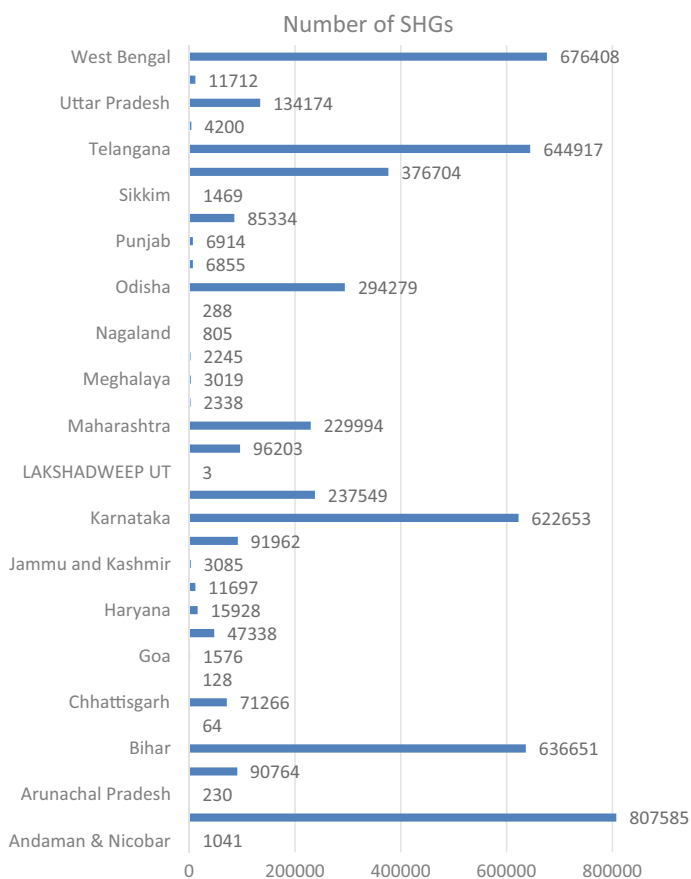
Fig. 3 Total number of self-help groups. *Source* data.gov.in (Open source data)

Table 1 Number of SHGs digitalized through E-Shakti during 2016–2022

Year	No of SHGs in 1000's
2016	8
2017	128
2018	349
2019	434
2020	644
2021	1233
2022	1274

Source Digital governance in India, open source data
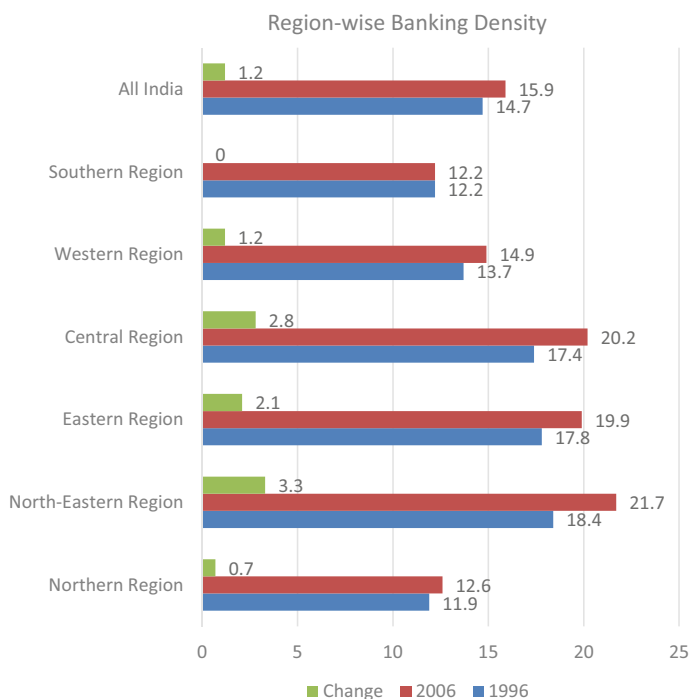
Fig. 4 Region-wise banking density. *Source* Author's calculation based on the RBI data

the lead in terms of the population's proportion holding a credit account. In comparison to their North-Eastern, Central, and Eastern equivalents, it seems as though the spread and depth of financing are greater in the Southern, Western, and Northern Regions (Fig. 4).

The proportion of the North-Eastern Area was just about 1.5%, whereas the Southern Region comprised 71.4% of all loans to SHGs. Despite the fact that close to 51.8% of all SHGs in all regions, with the exception of the Southern Region, were linked to banks, their proportion of total lending to SHGs was a mere 28.6%, suggesting that inadequate financing is not being channelled via SHGs in these areas.

SHG per million people has been considered a better measure of SHG dissemination in various areas because the regions differ in physical area and population. The percentage of SHGs is adjusted for variation by the population density of the region (Fig. 5).
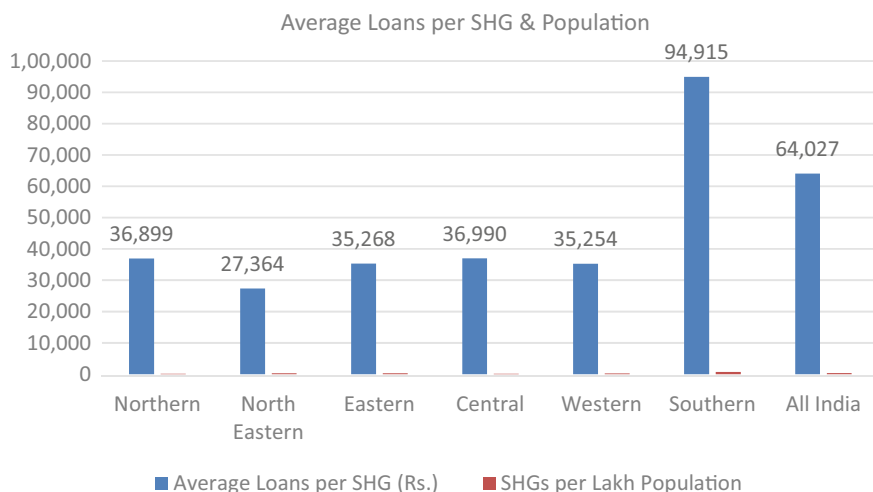
Fig. 5 Progress of SHG-Bank linkage programme in India (figures are in percentages). *Source* Author's calculation based on the RBI data

6   Major Findings and Conclusion

A recent evaluation of the DAY-National Rural Livelihood mission found that both subjects and functionaries thought the programme had high impacts on women's empowerment, self-esteem improvement, personality development, and the reduction of social evils, as well as medium impacts on better education, greater involvement in village institutions, and easier access to government programmes. The regions like Andaman & Nicobar, Bihar, Kerala, Manipur, Pondicherry, Tamil Nadu and Uttarakhand has significantly contributed to the formation of self-help group. The women-led self-help organisations (SHG), which disburse billions of rupees annually, are specifically mentioned in the economic report for 2022–2023, which was delivered by the Union's finance minister to Congress on January 31. India boasts 12 million SHGs, 88% of which are made up entirely of women. These teams often have 20–25 members, the majority of whom are village dwellers. In 2006, the bank credit-to-GDP ratio varied by region, ranging from 13.2% in the North-Eastern Area to 76.6 in the Western Region. The credit-deposit ratio varied significantly among regions as well. The Western Region (92%) and the Southern Region (84.4%) had the greatest credit-deposit ratios, respectively. However, when compared to other regions, the Southern Region was clearly in the lead in terms of the population's proportion holding a credit account. In comparison to their North-Eastern, Central, and Eastern equivalents, it seems as though the spread and depth of financing are greater in the Southern, Western, and Northern Regions. The proportion of the North-Eastern Area was just about 1.5%, whereas the Southern Region comprised 71.4% of all loans to SHGs. Despite the fact that close to 51.8% of all SHGs in all regions, with the exception of the Southern Region, were linked to banks, their proportion of

total lending to SHGs was a mere 28.6%, suggesting that inadequate financing is not being channelled via SHGs in these areas. On the whole, the income of the people has increased due to financial inclusion through self-help groups economic activity and bank-linkage programmes.

7 Scope for Future Research

This study has certain limitations such as data restrictions and limited data access. There is a large scope for this study to enhance through primary data survey and carry out analytical research. There is a wider scope to examine the state-wise programmes for poverty alleviation and measure inclusivity.

References

1. Dandona, L., Dandona, R., Kumar, G.A.: Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016 in the global burden of disease study. Lancet. **390**(10111), 2437–2460 (2017). https://doi.org/10.1016/S0140-6736(17)32804-0
2. Diganta Kumar Das, S., Boruah, S. D.: Microfinance through self-help groups (SHGs): a tool ForSocio-economic development of rural Assam (A case study of Lakhimpur and Dhemaji District). J. Bus. Manage. Soc. Sci. Res. **2**(8) (2013)
3. Pitt, M.M., Khandker, S.R.: The impact of group-based credit programs on poor households in Bangladesh: does the gender of participant's matter? J. Polit. Econ. **106**(5), 958–996 (1998). https://doi.org/10.1086/250037
4. Imai, K.S., Arun, T., Annim, S.K.: Microfinance and household poverty reduction: new evidence from India. World Dev. **38**(12), 1760–1774 (2010). https://doi.org/10.1016/j.worlddev.2010.04.006
5. Mukherjee, S., Mallik, S. S., Thakur, D.: Tracking financial inclusion in India: a study of SHG initiatives. Indian J. Hum. Develop. (2019)
6. Nguyen, V. C.: Is a governmental micro-credit program for the poor really pro-poor? evidence from Vietnam. Develop. Econ. 151–187 (2008)
7. Hendriks, S.: The role of financial inclusion in driving women's economic empowerment. Dev. Pract. **29**(8), 1029–1038 (2019). https://doi.org/10.1080/09614524.2019.1660308
8. Hassan, A.: Financial inclusion of the poor: from microcredit to Islamic microfinancial services. Humanomics **31**(3), 354–371 (2015). https://doi.org/10.1108/H-07-2014-0051
9. Islam, M. N.: The microfinance guarantee for financial inclusion: evidence to support in India. Indian J. Commer. Manag. Stud. **3**(I):129–132 (2012)
10. Abdul Samad, M.: Islamic microfinance: tool for economic stability and social change. Humanomics **30**(3), 199–226 (2014). https://doi.org/10.1108/H-12-2013-0085
11. Klaus, D., Yanyan, L.: Economic and social impacts of self-help group in India. Policy Research Working Papers (2013)
12. Reddy, A.A., Malik, D.P.: A review of SHG-bank linkage programme in India. Indian J. Industr. Econ. Develop. **7**(2), 1–10 (2011)
13. Smith, J.A., Todd, P.E.: Does matching overcome LaLonde's critique of nonexperimental estimators? Jurnal Economia **125**(1–2), 305–353 (2005)

14. Yaron, G., Gordon, R., Best, J., Choudhary, S.: Microfinance for the marginalized: the impact of the Rojiroti approach in India. Enterprise Develop. Microfinan. **29**(1), 80–93 (2018). https://doi.org/10.3362/1755-1986.17-00011
15. Shankar, S.: Financial inclusion in India: do microfinance institutions address access barriers? ACRN J. Entrepreneur. Perspect. **2**(1), 60–74 (2013)

Does Materialism Affect Compulsive Buying Behavior Among Multiple Credit Card Users in Jakarta?

Michael Christian ⑩**, Ferry Halim** ⑩**, Henilia Yulita** ⑩**, Kurnadi Gularso** ⑩**, Sunarno Sunarno** ⑩**, and Suryo Wibowo** ⑩

1 Introduction

Digitalization appears to be a component of typical everyday standards in the future [1]. Technological advancements, particularly in the financial sector, impact the community's routines and behaviors as consumers of this financial technology. Digital wallets, electronic payments, and digital banks, continue to arise and exist to offer alternative services. On the other hand, services from payment instruments that were previously deemed sophisticated and worldwide payment instruments, such as credit cards, are now beginning to be affected. This effect may be observed in the public's diminishing interest in possessing a credit card, particularly among younger people. This generation is considerably pickier and more likely to follow trends. People desire a credit card because it gives them a sense of pride that may be utilized to alter their economic and social position.

Money connotes subjective and emotional values in a consumer-oriented society, whether in industrialized and developing nations [2]. It also appears to be appealing to study in large cities, one of which is Jakarta. As previously said, obsessive shopping offers a solution, even highlighting the individual's financial standing. However, if this tendency becomes out of control, it might worsen. The amount of individual materialism can alter this control [3]. Furthermore, obsessive purchase can aid in the resolution or transition from stressful, disappointing, or frustrating situations [4].

The traditional perspective of compulsive buying disregards materialism. Once it arrives, it disappears and is seldom demonstrated. Materialism is said to foster

M. Christian (✉) · F. Halim · H. Yulita · K. Gularso
Universitas Bunda Mulia, Jakarta, Indonesia
e-mail: michaelchristianid@gmail.com

S. Sunarno
Universitas Tama Jagakarsa, Jakarta, Indonesia

S. Wibowo
Universitas Persada Indonesia YAI, Jakarta, Indonesia

the creation of compulsive purchases due to the comfort of accessible credit up to a certain amount and the simplicity of utilizing credit card services. With the proliferation of more sophisticated payment instruments that can be applied to all users without conditions (age, minimum monthly income, identity card, domicile, and so on), it is necessary to study credit cards and current credit card usage in accordance with the goals of this research. Furthermore, this study sees the necessity to investigate if materialism encourages obsessive buying.

This article's format begins with an introduction section that outlines the research's context. Furthermore, the next section's literature review and hypothesis formulation parts clarify the theoretical research and hypothesis submission. A range of methodologies and tests utilized in this study are discussed in the method section. The results and discussion section follows, as do the conclusions, limitations, and recommendations for further research.

2 Literature Review and Hypothesis Development

Materialism is defined as the placing of material goods to be utilized at any moment in order to attain a desired objective, such as happiness or well-being [5], or the user's satisfaction. Aside from these ultimate aims, the amount of socioeconomic status or prestige as a result of certain conditions or trends [6]. This materialism is extreme and harmful when it comes to credit card use. This is because you might lose control of your ambition to attain things you want for a little while or continue to compare your socioeconomic level with others [7, 8]. Keeping this in mind, this study provides a hypothesis (H) to show the following:

H1:Materialism significantly influences compulsive buying.

H2:Materialism, which is moderated by an attitude toward use, significantly affects compulsive buying.

Credit card attitudes can essentially differ. However, if the usage of a credit card becomes unplanned and unregulated, it can lead to the establishment of obsessive shopping attitudes or even a misuse of functions that should be [9]. Some argue that a purchasing mindset like this, on the other hand, might provide pleasure [3]. Although many individuals believe that the attitude of use encourages the creation of compulsive purchasing, others argue that the role of attitude and compulsive buying are not formed [10]. These reasons and differences prompt this study to offer the following hypotheses:

H3:Attitude of use significantly influences compulsive buying.

Excessive purchasing behavior can be defined as compulsive buying. Several behavioral traits are present in this scenario, including uncontrolled buying, purchases counter to genuine wishes, abrupt purchases, unexpected purchases [11],
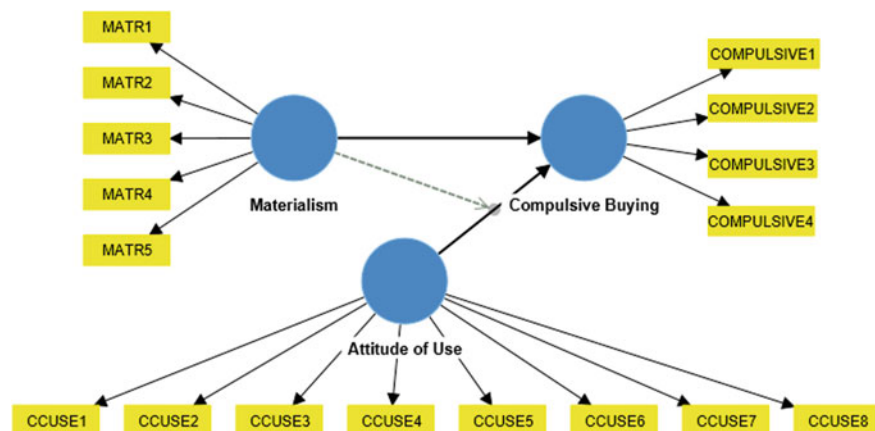
Fig. 1 Conceptual framework

and repetitive purchases [12]. When using a credit card, these traits allow individuals to combine with a huge credit card limit, which can be a motivating force for compulsive shopping behavior.

This study proposes a research conceptual framework based on the development of the hypotheses, as illustrated in Fig. 1.

3 Methods

In this work, data was analyzed utilizing quantitative methodologies and SEM-PLS modeling with SmartPLS 4.0 as the analytic tool. Complex constructions or pathways can be solved using this modeling. This analytical method is employed because it allows for the study of data with a small sample size. The questionnaire was prepared using a random survey and a Likert scale of 1 (strongly disagree) to 5 (strongly agree) based on the variable operationalization (Table 1).

In this study, the sample requirements are credit card users in Jakarta who hold at least three credit cards. This is consistent with the research's focus, which is on multiple credit card users. For the lowest sample size, multiply the number of items by five; for the biggest sample size, multiply by 10. According to the distribution of questionnaires, 135 questionnaires from participants were qualified to be processed. This figure remains consistent with the sample size provisions discussed before. The findings of average variance extracted (AVE), which must be larger than 0.5, and outer loading (OL), which must be greater than 0.7, are used to assess the validity of this study. Meanwhile, Cronbach's alpha (CA) and Composite reliability (CR) is for reliability test, both of which must be larger than 0.7.

Table 1 Variable operationalization

Variable	Item	
Compulsive buying [3]	COMPULSIVE1	Rather of considering what to buy, the overriding urge is to get items
	COMPULSIVE2	Pressuring individuals to buy items even when it disturbs financial conditions
	COMPULSIVE3	Purchasing stuff creates mental calm
	COMPULSIVE4	Purchased products are eventually kept rather than utilised
Attitude of use [3]	CCUSE1	When using a credit card, don't be concerned about the price
	CCUSE2	When you use a credit card, you become more impulsive
	CCUSE3	Having an excessive number of credit cards
	CCUSE4	Concerned about using credit cards to pay
	CCUSE5	Credit cards are used for more purchases
	CCUSE6	Pay only the minimal amount on your credit card bills
	CCUSE7	We're used to maxing up our credit cards
	CCUSE8	Paying credit card bills with another credit card
Materialism [13]	MATR1	Other people's branded or pricey things amaze me
	MATR2	Purchasing stuff produces a pleasant experience
	MATR3	Sensation that life will be better if you can have stuff that you don't now have
	MATR4	Having more stuff makes life more enjoyable
	MATR5	Feeling uneasy because you can't afford the items you want

4 Results and Discussion

In this study, as demonstrated in Table 2, women made up about 60% of the participants. Most of the participants worked as private workers, accounting for more than 87% of their work history. Participants with more than four credit cards account for more than 41% of those in this survey. The bulk of participants, about 79%, had used credit cards for more than three years. Furthermore, about 73% of participants had credit card liabilities in the amount of 9 million rupiah.

Table 3 shows the PLS-Algorithm-based reliability and validity that met the study's requirements. Several result items in the data processing must be removed since they do not fulfil the standards. CA and CR results show that all variables have values > 0.7, indicating that all variables are reliable. Furthermore, the findings of AVE on all variables and OL on all items fulfil the criteria (AVE > 0.5 and OL > 0.7). All items and variables are declared legitimate based on these results.

Table 2 Participant profile distribution

Profile		N	%
Gender	Female	78	57.78
	Male	57	42.22
Job	Private sector employee	119	88.15
	Professionals (doctors, pilots, lawyers, etc.)	3	2.22
	Self-employed	10	7.41
	Housewife	3	2.22
Number of credit cards owned	Three credit cards	55	40.74
	Four credit cards	23	17.04
	More than four credit cards	57	42.22
How long have you been using a credit card?	Less than one year up to one year	2	1.48
	Two years	9	6.67
	Three years	18	13.33
	More than three years	106	78.52
Credit card spending per month	≤ 9 million rupiah	98	72.59
	10–20 million rupiahs	33	24.44
	21–30 million rupiah	3	2.22
	> 30 million rupiah	1	0.74

Table 3 Reliability and validity test

Variable	Item	CA	CR	AVE	OL
Compulsive buying	COMPULSIVE1	0.759	0.764	0.580	0.778
	COMPULSIVE2				0.730
	COMPULSIVE3				0.739
	COMPULSIVE4				0.796
Attitude of use	CCUSE6	0.805	0.862	0.716	0.786
	CCUSE7				0.845
	CCUSE8				0.904
Materialism	MATR2	0.839	0.865	0.669	0.756
	MATR3				0.849
	MATR4				0.835
	MATR5				0.830

The hypothesis outcomes are shown in Table 4 below. P = 0.000 (<0.05) for the materialism path to compulsive purchasing, indicating that materialism has a substantial influence on compulsive buying. This result suggests that H1 is acceptable. Furthermore, the P = 0.025 (P < 0.05) finding shows that the attitude of use,

which is regulated by materialism, has a significant impact on compulsive buying. This result suggests that H2 is suitable. The third route has a P value of P = 0.000 (<0.05). These findings demonstrate that one's attitude toward usage has a substantial effect on compulsive purchase. In other words, this outcome indicates that H3 is acceptable.

The coefficient of determination is provided in Table 5 as the outcomes of this study's coefficient of determination. The R-square of 0.370 indicates that when assessing compulsive buying, the materialism and attitude of use factors correctly explain 37% of the variance.

According to this study, materialism and compulsive buying are closely proportional. In this scenario, materialism has a big impact on compulsive buying. These findings back up prior research [14, 15], which found similar outcomes. In contrast to the findings of other investigations, classic research indicates that materialism is unrelated to compulsive purchase. It is comprehensible given that materialism did not exist in big quantities at the time, and credit card use was still constrained (the number of credit limits available and the ease with which they could be obtained). Nowadays, especially in major cities, the lifestyle leads to materialism becoming simpler. This can develop into compulsive buying, which is much more uncontrolled and harmful. Previous research has also demonstrated that obsessive purchasing is harmful.

There is no denying that opinions regarding credit card use are impacted by a multitude of circumstances. Its role can be determined by the level of socioeconomic status in terms of social standing. Furthermore, contextual influences can influence attitudes toward credit card use. Personal and universal hedonic attitudes can be motivating factors. It is believed that if this mindset persists, it will lead to a misdirected compulsive buy. As a result, users' attitudes, particularly those with several credit cards, must be accompanied by self-psychological control. This means that controlling the urge to acquire an item must be based on weighing the reasons and rewards of doing so. Control over the attractiveness supplied by credit card application service providers is also included, including the use of a direct approach at live exhibits as well as ads in other forms of media. Because both exhibits and marketing have the potential to influence individual decisions [16, 17].

Table 4 The testing of hypotheses

Path	T statistics	P values	Remark
Materialism  Compulsive buying	5.955	0.000	H1 accepted
Materialism × Attitude of use  Compulsive buying	2.244	0.025	H2 accepted
Attitude of use  Compulsive buying	4.348	0.000	H3 accepted

Table 5 Determination coefficient

Variable	R-square	R-square Adjusted
Compulsive buying	0.370	0.355

It may appear premature to determine if credit card users will disappear. But one thing is certain: credit cards will always have a particular place in the hearts of aficionados. People who are elderly and have a credit card habit may be more relevant user criteria to continue to consider. Furthermore, financial technology, in terms of payment methods, is now, for some individuals, a supplement to the payment methods that already exist. This may change in the future. This means that a real credit card can be lost or converted into a virtual credit card.

5 Conclusion

Despite the fact that advances in financial technology have resulted in a variety of payment instruments that are more complicated and acceptable to all levels of society, credit cards continue to occupy a special place in the hearts of some people, particularly those who espouse materialist ideas. This study was successful in demonstrating the role of credit cards in their usage, where materialism has a substantial influence on compulsive buying, even among credit card owners with several cards. This underlines the function of credit cards as a means of payment as well as a medium for users to position themselves at a specific degree of social and economic standing. Furthermore, this materialism is linked to the mindset of using many credit cards. As is well known, these findings support the notion that using a credit card might promote the production of sensations of joy and happiness. It will foster the creation of obsessive purchases with a range of quantities or credit limitations on credit cards owned by users. By extension, this study enhances the theoretical view of credit card use, which might alter user psychology, particularly in terms of affecting emotions and ideas. In terms of managerial implications, the findings of this study can help to focus on areas where the credit card market is very likely to decline, but it is also very likely that it will continue to exist, particularly for people who have special attitudes or characteristics, one of which is materialism.

5.1 Limitations and Suggestions for Future Study

The factors included are the study's limitations and should be elaborated upon. The only point of view used is materialism, while other qualities such as hedonism, extravagance, or prestige may be investigated further to broaden the study's conclusions. Furthermore, in this study, credit card users only used a few credit cards, rather than a defined number of credit cards. The credit limit amount will most likely be able to improve the materialistic position that will prevail in the credit limit amount. Aside from the study's shortcomings, the sample size may be increased to cover a greater number of participants.

References

1. Raju, V.: A case study on the buying behaviour of online customers in Bangalore BT—current trends in economics, business and sustainability. In: International Conference on Economics, Business and Sustainability (ICEBS 2023), pp. 54–65. https://doi.org/10.1007/978-981-99-3366-2_7

2. Fogel, J., Schneider, M.: Credit card use: disposable income and employment status. Young Consum. **12**(1), 5–14 (2011). https://doi.org/10.1108/17473611111114740

3. Pradhan, D., Israel, D., Jena, A.K.: Materialism and compulsive buying behaviour. Asia Pacific J. Mark. Logist. **30**(5), 1239–1258 (2018). https://doi.org/10.1108/APJML-08-2017-0164

4. Roberts, J.A., Roberts, C.: Stress, gender and compulsive buying among early adolescents. Young Consum. **13**(2), 113–123 (2012). https://doi.org/10.1108/17473611211233440

5. Richins, M.L., Dawson, S.: A consumer values orientation for materialism and its measurement: scale development and validation. J. Consum. Res. **19**(3), 303–316 (1992). https://doi.org/10.1086/209304

6. Unger, A., Papastamatelou, J., Okan, E.Y., Aytas, S.: How the economic situation moderates the influence of available money on compulsive buying of students—a comparative study between Turkey and Greece. J. Behav. Addict. **3**(3), 173–181 (2014). https://doi.org/10.1556/jba.3.2014.018

7. Gilovich, T., Kumar, A., Jampol, L.: A wonderful life: experiential consumption and the pursuit of happiness. J. Consum. Psychol. **25**(1), 152–165 (2015). https://doi.org/10.1016/j.jcps.2014.08.004

8. Pandelaere, M.: Materialism and well-being: the role of consumption. Curr. Opin. Psychol. **10**, 33–38 (2016). https://doi.org/10.1016/j.copsyc.2015.10.027

9. Maccarrone-Eaglen, A., Schofield, P.: Compulsive buying behavior: re-evaluating its dimensions and screening. J. Consum. Behav. **16**(5), 463–473 (2017). https://doi.org/10.1002/cb.1652

10. Khare, A.: Credit card use and compulsive buying behavior. J. Glob. Mark. **26**(1), 28–40 (2013). https://doi.org/10.1080/08911762.2013.779406

11. Jones, M.A., Reynolds, K.E., Weun, S., Beatty, S.E.: The product-specific nature of impulse buying tendency. J. Bus. Res. **56**(7), 505–511 (2003). https://doi.org/10.1016/S0148-2963(01)00250-8

12. Ridgway, N.M., Kukar-Kinney, M., Monroe, K.B.: An expanded conceptualization and a new measure of compulsive buying. J. Consum. Res. **35**(4), 622–639 (2008). https://doi.org/10.1086/591108

13. dos Felipe, I. J., Silva, M. M., Ceribeli, H. B.: Precedents of the compulsive use of a credit card: an analysis of university students' buying behavior. Rev. Gestão **30**(1):47–61, 2023. https://doi.org/10.1108/REGE-12-2020-0122

14. Burroughs, J.E., Rindfleisch, A.: Materialism and well-being: a conflicting values perspective. J. Consum. Res. **29**(3), 348–370 (2002). https://doi.org/10.1086/344429

15. Kasser, T.: Materialistic values and goals. Annu. Rev. Psychol. **67**(1), 489–514 (2016). https://doi.org/10.1146/annurev-psych-122414-033344

16. Sirgy, M.J., Lee, D.-J., Yu, G.B., Gurel-Atay, E., Tidwell, J., Ekici, A.: Self-expressiveness in shopping. J. Retail. CONSUM. Serv. **30**, 292–299 (2016). https://doi.org/10.1016/j.jretconser.2016.02.008

17. Thoumrungroje, A.: A cross-national study of consumer spending behavior: the impact of social media intensity and materialism. J. Int. Consum. Mark. **30**(4), 276–286 (2018). https://doi.org/10.1080/08961530.2018.1462130

Reasons for the Misuse of Daily and Semester Plans by Teachers of English in Zarqa Secondary Schools in Jordan

Anwar AL-Bzour

1 Introduction

Technology has been developed a lot in the twentieth century, so planning is needed for different fields of knowledge. Planning is considered a civilized aspect which is developed to become a requirement for success. Some studies in this field were conducted that had suggestions and recommendations in the light of lesson planning. Teachers still suffer from the weakness of preparing the plan in Jordan this makes teachers of English neglect lesson planning and to treat the problem and relation with some variables to know it's causes [1].

1.1 Research Problem

The research problem came as a result of my long experience as a teacher and supervisor of English, I noticed that most English teachers neglect planning which shows the weakness of representing methodology and the way to work. The reasons for not writing the teaching plan, teachers think that planning is just writing a set of behavioral goals which make negative attitudes towards planning and they suffer a lot of this problem to be written and implemented which make planning an important issue. New teachers don't know the importance of planning and its effect on the educational process because planning lead to achieve the desired goals seeking to develop learner mentally & physically [2].

A. AL-Bzour (✉)
Zarqa University, Zarqa, Jordan
e-mail: abzour@Zu.ed.jo

1.2   Research Question and Significance of the Study

What are the reasons beyond making teachers of the English Language neglect to use both daily and semester plan?

Educational process needs planning in order to be successful, so the teacher's responsibility to educate and to provide knowledge. Teachers are the source of good educational results no matter how is the curriculum or the teaching methods is conducted Hunter and Russell [3]. Therefor e, educators praise the functional roles of good teachers while teaching. Teacher should have the skill of planning in order to use his skill and experience to instruct his students to a far extent, the plan limits what the student can learn because planning changes curricula to activities and tasks to students. Teachers devote long hours to teach language, so students learn more and more [4].

1.3   Aims of the Research

To know the reasons beyond making teachers of English neglect the use of both daily and semester.

1.4   Limitations of the Study

Male and female teachers of the English Language at secondary schools in Zarqa governorate of the scholastic years 20172018.

2   Theoretical Introduction

It has been argued that students should be provided with information by teachers who should have the educational methods and who should know the educational methods ideas, attitudes, skills and responsibilities. Slavan [5] the recent years, an interest of planning is needed to teachers planning is important for some researchers to show the students can learn and activate assignment for students when teacher spends hours for teaching [4]. It is clear that planning greatly provides teachers with best teaching and lesson must be flexible Clark and Peterson [6].

Additionally teachers plan at different levels, including the annual, semi-annual and at the unit level of course all these levels should be in harmony, because to achieve the annual plan demands for the4 teacher with experience, planning at the unit level is the most important, followed by weekly than daily planning [7]. Planning should

be directed to invest inputs of teaching also the importance is a needed mechanism process to translate the desired goals [8].

2.1 The Importance of Planning

It is possible to illustrate the importance of planning through the following:

(1) To organize the educational process elements.
(2) To organize the educational process.
(3) Teachers organize their job.
(4) To develop the educational process.
 – Planning plays a significant role in advancing the educational process and improving the quality of learning in schools. In the light of the aforementioned, it is possible to determine the importance of the current research as follows:
(1) To achieve the scientific progress.
(2) The importance of the teacher in learning because he is an important element in the educational process.
(3) To achieve the lesson goals and the method and the teaching means of the subject.
(4) To aach8ieve the English language grammar.

2.2 Lesson Planning

Teaching is a field in which the teacher needs the planning skills and understanding its components and the principles of its pillars. Shepard [9] teaching English is a multifaceted process as it involves working with students of various ages, abilities, interests, and attitudes, amidst a range of factors and conditions that directly impact the educational process. In addition to the constantly evolving nature of the English curriculum, teachers must also navigate the changing environmental factors surrounding the school. Therefore, English teaching is a challenging task that requires careful consideration and adaptation to effectively meet the diverse needs of students and provide a quality education [10].

The complex nature of teaching English necessitates the need for careful planning to achieve the desired results. Failing to plan the lessons can lead to uninspiring classes that stifle creativity and create confusion and disorganization for both the teacher and the students. This, in turn, increases the teacher's workload. It is especially important for new teachers to have a well-defined plan, as they may lack the experience to effectively navigate the diverse needs and challenges of teaching English [9].

There are many reasons that push the teacher to perform the planning before imitating the teaching process, including the following:

(1) The pre-planning provides the teacher with security and confidence in the English language teachers' self, and reducing the anxiety and tension to perform his work.
(2) Planning makes the teacher aware of the teaching steps in which the English language teachers is at and the following step, so will be standing on a solid ground.
(3) Planning provides the teacher with educational experience so the English language teachers start with them to know when to move to the following step and if there is a need to modify plan or part of it.
(4) Planning enables to meet the students' needs.
(5) Planning provides the teacher with teaching strategies and with a work method in teaching.
(6) Planning is an urgent necessity and pre-requisite for the teachers, the teacher may gain the experience in the planning field during performing his/her work.

2.3   Justifications of the Planning in Teaching

The educational process needs the pre-planning because it is a technical and accurate work, there are justifications for teachers to plan the lesson, and justifications are the following:

(1) Good planning makes the teacher understand more, and enables the English language teachers to set the goal that wishes to achieve the educational goals.
(2) Planning a lesson helps new teachers build confidence and enables them to create a positive classroom environment that minimizes anxiety for both the teacher and students during the lesson.
(3) Students have a greater level of respect and appreciation for teachers who are organized, clear, and who provide meaningful and valuable instruction that helps them achieve their academic and personal goals.

2.4   Competences Related to Planning

Competence is a compound capability that includes the knowledge, skills, and attitudes, so there are educational competence connected with the capability to perform the related tasks to the teaching profusion and the teacher's tasks. Competence is not only connected with the classroom work but also with the comprehensive roles of the teacher.

Teaching planning competencies include:

(1) Having a thorough understanding of the topic.
(2) In addition to academic knowledge and skills, the procedures of teaching should encourage students to explore their values, positive interactions, self-control, and research.

(3) Identifying learning and teaching goals.
(4) Selecting tests that are relevant to students' progress toward specific goals and placing them accordingly.
(5) Identifying the type of learning necessary to help students achieve their goals.
(6) Identifying the specific educational characteristics for the students based on their capabilities and developmental characteristics [11].

2.5 Planning Principles

Lesson planning should follow the following principles:

(1) In order to set realistic educational goals, it is essential to fully understand the goals and their general context and behavior.
(2) The teacher should know the characteristics of the students in addition to knowing the general educational goals, as well as the students' nature, needs, and aptitudes. In order to develop students scientifically, socially, and intellectually, English language teachers must also know their nature, needs, and aptitudes. Taking these factors into account will result in good planning.
(3) Mastering the subject: A good teacher is one who knows the material well, not only about the details, but also about the values of the material in order to help the students achieve their educational goals.
(4) Being familiar with a wide variety of teaching methods and knowing when to use them can benefit students, and help teachers accomplish their goals. The English language teacher will use the appropriate teaching methods in the teaching plan in order to achieve the goals effectively.

2.6 Planning for the Teaching and the Elements of the Educational Process

Planning is one of important elements and the teacher holds the basic responsibility in planning the activities related to material he is teaching child the one who is following the developments in teacher education will find a new trend that is expanding represents in analyzing the complex learning process to parts or separate skills and training the teachers on them, the goal from this is to develop the needed educational skills.

There are several dimensions and elements involved in teaching planning, which include:

(1) Students: One of the most important elements of the educational process is the delivery of information to students as quickly and efficiently as possible.
(2) The teacher: The teacher plans to determine the priorities of a lesson and the educational means by which the information will be delivered, and he or she prepares the opportunity for English language teachers to present the lesson in an organized and confident manner [12]. It is the teacher's responsibility

to provide the first base for learning in all educational stages. Communication between teachers and students is the result of the teacher's communication with them. The relationship between the teachers and students is very important for building the learners' personalities, as is the teachers' personality.

(3) The learning processes: Teaching planning facilitates the learning process and makes it meaningful for students because it searches, brings, and selects the best methods for delivering scientific material to students of English language teachers in order to meet their learning goals.

2.7 The Curriculum

The process involves learning facts and concepts through a series of educational experiences. Specifically, it entails skills and attitudes that the School makes available to its students both within and outside its borders so that they can make a comprehensive change in their personality, directing their behavior in accordance with the educational goals set by their society in order to fulfill its needs.

The curriculum should prepare the student for life and further study. Also, the curriculum has goals that the teacher should know and to be able to achieve them through the lesson, also the teacher should have the knowledge and awareness about the multiple levels of the educational goals and analyze them to specific goals [13]. School exam: A successful teaching plan directly reflects on the exams, making it easier for the teacher to determine the dates and set the dates for the daily and monthly exams [14].

3 Research's Methodology and Procedures

The following sections detail the research methods and procedures for determining the research population, selecting the sample, and building the instrument.

To affirm its validity and consistency, the following statistical methods were adopted:

3.1 Research's Method

In selecting the descriptive method, the researcher is evaluating the relevance and suitability of the method to the nature of the research, since describing the current problem assists with making the required treatment steps, by analyzing and explaining the current situation.

According to this method, every inquiry is aimed at the phenomenon as it is in reality, exploring its aspects and establishing the relationship between its elements or between it and other social or educational phenomena) [15].

3.2　Research Population

Teachers' population: The research population consists of the male and female teachers of English language at the secondary schools (boys and girls) in Al-Zarqa District, the number of the teachers was (320) teachers for the scholastic year 2017–2018 distributed at the secondary schools of Al-Zarqa education directorate, the number of schools was (100) sch.

3.3　Researches Sample

Male and female teachers sample: The researcher selected (100) secondary and primary schools in Al-Zarqa governorate and randomized sample method in selecting the teachers sample of (320) teachers.

3.4　The Research Instrument

The researcher used the questionnaire as a tool for collecting information and to achieve the objectives of the research. The questionnaire is considered a suitable mean to obtain the information and data and opinions in short time, also it is the only mean to obtain some information of human sources [16].

By informing the researcher of the literature and studies, including books, references and personal experience, the researcher designed a tool according to the following steps.

(1) An orientation of an open survey questionnaire was directed to the teachers of the English language, and their number is 50 teachers which contains the open questions of the reasons that make teachers neglect planning.
(2) After the researcher obtaining more items through the orientation questionnaire. The researcher built the research tool and there are 30 items.

3.5　Credibility of the Instrument

The researcher presented the items of the questionnaire in its initial form, which was prepared by the researcher to a number of arbitrators in the methods of teaching

English, and to determine the validity or invalidity of each item of the question-naire. After each item the researcher put three alternatives that are (valid, invalid, the amendment) and ask each arbitrator to put a mark () under the appropriate alternative. The researcher chose the items that obtained an agreement rate of 80% and above, and the invalid items were excluded and some items that needed to be modified were reformulated and questionnaire in its final form consisted of 30 items.

3.6 Reliability of the Tool

The tool should be stable, and the tool is not stable unless it gives the same results or approaches when re-applied to the same individuals and under the same conditions.

In measuring the stability of the research tool, the researcher relied on the method of re-applying the test twice on a group of 20 teachers, and the period between the first application and the second application was 15 days. To find the reliability coefficient the researcher used the Pearson correlation coefficient as a statistical method. The reliability coefficient was 0.86 which is a good correlation coefficient.

3.7 Tool Application

The researcher started the application of the tool 19/10/2017 and he finish the application on 18/10/2018.

Statistical means:

The researcher used the following statistical means:

(1) Pearson correlation coefficient.
(2) Weighted mean equation to arrange items according to their severity and relative importance.

4 Results and Findings

To find the reasons that led to the teacher's reluctance to prepare the daily lesson plan, where the frequency of teachers' responses to the questionnaire items were calculated, and then the weighted mean was calculated, each item has its relative weight, then arrange the items in descending order.

4.1   The Results of the Study and Discussion

In this chapter, Results will be illustrated that the research reached and discussion them according to the research goals.

According to the results, teachers believe to teach lessons without the need to the lesson plan then some teachers are very weak to prepare the lesson plan. Also new teachers need training courses It shows also teachers don't use the correct methods to teach the lesson, the lack of incentives and privileges which make teachers neglect planning, next, some teachers don't know the importance of planning, the next step, teachers find lessons easy, so no need for planning, teachers with long experience mentioned that, we don't have to plan. More teachers ascribe that for the lack of the convenient atmosphere m, according to the point of view of headmasters and supervisors, mentioning that no legal punishment for those who don't prepare. Also some teachers pretend that planning need effort and hard work. And the forms of preparing snot easy. Moreover, teachers mentioned that planning is just routine, also some principles don't follow up planning. More and more teachers pretend to feel very tired because of the heavy load of lessons. The fact that some teachers are academically weak and they have no interest of planning. Also some teachers find planning as a kind of rejection to the headmaster and system. And planning doesn't help them and it is difficult for some teachers to formulate the specific educational goals; Moreover some teachers believe that they don't have time to prepare.

4.2   The Results of the Study

In the research, the following important results were found:

(1) There is no need for a teaching plan for the subject to be taught by the teacher.
(2) It is difficult for teachers to prepare a daily semester plan and apply it on a day-to-day basis.
(3) It is necessary to train teachers in effective teaching methods.
(4) Teachers face difficult economic and financial conditions.
(5) Preparation of the teaching plan takes some time.
(6) There is no scientific atmosphere to create a teaching plan and no aids to assist in achieving it.
(7) Teaching plans are not taken into account by teachers when they plan the daily lesson plans and semester lesson plans.
(8) There is no legal punishment for careless teachers.
(9) Teachers tend to not prepare according to tense relationships with school principals.
(10) Some teachers don't prepare to show that the English language teachers is a courageous on among fellow.
(11) Some teachers don't prepare as a challenge to the educational system.

5   Recommendations and Suggestions

In the light of the present, research results. The researcher recommends the following:

(1) Serious and intensive work to address the reasons for reluctance to prepare the lessons and daily semester plans that face the male and female teachers by the following up of the female teachers by male and female supervisor.
(2) Raising the awareness of the teachers about the importance of the lessons daily plan because of its importance in communicating the curriculum to the students, so to achieve the desired educational goals, this could be done through the schools administration that see the book plan daily then signing it.
(3) Conducting developmental seminars for the teachers through the different teaching methods and the importance of planning the lesson according to the relevant method for each subject.
(4) Encouraging the teachers to plan the lesson through providing the material and financial incentives.
(5) Issuing a guide in clues the types of plans and how to extract the educational goals in its types. The general or the specific goals like the guidance issues by the general directorate of the curriculum and the educational means at the ministry of education for teacher and the supervisor.
(6) To benefit from the constructed questionnaire in finding out the reasons that lead to refrain from preparing the lessons daily plan by applying it to one their segments of teacher.
(7) Intensive work to address the causes of the English teachers' neglect in secondary schools by preparing daily and semester plans for lessons by following them up by the English language supervisors in the ministry of education.

In this research we suggest conducting a similar study to know the reasons that teachers don't prepare the lesson plan. We also suggest conducting a similar study to know the reason that teachers don't prepare the lesson plan in other stages. The researcher also suggests circulating the current study to the English language supervisors and principals of public schools to review its results to be adopted and to support the idea of preparing the daily and semester plan because of their positive effects on the students and the educational process.

References

1. Richards, J.C.: Methodology in Language Teaching. Cambridge University Press (2004)
2. Ur, P.: A Course in Language Teaching: Practice and theory. Cambridge University Press, Cambridge (1996)
3. Hunter, M., Russell, D.: How can I plan more effective lessons? Instructor (1997)
4. Doyle, W.: Academic Work: Review of Educational Research **53**, 317–487 (1983)
5. Slavan, R.E.: Cooperative Learning: Theory, Research and Practice, 2nd edn. Alln & Bacon, Boston, MA (1995)

6. Clark, R.E., Peterson, P.L.: Teacher (ED) Handbook of Research on Teaching, (3rd). Macmillan, New York (1985)
7. Nation, I.S.P.: Language teaching techniques Wellington: English language Institute, Victoria University (1990)
8. Richter, S.E.: Using portfolios as an additional means of assessing written language in special education classroom. Teach. Change **5**, 58–70 (1997)
9. Shepard, L.: The role of assessment in a learning culture. Educ. Res. **29**:4–14 (2000)
10. Dickinson, L.: Self instruction is language learning. Cambridge University Press, Cambridge (1987)
11. Sutton, R.: The Learning School. Sutton Publications, Davies, A., & Le Mahieu, Salford, UK (1997)
12. Brumfit, C.J., Johnson, K.: The Communicative Approach to Language Teaching. Oxford University Press, London, Oxford (1979)
13. Kelly, A.V.: The curriculum: Theory and Practice. Paw Chapman publishing, London (1989)
14. Yalden, J.: Principles of Course Design for Language Teaching. Cambridge University Press, Cambridge (1987)
15. Willis, D.J.: Students Perceptions of their Experiences with Kentucky's Mandated Writing Portfolio, Unpublished doctoral dissertation, University of Louisville (2000)
16. White, R.: The ELT Curriculum: Design Innovation and Management. Basil Blackwell, Cambridge, MA (1988)

Enhancing Sustainability and Smart Living: Adoption of IoT-Driven Automation of Vertical Gardens in Urban Spaces

Anna M. Orel , **Volodymyr M. Orel** , **Viktor V. Diachenko** ,
Iryna Perevozova , **Mainka Marcel Kurt** , **and Khrystyna Kirshak**

1 Introduction

In the dynamic landscape of modern urbanization, the synergistic interplay between innovative concepts such as vertical farming and the visionary pursuit of smart cities is shaping the future of our urban environments. At the crux of this transformative journey lies the revolutionary notion of vertical farming, a pioneering agricultural practice that addresses multifaceted challenges posed by rapid urban growth, environmental sustainability, and the quest for enhanced living standards. This amalgamation of vertical farming with the evolving concept of smart cities holds the potential to redefine urban existence in ways that align seamlessly with technological advancement, resource optimization, and holistic well-being [1].

A. M. Orel · V. V. Diachenko
Sumy National Agrarian University, Sumy, Ukraine

V. M. Orel
Director of the Private Enterprise "Oboyan", Mykolaiv, Ukraine

I. Perevozova (✉) · K. Kirshak
Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine
e-mail: perevozova@ukr.net

M. M. Kurt
Lviv University of Business and Law, Lviv, Ukraine

1.1 Vertical Farming

Vertical farming, conceived and promoted by pioneering minds like Dickson Despommier, epitomizes a paradigm shift in agricultural methodology. By vertically layering crops within controlled environments nestled in urban landscapes, this innovation transcends the constraints of conventional land use, ushering agriculture into the heart of sprawling cities [2]. Such an approach is an ideal complement to the aspirations of smart cities, designed to foster intelligent, sustainable, and interconnected urban ecosystems that can effectively cater to the evolving needs of their inhabitants [3].

The history of vertical farming is a compelling narrative that spans visionary ideas, technological breakthroughs, and the persistent pursuit of sustainable agricultural solutions. While the concept itself has roots dating back over a century, it wasn't until recent decades that the convergence of technological advancements, environmental concerns, and rapid urbanization brought the concept from theoretical contemplation to practical implementation.

The early twentieth century marked the emergence of early notions and theoretical foundations of vertical farming, with figures like Gilbert Ellis Bailey proposing the idea of multi-story greenhouses for urban crop cultivation in 1915. However, limitations in technology and prevailing traditional agricultural practices confined these concepts to the realm of theory.

The modern resurgence of vertical farming gained momentum in the 2000s, fueled by the pioneering work of Dr. Dickson Despommier, whose book "The Vertical Farm" [2] captured the imagination of enthusiasts and experts alike. Technological progress played a pivotal role in this revival, with innovations in LED lighting, hydroponics, and automation enabling controlled indoor environments conducive to year-round crop growth.

The early 2010s witnessed the establishment of some of the first operational vertical farms, exemplified by ventures like "Sky Greens" in Singapore, which employed rotating shelves to optimize sunlight exposure. These initiatives showcased the potential of vertical farming not only to provide urban food sources but also to address sustainability challenges, such as reduced water usage and minimized carbon emissions from food transportation.

Advanced hydroponic and aeroponic systems, tailored LED lighting, and sophisticated automation underscore the dedication to refining vertical farming technologies. The scope of vertical farming has expanded beyond leafy greens and herbs, with experimentation in growing a wider array of crops, including fruits and vegetables, underscoring its potential to revolutionize urban food production and address pressing global challenges.

1.2 Smart City Vision

The vision of smart cities enriched by vertical gardening encapsulates a harmonious blend of technological innovation, sustainable living, and urban resilience. By integrating the principles of smart urban planning with the transformative potential of vertical gardening, these cities aspire to create vibrant, efficient, and environmentally conscious urban landscapes. In this vision, vertical gardening serves as a cornerstone of urban greenery, transforming concrete jungles into thriving oases of biodiversity and well-being. Skyscrapers, high-rises, and other vertical structures are adorned with lush vegetation, creating visually stunning green facades that improve air quality, reduce heat island effects, and contribute to a healthier urban environment [4].

Smart cities guided by this vision leverage technology to enhance the efficacy and impact of vertical gardening. Sensors embedded within these vertical gardens monitor plant health, moisture levels, and nutrient requirements in real time, ensuring optimal growth conditions. Automated irrigation and fertilization systems further optimize resource utilization, conserving water and minimizing waste.

Energy-efficient LED lighting systems supplement natural sunlight, allowing vertical gardens to flourish indoors, in spaces with limited exposure to sunlight, and even during the night. The integration of renewable energy sources, such as solar panels, powers these systems, ensuring sustainability and reducing the ecological footprint of vertical gardening [5]. The benefits extend beyond aesthetics and environmental improvements. Vertical gardens become hubs of urban interaction, providing spaces for relaxation, recreation, and social engagement. Community gardens in residential areas promote a sense of ownership and foster a strong community spirit, while public vertical gardens serve as educational platforms, raising awareness about sustainable practices and fostering a deeper connection with nature [6].

Smart cities, underpinned by data-driven solutions and synergistic urban infrastructures, aspire to elevate the quality of life for urban dwellers while optimizing the allocation of precious resources. The fusion of vertical farming with the smart city ethos materializes in various dimensions:

Optimal Spatial Utilization: Vertical farming, characterized by its vertical cultivation arrays, optimizes spatial usage, effectively transforming underutilized urban plots into thriving agricultural hubs. This coalesces effortlessly with the smart city principle of maximizing urban real estate [3].

Resource Efficiency: Amidst global concerns of resource depletion and environmental degradation, the controlled environments of vertical farming offer precision in resource management [7]. This approach conserves water, minimizes fertilizer runoff, and mirrors the resource optimization goals of smart cities [8].

Local Food Sovereignty: Smart cities advocate for reduced carbon emissions linked to food transportation. Vertical farming aligns with this objective by empowering cities to cultivate fresh produce locally, reducing dependence on distant supply chains and reinforcing community resilience [9].

1.3   Unveiling Multifaceted Impacts

The ramifications of vertical farming transcend conventional boundaries, encompassing various dimensions of urban existence:

Environmental Stewardship: Vertical farming's compact design, coupled with its resource-efficient practices, contributes to a reduction in land usage, water consumption, and overall ecological footprint [10]. These outcomes resonate with the sustainability mandates of modern urban planning [4, 11].

Enhanced Well-being: The availability of locally grown, nutrient-rich produce is a cornerstone of vertical farming. The integration of such fresh offerings into urban diets holds potential for promoting healthier lifestyles and mitigating urban health challenges [12]. Additionally, the incorporation of greenery within vertical farming installations can provide aesthetic relief and bolster psychological well-being.

Economic Resurgence: By ushering in a novel sector of urban agriculture, vertical farming introduces a fresh wave of employment opportunities [5]. This fosters economic growth while providing a locally rooted means of livelihood and income generation [13].

Gender Empowerment: The innovative scope of vertical farming extends an avenue of empowerment for women within urban settings, offering opportunities for entrepreneurship and employment engagement within the domain of innovative agriculture.

1.4   Internet of Things

Urban green spaces are growing due to people's interest in a clean environment. IoT technology connects the physical world and the internet, and vertical gardens (VG) address urban sustainability and food security [14]. This study examines IoT-based automation for sustainable VG in smart cities. Data from 30 publications and real-world VG implementations reveal common trends: 6–20 tier VGs, lettuce crops, sensor monitoring of temperature, light, humidity, and soil nutrition. Zigbee and Wi-Fi are popular for data collection, with threshold-based algorithms for decision-making. USA and China lead in VG IoT automation. The study also discusses human well-being impacts and patents related to VG IoT control [15].

Author [16] investigates motivating factors for Agripreneurs in farm-based enterprises across Zahirabad, Narayanakhed, and Sanga Reddy Revenue divisions in Telangana. The sample of 200 Agripreneurs engaged in agri input services was surveyed. Results reveal factors like education, self-interest, family advice, economic necessity, resource availability, risk-taking, achievement motivation, and innovativeness significantly contribute to enterprise success. The exploratory survey design offers insights into regional Agripreneurship dynamics, with potential implications for policy and development initiatives in the agricultural sector.

The rising demand for agricultural products and resource limitations like soil fertility, water availability, and climate have spurred the adoption of indoor vertical farming [17]. This study presents a 3D numerical model to optimize air flow and heat transfer within such systems. It factors in transpiration, CO2 consumption, and oxygen production, employing the near-wall RNG turbulent model to account for turbulence and obstacles [18]. An objective uniformity parameter evaluates tray uniformity, while an efficiency parameter gauges inlet and outlet effectiveness. Eight designs are analyzed, with one showing 91.7% uniformity due to robust spiral flow. Surprisingly, some cases with lower mass flow rates still ensure uniform flow, reducing energy usage. The model proves effective in enhancing heat transfer and fluid flow uniformity for indoor vertical farming.

Amid [19] the COVID-19 pandemic, countermeasures sparked discussions on their temporal nature and the positive environmental impacts of the pandemic-induced anthropause. This context emphasized the need for urban transformation during crises, unveiling digital tools and greening practices that could shape new policies. The concept of 'urban acupuncture' highlighted how greening and gardening contribute to urban resilience and sustainability. The study explores vertical gardening (VG) as an enhancer of urban health and its potential within smart cities. Through two case studies integrating VG and machine learning (ML), the study demonstrates their combined impact on environmental control. This experimentation provides insights for future research and implementation to enhance urban environments. The summary maintains the original ideas while avoiding verbatim duplication.

2 Methodology

This research embarks on an exploration of the intricate interplay between vertical farming and the forward-thinking smart city paradigm. It endeavors to decipher how vertical farming harmonizes with the overarching goals of smart cities, tackling pressing urban challenges. Additionally, this study delves into the diverse environmental, individual, and economic impacts of vertical farming. A distinctive focus on the potential benefits for women in the context of urban agricultural innovation and economic prosperity further contributes to a comprehensive narrative. In the midst of an accelerating wave of urbanization, the seamless integration of vertical farming into the fabric of smart city frameworks beckons a promising trajectory toward sustainable urban development.

2.1 Objectives

Identify motivational factors driving the adoption of vertical gardening in the smart city context.

Examine the acceptance factors influencing individuals and communities to embrace vertical gardening.

Understand how vertical gardening aligns with and contributes to the principles of the smart city concept.

To achieve the stated objectives, a mixed-methods research approach will be employed, combining both qualitative and quantitative data collection and analysis. The study will target a sample size of 250 respondents from diverse urban backgrounds within the smart city context.

2.2 Qualitative Phase

Sampling: A purposive sampling technique will be used to select a diverse range of participants representing different demographics, including age, gender, occupation, and residential areas within the smart city.

Data Collection: In-depth interviews and focus group discussions will be conducted to explore motivational factors and acceptance influences. Participants will be encouraged to share their perspectives on vertical gardening and its integration within the smart city framework.

Data Analysis: Thematic analysis will be employed to extract common themes, patterns, and insights from the qualitative data. The emergent themes will serve as a foundation for developing hypotheses and refining the quantitative survey.

2.3 Quantitative Phase

Survey Design: Based on the insights from the qualitative phase, a structured questionnaire will be designed to measure the identified motivational and acceptance factors.

Sampling: Using convenience sampling, a larger sample size of 250 respondents will be surveyed to ensure representation across different demographics and residential areas within the smart city.

Data Collection: The survey will be administered through online platforms and in-person interactions, collecting responses from participants regarding their perceptions of vertical gardening and its alignment with the smart city concept.

Data Analysis: Descriptive statistics, correlation analysis, and regression analysis will be performed to quantify the relationships between motivational factors, acceptance influences, and the alignment with smart city principles.

2.4 Hypotheses

H1: A positive correlation exists between individuals' level of environmental concerns and their inclination towards adopting vertical gardening within the smart city context.

H2: The adoption of vertical gardening within the smart city context is positively linked to the perceived benefits of health and well-being that individuals associate with this practice.

H3: An affirmative connection is observed between the aesthetic appeal of vertical gardening and its adoption within the smart city context.

H4: The adoption of vertical gardening in the smart city context demonstrates a favorable correlation with individuals' aspirations for enhanced food security and self-sufficiency.

Based on the above hypotheses the following conceptual frame work is developed to prove the hypotheses (Fig. 1).

By employing a mixed-methods approach, this research aims to provide a comprehensive understanding of the motivational and acceptance factors driving vertical gardening adoption in the smart city context. The quantitative analysis will statistically test the identified hypotheses, shedding light on the relationships between variables and contributing to a deeper comprehension of the synergy between vertical gardening and the principles of smart cities.
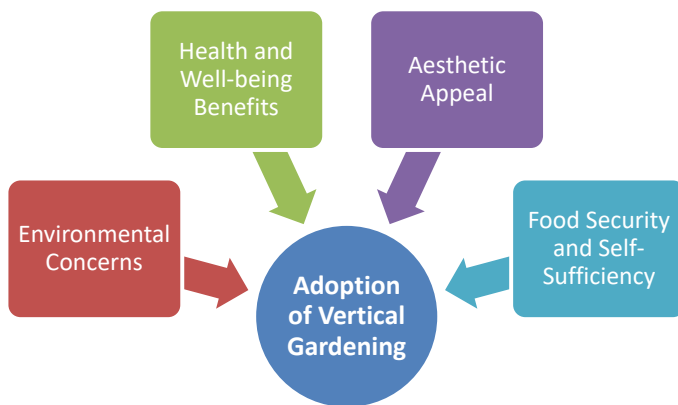
Fig. 1 Motivational factors & adoption of vertical gardening. Source: Author's

3 Data Analysis—Exploring Vertical Gardening in Smart Cities

The Table 1 provides demographic profile which gives valuable insights into the characteristics and composition of the respondents who participated in the current research. Understanding the demographic makeup of the participants is crucial for contextualizing the research findings and drawing meaningful conclusions that can be applied within specific demographic segments. This analysis delves into the gender distribution, age distribution, occupational backgrounds, income levels, and family types of the respondents.

The participants' gender distribution shows a slight majority of males at 56% and females at 44%. This balanced gender representation ensures a diverse and comprehensive perspective on the research topic. The age distribution indicates a varied representation across different age groups. The majority of respondents fall within the age range of 25 to 44 years (66%). This implies that the research captures the perspectives of individuals in their prime working and family-building years. The respondents' occupational backgrounds reveal a diverse mix of employment scenarios. The largest segment consists of employees at 42%, followed closely by business owners at 37%. The presence of a significant proportion of homemakers (21%) reflects a variety

Table 1 Demographic profile analysis of the respondents

Demography profile		Percentile
Gender	Male	56
	Female	44
Age	Below 25	12
	25–34 years	34
	35–44 years	32
	45–55 years	15
	55 and above	7
Occupation	Employee	42
	Business man	37
	Home makers	21
Income level	Low (Less than 1000$)	39
	Middle (1000–4000$)	42
	Upper (above 4000$)	19
Family type	Nuclear family	52
	Joint family	15
	Single-parent family	17
	Childless family	6
	Empty nest family	10

Source Primary Data

of roles and responsibilities among the participants. The distribution of income levels is notable, with the middle-income range (1000\$–4000\$) being the most prevalent at 42%. This suggests a balanced representation of participants across income brackets, enabling a comprehensive examination of perspectives from various economic strata. The composition of family types provides insights into the diverse family structures of the participants. The dominant family type is nuclear families (52%), followed by single-parent families (17%) and empty nest families (10%). The presence of joint families (15%) and childless families (6%) showcases the variety of family dynamics represented in the study.

3.1 Adoption of Vertical Gardening in Smart City

Data were collected from the respondents to explore the relationship between motivational factors and the adoption of vertical gardening in the smart city context. The presented analysis outlines the results of a multiple linear regression model examining the predictors influencing the adoption of vertical gardening within the context of a smart city. The model accounts for the potential impact of environmental concerns, health and well-being benefits, aesthetic appeal, and food security and self-sufficiency as predictors of the adoption of vertical gardening.

The Table 2 shows regression results, the overall model fit indicates a significant relationship, as indicated by the model's R-squared value of 0.424, suggesting that approximately 42.4% of the variance in the adoption of vertical gardening can be explained by the included predictors. The adjusted R-squared value of 0.416 further supports this relationship, considering the number of predictors in the model.

The ANOVA table highlights the statistical significance of the regression model. The F-statistic of 28.552 with a corresponding p-value of 0.000 indicates that at least one predictor significantly contributes to predicting the adoption of vertical gardening.

Delving into the individual predictor coefficients, it is noted that the health and well-being benefits exhibit a standardized coefficient (Beta) of 0.143. This coefficient suggests that for every one-unit increase in the perceived influence of health and well-being benefits, there is a corresponding increase in the adoption of vertical gardening by approximately 0.143 units. Similarly, aesthetic appeal and food security/self-sufficiency display standardized coefficients of 0.133 and 0.439, respectively, indicating their positive influence on the adoption of vertical gardening.

Further, the predictor of environmental concerns, while exhibiting a positive coefficient of 0.069, is statistically significant ($p = 0.042$), suggesting that it have a meaningful impact on the adoption of vertical gardening in the smart city context. The constant term in the model is found to be statistically significant with a coefficient of 2.083, indicating the expected adoption of vertical gardening when all predictor variables are at zero.

Table 2 Motivational factors and adoption of vertical gardening

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.674[a]	0.424	0.416	0.906

a. Predictors: (Constant), environmental concerns, health and well-being benefits, aesthetic appeal, food security and self-sufficiency

ANOVA[a]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	93.695	4	23.424	28.552	0.000[b]
	Residual	324.055	395	0.82		
	Total	417.75	399			

a. Dependent variable: adoption of vertical gardening in smart city

b. Predictors: (Constant), environmental concerns, health and well-being benefits, aesthetic appeal, food security and self-sufficiency

Coefficients

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.083	0.26		8.9521	0.000
	Environmental concerns	0.076	0.056	0.069	1.532	0.042
	Health and well-being benefits	0.144	0.082	0.143	2.575	0.021
	Aesthetic appeal	0.328	0.044	0.133	2.978	0.002
	Food security and self-sufficiency	0.626	0.046	0.439	7.536	0.000

a. Dependent variable: adoption of vertical gardening in smart city

Source Author compilation

Table 3 Rank spearman correlation between vertical gardening practices and its adoption

Practices	Correlation coefficient	Sig.	Result
Resource efficiency (Water, Energy)	0.415	0.001	Moderate
Integration of technology (Sensors, Automation)	0.601	0.002	Strong
Biodiversity enhancement	0.321	0.021	Low
Reduction of urban heat island effect	0.332	0.032	Low
Localized food production	0.632	0.000	Strong

3.2 Vertical Gardening Practices—Alignment with Smart City Principles

The present research used Spearman's correlation to understand how specific aspects of "Vertical Gardening Practices Alignment with Smart City Principles" relate to the "Adoption of Vertical Gardening." This analysis helps reveal connections between these variables and offers insights into factors influencing the acceptance of vertical gardening in the context of smart cities.

Resource Efficiency (Water, Energy):

The Spearman correlation coefficient of 0.415 (Table 3) with a significance level of 0.001 suggests a moderate positive correlation between the efficiency of resource utilization (specifically water and energy) in vertical gardening practices and the adoption of vertical gardening within the smart city context. This implies that as the efficient use of resources increases, there is a tendency for a higher rate of adoption of vertical gardening practices. The low p-value indicates that this correlation is statistically significant.

3.3 Integration of Technology (Sensors, Automation)

The Spearman correlation coefficient of 0.601 with a significance level of 0.002 signifies a strong positive correlation between the integration of technology, such as sensors and automation, within vertical gardening practices and the adoption of vertical gardening in smart cities. This result suggests that as technological integration becomes more prominent in vertical gardening, the likelihood of adoption by individuals also increases. The low p-value underscores the statistical significance of this correlation.

3.4   Biodiversity Enhancement

With a Spearman correlation coefficient of 0.321 and a significance level of 0.021, a low positive correlation is observed between the enhancement of biodiversity through vertical gardening practices and the adoption of vertical gardening. While statistically significant, this correlation indicates a comparatively weaker relationship than the previously mentioned factors.

3.5   Reduction of Urban Heat Island Effect

The Spearman correlation coefficient of 0.332 with a significance level of 0.032 reveals a low positive correlation between the reduction of the urban heat island effect and the adoption of vertical gardening practices. This suggests that vertical gardening's contribution to lowering urban temperatures may influence adoption decisions, albeit to a lesser extent than other factors.

3.6   Localized Food Production

A strong positive correlation is evident between localized food production through vertical gardening practices and the adoption of vertical gardening, with a Spearman correlation coefficient of 0.632 and a significance level of 0.000. This result underscores that the concept of producing food locally via vertical gardening significantly encourages its adoption within the smart city context.

4   Conclusion

Vertical gardening signifies a fusion of innovation, sustainability, and urban living. The exploration of vertical gardening in smart cities provides insights into how urban agriculture, technology, and sustainability intersect. Vertical gardening aligns with smart city principles, optimizing space and promoting local food production. Motivations for adoption, including environmental concerns and health benefits, reveal diverse drivers. Strong correlations with technology integration and localized food production emphasize their pivotal roles. This topic illustrates urban agriculture's potential to address urbanization challenges and reshape cities into self-sufficient, eco-friendly hubs. This study has provided a comprehensive exploration of the adoption of vertical gardening within the context of smart cities. The analysis of demographic profiles revealed a diverse range of participants, ensuring a well-rounded understanding of the topic. The hypotheses testing demonstrated the significance of

various factors, including environmental concerns, health and well-being benefits, aesthetic appeal, and food security, in influencing the adoption of vertical gardening.

The examination of the correlation between vertical gardening practices alignment with smart city principles and adoption offered valuable insights into the interplay between these variables. Notably, the integration of technology and localized food production emerged as influential factors driving adoption, highlighting their potential impact on encouraging individuals to embrace vertical gardening practices. In a broader context, this study adds to the growing body of knowledge about innovative urban agriculture practices and their role in shaping the cities of the future. The insights gained provide a foundation for informed decision-making, guiding urban planners, policymakers, and individuals toward more sustainable and nature-integrated urban environments. As cities continue to evolve, the concept of vertical gardening stands as a promising avenue for addressing key challenges such as resource scarcity, food security, and sustainable living.

References

1. Bass, B., & Baskaran, B.: Evaluating rooftop and vertical gardens as an adaptation strategy for urban areas (2003)
2. Jain, R., Janakiram, T.: Vertical gardening: a new concept of modern era. Commer. Horticult. **1**, 527–536 (2016)
3. Félix, M.J., Santos, G., Barroso, A., Silva, P.: The transformation of wasted space in urban vertical gardens with the contribution of design to improving the quality of life. International Journal for Quality Research **12**1, 803–822 (2018)
4. Salas, M. C., Verdejo, M. M., Sánchez, A., Guzmán, M., Valenzuela, J. L., Montero, J. L.: Vertical gardening. adaptation of hydroponic systems and ornamental species. In: XXVIII International Horticultural Congress on Science and Horticulture for People (IHC2010): International Symposium on 937, pp. 1153–1160 (2010). https://doi.org/10.17660/ActaHortic.2012.937.144
5. Ivanova, N., Ganzha, O., Podkovyrov, I.: Basic methodology in construction of vertical gardening of a building. In: Journal of Physics: Conference Series, vol. 1614, no. 1, pp. 012034. IOP Publishing. (2020). https://doi.org/10.1088/1742-6596/1614/1/012034
6. Mandal, A., Byrd, H.: Density, Energy and Metabolism of a proposed smart city. J. Contemp. Urban Aff. **1**(2):57–68 (2017). https://doi.org/10.25034/ijcua.2017.3648
7. Tymkiewicz, J.: The role of an architect in creating the image of an elderly-friendly sustainable smart City. Buildings **9**(10), 223 (2019). https://doi.org/10.3390/buildings9100223
8. Ekren, E.: Advantages and risks of vertical gardens. Bartın Orman Fakültesi Dergisi **19**(1), 51–57 (2017)
9. Maye, D.: 'Smart food city': conceptual relations between smart city planning, urban food systems and innovation theory. City Cult. Soc. **16**(18), 24 (2019). https://doi.org/10.1016/j.ccs.2017.12.001
10. Ivanova, N., Ganzha, O.: The methodological aspect of the landscape and ecological forming of a comfortable environment for the Smart City. In: MATEC web of Conferences, vol 106, pp 01002. EDP Sciences (2017). https://doi.org/10.1051/matecconf/201710601002
11. Rodríguez-Pérez, J. A., Hernández González, G.: Use of endemic plants from the Canary Islands for gardening. In: XXVIII International Horticultural Congress on Science and Horticulture for People (IHC2010): International Symposium on 937, pp. 1147–1152 (2010). https://doi.org/10.17660/ActaHortic.2012.937.143

12. Lekareva, N., Zaslavskaya, A.: Gardening as vector of a humanization of high-rise building. In: E3S Web of Conferences, vol. 33, pp. 01010. EDP Sciences (2018). https://doi.org/10.1051/e3sconf/20183301010

13. Perini, K., Rosasco, P.: Is greening the building envelope economically sustainable? An analysis to evaluate the advantages of economy of scope of vertical greening systems and green roofs. Urban Forestr. Urban Green. **20**, 328–337 (2016). https://doi.org/10.1016/j.ufug.2016.08.002

14. Halgamuge, M.N., Bojovschi, A., Fisher, P.M., Le, T.C., Adeloju, S., Murphy, S.: Internet of Things and autonomous control for vertical cultivation walls towards smart food growing: a review. Urban Forestry Urban Green **61**, 127094 (2021). https://doi.org/10.1016/j.ufug.2021.127094

15. Da Mota, B., Mataloto, B., Coutinho, C.: Sustainable gardens for smart cities using low-power communications. In: 2022 IEEE 28th International Conference on Engineering, Technology and Innovation (ICE/ITMC) & 31st International Association For Management of Technology (IAMOT) Joint Conference, pp. 1–7. IEEE (2022)

16. Srishailam, B., Jirli, B.P.: Motivating factors of farm based agripreneurs to start farm based enterprises in Sanga Reddy District of Telangana State India. Int. J. Curr. Microbiol. App. Sci. **10**(03):502–507. https://doi.org/10.20546/ijcmas.2021.1003.066

17. Naranjani, B., Najafianashrafi, Z., Pascual, C., Agulto, I., Chuang, P.Y.A.: Computational analysis of the environment in an indoor vertical farming system. Int. J. Heat Mass Transf. **186**, 122460 (2022). https://doi.org/10.1016/j.ijheatmasstransfer.2021.122460

18. Hung, P., Peng, K.: Green energy water-autonomous greenhouse system: an alternative technology approach toward sustainable smart–green vertical greening in a smart city. In: Green City Planning and Practices in Asian Cities: Sustainable Development and Smart Growth in Urban Environments, pp. 315-335 (2018)

19. Geropanta, V., Ampatzoglou, T.: City vertical gardening: an ecological approach to urban planning linkages between machine learning, biometric data, climate control, and urban health. In: Smart Cities and Machine Learning in Urban Health, pp 20–46. IGI Global (2022)

20. Reznik, N. P., Popov, V. M., Podplietnii, V. V., Popova, S. P.: Financial support for the development of joint territorial communities. *Test Eng. Manag.* (2020). Retrieved from http://www.scopus.com/inward/record.ur1?eid=2-s2.0-85082999646&partnerID=MN8TOARS

21. Brych, V., Manzhula, V., Halysh, N., Kalinichuk, N., Reznik, N. Hrynchak, I.: Modeling the dynamics of living standards based on factors of the remuneration system. In: 2021 11th International Conference on Advanced Computer Information Technologies (ACIT), pp. 420–423 (2021). https://doi.org/10.1109/ACIT52158.2021.9548617

22. Reznik, N.P.: Orhanizatsiino-ekonomichnyi mekhanizm zaluchennia investytsii v ahropromyslovyi kompleks Ukrainy [Organizationally economic mechanism of bringing in of investments in the agroindustrial complex of Ukraine]. Ekonomika APK **7**, 70–77 (2013)

23. Reznik, N.: Mizhnarodna praktyka investuvannya v ahrarnomu sektori. [International practice of investing in the agrarian sector]. Economy of AIC **12**, 65–67 (2008)

Application of Grey Relational Analysis for Utilizing Artificial Intelligence Methods in Aviation Management

Bogdanov Ivan ⓘ**, Bogdanova Olga** ⓘ**, Hlukhonets Oksana** ⓘ**,
Petryshyn Roman** ⓘ**, Shkvarylyuk Marta** ⓘ**, and Kirshak Khrystyna** ⓘ

1   Introduction

Modern businesses face hurdles as a result of ongoing innovation, multinational collaborations, and complicated risk management. Intangible resources in their current state of anyone in the value chain must have access to product and process data. To solve these difficulties, product lifecycle management (PLM) has been advocated in recent years as a business model that integrates people, processes, business systems, and information to manage a product's whole life cycle across companies. From market conceptualization to product retirement, PLM enables cooperation in the generation, management, distribution, as well as and use of merchandise definition and process operating information across the company. Because an aircraft has a life expectancy of more than 30 years, opportunities for the use of PLM in aviation repair, overhaul, and upkeep (MRO) abound. However, the usage software PLM in the administrative phase is less prevalent in the airline sector as it is in the design phase. The purpose of the article is to investigate the prospects, benefits, and drawbacks of applying PLM in the airline MRO business. This report is divided into three components, the first of which is this introduction. The second portion examines the field of PLM.

The third section uses case studies to explore the prospects and benefits of using PLM throughout the aviation MRO industry. All machines must be reliable and available at all times. This is particularly relevant for commercial and industrial machines. However, wear-out and eventually system failure are inescapable in industries, making an adequate monitoring system essential for decreasing failure rates and maximizing equipment lifetime. The oldest maintenance method, "fix it when

B. Ivan · B. Olga · H. Oksana
National Transport University, Kyiv, Ukraine

P. Roman (✉) · S. Marta · K. Khrystyna
Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine
e-mail: romeopetryshyn@gmail.com

it breaks," is still utilized in most sectors. Depending on the industry, unscheduled maintenance expenses might account for up to 60% of overall production costs. Technological Advancement: Research in AI applications for aviation maintenance drives technological advancements and innovation. This includes developing more sophisticated machine learning algorithms, integrating AI with robotics and automation, improving data analytics capabilities, and enhancing human–machine interfaces for maintenance support [1]. Sustainability: AI applications contribute to sustainability efforts in aviation maintenance by optimizing maintenance activities, reducing unnecessary inspections, minimizing resource consumption, and improving the overall efficiency of operations. This leads to reduced environmental impact and more sustainable use of resources [2]. Knowledge and Expertise Development: Research in AI applications in aviation maintenance helps build knowledge and expertise in the field. It contributes to the development of best practices, guidelines, and standards for implementing AI technologies, ensuring their safe and effective utilization in the aviation industry [3]. By exploring and advancing AI applications in aviation maintenance, research plays a critical role in improving safety, efficiency, and cost-effectiveness, driving technological innovation, promoting sustainability, and fostering continuous improvement in maintenance practices [4].

2 Materials and Concepts

AI applications help airlines and maintenance providers optimize spare parts inventory management, reduce unnecessary maintenance activities, and minimize overall maintenance costs. By identifying critical components and predicting failures, AI enables efficient resource allocation and cost-effective maintenance strategies. Enhanced Decision-Making: AI-based data analysis and diagnostic tools provide valuable insights for maintenance decision-making. By processing vast amounts of data from multiple sources, AI algorithms help maintenance personnel make informed decisions, improving maintenance planning, resource allocation, and troubleshooting procedures.

Alternative Parameter: Document Management, Augmented Reality, Anomaly Detection Recruitment, Supply Chain Optimization, Predictive and Preventive Maintenance, Maintenance Scheduling, Automated Quality Control.

Evaluation Parameter: Automated Quality Control, Revenue Growth, Maintenance Time, Maintenance Cost.

The following factors are considered for the study.

2.1 Flight Safety

Flight protection refers to the policies and procedures put in place to ensure the secure functioning of aircraft including the protection for passengers, crew, including the general public while flying. It includes a wide range of processes, rules, and technologies aimed at reducing the risks involved with aviation operations. Flight safety is a complicated endeavour that necessitates cooperation among aviation stakeholders such as airlines, air traffic controllers, pilots, maintenance workers, regulators, and manufacturers. The constant emphasis on protection, adherence to rules, continual training and education, as well as the deployment of sophisticated technology all contribute to the maintenance and improvement of flight safety standards [5].

2.2 Customer Satisfaction

Customer satisfaction is the level that contentment or fulfilment felt by customers with a business's product, service, overall experience. It is a measure of how successfully a company fulfils or exceeds its customers' expectations, and it is an important aspect in fostering customer loyalty and generating repeat business. In a nutshell, customer satisfaction is often defined as the degree to which customers are pleased, satisfied, especially happy with a firm and its services [6].

2.3 Employee Acceptance

Employee acceptance applies to an organization's employees' willingness and readiness to embrace and absorb changes, new technology, processes, or projects. Employees must recognise and acknowledge the need that change, be willing to learn and adapt, and actively support and participate in the enactment of new practises. In a nutshell, employee acceptance is the degree to which staff members are receptive to and in favour of organisational changes or activities [7].

2.4 Revenue Growth

Revenue growth is defined as an upsurge in the overall sales of a business or income throughout a given time period. It is an important indication of corporate performance since it represents a company's ability to earn greater income from its goods, offerings, or operations. In a nutshell, revenue growth is the positive adjustment or expansion of a company's sales revenue income over time [8].

2.5 *Maintenance Time*

Maintenance time is the amount of time required to carry out maintenance or repairs upon equipment, machinery, including systems. It denotes the period of time that the equipment has become operational or usable owing to maintenance-related duties. In a nutshell, maintenance time is the time spent servicing, repairing, or performing preventative maintenance on assets, which causes them to be temporarily unavailable for regular operations [9].

2.6 *Maintenance Cost*

The expenses incurred by a corporation or organisation in performing maintenance tasks on its resources, equipment, or facilities are referred to as maintenance costs. It includes direct costs such as labour, materials, and other services needed to complete maintenance chores, along with indirect costs including as overhead expenses including administrative costs connected with maintaining the system. In a nutshell, maintenance costs are the financial outlays incurred in repairing and servicing assets that guarantee their correct operation and durability [10].

3 Methodology

The methodology for implementing artificial intelligence (AI) applications in aviation maintenance involves several key steps:

3.1 *Data Collection*

Gather relevant data from various sources, including aircraft sensors, maintenance records, historical data, and external sources. This data forms the foundation for training and validating AI models [4].

3.2 *Data Preprocessing*

Clean and preprocess the collected data to ensure its quality and compatibility with AI algorithms. This may involve removing outliers, handling missing values, normalizing data, and transforming it into a suitable format for analysis [11]. Feature Engineering: Extract meaningful features from the preprocessed data that can effectively

capture patterns and characteristics related to maintenance issues. This step requires domain knowledge and expertise in understanding the relationship between the data and the maintenance outcomes of interest [12]. Model Selection: Choose appropriate AI models or algorithms based on the specific maintenance problem. This may include machine learning techniques like regression, classification, or clustering algorithms, as well as deep learning models such as neural networks [13]. Training and Validation: Split the data into training and validation sets. Use the training data to train the selected AI model, adjusting its parameters to optimize performance. Validate the trained model using the validation set to assess its accuracy, reliability, and generalizability. Implementation and Integration: Integrate the trained AI model into the existing aviation maintenance infrastructure or systems. This may involve developing software interfaces, connecting with data sources, and ensuring compatibility and scalability [14]. Testing and Evaluation: Conduct rigorous testing of the implemented AI application to evaluate its performance in real-world scenarios. Assess its accuracy, precision, recall, and other relevant metrics to determine its effectiveness in detecting and predicting maintenance issues [15]. Deployment and Monitoring: Deploy the AI application into operational use, monitoring its performance and collecting feedback. Continuously evaluate the AI system's performance and update or fine-tune the model as necessary to maintain accuracy and adapt to changing maintenance requirements [16]. Knowledge Transfer and Training: Facilitate knowledge transfer and training for maintenance personnel to ensure proper utilization and understanding of the AI application. This may involve providing training on interpreting AI outputs, incorporating them into maintenance decision-making processes, and addressing any concerns or limitations [17].

3.3 Continuous Improvement

Continuously improve the AI application by incorporating feedback, addressing limitations, and updating the models or algorithms. Stay updated with advancements in AI technologies and research to leverage new techniques and approaches that can further enhance the application's performance [18].

By following this methodology, organizations can effectively implement and leverage AI applications in aviation maintenance, improving safety, efficiency, and maintenance decision-making processes [19].

The Grey Relational Analysis (GRA) method is a decision-making technique that helps assess the relative performance and rank different alternatives based on multiple criteria. It is particularly useful when dealing with complex and uncertain situations where precise numerical data may be limited. Here is a summary of the GRA method:

- Problem Identification: Clearly define the problem and determine the criteria for evaluation. Identify the alternatives or options that will be assessed.

- Data Normalization: Normalize the raw data to eliminate the influence of different measurement units and scales. Normalize the data to a comparable range, typically between 0 and 1, where 1 represents the most desirable value.
- Determine the Reference Sequence: Select a reference sequence, which serves as the benchmark or reference point for comparing the alternatives. The reference sequence can be chosen based on specific requirements or predefined standards.
- Calculate Grey Relational Coefficients: Calculate the Grey Relational Coefficients (GRC) for each alternative by comparing their normalized values with those of the reference sequence. The GRC measures the similarity between the alternative and the reference sequence for each criterion.
- Weighting the Criteria: Assign weights to the criteria to reflect their relative importance in the decision-making process. The weights can be determined based on expert opinions, stakeholder preferences, or analytical methods such as Analytic Hierarchy Process (AHP).
- Calculate the Grey Relational Grade: Calculate the Grey Relational Grade (GRG) for each alternative by aggregating the GRC values weighted by the criteria weights. The GRG represents the overall performance or suitability of each alternative.
- Rank the Alternatives: Rank the alternatives based on their GRG values. The alternative with the highest GRG is considered the most favorable or optimal choice.
- Sensitivity Analysis: Perform sensitivity analysis to evaluate the robustness of the results. Assess the impact of changes in criteria weights or reference sequence on the rankings to understand their influence on the final decision.

The GRA method provides a systematic and quantitative approach to decision-making by considering multiple criteria and their interrelationships. It helps decision-makers evaluate and compare different alternatives objectively, facilitating informed and rational decision-making.

4 Result and Discussion

Table 1 showing the data set for Alternative parameter is Document Management, Augmented Reality, Anomaly Detection Recruitment, Supply Chain Optimization, Predictive and Preventive Maintenance, Maintenance Scheduling, Automated Quality Control. Evaluation parameter is Flight Safety, Customer Satisfaction, Employee Acceptance, Revenue Growth, Maintenance Time, Maintenance Cost.

Figure 1 showing the data set for Alternative parameter is Document Management, Augmented Reality, Anomaly Detection Recruitment, Supply Chain Optimization, Predictive and Preventive Maintenance, Maintenance Scheduling, and Automated Quality Control. Evaluation parameter is Flight Safety, Customer Satisfaction, Employee Acceptance, Revenue Growth, Maintenance Time, and Maintenance Cost.

Table 1 Data set

	Confirmity with government policy	Maintenance cost	Flexibility with local lifestyle	Payback period
Solar power station	4.0	4.0	4.0	4.0
Pit backfilling	1.2	4.0	6.2	1.6
Educational centers	7.3	2.7	2.2	8.6
Industrial construction	7.4	5.4	4.0	2.1
Revegetation	4.2	2.1	9.0	3.7
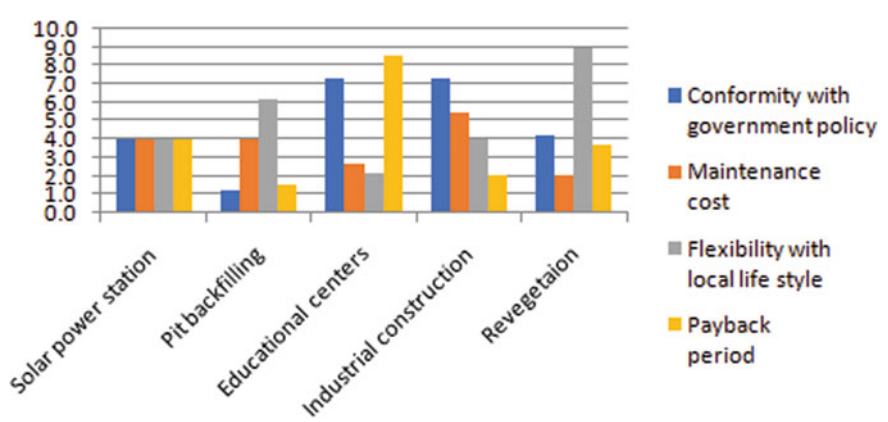
Fig. 1 Data set

Table 2 presents the normalized data for the material alternatives based on their conformity with government policy, maintenance cost, flexibility with local lifestyle, and payback period. The values represent the relative magnitude of each criterion for each material alternative, ranging from 0 to 1.

Table 3 presents the Grey Relation Coefficient values for the material alternatives based on their conformity with the specified evaluation criteria. The Grey Relation Coefficient measures the degree of relationship or similarity between each material alternative and the ideal solution for each criterion.

Table 4 presents the Grey Relation Grade (GRG) values for the different material alternatives based on the evaluation criteria. The GRG values quantify the degree of conformity of each material alternative with the specified criteria. Here are the GRG values for the respective material alternatives:

1. Solar power station: The GRG value for the solar power station is 0.5593.
2. Pit backfilling: The GRG value for pit backfilling is 0.7311.
3. Educational centers: The GRG value for educational centers is 0.6009.

Table 2 Normalized data

	Conformity with government policy	Maintenance Cost	Flexibility with Local Lifestyle	Payback Period
Solar power station	0.5484	0.4242	0.7353	0.6571
Pit backfilling	1.0000	0.4242	0.4118	1.0000
Educational centers	0.0161	0.8182	1.000	0.0000
Industrial construction	0.000	0.0000	0.7353	0.9296
Revegetation	0.5161	1.000	0.000	0.7000

Table 3 Grey relation coefficient

	Conformity with government policy	Maintenance cost	Flexibility with local lifestyle	Payback period
Solar power station	0.5254	0.4648	0.6538	0.5932
Pit backfilling	1.0000	0.4648	0.4595	1.0000
Educational centers	0.3370	0.7333	1.000	0.3333
Industrial construction	0.3333	0.3333	0.6538	0.8750
Revegetation	0.5082	1.0003	0.3333	0.6250

Table 4 GRG values

Solar power station	0.5593
Pit backfilling	0.7311
Educational centers	0.6009
Industrial construction	0.5489
Revegetation	0.6166

4. Industrial construction: The GRG value for industrial construction is 0.5489.
5. Revegetation: The GRG value for revegetation is 0.6166.

These GRG values provide an indication of the relative performance or suitability of each material alternative based on the specified evaluation criteria (Fig. 2).

Table 5 displays the rankings of the material alternatives based on their performance or suitability according to the evaluation criteria. Here are the rankings for each material alternative:

1. Pit backfilling: Pit backfilling achieves the top rank with a ranking of 1, indicating its strong performance or suitability based on the specified criteria.
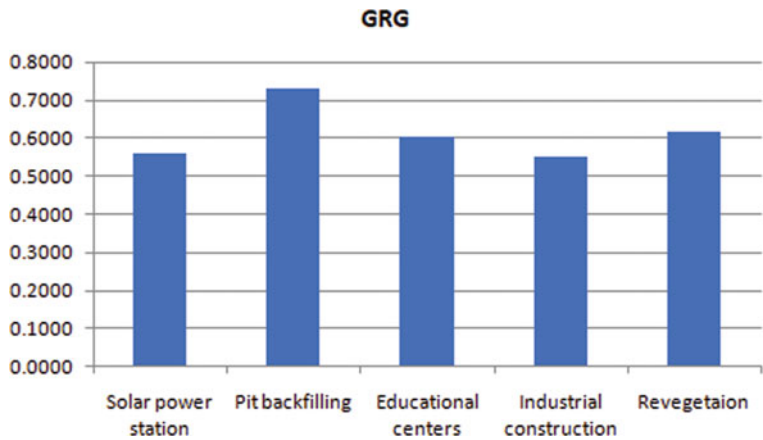
Fig. 2 GRG values

Table 5 Rank

Item	Rank
Solar power station	4
Pit backfilling	1
Educational centers	3
Industrial construction	5
Revegetation	2

2. Revegetation: Revegetation secures the second rank, reflecting its relatively high performance or suitability among the material alternatives.
3. Educational centers: Educational centers receive the third rank, signifying their favorable performance or suitability.
4. Solar power station: Solar power station obtains the fourth rank, indicating its lower performance or suitability compared to the higher-ranked alternatives.
5. Industrial construction: Industrial construction receives the fifth and final rank among the material alternatives, suggesting its relatively lower performance or suitability based on the specified criteria.

The rankings provide a clear indication of the order of preference or performance of the material alternatives, assisting in the decision-making process for material selection as seeing Fig. 3.
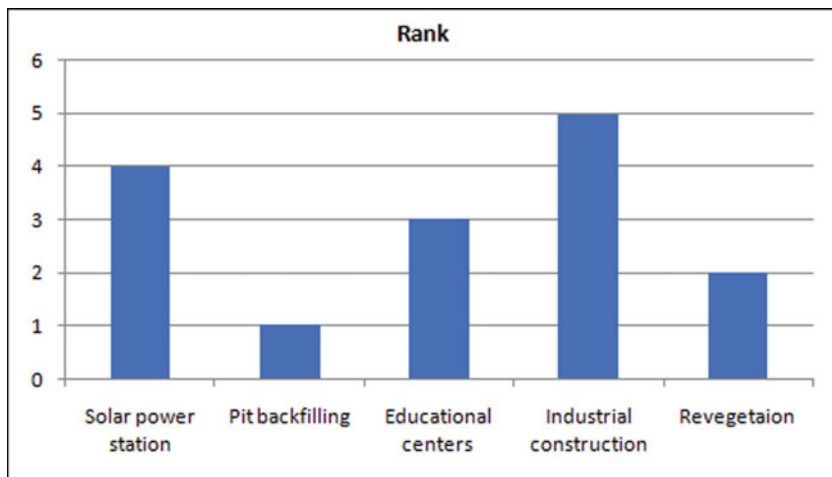
Fig. 3 Ranking

5 Conclusion

Artificial intelligence has enormous potential in the realm of FOD identification. An significant FOD detection method is based on artificial intelligence algorithms, which use image sensors for tracking airport runway photographs in real time in order to detect FOD. The primary job of FOD detecting is to locate the FOD target and offer semantic information about the target's risk level and drug kind. The danger level information is utilized to assist the system in dividing the processing responsiveness level into distinct hazard levels and processing levels. High-risk items must be addressed immediately, while low-risk objectives can be addressed at a later date. Material category semantic information can aid in the safe handling of FOD targets. Different material goals are processed in various ways in order to render the system genuinely intelligent and accomplish autonomous operation to the greatest extent possible with the assistance of some machinery that is automated. Future work could include different task adaptation methodologies to improve and expand the model's performance over diverse aircraft architectures, as well as measuring the impact of covering thickness—for example, separate Boeing-class fuselages for military helicopters may have thicker materials. In light of our computational model's effectiveness, we have thought about deploying a DNN-based model trained using Boeing and Airbus aircraft on identifying corrosion tests of military jets and fighting helicopters.

References

1. Chiu, C., Chiu, N.-H., Hsu, C.I.: Intelligent aircraft maintenance support system using genetic algorithms and case-based reasoning. Int. J. Adv. Manuf. Technol. **24**, 440–446 (2004)
2. Ma, H.-L., Sun, Y., Chung, S.-H., Chan, H.K.: Tackling uncertainties in aircraft maintenance routing: a review of emerging technologies. Transp. Res. Part E: Logist. Transp. Rev. **164**, 102805 (2022)
3. Siyaev, A., Jo, G.-S.: Towards aircraft maintenance metaverse using speech interactions with virtual objects in mixed reality. Sensors **21**(6), 2066 (2021)
4. Kobbacy, K.A.H., Prabhakar Murthy, D.N., Kobbacy, K.A.H.: Artificial intelligence in maintenance. In: Complex System Maintenance Handbook, pp. 209–231 (2008)
5. Wei, G.: Grey relational analysis model for dynamic hybrid multiple attribute decision making. Knowl.-Based Syst. **24**(5), 672–679 (2011)
6. Kuo, Y., Yang, T., Huang, G.-W.: The use of grey relational analysis in solving multiple attribute decision-making problems. Comput. Ind. Eng. **55**(1), 80–93 (2008)
7. Sridharan, V., Muthukrishnan, N.: Optimization of machinability of polyester/modified jute fabric composite using grey relational analysis (GRA). Procedia Eng. **64**, 1003–1012 (2013)
8. Reznik, N., Boshtan, A.: Features of execution of customs control in Ukraine during the war. Young Scientist **11**(111), 103–107 (2022). https://doi.org/10.32839/2304-5809/2022-11-111-22
9. Reznik, N., Stanovy, O.: Convention on the common transit procedure—customs visa free' or additional complications for the customs system of Ukraine. Young Scientist **11**(111), 108–113 (2022). https://doi.org/10.32839/2304-5809/2022-11-111-23
10. Tiupysheva, V., Reznik, N., Zahorodnia, A.: Modern condition and direct development of warehouse logistics. Int. J. Innov. Technol. Econ. **1**(41) (2023). https://doi.org/10.31435/rsglobal_ijite/30032023/7938
11. Kumar, M.: Optimized application of artificial intelligence (AI) in aviation market. Int. J. Recent Res. Aspects **9**(4) (2022)
12. Lv, Z., Xie, S.: Artificial intelligence in the digital twins: state of the art, challenges, and future research topics. Digital Twin **1**(12), 12 (2022)
13. Chen, Z.-H., Juang, J.-C.: Attention-Based YOLOv4 Algorithm in Non-Destructive Radiographic Testing for Civic Aviation Maintenance (2021)
14. Zhang, P., Zhao, S.-W., Tan, B., Yu, L.-M., Hua, K.-Q.: Applications of decision support system in aviation maintenance. In: Efficient Decision Support Systems-Practice and Challenges in Multidisciplinary Domains–InTech, pp. 397–412 (2011)
15. Chang S., Wang, Z., Wang, Y., Tang, J., Jiang, X.: Enabling technologies and platforms to aid digitalization of commercial aviation support, maintenance and health management. In: 2019 International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering (QR2MSE), pp. 926–932. IEEE (2019)
16. Antosz, K., Pasko, L., Gola, A.: The use of artificial intelligence methods to assess the effectiveness of lean maintenance concept implementation in manufacturing enterprises. Appl. Sci. **10**(21), 7922 (2020)
17. Ivanov, D., Pelipenko, E., Ershova, A., Tick, A.: Artificial intelligence in aviation industry. In: Digital Technologies in Logistics and Infrastructure, pp. 233–245. Springer International Publishing, Cham (2023)
18. Harrison, L., Saunders, P., Janowitz, J.: Artificial Intelligence with Applications for Aircraft. Galaxy Scientific Corp, Pleasantville NJ (1994)
19. Wei, G.-W.: GRA method for multiple attribute decision making with incomplete weight information in intuitionistic fuzzy setting. Knowl.-Based Syst. **23**(3), 243–247 (2010)

Finance, Technology and Sustainability

Financial Inclusion and Economic Development: A Study on the Women Marginalized People in India

Roopa Adarsh and **K. Sivasubramanian**

1   Introduction

Inclusive growth would be possible when all the people in the country are included in the developmental procedure. Financial inclusion is one of the methods to enhance the socio-economic progression of the poor and vulnerable secs in developing nations [8]. Financial inclusion has been defined as a process to access into the formal financial services where adequate finances are provided at affordable rates. The concept of financial inclusion would be defined as universal access of all ranges of the financial services to all segment of the people in the society [7]. By encouraging an attitude of saving among a significant portion of the rural population, financial inclusion deepens the financial system's resource base and contributes to economic growth on its own. Furthermore, financial inclusion safeguards low-income groups' financial assets and other assets during emergency situations by bringing them within the boundaries of the formal banking sector. By making it simple to obtain formal credit, financial inclusion also reduces the exploitation of weaker groups by predatory lenders [15]. In order to increase the amount of money in the nation, the RBI has chosen a bank-led strategy and eliminated all regulatory barriers. RBI has also established a supportive regulatory environment and given banks institutional support to help them speed up their financial inclusion initiatives in order to achieve the stated goals. The Indian financial system, which includes numerous segments with banking organisations, agents, practises, and marketplaces, is essential to a country's economic success [2]. Financial inclusion was described as "the process of ensuring the availability of banking services and adequate and on time credit where required by those who

R. Adarsh
Department of Economics, Mount Carmel College, Bangalore, India

K. Sivasubramanian (✉)
Department of Economics, Kristu Jayanti College, Bangalore, India
e-mail: sivasubramanian@kristujayanti.com

are vulnerable such as less fortunate individuals and people with low incomes at an affordable cost" in the Panel on Financial Inclusion's report.

2 Structure of the Paper

This paper is articulated such as introduction, literature review, objectives of the study, methodological framework, data analysis, results and concluding remarks with scope for further research.

3 Literature Review

The study's findings showed that a rural community's financial literacy directly affects how financially literate they are; however, when they are able to make wise financial decisions and behave responsibly, they are more likely to practise financial inclusion, which has aided in their socioeconomic empowerment. The Indian government may start spending considerable sums of money to encourage financial education, which can greatly increase financial inclusion, as a result of realising the key function of financial literacy [10].

It is highlighted that providing financial services to the poor primarily involves assisting them in growing their savings into amounts sufficient to cover a variety of needs, including those related to assets, consumption, personal needs, and social obligations. Such "swaps" ought to occur in a variety that can meet short-, medium-, and long-term demands, as well as must be given in a fashion that is practical, suitable, safe, and economical. Effective financial services for the poor help them manage their vulnerability and can consequently aid in the reduction of poverty [9]. It is complicated and not an easy relationship to maintain because of these complex livelihood imperatives. The poor cannot be rescued from poverty with a mystical sky-hook or microfinance [9, 19].

Based on the literature that is currently accessible, the author of this study makes the case that knowledge of finances and household income have a favourable association. As a result, those with a high level of financial literacy are more likely to raise their household income. Individuals who lack financial literacy are unable to make informed investment decisions, which has a negative impact on their income. A sign that better investment decisions are made to increase revenue when one has the right financial understanding. Once more, effective budgeting (financial literacy) has a favourable impact on the accumulation of wealth and financial well-being for both individuals and households [17].

The adoption of policies and activities to enhance the possibilities and well-being of people living in rural areas is the economic empowerment of rural people. It covers a range of topics, including community involvement, employment, equality for women, and education and health. For instance, initiatives like India's Sarva

Shiksha Abhiyan (SSA) seek to offer free and required education to all kids in rural areas, with a focus on girls and underserved groups. Similar to this, the World Health Organization's Village Health Worker programme educates people in rural areas on how to offer basic medical treatment and spread knowledge of health issues. Rural people that are economically empowered have better livelihoods and financial well-being because they have more control of their economic prospects and resources. This is accomplished through programmes that offer financial services, encourage entrepreneurship, and improve skills for generating money. For instance, Grameen Bank in the nation of Bangladesh and other microfinance organisations have been instrumental in providing financial services and microcredit to rural residents, especially women, allowing them to start enterprises and improve their economic situation [18].

Fintech, often known as financial technology, is the use of innovative technology in a financial institution or industry. The emergence of financial technology, or Fintech, has greatly increased financial inclusion throughout the world. Numerous Fintech businesses in India are also working hard to streamline the process of offering potential customer's financial services. Successful Fintech businesses also provide financial services and goods at low prices. Customers benefit greatly from this because their costs are minimal and they can use their savings to meet other demands [1]. The process of crowd funding online banking, peer-to-peer, e-wallets, and other recent Fintech innovations are just a handful that people employ. Many people are using these cutting-edge banking solutions, both in urban and rural settings. But there are still a lot of untapped people who have never dealt with a bank or any other type of financial institution. It is challenging for these individuals to use any financial mobile service [13].

4 Objectives

To understand the financial inclusion for the eradication of poverty.

To study the selected financial inclusion schemes of the government of India in the development of women.

5 Methodology

This paper is only based on secondary data published from various sources. The collected data has been analysed based on the objectives framed. The secondary data was collected through published articles and reports. The major portion of data collected from government reports such as RBI, World Bank, and Ministry of Finance. This disruptive study aims to understand the financial inclusion of women for their social and economic development.

6   Data Analysis and Results

The government has taken various steps to enhance the financial inclusivity of the poor and vulnerable people in the rural areas particularly women. In this context various schemes where introduced including Mahila Bank (A bank has been operating exclusively by women for women). Due to these initiations, the people could able to achieve and get the benefit from all the financial services.

Table 1 exhibits the number of ATMs increased over a period of time from 2013 to 2020 starting from 13 to 22 for one lakh account holder. Bank branches also increased significantly from 12 to 15 per one lakh adults. Mobile transaction had an exponential growth from 36 to 4223 per lakh adults.

It is observed from the Table 2, the data published by the Reserve Bank of India states that there was consistent growth of the financial inclusion through the bank accounts by the women. In 2011, it was recorded with 44% male and 26% female using the banking services. The number was grown to 63% for male and 43% for female. Similarly, the percentage of female account holders was increased further to 77 in 2017 and 78 in 2021. It clearly shows the positive progress of the financial inclusion plan by the government of India for the women in India especially for the rural areas.

Table 1   Financial inclusion indicators

Indicator	2013	2014	2015	2016	2017	2018	2019	2020
ATMs per lakh adults	13	18	20	21.24	22	22	21	22
Branches per one lakh adults	12	13	14	14.06	15	15	15	15
Accounts per 1K adults	1161	1337	1542	1731	1882	1937	1968	2031
Loan per 1K adults	143	152	154	171	178	200	232	267
Mobile transactions per 1K adults	36	117	273	635	1679	3067	4130	4223

Source IMF Financial Access Survey, 2020

Table 2   Bank account by gender

Year	Male (%)	Female (%)
2011	44	26
2014	63	43
2017	83	77
2021	78	78

Source RBI

7   Financial Inclusion Initializations

The PMJDY—Prathan Mantri Jan Dhan Yojana is one of the flagship financial inclusivity programme by the government.

In this initiative, the public sector banks are playing a key role in the process of including the women in the financial market and services. The public sector bank has 21.48 crore female accounts. The number of accounts with public bank was the highest among other banks. The private sector bank has only 0.76 crore and regional rural bank has 5.33 crore accounts (Table 3; Fig. 1).

Table 3 Gender-wise number of beneficiaries and money deposited

Type bank	Total beneficiaries (Cr)	Female beneficiaries (Cr)	Money deposited in Crore
Public sector	38.98	21.48	155,311.87
Rural banks	9.24	5.33	38,937.45
Private sector	1.42	0.76	5734.79
Total	1.42	27.57	199,984.1

Source Department of Financial Services, Ministry of Finance, 2023. *Note* Data is publicly available
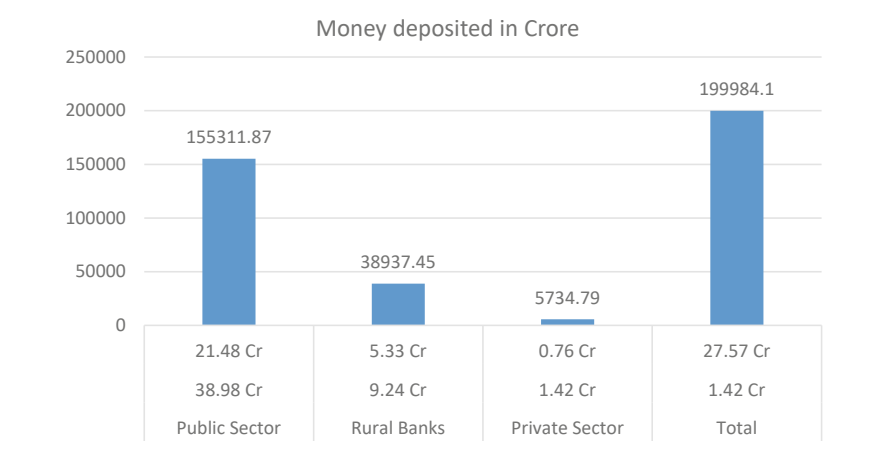
Fig. 1 Gender-wise number of beneficiaries and money deposited. *Source* Department of Financial Services, Ministry of Finance, 2023

Table. 4. Number of
beneficiaries under Atal
Pension scheme

Year	2016–2017	2017–2018	2018–2019
Total Beneficiaries	48,54,355	48,50,205	57,12,359

Source Press Information Bureau, GOI

8 APY—Atal Pension Yojana

All owners of savings accounts between the ages of 18 and 40 are eligible for the Atal
Pension Yojana (APY), which provides old age income security. The programme also
encourages workers to actively save for their golden years while addressing longevity
risks among those employed in the unorganised sector.

The total number of beneficiaries increased from 48,54,355 in 2016–2017 to
57,12,359 in 2018–2019 period (Table 4).

9 Sukanya Samridhi Yojana

This scheme was launched specially to promote and include the financial inclusion
plan for the gild children.

The states like Uttar Pradesh, Tamil Nadu, Maharashtra, Madhya Pradesh and
Karnataka have significantly contributing to promote this scheme for the benefit of
the women development through financial inclusion (Fig. 2).
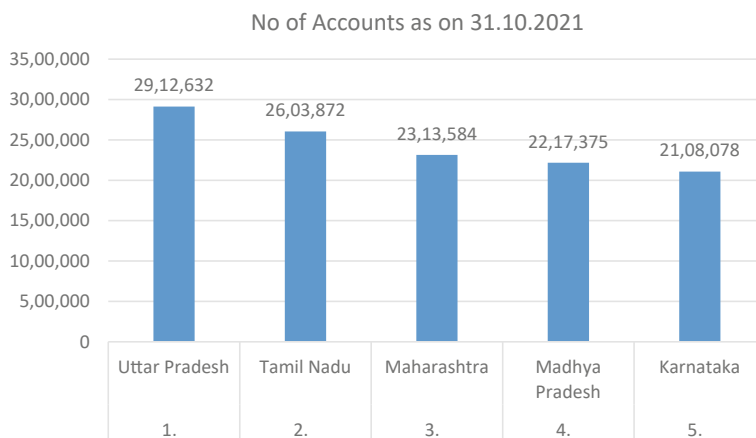
Fig. 2 Sukanya Samridhi Yojana Performance. *Source* Press Information Bureau, GOI

10 Financial Inclusion and Women Empowerment

Women's participation in home financial management is a key component of financial inclusion. According to financial inclusion, women are better equipped than males to manage household finances effectively. Therefore, financial inclusion initiatives focus on women by assisting them in beginning to handle their finances. Women are frequently prohibited from handling finances in many homes [3]. The males of the house control them and instruct them to do solely household duties. In India, a lot of conservative people think that women can't handle money. The government and non-governmental organisations want to eradicate this mentality with the aid of financial inclusion. Women are being encouraged to pursue greater career options and achieve financial independence as a result of financial inclusion. It also illustrates how women won't need to rely on males for financial support. Additionally, they are not need to wait for approval from men before acting. By raising financial awareness among low-income women, financial inclusion aims to give them more influence. Women are also given straightforward advice on how to save money for the future. They are exposed to a variety of readily available savings options. Additionally, they learn about the many kinds of credit that are offered on the market. They can use these loan options to launch their first small company or enrol in a study to prepare for a new career. Their monthly revenue will rise as a result of this. Many women are also purchasing cell phones for their personal use as a result of financial inclusion. Only men were allowed to own cell phones in some regions of the country, forcing women to rely on these guys. Women have begun to purchase mobile phones in recent years, and they have begun to use them to fulfil employment, business, and financial needs [4]. Many of users have begun to use mobile devices to do additional financial transactions and use digital payment methods. This has made their transactions easier and faster. Bank and other financial companies are being urged to help the unbanked segments of society as part of the concept of financial inclusion. By offering unique rates, exclusive discounts, or other incentives, many of these organisations are likewise focusing on helping women become financially independent [6]. For certain lending products, many banks provide women subsidised or reduced interest rates. Women depositors earn greater interest on their deposits than males do for savings accounts provided by particular banks and non-banking financial firms [11].

Government encouraged every financial institution to open Basic Savings Bank Deposit (BSBD) account with the bare minimum of common features, such as no minimum balance, cash deposits and withdrawals at bank branches and ATMs, money receipt/credit through digital payment channels, and the ability to provide ATM cards. Relaxed and streamlined KYC requirements would make it easier to create financial accounts, especially for minor accounts with balances under Rs. 50,000 and annual credit limits of Rs. 1 lakh. Additionally, banks are urged not to demand an introduction in order for customers to open bank accounts. Furthermore, banks are permitted to accept an Aadhar Card as identification and address verification [16]. Domestic SCBs are allowed to open offices in Tier 2 to Tier 6 centres with populations of less than 1 million under universal permission, subject to reporting,

in order to solve the issue of unevenly distributed bank branches. Domestic SCBs may open branches in Sikkim and the North-Eastern States without obtaining RBI approval. General authorization for domestic scheduled commercial financial institutions (other than RRBs) for establishing branches in Tier 1 locations, subject to certain requirements, with the intention of progressively liberalising. Banks are required to designate at least 25% of the total amount of branch to be established during the year in unbanked rural areas under the Mandatory Requirement for Opening Branches in Un-Banked Communities regulation. For efficient cash management, paperwork, customer complaint resolution, and close monitoring of BC activities, banks have been urged to establish intermediary brick and mortar facilities between the current base bank and BC sites [5]. This branch might be a low-cost, straightforward brick and mortar building with the bare minimum of infrastructure, including a core banking solution terminal connected to a pass book printers and a safe for cash storage for handling larger customer transactions. Beginning in April 2010, banks in both the private and public sectors were urged to submit board-approved financial inclusion Plans [12]. These regulations seek to maintain self-imposed goals for opening rural brick-and-mortar branches, hiring BCs, covering unbanked villages with populations over and below 2000, opening BSBD accounts, issuing KCCs and GCCs, and other objectives. These proposals have been under monthly review by RBI. It has been suggested to banks that their FIPs be broken down and percolated all the way down to the local level. This would guarantee the participation of all parties involved in the initiatives to promote financial inclusion [14].

11 Conclusion

The current wave of new bank licencing primarily aims to support our nation's efforts to increase financial inclusion. When reviewing applications for a banking licence, inventive business models designed to advance financial inclusion initiatives will be carefully examined. The development of an economic inclusion plan could be a crucial requirement for obtaining additional bank licences. In August 2013, the RBI released a discussion paper on bank structure for feedback from the general public. The topic of "Differentiated Banking Licences" is one of the primary problems. There, the topic of licencing "small banks and financial inclusion" was covered. RBI will consider the feedback and ideas it has gotten from the public at large before making a decision. In this regard, it is important to note that the 1606 Urban Cooperative Banks (UCBs), 64 Regional Rural Banks (RRBs), and 4 Local Area Banks (LABs) that operate in this nation are all Small Finance Banks. Apart from these, there is a three-tier rural cooperative structure with Primary Agriculture Credit Societies (PACs), which have a total number of 31,371 and 92,432 members, at the bottom and District Central Cooperative Banks (DCCBs) in the middle. In addition, as of March 2013, there were around 12,225 NBFCs, which are conceptually similar to semi-banks and primarily engage in lending and investing operations.

12 Scope for Future Study

This study is based on the data available from various sources at secondary level. It is limited and rely on the published data. But there is a large chunk of avenues available for the take up this particular study to find out the impact of various government schemes relating to financial inclusion.

References

1. Busenbark, J.R., Graffin, S.D., Campbell, R.J., Lee, E.Y.: A marginal effects approach to interpreting main effects and moderation. Organ. Res. Methods **25**(1), 147–169 (2022). https://doi.org/10.1177/1094428120976838
2. Deb, R., Das, P.: Perceptions of bank account holders about PMJDY—a study on Baikhora region of South Tripura. Amity J. Financ. **1**(1), 67–91 (2016)
3. Dikshit, S., Pandey, A.C.: Role of financial inclusion in realizing sustainable development goals (SDGs). Int. J. Res. Financ. Manage. **4**, 35–39 (2021)
4. Gautam, R.S., Rastogi, S., Rawal, A., Bhimavarapu, V.M., Kanoujiya, J., Rastogi, S.: Financial technology and its impact on digital literacy in India: using poverty as a moderating variable. J. Risk Financ. Manage. **15**(7), 311 (2022). https://doi.org/10.3390/jrfm15070311
5. Drury, A., Pratt, D.: Islam in New Zealand—a mixed reception: historical overview and contemporary changes. J. College Sharia Amp Islamic Stud. **39**(1) (2021)
6. Hendriks, S.: The role of financial inclusion in driving women's economic empowerment. Dev. Pract.Pract. **29**(8), 1029–1038 (2019). https://doi.org/10.1080/09614524.2019.1660308
7. Kaur, H., Singh, K.N.: Pradhan Mantri Jan Dhan Yojana (PMJDY): a leap towards financial inclusion in India. Int. J. Emerg. Res. Manage. Technol. **4**(1), 25–29 (2015)
8. Kalhan, A.: Repercussions of protracted currency shortage across two models of financial inclusion in India. Econ. Pol. Wkly **35**(44), 40–46 (2020)
9. Matin, I., Hulme, D., Rutherford, S.: Finance for the poor: from microcredit to microfinancial services. J. Int. Dev. **14**(2), 273–294 (2002). https://doi.org/10.1002/jid.874
10. Panakaje, N., Rahiman, H.U., Parvin, S.M.R., Kulal, A., Siddiq, A.: Socio-economic empowerment in rural India: do financial inclusion and literacy matters? Cogent Soc. Sci. **9**(1), 1 (2023). https://doi.org/10.1080/23311886.2023.2225829
11. Pandey, A., Kiran, R., Sharma, R.K.: Investigating the impact of financial inclusion drivers, financial literacy and financial initiatives in fostering sustainable growth in North India. Sustainability **14**(17), 11061 (2022). https://doi.org/10.3390/su141711061
12. Pillai, T.J.: Financial inclusion and Pradhan Mantri Jan Dhan Yojana: an empirical study conducted in the villages of Mulshi Taluka in Pune District. Indian J. Sci. Technol. **9**(45), 1–6 (2016)
13. Pradhan, R.P., Sahoo, P.P.: Are there links between financial inclusion, mobile telephony, and economic growth? Evidence from Indian states. Appl. Econ. Lett. **28**(4), 310–314 (2021). https://doi.org/10.1080/13504851.2020.1752893
14. Pushp, A., Gautam, R.S., Tripathi, V., Kanoujiya, J., Rastogi, S., Bhimavarapu, V.M., Parashar, N.: Impact of financial inclusion on India's economic development under the moderating effect of internet subscribers. J. Risk Financ. Manage. **16**(5), 262 (2023). https://doi.org/10.3390/jrfm16050262
15. Singh, B.P., Kumari, A., Sharma, T., Malhotra, A.: Financial inclusion, Pradhan Mantri Jan Dhan Yojana scheme and economic growth: evidence from Indian States. Econ. Notes **1–14**, e12186 (2021)
16. Suresh, A., Dutta, T.: Economic development and women: role played by financial inclusion. SSRN Electron. J. (2018). https://doi.org/10.2139/ssrn.3102809

17. Twumasi, M.A., Jiang, Y., Ding, Z., Wang, P., Abgenyo, W.: The mediating role of access to financial services in the effect of financial literacy on household income: the case of rural Ghana. SAGE Open **12**(1), 215824402210799 (2022). https://doi.org/10.1177/215824402210 79921

18. Yunus, M.: Creating a world without poverty: social business and the future of capitalism. Public Affairs (2007)

19. Zelizer, V.A.: The Social Meaning of Money: Pin Money, Paychecks, Poor Relief, and Other Currencies. Princeton University Press (2021). https://doi.org/10.2307/j.ctv1t1kg6k

"Moment of Truth" in Aviation Marketing—A Study on Factors that Influence the Decision Making of Customers

Ponny Thomas and Priyanka Ghosh

1 Introduction

The expansion of the service industry can be attributed to various factors. Factors like growing wealth, urbanization, technical advancement, market growth, the opening of economies, and demand for intermediary and final consumer services, are among these.

Nevertheless, despite the great advantages that the sector provides, there appears to be a problem controlling it, particularly in the aviation industry. Particularly in the management of service encounters, the aviation sector faces several difficulties.

Carlzon [1] took over a failing airline and successfully converted it into one of the most reputable ones in the business. His key initiatives involved putting the customer first, promising risk-taking, giving front-line staff greater power, and getting rid of vertical layers of hierarchy in favor of a more parallel structure that embodied entrepreneurial management and the quest for excellence. He concluded that the first 15 s of a passenger's interaction with the airline staff set the tone or picture of the entire organization in that customer's mind. The idea was to make sure that each "moment of truth" turned out well for the customer.

A service sector with a comparatively high degree of customer contact is the Aviation industry. Customer and service employee interactions increase with the degree of customer contact and are longer and more frequent.

When customers engage with service personnel or self-service equipment during the course of receiving a service, the result may have an impact on how those customers perceive the quality of the service. In the aviation sector, passengers can become unsatisfied for a variety of reasons, including an employee's careless behavior, impolite response, not attending to their queries on time, or an unexpected request. It is critical for service providers to have an impact on how customers

P. Thomas (✉) · P. Ghosh
Kristu Jayanti College (Autonomous), Bengaluru, India
e-mail: ponnythomas@kristujayanti.com

perceive the value of their offerings at this time. For example, a passenger in the aviation sector experiences several service interactions while traveling in an aircraft right from booking the ticket, doing web check-in, dropping the baggage in the baggage counter area, completing the security check-in process, waiting in the gate area, using the facilities in the airport, boarding the flight, having meals inside the aircraft, interacting with the cabin crew and finally collecting the luggage from the airport. During the interactions, the passenger creates an overall impression of the airline's service quality and each interaction adds to the passengers' overall satisfaction and interest to fly with them again. For the airline, every interaction is a chance to provide excellent service to its passengers [2].

The moment a customer directly engages with a service is referred to as a "service interaction." The "moment of truth" is another term used to describe this point of contact between clients and the service provider. The actions of front-line employees, whose experience and dedication are limited and whose attitudes may fluctuate from one customer to another, frequently affect the quality of service encounters. Regardless of the nature and duration of the interaction, each "encounter" serves as a crucial "moment of truth" for the client [3].

Consumer outlooks, objectives, choices, and purchasing patterns make up the entire consumer tastes that are connected to a consumer's actions when purchasing a product or service [4].

Customers acquire various experiences after consuming products from the service industry. Every person makes decisions based on a unique set of sociodemographic and psychographic traits because of which their reaction towards the service also will vary [5].

The primary objective of the Service industry is to focus on providing excellent customer service. In the current competitive environment, the capacity of a service provider to provide quality service is thought to be a crucial tactic for accomplishment and existence [2].

Moses and Kumar [6] studied the effect of Covid-19 on various countries as well as on street vendors. Due to different limitations imposed during the pandemic, the economies of all countries were severely disrupted.

Karthick and Gopalsamy [7] studied the role of Big Data, Artificial Intelligence, and Advanced Robotics in various industries. These industries are known as Smart Industries and they are using this advanced technology to improve industrial performance and optimize the energy and workforce needs. The advancement of IoT has changed the manufacturing industries tremendously.

Abdullah and Pratt [8] studied the history of Islam in New Zealand. When a multicultural civilization or community attempts to forge unity or form one community, understanding one another's cultures is crucial. The study is primarily based on a critical analysis of available resources.

1.1 Face to Face Encounter in Aviation Sector

There is direct contact between the passenger and the employee in face to face encounter stage. There are a number of factors that determines the quality of this face-to-face encounter in the aviation sector such as the readiness of the airline staff to help the passengers, politeness of the cabin crew members, the response of the employees towards the needs of the passengers, friendly nature, etc. It's important to identify the factors that could make a customer happy with the service experience and those that might make them unhappy. The adaptability of the employees in how they respond to customer needs and request plays a pivotal role in creating an impression on the airline brand. A lack of response to customer needs will create customer dissatisfaction. Furthermore, the intangibility nature of the aviation sector makes it highly difficult for airline companies to satisfy customers.

1.2 Types of Moments of Truth

1.2.1 Zero Moment of Truth (ZMOT)

This is the most important phase of a consumer's journey of purchase. The ZMOT stage in the aviation industry refers to the phase where a customer researches an airline company and its services. At this stage, the customer goes through all possible reviews where they get information about the airline company and its services.

- First Moment of Truth: It arises at the first stage of usage of the product.
- Second Moment of Truth: It arises when the customer has used the product after purchase.
- Ultimate Moment of Truth: It arises when the customers are providing feedback after use.

In this study, the researchers have tried to analyze the various factors which are affecting the decision-making of customers. The study has conducted in the following steps: Introduction with Review of Literature, Research Methodology, Hypothesizes, Data Analysis, and Conclusion.

2 Hypothesizes

H_1—Moment of Truth has a positive impact on customer satisfaction in aviation marketing.

H_2—The Quality of Service does have a positive effect on Customer Satisfaction.

H_3—Moment of Truth does have a positive effect on service quality in aviation marketing.

3 Research Methods and Techniques

3.1 Objectives

The main objectives of this study are:

- To find out whether Moment of Truth does have any impact on customer satisfaction in aviation marketing.
- Whether the Quality of service does have any effect on customer satisfaction in the aviation industry.
- Also, to find out the effect of Moment of Truth on service quality in aviation marketing.

The researchers have considered 230 respondents to test the framed hypotheses. The responses have been collected through a questionnaire. The considered respondents belonged to Bengaluru city and a Random Sampling Technique has been used to collect the data. The research has been conducted on Aviation Marketing. The study period was January 2023. The researchers have considered the Partial Least Square Method to analyze the Hypothesizes.

The plan of this research has been presented through Fig. 1, where Moment of Truth can be calculated based on 2 factors i.e. Quality of the Service and Satisfaction level of the customers. Based on these two factors three hypotheses had been framed.
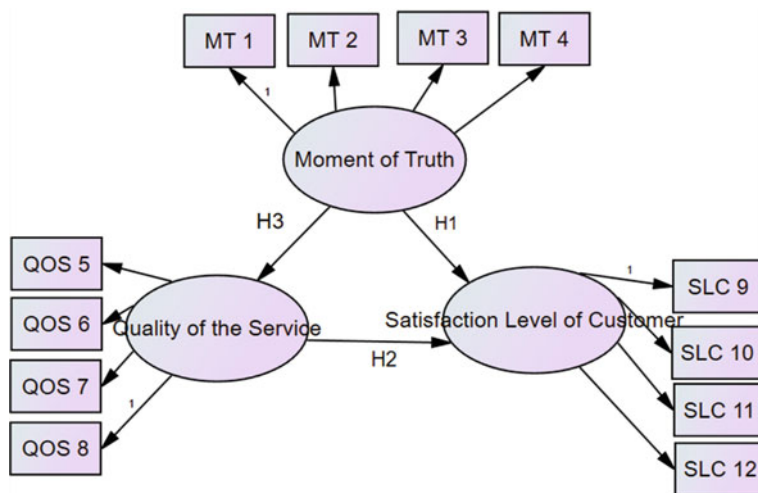
Fig. 1 Framework of the research

3.2 Scale of Measurement

To measure the Moment of Truth of Customers in Aviation Marketing the Moment of Truth Scale [9] had been applied. Again, the Service Quality Scale [10] and Customer Satisfaction Scale [11], had been applied to measure service quality and customer satisfaction level respectively.

Table 1 has indicated the various factors of Moment of Truth. Service Delivery, Quality of Service, Safety, and Interpersonal skills have been considered as various factors of Moment of Truth.

Out of 4 factors which have been mentioned in Tables 1, 2 factors namely Quality of Service and Satisfaction Level of Customers have been considered for research. In Table 2, various factors which are representing the quality of service has been discussed and considered for research purpose.

In Table 3, the researchers have mentioned various factors of the Satisfaction Level of Customers have been mentioned. Pricing, Responsibility, Customer Treatment, and Special Assistance are the 4 factors that have been considered in the Satisfaction Level of Customers.

Table 1 The indicators of moment of truth in aviation marketing

S. No.	Indicators/factors	Statement
MT 1	Service delivery	The different stages involved in booking tickets
MT 2	Quality of services	In Flight services available in an aircraft
MT 3	Safety	Measures used for passenger safety
MT 4	Interpersonal skills	The way the airline staff greets its customers

Source Primary data

Table 2 Indicators/factors of service quality

S. No.	Indicators/factors	Statements
QOS 5	Availability of information	The information available on the airline website
QOS 6	Frequency	Frequency of flight operation
QOS 7	Following timely schedule for airline operation	Following the time schedule for airline operation
QOS 8	Comfort	Comfort of the seats

Source Primary data

Table 3 Factors of customers satisfaction in aviation marketing

S. No.	Indicators/factors	Statements
SLC 9	Pricing	The amount charged for the tickets
SLC 10	Responsibility	The response towards the complaints of the passengers
SLC 11	Customer treatment	Friendly nature of the Cabin Crew
SLC 12	Special assistance	Passenger special assistance

Source Primary data

3.3 Information Related to Demography

The Researchers have also collected demographic information about the respondents such as age, education level, income level, frequency of traveling, and uses of air travel.

3.4 Limitations of Study

- The study is based on respondents of the customers which purely depends on their personal choices of airlines and preferences on various factors.
- The study has considered limited responses and the respondents are from Bengaluru city only.
- It has been conducted within a limited time period.

4 Research Results and Analyses

4.1 Result of Hypothesizes Testing

The data has been analyzed in Table 4 and Fig. 2 in relation between Moment of Truth and Customer Satisfaction. The data resulted that the relationship has a co-efficient value of 0.221 with a probability value of 0.023 and a t value 2.225. From the above table, it is clear that the t value is greater than the table value (t table value 1.96). hence, it can be concluded that Moment of Truth does have an effect on Customer satisfaction in the aviation industry. Again, as per Table 5 the relationship between the quality of service and customer satisfaction has a co-efficient value of 0.584 and the probability value is 0.001 with a t value 5.65 (t table value 1.96). So, the quality of services provided by aviation companies does have a positive impact on customer satisfaction. The relationship of Moment of Truth with service quality had a co-efficient value of 0.873 and the probability value is 0.0013 with a t value is

3.0075 (*t* table value 1.96). Thence, it also can be stated that Moment of Truth does have an effect on service quality provided by the aviation companies in India.

Table 4 Measurements of factors

Measurements	Factors	Loading of Factors	CR	AVE
Moment of truth	MT 01	0.8178	0.8952	0.6381
	MT 02	0.683		
	MT 03	0.758		
	MT 04	0.736		
Quality of service	QOS 05	0.829	0.9825	0.6726
	QOS 06	0.693		
	QOS 07	0.881		
	QOS 08	0.791		
Satisfaction level of customers	SLC 09	0.801	0.9271	0.6927
	SLC 10	0.785		
	SLC 11	0.852		
	SLC 12	0.8015		

Source Primary data
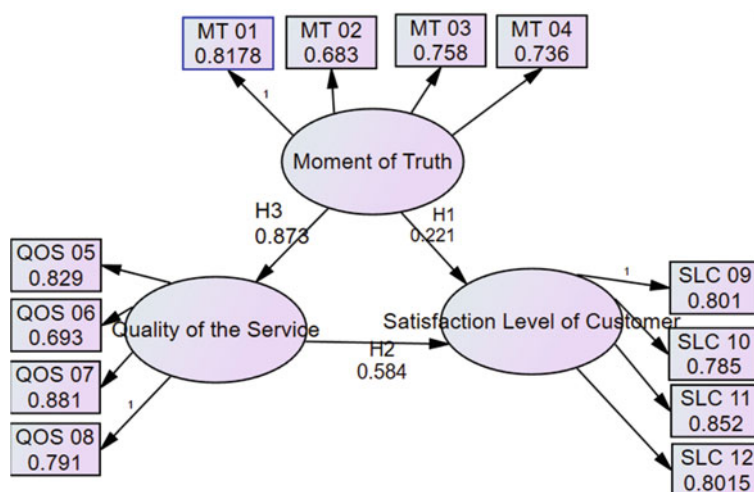
Fig. 2 Loading values of various factors

Table 5 Result of hypothesizes testing

Hypothesizes	Actual sample	Sample	Standard deviation	T statistics	P value	Accepted/Rejected
H_1	0.221	0.223	0.0050	2.225	0.023	Accepted
H_2	0.584	0.589	0.0058	5.65	0.001	Accepted
H_3	0.873	0.875	0.001134	3.0075	0.0013	Accepted

Source Primary data

5 Conclusion

The main objectives of this study are to find out the effect of Moment of Truth on customer satisfaction and service quality of aviation companies. The study also tried to analyze the effect of service quality on customer satisfaction. To test the hypotheses it considered the responses from 230 respondents through a questionnaire. The study finds out that Moment of Truth does have a positive effect on customer satisfaction. It is also stated that the quality of services provided by airline organizations does have an impact on customer satisfaction in the aviation industry of India. And, in the case of the third hypothesis, it can be stated that Moment of Truth does have a positive impact too on service quality provided by the companies in the aviation industry in India. During the research, it also found out that higher quality of services will lead to higher customer satisfaction. And, higher customer satisfaction will create goodwill for the company which will again in turn create a good impression among the customers' minds and the customers will avail the services again and again.

References

1. Carlzon, J.: Moments of Truth. Ballinger Publishing (1987)
2. Widjaja, D.C.: Managing service quality in hospitality industry through managing the moment of truth: a theoretical approach. Jurnal Manajemen Perhotelan **1**(1) (2005)
3. Sarpong, S.: The service industry and the "moment of truth": the quest for the Holy Grail. Athens J. Tourism **3**(1), 25–40 (2016)
4. Veysel Ertemel, A., Köksal, G.: Effects of zero moment of truth on consumer behavior for FMCG. Int. J. Soc. Sci. Educ. Res. **1**(2), 526–536 (2017)
5. Jevtić, J., Tomić, S., Leković, K.: Customer experience in the tourism industry–determinants influencing complaint behaviour. Менаџмент у хотелијерству и туризму **8**(2), 25–33 (2020)
6. Joshua Paul Moses, L., Pavala Kumar, B.: Adaption of livelihood practices by hawkers during COVID 19 Jolt—an empirical study with special reference to the Tenkasi town. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_1
7. Karthick, A.V., Gopalsamy, S.: Role of IoT in business sustainability. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics,

Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_2

8. Drury, A., Pratt, D.: Islam in New Zealand—a mixed reception: historical overview and contemporary challenges. J. College Sharia Islamic Stud. **39**(1) (2021). https://doi.org/10.29117/jcsis.2021.0290

9. "Phil" Klaus, P., Maklan, S.: EXQ: a multiple-item scale for assessing service experience. J. Serv. Manage. **23**(1), 5–33 (2012)

10. Kotler, P., Keller, K.L.: Manajemen Pemasaran, Alih Bahasa Bob Sabran. Erlangga, Jakarta (2012)

11. Anderson, R.E., Srinivasan, S.S.: E-satisfaction and e-loyalty: a contingency framework. Psychol. Mark. **20**(2), 123–138 (2003)

Leniency Factors: An Insight into the Online Customer Return Behaviour

R. Vijaya Kumar and **T. K. Sateesh Kumar**

1 Introduction

The online or electronic marketplace are experiencing accelerated growth and adopting of new phenomena in a new order. This statement is being echoed in the report of several governmental, judicial outreach (The E-commerce Council of India, IBEF[1] & PwC India[2]). It is expected to reach to as high as USD 350 by the end of 2030.

The other side of the view wherein, the customer consumption pattern also transformed from brick and store to virtual market place [1]. The spur in the technology and legislation has varied but positive impact on the online retail customer spending [2]. This transformation also changes the order of the place, the electronic-retailer (e-tailer) plays a trivial role influencing, nevertheless, the customer psychology [1, 3] and other factors influence the whole retail transaction [2]. Having the highest rate of growth, it is inevitably attach other subtle elements viz., customer complaint behaviour, satisfaction etc.

During the course of transactions, the consumer exhibits behaviours with pre purchase, the consumption and post purchase [4, 5] in both online and offline scenarios. The compounding effect of market competitiveness compelled to adopt 'sales return strategy' [6–8].

---

[1] https://www.ibef.org/industry/ecommerce.

[2] https://www.pwc.in/assets/pdfs/consulting/digital-transformation/front-office-transformation/digital-consumer-activator.pdf.

R. Vijaya Kumar · T. K. Sateesh Kumar (✉)
Department of Commerce, Kristu Jayanti College (Autonomous), K. Narayanpura, Bangalore, India
e-mail: sateeshtk@kristujayanti.com

R. Vijaya Kumar
e-mail: vijayakumar@kristujayanti.com

The business leaders experienced the outgrowth of sales return, which is conceptualized theoretically by scholars are manifestation of customer response to the retail offering [9]. Many scholars have conceptualized the psychology of customer who ponder of returning in the virtual market scenario. Van Doorn [13], highlighted the incident levels of customer experience but priori refractive levels were less focused viz, Leniency factors. The study conducted by Janakiraman [10], lights five common factors which determines the customer product return tendency. These also illustrated in an article featured in Washington post by Sarah Halzack (2016)[3] as below.

- Monetary Leniency: How much of the price of purchase is refunded.
- Time Leniency: The duration within which returns are accepted.
- Effort Leniency: How hard it is for consumers to return the item.
- Exchange Leniency: Whether refunds come in the form of store credit or cash.
- Scope Leniency: The scope of products that can be returned—for instance, whether discounted items are included or not.

The emphasis is on the understanding of 'Leniency', as perceived by customers, it raises the question is it applicable to all products, and it is also en-thrust to validate the factors into the other product range with respect to demographic features. *Therefore, the first research gap is to applicability of above prime factors on the different strata of customer* viz., *age, gender* etc.

Indeed, the study of Sarah Halzack (2016), combines many aspects and correlates with Janakiraman [10]. *Nevertheless, these studies have less focused on the strength of such undelaying dimension which could be useful for understanding the customer perspective, and focused on the enterprise or retailers. This gives a research impetus for the exploring the customer product return behaviour (gap2). The gap 2 is modified into objective 3.*

Thus, this research gap precedes to drive answers to 'distinguish the demographic attributes impelling to return behaviour among the online customer'. Secondly to group such similar measured indicators for better understanding and analysis into further studies. The studies of Wang [11] and Akturk [12], explored the leniency factors in customer return behaviour. However, this current study attempting to know, 'how such Leniency and customer return behaviour' mapped for better understanding.

Notwithstanding, the studies were less focused on magnitude of such factors on the customer for pondering return. The subtle aspects of 'customer perceived leniency' need to be addressed and assessed, since the virtual market is driven by the customers and customers only. One of the aim is to understand latent factor, which influences by the 'Leniency' [11, 13] of sales/product returns on consumer return behaviour.

With this review and research question, the below objectives are developed.

1. To know the demographic features of online customers who ponder to return the product bought online.

---

[3] https://www.washingtonpost.com/business/technology/right-to-be-forgotten-vs-free-speech/2014/05/14/53c9154c-db9d-11e3-bda1-9b46b2066796_story.html.

2. To analyse the association of demographic features in the context of online customer return behaviour.
3. To study the relationship among the elements of Leniency, and bring out the facets for better understanding on customer return behaviour.

In order to achieve aforesaid objectives, this research adopts the descriptive methods to review the literature, and for data analyse for understanding the relationship between the quantified variables.

By survey method, primary data is collected through structured Likert scales questionnaires using Google forms. However, secondary sources referred for robust development of constructs. The sample frame includes the sample (population buying online) of Bangalore city. The 134 responses collected by using simple random method, hence data analysed using parametric tests (excluding demographic features). The researcher utilized the statistical tools such as MS-Excel, SPSS 24 and AMOS software.

2 Analysis

The First objective is to know and demographic features, hence the demographic analysis is carried with the data collected from primary source. At the outset analysis of demographic features carried out to achieve the prime objective of understanding the demographic features of the respondents. This includes viz., Age, Gender, Education Qualification, Frequency of Buying and Products preferred to buy online & Frequency of return the products bought online.

Table 1, wherein the demographics of the respondents are analysed viz., the age, Gender, Education qualifications and product preference, finally with frequency of returns made. It can be noted that the average of respondent is 21 years, and 79% of the respondents are young, it implies that younger generation prefers buying online. The second variable is Gender, wherein the male respondents who contributes 67%; it can be indicates that there is significant difference between the genders buying from online. This results in for validating the stated claim and hence to below hypothesis developed. This element is vital in a demographic study [14], therefore H1 is developed.

$H1_0$: There is no significant association between gender the preference of buying online (type of products bought online); $H_0 : p_{ij} = p_{io} \times p_{oj}$.

$H1_a$: There is significant association between gender the preference of buying online (type of products bought online); $H_a = p_{ij} \neq p_{io} \times p_{oj}$.

$$x^2 = \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}.$$

where, O = observed, E = Expected, for the jth observation. p_{ij} is observed number of cases categorized in the ijth cell, p_{ij} is expected cases in categorized in ijth cell.

Table 1 Demographic analysis

Variables		No. of respondents	%
Age	Less than 21 years	79	59
	21–30 years	32	24
	31–45 years	18	13
	More than 45 years	5	4
Gender	Male	88	67
	Female	42	32
	Prefer not to say	2	2
Education qualification	Doctor	2	1
	Undergraduate	105	78
	Post graduate	20	15
	Others	7	5
Frequency of buying	Yearly	14	10
	Quarterly	46	34
	Monthly	55	41
	Weekly	19	14
Products preferred to buy online	Beauty products	3	2
	Electronic and garments	35	26
	Electronic gadgets—Mobile phones	47	35
	Food and Grocery	39	29
	Toil tries—soaps, detergents	10	7

Note. Source Primary data

Since data is categorical in nature with two variables chi-square test of association is adopted.

Table 2, wherein the cross tabulation was analysed with respect to 'gender' and 'product preference'. Further the data was utilized to validate the hypothesis as in Table 3, where p value i.e., Asym significant value is < 0.05, and chi-square value is 35.426 the $H1_0$ is rejected. Thereby accepting the H1a, and inferring that there is significant difference between the gender and preference of the product bought.

The third variable is education qualification, there are significant respondents who comes under the undergraduate group (78%), which followed by post graduate respondents (15%). The demographic analysis pave way for understanding the frequency of buying, which exemplifies that there are more than 41% people who are purchasing online on monthly basis. But the yearly purchase population is insignificant (14%). As per preference concerned to products purchased online the electronic gadgets (47%), food and grocery (39%), and electronic and garments (35%) is the major product line.

Table 2 Product preferred * Gender (Cross tabulation)

Cases		Gender		Total
		Female	Male	
Product preferred	Beauty products	2	0	2
	Electronic and garments	1	0	1
	electronic gadgets - Mobile phones	26	6	32
	Food and Grocery	11	40	51
	Toil tries—soaps, detergents	24	18	42
	Beauty products	5	1	6
Total		69	65	134

Note. SPSS output

Table 3 Chi-square tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	35.426	5	0
Likelihood Ratio	38.806	5	0
Linear-by-linear association	1.742	1	0.187
No. of valid cases	134		

Note. SPSS output 6 cells (50.0%) have expected count less than 5. The minimum expected count is 0.49

Finally, the frequency is also substantial as it illustrates how often the people returns the products purchased online. Seventy-five respondents' states that they rarely returning products, where as 25% respondents feels they sometimes return the goods. But 75% respondents assume they not at all returned the products returned, which bought online.

This demographic analysis is followed with analysis of 14 (initially 16, later reduced to 14) Likert scale questionnaire, which comprises the awareness level, synthesis level and inference levels. The analysis is carried with assumed normal distribution of the data collected.

The primary data so collected is analysed with co-efficient of variation i.e., Cronbach Alpha calculation. This calculation is carried to measure the reliability of questionnaires Table 4.

With above result output (Table 4), it can be inferred that there is significant reliability (>0.7) of the instruments [15, 16].

Table 4 Reliability statistics

Cronbach's alpha	No. of items
0.804	14

Note. Output from SPSS

Pei [17] and Sun [18] grouped factors viz., Monetary, Time, Effort, exchange and scope as Leniency & Customer return behaviour. It paves for developing of latent construct of Leniency & Customer return behaviour, nevertheless, this factor/facet is criteria validated in Table 4 (Cronbach's alpha).

Thus, there are two aspects this latent variable study, firstly, to analyse relationships of such indicators. And secondly would be to examine how these measured indicators are correlated (with co-efficient) to latent variable as factor loading [19].

From the first aspect, the research develops the below hypothesis to test the relationship, since data is parametric in nature and with multiple indicators, Pearson correlation (r) is adopted for validation of hypothesis H2.

$H2_0$: There is no correlation exists between the prime latent leniency factors viz., Monetary, Time, Effort, Scope. (H0: $r = 0$).

$H2_a$: There is a correlation exists between the prime latent leniency factors viz., Monetary, Time, Effort, Scope. (Ha: $r \neq 0$).

Monetary includes—refund & mode; Time includes—sufficient & similar to other; Effort includes—process & repacking; scope includes—partial & replace/ exchange.

With above Pearson correlation test (r) in the Table 5, where the p value is < 0.05 and correlation (r) is > 0.5 [19]; hence the $H2_0$ is rejected and thereby accepting $H2_a$. The inference can be that is a significant correlation exists between the Leniency factors. Notwithstanding some indicators viz., 'similar to others' is not correlating with 'partial' and 'replace/exchange'.

In continuation of the final aspect of the objective 3, the researcher endeavour to understand the latent variables (η) through measured indicators. Hence below hypothesis 3, is formulated.

$H3_0$: There are no latent variables in the underlying structure & all indicators load equally.

$H3_a$: There are latent variables in the underlying structure & not all indicators load equally.

Hence, it is inevitable to measure the factor loading (correlation co-efficient), and thus, the Principal Component Analysis (PCA) technique adopted. In the PCA, those factor, which have Eigen value (total variance explained, λ) of > 1is considered.

Under this PCA test KMO (Table 6) measure is carried for checking the sample adequacy, and the test value resulted at 0.875.[4] Thus, confirming to threshold level [20]. Subsequently the sig. value is < 0.05, hence the sample is adequate and significant for further analysis.

The Principal Component Analysis (Table 7) is adopted for deriving the factors, in the output 3 major components extracted (using Eigen value, λ). As the component matrix explained in the Table 7, it also exhibited in the Fig. 1.

$$H_0: \eta = 0; \ m = K, \ \text{where} \ K \in \{0, 1, \ldots, M\}$$

---

[4] https://www.ibm.com/docs/en/spss-statistics/28.0.0?topic=detection-kmo-bartletts-test.

Table 5 Pearson correlations (*r*)

		Refund	Refund mode	Sufficient	Similar to other	Process	Repacking	Partial	Replace
Refund	r	1							
	Sig								
Refund mode	r	0.787**	1						
	Sig	0.00							
Sufficient	r	0.866**	0.694**	1					
	Sig	0.00	0.00						
Similar to other	r	0.297**	0.151	0.240**	1				
	Sig	0.00	0.081	0.005					
Process	r	0.852**	0.756**	0.735**	0.186*	1			
	Sig	0.00	0.00	0.00	0.031				
Repacking	r	0.767**	0.624**	0.881**	0.249**	0.628**	1		
	Sig	0.00	0.00	0.00	0.004	0.00			
Partial	r	0.619**	0.818**	0.514**	0.062	0.605**	0.472**	1	
	Sig	0.00	0.00	0.00	0.48	0.00	0.00		
Replace	r	0.592**	0.844**	0.513**	0.083	0.663**	0.450**	0.683**	1
	Sig	0.00	0.00	0.00	0.34	0.00	0.00	0.00	

Note. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)

Table 6 KMO and Bartlett's Test

Kaiser–Meyer–Olkin measure of sampling adequacy		0.875
Bartlett's test of sphericity	Approx. Chi-Square	2405.555
	Df	120
	Sig.	0

Note Output generated from SPSS and from the source is Primary data

$$H_a : \eta \neq 0; \; m = K,$$

η is $\Sigma\lambda$, and *m* denotes the observations with M as total Universe of observation and K is order of model.

With the Table 7 (variance explained), Table 8 (Rotated component matrix) and Table 9 (Component Transformation), which exhibits the variance, and factor loading of 3 components, whose value is more than Eigen value of 1 (Forkman J 2019; Fabrigar 1999). It summarises the three major factors 'Lenience factors', 'Mediating factor' and 'Return Behaviour factors'. Thus, the test disproving the null hypothesis 3, and thereby accepting alternative H3 (Forkman, J 2019). Therefore, it can be implied that there are 3 latent factors, and all indicator are not loaded equally.

Table 7 Total variance explained

Component	Initial eigen values			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	9.343	58.394	58.394	9.343	58.394	58.394	5.591	34.941	34.941
2	1.794	11.212	69.606	1.794	11.212	69.606	4.832	30.199	65.14
3	1.155	7.22	76.827	1.155	7.22	76.827	1.87	11.687	76.827
4	0.921	5.755	82.581						
5	0.654	4.089	86.67						
6	0.454	2.838	89.509						
7	0.394	2.461	91.969						
8	0.305	1.907	93.876						
9	0.285	1.778	95.655						
10	0.183	1.144	96.799						
11	0.168	1.049	97.848						
12	0.104	0.65	98.498						
13	0.093	0.584	99.082						
14	0.065	0.406	99.488						
15	0.046	0.29	99.777						
16	0.036	0.223	100						

Note Extraction method: principal component analysis

Fig. 1 Component plot in rotated space
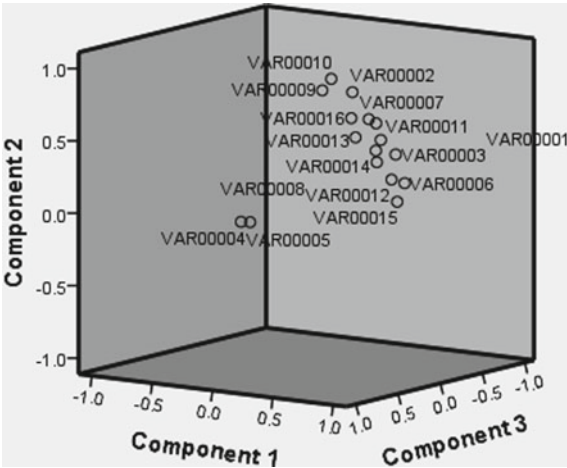
Table 8 Rotated component matrix

Items	Component		
	1	2	3
Refund	0.748	0.56	0.186
Time	0.414	0.836	
Refund	0.809	0.453	
Buyer	0.169		0.906
Buyer	0.112		0.932
Effort	0.878	0.262	
Not considered	0.562	0.667	
Effort	0.711	0.402	0.18
Scope	0.181	0.829	
Scope	0.185	0.894	
Subtlety	0.533	0.617	
Seller lapse	0.799	0.284	0.133
Not considered	0.512	0.549	0.149
Seller lapse	0.684	0.475	0.154
Time	0.815	0.126	
Subtlety	0.434	0.665	

Table 9 Component Transformation

Component	1	2	3
1	0.734	0.659	0.166
2	0.197	−0.44	0.876
3	−0.65	0.61	0.453

Note. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization

3   Discussion

The result of demographic analysis of respondents, it can be noted that there exists a clear significant difference between the gender and preference of buying online. This resulted in rejection of null hypothesis, thereby achieving the one of the objective of understanding of demographic features of respondents. It implies that there is a significant difference between the gender and their preferred products bought online.

Based on the horizons of literature, there are established constructs and latent variables in the form Leniency, Customer Return Behaviour. The objective of the study is to know the relationship between those factors, and also to derive the latent factor for better understanding of the online customer return behaviour.

The Factor analysis, which is performed to estimate the underlying similarity within the variables of the study. The factor analysis employed a technique called 'Principal Component Analysis', wherein, the Eigenvalues are calculated for extraction of components. The research objectives so developed based on the research question and gaps, further endorsed with the factor analysis. The items (observed variables) are grouped into factors viz., Leniency, Behaviour and Customer Subtlety. All the three Hypothesis (H1, H2, and H3) is validated using appropriate analogy and statistical technique. The third objective is identifying the underlying latent variables is achieved by PCA—factor analysis.

3.1   Managerial Implications

The demographic features plays a vital role viz., gender and age group plays vital propel in determining the online customer return behaviour. The demographic features plays a vital role viz., gender and age group plays vital propel in determining the online customer return behaviour. Indeed, the relationship among those variables also signifies for developing better marketing offering, and better online return management.

4   Suggestions, Scope for Further Research and Conclusion

The researcher studied the underlying factors which impel the customer to act and behave in certain pattern for online return platforms. This study achieved the objective of identifying and analysing underlying dimension of measured indicators. This current study has some flaws from the perspective of the sample size, and geographical limitations and few selected variables. Nevertheless, there are scope for further study in the other parameters viz., Non-Leniency factor and external facets of the customer psychological behaviour.

In conclusion, this study examined the demographic features in the context of online customer return behaviour. This apt for an analysis for understanding the variables so that researcher can derive the latent variables. Thus, study inferred that the major three factors for understanding relationship between the said variables.

References

1. Bernon, M., Cullen, J., Gorst, J.: Online retail returns management: Integration within an omni-channel distribution context. Int. J. Phys. Distrib. Logist. Manage. (2016)
2. Luo, X., Bhattacharya, C.B.: Corporate social responsibility, customer satisfaction, and market value. J. Mark. **70**(4), 1–18 (2006)
3. Diggins, M.A., Chen, C., Chen, J.: A review: customer returns in fashion retailing. Anal. Model. Res. Fashion Bus. 31–48 (2016)
4. Patil, B., Sateesh Kumar, T.K., Kumar, B.S., Shankar, M.S.: Impact of consumer behavior based on store atmospherics. PalArch's J. Archaeol. Egypt/Egyptology **18**(09), 480–492 (2021)
5. Berčík, J., Neomániová, K., Mušinská, K., Pšurný, M.: Use of consumer neuroscience in the choice of aromatisation as part of the shopping atmosphere and a way to increase sales volume. Appl. Sci. **12**(14), 7069 (2022)
6. Griffis, S.E., Rao, S., Goldsby, T.J., Niranjan, T.T.: The customer consequences of returns in online retailing: an empirical analysis. J. Oper. Manag.Oper. Manag. **30**(4), 282–294 (2012)
7. Anitha Kumari, S., Dost, A.B., Bhadani, S.: Design and automation of hybrid quadruped mobile robot for Industry 4.0 implementation. In: Nayyar, A., Naved, M., Rameshwar, R. (eds.) New Horizons for Industry 4.0 in Modern Business. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-20443-2_8
8. Das, A., Chanda, D. (2023). To trust or not to trust cybots: ethical dilemmas in the posthuman organization. In: Nayyar, A., Naved, M., Rameshwar, R. (eds.) New Horizons for Industry 4.0 in Modern Business. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-20443-2_9
9. Drury, A., Pratt, D.: Islam in New Zealand—a mixed reception: historical overview and contemporary challenges. J. Coll. Sharia Islamic Stud. **39**(1) (2021). https://doi.org/10.29117/jcsis.2021.0290
10. Janakiraman, N., Syrdal, H.A., Freling, R.: The effect of return policy leniency on consumer purchase and return decisions: a meta-analytic review. J. Retail. **92**(2), 226–235 (2016)
11. Wang, Y., Anderson, J., Joo, S.J., Huscroft, J.R.: The leniency of return policy and consumers' repurchase intention in online retailing. Ind. Manage. Data Syst. (2019)
12. Akturk, M.S., Ketzenberg, M., Heim, G.R.: Assessing impacts of introducing ship-to-store service on sales and returns in omni-channel retailing: a data analytics study. J. Oper. Manag.Oper. Manag. **61**, 15–45 (2018)
13. Van Doorn, J., Lemon, K.N., Mittal, V., Nass, S., Pick, D., Pirner, P., Verhoef, P.C.: Customer engagement behavior: theoretical foundations and research directions. J. Serv. Res. **13**(3), 253–266 (2010)
14. Keaveney, S.M., Parthasarathy, M.: Customer switching behavior in online services: an exploratory study of the role of selected attitudinal, behavioral, and demographic factors. J. Acad. Mark. Sci. **29**(4), 374–390 (2001)
15. Considine, J., Botti, M., Thomas, S.: Design, format, validity and reliability of multiple choice questions for use in nursing research and education. Collegian **12**(1), 19–24 (2005)
16. Nunnally, J.C.: Psychometric theory—25 years ago and now. Educ. Res. **4**(10), 7–21 (1975)
17. Pei, Z., Paswan, A.: Consumers' legitimate and opportunistic product return behaviors in online shopping. J. Electron. Commer. Res. **19**(4), 301–319 (2018)

18. Sun, M., Chen, J., Tian, Y., Yan, Y.: The impact of online reviews in the presence of customer returns. Int. J. Prod. Econ. **232**, 107929 (2021)
19. Ratner, B.: The correlation coefficient: Its values range between+ $1/-1$, or do they? J. Target. Meas. Anal. Mark. **17**(2), 139–142 (2009)
20. Abusaq, Z., Habib, M. S., Shehzad, A., Kanan, M., & Assaf, R: A Flexible robust possibilistic programming approach toward wood pellets supply chain network design. Mathematics, **10**(19), 3657 (2022)

Evaluate the Unique Taxi Service in the City of Makkah, Kingdom of Saudi Arabia

Sameer A. Alhakimi and **Alaa R. Sindi**

1 Introduction

The city of Makkah is in the western part of the Kingdom of Saudi Arabia and is one of the major cities in the region, as it attracts over 14 million visitors during the year [1]. Residents and visitors mostly use their own cars or taxis during off-peak times (Source: data collected from MOM) There are two types of taxis in Makkah: the first is regulated taxis owned and controlled by a company, while the second is "POOT, in which residents used their private cars and gave rides on the street for a fee. Drivers in this POOT mode can pick up additional customers during the tour as a high occupancy vehicle (HOV) and change travel routes; additionally, this mode provides door-to-door service in most cases within Makkah city. This study attempts to investigate residents' behavior in selecting this unique POOT mode of transportation, with the larger goal of simultaneously improving urban planning and better regulating POOT to make them more helpful and comparable to firms such as Uber, Careem, and company-owned taxis. The study also contributes by giving ideas for making applications for this mode to connect owners of POOT and customers of this mode in order to increase competition between this mode and POOT. This mode differs from Uber and Careem in that there is no fixed fare for trips, and the price is determined by the owner of POOT based on negotiation between the owner and trip makers. There is also no partnership between the owner of POOT and the operator company in order to gain rent from trips. Because POOT uses the full capacity of the vehicle, it helps reduce crowded and trivial traffic on Makkah's network of streets. To accomplish these objectives, the researchers developed and used a multinomial

S. A. Alhakimi (✉) · A. R. Sindi
Department of Civil and Environmental Engineering, Faculty of Engineering, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia
e-mail: ssaifalhakimi@stu.kau.edu.sa

A. R. Sindi
e-mail: ARSINDI@kau.edu.sa

logistic regression model (MNL) to quantify social demographic parameters that have a direct impact on the probability of mode choice for two types of vehicles: taxis and private cars.

2 Literature Review

The following section will provide a brief overview of the existing literature and contributions to this field of study. Originating in the 1960s and improving in the decades to come, the four-step travel demand forecasting process is the central column of transportation planning throughout the world [2, 3]. This conventional travel demand model consists of four steps which are trip production, trip attraction, mode split, and trip assignment. This study will focus on the third step of the conventional four-stage travel demand model, which is the mode choice model, also referred to as a mode split. Mode split is a common topic of discussion between traffic and urban planners [4]. It is a simplified representation of reality to better understand and interpret real and complex systems [5].

2.1 Overview of the Makkah Transport System

Transport is an important economic industry that moves people and products quickly. Private Auto (chauffeur), Company-Owned Taxi, Privately Owned and Operated Taxi, Minivans for Goods, Delivery Trucks (Pickups), Trucks, Private School Buses, Private Company Buses, Bicycles and Motorcycles, and Walk this main modes in city during four seasons, recently appeared for Bus Transit Rapid (TRB) and Metro for Hajj event in Makkah city. The provision of significant improvements to public transportation in the city, particularly with reference to considerably expanded carrying capacity, decreased pollution, and enhanced speed of operation, so that the government adopted and established a light rail system in Makkah, especially at Hajj season, to serve more than two million people every year during the two weeks of Hajj (also known as the pilgrimage). The electrically operated LRT will enhance air quality by eliminating hundreds of minibuses from city streets. Additionally, there may be a large reduction in noise pollution.

2.2 Problem Definition

Makkah is one of the most crowded cities in the Kingdom of Saudi Arabia (KSA). People visit Makkah from around the world, and it has diverse travel behavior and hosts many high-demand events throughout the year, like Hajj and Umrah. Residents of the city offer volunteer and paid jobs during these events and off-peak events to

meet the travel demands of residents and visitors. Some residents use their personal vehicles as taxis and charge a lower rate than other modes. This mode is not like Uber or Cream; it is not organized and has not received permission as a taxi mode from the traffic agency in Makkah. The study's goal is to look into residents' taxi mode choice behavior, especially POOT, in the context of Makkah's unique event structure and how to increase and organize POOT. It is not an easy task to design and build a multimodal transportation system in Makkah to accommodate the massive numbers of pilgrims who visit the city. Makkah faces a number of challenges, including unique seasonal demand patterns, hilly topography, and limited space. This mission, however, is feasible. Makkah is one of Saudi Arabia's most congested cities. This study created a taxi modes of choice model for the city in comparison to private cars, which is critical for predicting taxi mode use and the factors that influence mode choice.

Mode choice behavior is the key factor in public transportation planning, as it has a direct effect on the planning and layout of the network's master plan. Further, it is also the basis for urban public management planning to identify problems with public transit [6]. The choice mode widget is identified as an attraction correlating with a mode on an individual-specific trip. Therefore, individuals are imagined to select the mode with maximum repetition due to various attributes such as vehicle travel time, access point to transit point, a timeout for the mode to the access point, exchange time, travel fare, parking fees, and so forth. This hypothesis is called utility maximization [7]. The National Program on (Technology Enhanced Learning (NPTEL) describes the following factors under three groups that impact mode choice [8].

The following features are found to be important for trip planners:

(a) Vehicle access and/or ownership, as wait times for transit will reduce with increased vehicle access. This confirms findings from a study by Naveen Eluru et al.[9].
(b) If a tripmaker has a driving permit, they will be able to drive a car themselves. This will affect the mode of transportation they choose.
(c) Family and household structure, such as the ages of children and elderly relatives, their needs, and so on, affects the choice of mode.
(d) Income is directly related to car ownership, and more flexibility with income allows for travelers to choose preferred modes over others out of necessity.
(e) Requirements for travel, including the need to utilize a vehicle at work, taking children to school, running errands, attending events, and so forth.
(f) Residential density affects the creation of modes of transportation suitable for the density of the population, whether that is public transportation, private cars, or taxis.

The second thing that makes a trip stand out is the mode of transportation, which is strongly affected by:

(a) The purpose of trips, whether these might be related to household trips or work-based trips, Most of the time, public transportation is easier to take to work than other types because it runs regularly.

(b) When trips take place and for how long, whether that is in the mornings, afternoons, or evenings.
(c) Late trips being difficult to accommodate by public transport.

The third characteristic is the properties of transport facility features, and there are two types of factors. One of them is quantitative, and the other is qualitative. For both sets of factors, travelers make decisions based on what is important to them, which will vary according to their needs and preferences [10].

Quantitative factors are:

(a) Relative travel time: in-vehicle, paused, and strolling times by mode.
(b) Relative money-related costs (tolls, fuel, and direct expenses).
(c) Availability and cost of parking.

Qualitative factors, which are less easy to measure, are:

(a) More comfortable and convenient modes will be more frequently selected.
(b) Reliability and consistency.
(c) Protection and a sense of security.

Rayal et al. [11] performed a study comparing ride-sharing services (on apps such as Uber and Lyft) with traditional taxis and public transit in San Francisco. Even though taxis and ride sources are similar in some ways, the study found that differences in user characteristics, trips served, and waiting time are what lead people to choose ride sources over taxis. A recent study from Santi et al. [12] focused on the shareability of taxis in New York City. This study used mathematical and simulation methods and found that if shareability does not increase, taxi traffic will reduce by 40%. Sharing taxis also has the ability to decrease fleet size in large urban centers. A study by Vazifeh et al. [12] concluded that sharing taxis could decrease the fleet size in New York City by 30%. Also, Dong et al. [13] found that there was a decrease in taxi trips at John F. Kennedy International Airport and LaGuardia Airport in New York after the introduction of ride-hailing services (such as Uber and Lyft) compared to an absence of such services.

As smartphone technologies and internet communication have rapidly developed and popularized, new technology has resulted in the emergence of multiple service models in one travel mode over the last few decades. Several platforms, such as Uber, Careem, and Mrsool, provide online car-hailing, and this type of service is slowly emerging in Saudi Arabia. These platforms provide passengers with a preferred booking service and a fast payment system by implementing an online car-hailing application that effectively resolves information and provides virtual communication between taxi drivers and passengers. This mode of transportation is respected and loved by travelers because it allows passengers to reduce their wait times and use a convenient mode of transportation [11].

Diao et al. [14] looked at how Transport National Companies affect urban mobility in the United States in terms of how many people use public transportation, how much traffic there is, and how many people own private cars. The study found that TNCs increase traffic by 4.5–8.5% in terms of how bad it is and how long it lasts, but they

don't have much of an effect on how many private cars people own. Rapid development has a major effect on the conventional model of taxis. In a study by Li et al. [15, 16] focusing on taxi and subway use in Beijing, researchers found that there are 85% more taxi trips than subway trips, despite subway travel being less expensive. In this scenario, convenience took priority over cost. Their recommendation to the government was to build more subway stations, improve accessibility, and reduce walking distances to these stations. Recent studies of taxi customers find significant factors influencing their selections. In a study by Wong et al. [17], researchers examined factors impacting taxi customers in Hong Kong by comparing premium electrical taxis and liquid petroleum gas taxis using a binary logistic regression model. They found that walk time, waiting time, and the social demographics of customers were the most influential factors in their choice of taxi. Muhammad et al. [18] compared solo travel mode versus public transit during the COVID-19 pandemic. They found that elderly persons and women preferred taxi mode travel during the pandemic as this is a safer mode than public transit and women tend to prefer taxi travel based on social demographics in Pakistan. Wong et al. [17] and Muhammad et al. [18] studies referenced in this literature review will be discussed once again when the findings are presented.

Jung et al. [19] studied the impact of charging infrastructure and non-electric cabs on electric cabs and found that there is a gap because increasing queuing due to the delay in charging electric cabs gives non-electric cabs an increasing competitive advantage.

As noted above, there are different types of taxis in Makkah based on ownership, and we can also further distinguish taxi types by regulatory aspects. First, company-owned taxis are regulated and have authorized taxi plates issued by the General Department of Traffic, Ministry of Interior. Fare prices are set by the company, and drivers complete trips without picking up additional travelers or changing routes on the way. The second type, which are private taxis owned and operated by individuals, do not have authorized plates, and they are not regulated by the Ministry. For these privately owned taxis, the fare of the trip is negotiated and mutually agreed upon by the driver and traveler. Several customers can use the same taxi at the same time, and the taxi driver can pick them up on the way to the first destination. This mode is not like online hailing because the driver does not have an application for hailing online, and the price of this mode is usually less than that of company-owned taxis. Fare prices are variable based on owners, time of year, and mega events within Makkah. This mode exists in developing countries in the Middle East, like Jordan [20], and this study is expected to benefit countries that have similar taxi structures.

There are many types of mode choice models, such as binary choice, direct demand models (DDM), random utility models (RUM), aggregate, disaggregate, and the multinomial logistic model (MNL). This utility maximization theory is used within the framework of logistic models. Logistic models are the most widely used mode division models in traffic planning because they can model the mixed travel behaviors of any population's mathematical engineering [21]. That have been used to simulate the actual behavior of travel patterns of people and existing demand conditions [22]. The models are used to predict which type of mode is selected, changes in

travel, and utilization of the transportation system in response to changes in land use, demographics, and socio-economic conditions, as well as uncertainty when input parameters will affect mode selection [23, 24]. The chosen behavior can be modeled by a random utility model that treats the utility as one stochastic variable and consists of two separate parts: a harmonic measure part and an error part, as shown in the equations below.

$$Umi = Vmi + Emi$$

$$Um = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k$$

The mathematical framework of logistic models is based on utility theory maximization. We briefly present the probability frame for an individual who chooses mode X out of M of the total number of available modes given in flowing equation.

$$P_m = \frac{e^{Um}}{\Sigma \, for \, all \, m' \left(e^{Um} \right)}$$

where

P_m = probability that mode m is chosen.
U_m = utility of mode m (defined earlier).
e = base of logarithms.
m' = index over all modes included in the choice set.

3   Methodology

3.1   Collecting Data

The data was collected from the municipality of Makkah in 2010. For two months, a specialist team from the municipality of Makkah collected data for household surveys. The survey questionnaire contained three sections: (1) household social demographics, including income, age, type of home, education level, gender, nationality, profession, and possession of a driver's license; (2) type of trips made with distributions for origins, destinations, and frequencies for trips; and (3) mode choice during this two-month period of March and April in 2010 as shown in Tables 1 and 2.

Face-to-face interviews were conducted to obtain the required data. From this data, this study filtered the relative data for company-owned taxis, POOT, as well as private vehicles in Makkah to develop a multinomial model to compare all three modes of transport. The data size for volunteers' responses was 9450, which far exceeds the minimum sample size (400) according Yamane formula to represent population parameters [10, 18]. Then Research started with clear data and a flowing

Table 1 Purpose of trips and types of mode in Makkah city

Purpose	Mode in Makkah
1. Home to Work and Work to Home: HBW	1. Private Auto (chauffeur)
2. Home to School and School to Home: HBE:	**2. Private vehicle**
3. HBS: Home to Shopping and Shopping to Home	**3. Company owned taxi**
4. Home to recreation destination (e.g. restaurants, coffee shop, visit friends, etc.) and recreation destination to home: HBR	**4. Privately owned and operated taxi**
5. HBO: Home to other destination (e.g. hospital, clinic, barber, etc.) and other destination to home	5. Private school bus
6. Trip origin and destination are out-of-home (e.g. trip from the gym to a restaurant, trip from coffee shop to visiting friends): NHBO	6. Private company bus
7. An out-of-home trip to work (e.g. trip from municipality to workplace): NHBW	7. Bicycle and motorcycle
8. From and to Al Haram: HRM:	8. Others
9. No information available on this activity: NIA	

Source Makkah municipality, 2010

stepwise method by using Statistical Package for the Social Sciences (SPSS-26) to select the best parameters that have a significant effect on a dependent variable (mode choice) to get a multinomial logistic regression model for taxi mode choice in Makkah. Next, we took 10% of responses to validate the driven model and compared the actual response for mode selection with the probability of the utility equation driven from the model. In Table 1, we show the purpose of trips and the three modes of transportation for the study, and Table 2 shows the social demographic variables used in the survey, the analysis and results are discussed in the next section on model development.

3.2 Study Area and Population of the Study Area

A study area is generally defined as a geographical region in which transportation planning or readjusting of transportation system distribution is required for transportation research purposes. The Makkah City study area was chosen for the research. The city of Makkah was chosen since it is a crowded city that hosts large events such as Hajj event.

Table 2 Social demographic variables

House type	Income (SR)	Relations	Gender	License	Nationality	Education	Employment status	Profession	Car dispensability
1. Historic home 2. Villa 3. One floor in a villa or a historic home 4. Apartment 5. Other	1. Less than 3000 2. 3000–7000 3. 7000–10,000 4. 10,000–15,000 5. 15,000–20,000 6. More than 20,000 7. No responses	1. Main householder 2. Husband 3. Wife 4. Son 5. Daughter 6. Mother 7. Father 8. Brother 9. Sister 10. Grandmother 11. Grandfather 12. Grand children 13. Chauffeur 14. Laborer 15. Guest 16. Other	1. Male 2. Female	1. Yes 2. No	1. Saudi 2. Arab 3. Asian 4. Europe 5. Other-Specify	1. No formal education 2. Preschool 3. Primary 4. Secondary 5. University 6. Master's degree/PhD	1. On work 2. Student 3. Does not work 4. Retired 5. Other	1. Business man 2. Specialist in social, art, and human studies 3. Technicians in since, art, and human studies 4. Writer 5. Merchant 6. Services 7. Agricultural 8. Industrial 9. Engineering 10. Driver 11. Servant	1. Yes 2. No

Source Makkah municipality, 2010

Fig. 1 The study boundary of Makkah city at KSA

3.3 Study Area Boundary

The study area is the city of Makkah, in kingdom of Saudi Arabia. The area is about 1200 km^2 (see Fig. 1) and the population is about 1294,159 [1]. The data was collected from the municipality of Makkah.

3.4 Analysis Methods

Several statistical software could be employed for data analysis. The Statistical Package for the Social Sciences (SPSS) is one of the most broadly utilized measurable investigation bundles [18]. The SPSS program and modeler provide a wide scope of methodology and tests utilized in measurements. Additionally, it offers graphic insights, frequencies, means, and relationships. Finally, it helps to make outlines. In this examination, the SPSS-26 programming will be utilized to estimate the mode choice model. Like the linear regression model, we will generalize the simple logistic regression model. Initially, we explained exploratory factor analysis for data collection and a descriptive analysis for the questionnaire. The analysis for developing multiple Logistic Models to compare the three modes is shown in Fig. 2.
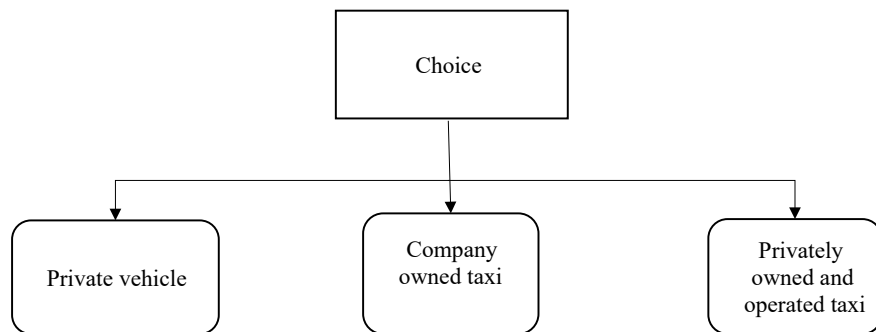
Fig. 2 Multinomial logistic regression model

4   Results

4.1   Descriptive Statistics

The descriptive statistics after filtering the data focused on the three modes (taxi of company, POOT, and private car) in this study, which are presented in Table 3. After filtering data to taxi modes and comparing to private car, the most commonly used Taxi (company owned) mode for trips was followed by private car, with less than 3% choosing POOT mode for their trip purpose. The income level of most of the respondents was less than 3000 Saudi Riyals (SR) for low income and 3000–7000 SR in relative terms as well as by the national standard because this data filtered to taxi mode only and private cars and most people at this level of income use taxi mode in Makkah and there is no public transport available for residents, which provides a lower fare for transport. In Fig. 3, as shown below for felted study modes, more than 52% of females use the taxi (company-owned).

4.2   Model Fitting Information

The likelihood ratio test for independent variables used in the model has significantly affected mode choice, as shown in Table 4. The goodness of fit model measures are provided in Table 5. The 2 log likelihood value intercept only model, the estimated final model, the Chi-square likelihood ratio test values, and Pseudo-R-Square values are clarified in Table 5.

The -2 log likelihood value obtained for the intercept-only model is greater than the final estimated model. The Chi-square likelihood ratio is significant. The Pseudo-R-square values are estimated at around 0.3 according to Greene et al. [25, 26]. A Pseudo-R square value of 0.34 is considered to be a good fit for a multiple-choice model. From Table 5, we can see that the Pseudo-R-square measures like Cox

Table 3 Sample characteristics of social demographic variables

Case processing summary			
Independent variables category	Sub-category	N	Marginal percentage (%)
Mode	Private vehicle	2158	22.8
	Taxi (company owned)	7088	75.0
	Taxi (privately owned)	204	2.2
Gender	Male	3269	34.6
	Female	6181	65.4
Driver's license	Yes	1508	16.0
	No	7942	84.0
Education level	No formal education	1966	20.8
	Preschool	1636	17.3
	Primary	1694	17.9
	Secondary	2390	25.3
	University	1664	17.6
	Master's degree/PhD	100	1.1
Income	Less than 3000 SR	3634	38.5
	3000–7000 SR	3215	34.0
	7000–10,000 SR	1493	15.8
	10,000–15,000 SR	781	8.3
	15,000–20,000 SR	224	2.4
	More than 20,000 SR	103	1.1
Valid		9450	100.0
Missing		0	
Total		9450	
Subpopulation		2717[a]	

[a] The dependent variable has only one value observed in 2143 (78.9%) subpopulations

and Snell R square, Nagelkerke R square, and McFadden R squared values for the estimated model represent a reasonably good fit.

From the developed model it was observed that social demographics and trips number influence the selection mode. This result corresponds with previous studies done by Wong et al. [17], which reported "The socio-demographic status of taxi customers influences their choices", and a study done by Muhammad et al. [18] in Pakistan during the covid-19 pandemic which find there are effects socio-demographics on the choice of public transport versus solo travel mode, also conformation with studies of Babu and Anajaneyulu [26]which reported that socio-demographics influence on the nature of activity-travel pattern as companionship.

Table 4 provides the parameter estimates for the minimally acceptable model. The number of predictors in the model determines the degrees of freedom (df) of the
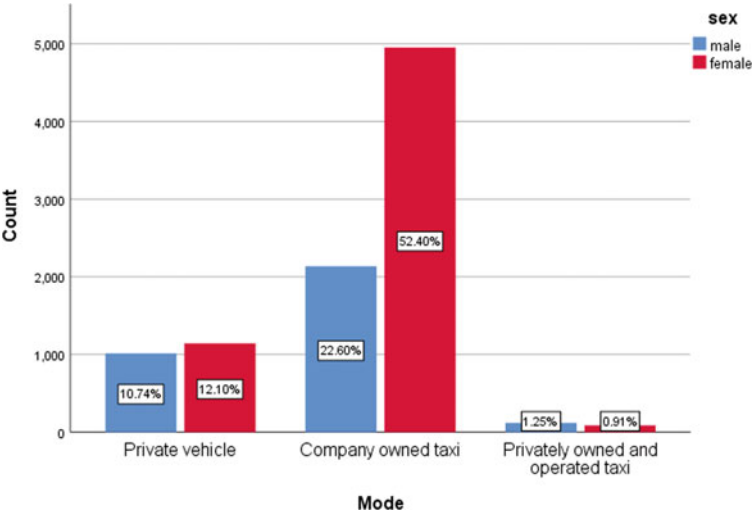
Fig. 3 Types of mode choices in Makkah relative to gender

Table 4 Likelihood ratio test

Likelihood ratio tests

Effect	Model fitting criteria	Likelihood ratio tests		
	−2 log likelihood of reduced model	Chi-square	df	Sig.
Intercept	5752.547[a]	0.000	0	
Age	7154.109	1401.563	2	0.000
Trips no	5792.607	40.060	2	0.000
Gender	5890.837	138.291	2	0.000
Drive license	5777.750	25.203	2	0.000
Education level	5898.966	146.419	10	0.000
Revenue	5927.139	174.592	10	0.000

The chi-square statistic is the difference in −2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0

[a] This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

chi-square distribution, which was used to evaluate the LR Chi-Square statistic (six predictors in two models). The probability that an LR test statistic will be as extreme as or more extreme than the observed statistic under the null hypothesis, which is that all of the regression coefficients in the model will be equal to zero, is referred to as "significance." In other words, if there is no effect of the predictor variables, then this is the likelihood of obtaining this chi-square statistic (2682.952), or one more extreme.

Table 5 Model fitting Information and Pseudo R-Square

Model fitting information					Pseudo R-square	
Model	Model fitting criteria	Likelihood ratio tests				
	−2 log likelihood	Chi-square	df	Sig.	Cox and snell	0.247
Intercept only	8435.499				Nagelkerke	0.343
Final	5752.547	2682.952	28	0.000	McFadden	0.223

This p-value is compared to an alpha level, which is commonly set at 0.05 or 0.01. This alpha level represents the readiness to accept a type I error. Since the LR test's p-value was so low (0.00001), we can infer that at least one of the model's regression coefficients is not equal to zero. Examining the signs of the estimated parameters with theory, intuition, and judgment regarding the anticipated impact of the associated variables is the simplest way to test the findings of the estimation.

4.3 Interpretation of Results

Table 6 shows the regression coefficients and their significance in the final model. Regarding the interpretation of the symbol parameters, the parameters with significant negative coefficients are explained to reduce the likelihood of that kind of reaction to the reference item. On the other hand, the parameters have a positive coefficient that is considered to lead to an increase in the likelihood of that type of reaction.

4.4 Taxis (Company Owned Taxis and POOT) Relative to Private Vehicles

4.4.1 The Parameters of Age

The use of taxis owned by companies and POOT increases with age. This is consistent with the trend that as people age, their driving skills deteriorate and they may be affected by the ailments of old age, causing them to prefer taxis. This coincides with Wong et al.'s study [17]. According to the study's regression coefficient, older people are more comfortable with taxi use in general, and especially with company-owned taxis where service standards and fares are clearly laid out.

Table 6 Regression coefficients and model fit information

Mode [a]		Regression coefficients	Sig.	Exp(B)	95% confidence interval for Exp(B)	
					Lower bound	Upper bound
Company-owned Taxi	Intercept	−0.334	0.129			
	Trip no	−0.463	0.000	0.630	0.552	0.719
	Age	0.099	0.000	1.104	1.097	1.111
	Gender	0.738	0.000	2.091	1.811	2.414
	Driver's license	−0.374	0.000	0.688	0.563	0.840
	Education level	−0.166	0.000	0.847	0.810	0.886
	Income	−0.318	0.000	0.728	0.693	0.764
Privately owned and operated taxi	Intercept	−2.182	0.000			
	Trip no	−0.242	0.174	0.785	0.553	1.113
	Age	0.041	0.000	1.042	1.028	1.057
	Gender	−0.668	0.000	0.513	0.367	0.716
	Driver's license	0.548	0.029	1.730	1.057	2.831
	Education level	−0.070	0.238	0.933	0.830	1.047
	Income	−0.306	0.000	0.736	0.639	0.847

[a] The reference category is: 2—Private Auto

4.4.2 The Parameter Trips Number

If the number of trips has a negative effect on selecting the taxi mode (company-owned taxis) by 0.463 units and 0.242 for POOT taxis relative to private vehicles, this is logical as more trips require flexibility on the part of trip makers, and trip makers have freedom to manage their time. The cost is also less for POOT, but privately owned taxis tend to be more accessible, so the negative effect of POOT on private cars is less than that of company-owned taxis.

4.4.3 Gender Parameter

When moving from (1) males to (2) females, the use of taxis owned by the company goes up for females, which results in a positive regression coefficient. However, when moving from (1) males to (2) females, the use of POOT taxis goes down, which shows that females don't like to use POOT mode. This confirms the social situation in Makkah, where men are more likely to own or use their own cars because women haven't been able to drive for a long time (since 2010). The study also shows that

women prefer company-owned taxis because they are safer and more regulated than POOT, which uses the full capacity of the vehicle and picks up any customer along a route. Women don't like to ride with unknown men the whole way. The complete opposite is true for men as they use POOT, as their views on multi-stop trips, picking up new tripmakers, and riding beside men through journeys with unknown drivers are not the same as women's. This is in line with studies by Wong et al. [17] and Abdullah et al. [18], which found that women prefer the superior service that taxis offer.

4.4.4 Driver's License

People who have a driver's license still use company-owned taxis more than those who do not have one. This may explain why the use of company-owned taxis in Makkah is so high. If we refer to descriptive Table 3, we will see that the percentage for a taxi owned by a company is 75% for the filtered data for the focused study of three modes (private car, company-owned taxi, and POOT), and the people who have a driver's license do not prefer to use a POOT, as the majority of people that possess a driver's license prefer to use their own private car and there is no need to use a POOT.

4.4.5 Education Level Parameters

Nursery, primary, and secondary-educated individuals use company-owned taxis and POOT more than university and college students do because government regulations do not support early possession of the driver's license for teenagers. Higher education is also tied to higher income, so this subgroup is more likely to have private vehicles and doesn't prefer the two types of taxis (owned-company taxi and POOT). This is the same as what Wong et al. [17], and Abdullah et al. [18] found in their studies, which we've already talked about. They found the same things about education level parameters.

4.4.6 Revenue Parameters

Low-income individuals' use of taxis owned by companies outnumbered the same use in the high-income subgroup because individuals with a lower income lack the necessary resources to purchase and own their own cars. As income increases, people will use private cars more than taxis, which again confirms findings in the previously mentioned studies by Wong et al. [17]and Muhammad et al. [18]. Low-income people use POOT more frequently than private vehicles. Further, if we examine the regression coefficients, lower-income people prefer POOT over company-owned taxis. Also, individuals with a medium level of income use POOT mode more than private vehicles, which means that this taxi mode is common in Makkah City and provides

more flexible transit for those with a mid-sized income. This is consistent with the findings of a study conducted by Chen et al. [27] who discovered a decrease in overall taxi trips between 2014 and 2016 in Chicago due to better services provided by ride-sharing services in remote areas, and POOT provide the same ride-sourcing services but without online reservation.

5 Conclusion

Taxis are an important part of urban transportation, but they also contribute a lot to traffic jams and air pollution, which can be very bad for people's health. The objective of this study is to develop a multinomial logistic model for taxi mode choice (company-owned taxi and POOT taxi) relative to private vehicles using SPSS version 26. The developed model included significant variables of social and demographic factors. The results of the model-driven analysis found that social demographics such as age, gender, education levels, and income, along with the number of trips, have a significant impact on taxi mode choice. No previous study was executed to compare the unique taxi mode POOT alongside company-owned taxis and private vehicles in Makkah. Also, the study found that POOT mode is unique to the area, is preferred by men, and is a common choice for all levels of income in Makkah compared to private cars and company-owned taxis. This unique mode is also used more by students than private vehicles. The research also found that women and elderly people prefer company-owned taxis more than POOTs and private vehicles. This conforms to the findings in the previously discussed study by Wong et al. [17], which found that older people are more comfortable with taxis, and women prefer the better services offered by taxis. The study also found that people regularly choose POOT due to better savings, less time consumed, and increased confidence in their experience in Makkah to avoid crowds on the streets at mega events. This particular mode proves to be popular during hot weather and is considered to be the most flexible, accessible, and offers a competitive price in Makkah. These findings are useful for traffic policy makers to aid them in making POOT mode more effective by developing traffic regulations, which might include adopting a system like the DRT system or immersing it within transportation national companies such as Uber and Careem. This would improve this mode by increasing regulation and efficiency to encourage the full occupancy of a car versus making multiple trips. Further, this mode helps to decrease the number of cars versus solo travel mode in the transport network in Makkah, thereby reducing air pollution and oil consumption and creating conditions for a more sustainable environment.

The findings are unique contributions to the field, as no previous research or study has been done on this mode of choice for POOT as a mode of choice. This work also contributes significantly to regulatory bodies and policy makers in both Saudi Arabia and other cities (with similar characteristics and taxi markets), where further promotion of taxis offering better service and low roadside emissions can improve the urban landscape.

Although this study proposed a comprehensive system to evaluate taxi model split performance, the conclusions are still limited due to some considerations, such as limited parameters, and there are some significant recommendations to be considered for future research, which are:

1. Expand the parameters, which affect mode choices like travel time and activity duration.
2. Future studies will be more realistic due to different laws and regulations issued in the country, an example being Saudi Arabian regulations that now allow for women to obtain driver's licenses, which were not allowed in 2010.
3. Further studies could be conducted to develop infrastructure, public transportation systems, and oil price changes to test their effects on mode choice and the taxi market.
4. This study does not cover TNC online car-hailing in Makkah because it did not exist in 2010, when the data was collected.
5. Include the impact of COVID-19 on taxi modes according to health regulations for occupancy and safe distances between people both during the pandemic and post-pandemic.

References

1. General Authority for Statistics Database: General Authority for Statistics Kingdom Of Saudi Arabia, Oct. 10, 2022. https://database.stats.gov.sa/beta/dashboard/landing. Accessed 10 Oct 2022
2. Giuliano, G.: Land use impacts of transportation investments. Geogr. Urban Transp. **3**, 237–273 (2004)
3. Bernardin Jr, V.L., Koppelman, F.S., Boyce, D.E.: A trip-based travel demand framework consistent with tours and stop interaction. Ann Arbor [Online]. Available: https://www.proquest.com/dissertations-theses/trip-based-travel-demand-framework-consistent/docview/288238163/se-2?accountid=43793 (2008)
4. Gachanje, J.N.: Towards Integrated Land Use and Transport Modelling: Evaluating Accuracy of the Four Step Transport Model: the Case of Istanbul. University of Twente Faculty of Geo-Information and Earth Observation (ITC), Turkey (2010)
5. Ortuzar, J., Willumsen, L.: Modelling Transport (3rd edn.). New York (2004)
6. Hensher, D.A., Rose, J.M.: Development of commuter and non-commuter mode choice models for the assessment of new public transport infrastructure projects: a case study. Transp. Res. Part A: Policy Pract. **41**(5), 428–443 (2007). https://doi.org/10.1016/j.tra.2006.09.006
7. Hanif, M., Munir, A.: Biostatistics for Health Students With Manual on Software Applications. Ezz H. Abdelfattah (2001)
8. Mathew, T., Rao, K.: Modal Split 9.1 Overview (2007)
9. Eluru, N., Chakour, V., El-Geneidy, A.M.: Travel mode choice and transit route choice behavior in Montreal: insights from McGill University members commute patterns. Public Transp. **4**(2), 129–149 (2012). https://doi.org/10.1007/s12469-012-0056-2

10. Bujang, M.A., Sa'at, N., Bakar, T.M.I.T.A.: Sample size guidelines for logistic regression from observational studies with large population: emphasis on the accuracy between statistics and parameters based on real life clinical data. Malays. J. Med. Sci. **25**(4), 122 (2018)
11. Rayle, L., Dai, D., Chan, N., Cervero, R., Shaheen, S.: Just a better taxi? A survey-based comparison of taxis, transit, and ridesourcing services in San Francisco. Transp. Policy (Oxf) **45**, 168–178 (2016). https://doi.org/10.1016/j.tranpol.2015.10.004
12. Vazifeh, M.M., Santi, P., Resta, G., Strogatz, S.H., Ratti, C.: Addressing the minimum fleet problem in on-demand urban mobility. Nature **557**(7706), 534–538 (2018). https://doi.org/10.1038/s41586-018-0095-1
13. Dong, X., Ryerson, M.S.: Taxi drops off as transit grows amid ride-hailing's impact on airport access in New York. Transp. Res. Rec. **2675**(2), 74–86 (2020). https://doi.org/10.1177/0361198120963116
14. Diao, M., Kong, H., Zhao, J.: Impacts of transportation network companies on urban mobility. Nat. Sustain. **4**(6), 494–500 (2021). https://doi.org/10.1038/s41893-020-00678-z
15. Li, L., Wang, S., Li, M., Tan, J.: Comparison of travel mode choice between taxi and subway regarding traveling convenience. Tsinghua Sci. Technol. **23**(2), 135–144 (2018). https://doi.org/10.26599/TST.2018.9010059
16. Curtis, C.: Evolution of the transit-oriented development model for low-density cities: a case study of Perth's new railway corridor. Plan. Pract. Res. **23**(3), 285–302 (2008). https://doi.org/10.1080/02697450802423559
17. Wong, R.C.P., Szeto, W.Y., Yang, W.H.: Customers' selections between premium electric taxis and liquefied petroleum gas taxis. Transp. Res. D: Transp. Environ. **78** (2020). https://doi.org/10.1016/j.trd.2019.11.001
18. Abdullah, M., Ali, N., Javid, M.A., Dias, C., Campisi, T.: Public transport versus solo travel mode choices during the COVID-19 pandemic: self-reported evidence from a developing country. Transp. Eng. **5** (2021). https://doi.org/10.1016/j.treng.2021.100078
19. Jung, J., Chow, J.Y.J.: Effects of charging infrastructure and non-electric taxi competition on electric taxi adoption incentives in New York City. Transp. Res. Rec. **2673**(4), 262–274 (2019). https://doi.org/10.1177/0361198119837955
20. Hamed, M.M., Olaywah, H.H.: Travel-related decisions by bus, servis taxi, and private car commuters in the city of Amman, Jordan. Cities **17**(1), (2000). https://doi.org/10.1016/S0264-2751(99)00052-9
21. Rajalakshmi, P.: Proceedings of International Conference on Energy and Environment-2013 (ICEE 2013) on 12–14th December Organized by Mode Choice Modelling based on Work Trips-Artificial Neural Network Model [Online]. Available: www.ijirset.com (2007)
22. Zhang, K.: Dynamic Stochastic User Equilibrium: Models and Algorithms for Multidimensional Network Choices (2009)
23. Manzo, S., Nielsen, O.A., Prato, C.G.: How uncertainty in input and parameters influences transport model: output A four-stage model case-study. Transp. Policy (Oxf) **38**, 64–72 (2015). https://doi.org/10.1016/j.tranpol.2014.12.004
24. For, P., et al.: Koppelman and Bhat A Self Instructing Course in Mode Choice Modeling: Multinomial and Nested Logit Models (2006)
25. Hensher, D.A., Rose, J.M., Greene, W.H.: Getting started modeling: the basic MNL model. Appl. Choice Anal. (2010). https://doi.org/10.1017/cbo9780511610356.011
26. Babu, D., Anjaneyulu, M.V.L.R.: Exploratory analysis on worker's independent and joint travel patterns during weekdays and weekends. Transp. Eng. **5**, (2021). https://doi.org/10.1016/j.treng.2021.100073
27. Chen, Y., Hyland, M., Wilbur, M.P., Mahmassani, H.S.: Characterization of taxi fleet operational networks and vehicle efficiency: Chicago case study. Transp. Res. Rec. **2672**(48), 127–138 (2018). https://doi.org/10.1177/0361198118799165

Unveiling the Trade Dynamics: India's Thriving Exchange with ASEAN Nations

Jayaram Kanzal, Tinto Tom ⓘ**, N. M. Vipulkumar** ⓘ**, Ajith P. Mathews** ⓘ**, S. Vidhya, and V. Raju**

1 Introduction

India has diplomatic ties with many nations worldwide following the non-alignment, strategic alliance, and regional cooperation tenets. India has long close relations with Southeast Asian nations, the United States, and Russia. Additionally, it has developed tight ties with nearby countries like Bangladesh, Nepal, and Bhutan, fostering economic collaboration and cultural interactions [1]. India has recently collaborated with African countries to strengthen trade and development relationships. In addition, economic partnership and energy security have improved India's relations with Middle Eastern nations. India generally aims to sustain cordial and mutually beneficial relations with other countries to promote peace and stability.

The Association of Southeast Asian Nations (ASEAN) comprises ten countries. These countries are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, a regional intergovernmental organization. ASEAN, founded in 1967, strives to advance regional stability, socio-cultural integration, and political and economic cooperation. It works towards the ASEAN Community vision, which includes the three pillars of the ASEAN Political-Security Community, ASEAN Economic Community, and ASEAN Socio-Cultural Community, and functions through a consensus-based decision-making process. Despite having different economies, cultures, and political structures, ASEAN members are

J. Kanzal
Benedictine Academy Anchepalya, Bangalore 560074, India

T. Tom (✉) · V. Raju
Faculty, Department of Economics, Kristu Jayanti College (Autonomous), Bengaluru, India
e-mail: tintotom@kristujayanti.com

N. M. Vipulkumar · A. P. Mathews
Faculty, Commerce and Management, Kristu Jayanti College (Autonomous), Bengaluru, India

S. Vidhya
Faculty, Department of Commerce, Kristu Jayanti College (Autonomous), Bengaluru, India

united by a dedication to regional cooperation, respect for one another, and the pursuit of shared interests in Southeast Asia.

India and the nations of the Association of Southeast Asian Nations (ASEAN) have a close relationship that is characterized by geopolitical, economic, and cultural links. In 1992, India joined ASEAN as a Sectoral Dialogue Partner, and in 1996 it was upgraded to a Full Dialogue Partner. The "ASEAN-India Partnership for Peace, Progress, and Shared Prosperity" framework is the basis for the bilateral relationship between ASEAN and India. India and the Association of Southeast Asian Nations (ASEAN) collaborate on domains encompassing connectivity, counterterrorism, maritime security, trade and investment, and cultural exchanges. Trade and economic cooperation have been fostered through the ASEAN-India Free Trade Agreement (AIFTA). India actively participates in various ASEAN-led forums, such as the East Asia Summit (EAS) and the ASEAN Regional Forum (ARF). Both parties share a mutual interest in enhancing their bilateral ties and promoting regional peace, stability, and economic development.

Various products and commodities are traded between India and the ASEAN nations. India exports steel, textiles, grains, diamonds, pharmaceuticals, vehicles, chemicals, and fabrics to ASEAN. In exchange, India buys crude oil, electronic equipment, machinery, chemicals, rubber, palm oil, precious stones, timber, paper, textiles, and clothing from ASEAN nations. These trade exchanges, whose specific products evolve and reflect the needs and advantages of each country, support economic cooperation and bilateral relations. There are many advantages to commerce between India and ASEAN nations. Opening new markets, increasing trade volume, and fostering bilateral investments promote economic growth. Product trade enables each country to use its comparative advantages by encouraging specialization and efficiency [2]. It helps industries in both regions and encourages employment growth. These trades also improve regional connectedness, integration, and cooperation. They promote mutual understanding and friendship between India and ASEAN countries by enhancing diplomatic connections, cultural exchanges, and interpersonal contacts. Generally, commerce between India and ASEAN promotes regional stability, sustainable development, and mutual prosperity.

In the Introduction, India's trade relations with ASEAN countries are discussed. India has been maintaining a good relationship with ASEAN countries. To get clarity about the area of the study, we referred to various research papers and articles: trend analysis and growth rate used as methodology. The study conveys that India's trade fluctuations with ASEAN nations focus on export–import patterns. Notable growth in India's exports to ASEAN, particularly in petroleum, meat, steel, and diamonds, reflects its competitive edge. In contrast, substantial imports like coal, petroleum, and palm oil highlight India's dependence on ASEAN for vital resources and agriculture.

2   Review of Literature

Sen et al. [3] studied about ASEAN-Indian Economic Relations. The study conveys that although there has been an increase in the number of political and economic engagements between ASEAN and India, there has not been much change in the elites of some ASEAN countries' attitudes about forging closer ties with India. Universities, think tanks, and the media in ASEAN seem to lack knowledge of or interest in India. Therefore, even if the de facto ASEAN plus Three groupings would naturally upgrade to ASEAN plus Four to include India, ideological, informational, and other biases seem to impede this from happening soon.

Pal and Dasgupta [4] researched Does a Free Trade Agreement with ASEAN Make Sense? The research states that the new free trade deal between India and the Association of Southeast Asian Nations will not benefit India in the medium term because ASEAN is not a natural commercial partner for India and, unlike China, India has not developed strong ties with the region. In the long run, though, the deal might make strategic Sense, particularly if India wants to become a powerhouse for service exports.

Chandran [5] tried to study Trade Complementarity and Similarity between India and ASEAN Countries in the Context of the RTA. The research analyzed the trade structures between India and the ASEAN nations to identify complementary industries and product groupings for enhanced trade cooperation. Trade indices, such as the Trade Intensity Index (TII) and Revealed Comparative Index (RCA), are constructed for 16 product groups to assess trade complementarity and similarity. The report highlights the potential for increased collaboration between India and ASEAN, as their respective industries and products exhibit complementary characteristics. ASEAN nations have comparative advantages in producing electrical goods, electronic products, vegetable oils, rubber products, and agricultural products. Conversely, India exhibits comparative advantages in producing food grains, minerals, chemicals, gems, jewellery, and manufactured goods.

Bhattacharyya and Mandal [6] inspected the impact of the Indo-ASEAN free trade agreement on India's trade balance. India and ASEAN agreed to a free trade agreement on August 13, 2009. The future effects of the FTA on India's trade balance are one of the possible effects we examine in this writing. It is determined that a negative impact on India's trade balance is anticipated due to the agreement. India's imports will increase dramatically, but its exports to these nations—except Indonesia—will not increase proportionally.

Ohlan [7]. ASEAN-India free trade agreement in goods: An assessment. The paper explores India's trade prospects with ASEAN nations by examining the pattern and trends in India's bilateral goods trade with ASEAN countries and their disclosed comparative advantage in various products. The findings indicate that while India's proportion of the ASEAN countries' merchandise trade has increased over the past three decades, it has remained lower than that of China and Japan. In the case of imports, this change has been more apparent. India has a significant and growing trade deficit with ASEAN nations. Regarding trade with ASEAN nations, India's

Table 1 The export figures with respect to the ASEAN region for the last seven years

India's trade with ASEAN—Years	Export (USD Billion)	% of growth
2016–17	30.96	23.19
2017–18	34.2	10.47
2018–19	37.47	9.56
2019–20	31.55	− 15.82
2020–21	31.49	− 0.19
2021–22	42.32	34.43
2022–23	44	3.95

Source Ministry of Commerce and Industry

trade deficit to overall foreign exchange has historically been at its worst. India's trade volume with ASEAN nations has drastically decreased.

Joseph [8]. Researched about ASEAN-India pact and plantations: Realities of the myths Simple static analytics underpin Kerala's plantation industry's objection to the ASEAN-India free trade agreement: a tariff reduction will weaken protection, boost imports, and cause a price collapse. A more dynamic model, however, shows that implications depend equally on productivity disparities, market structure, exchange rates, and reduced tariffs. In cases where domestic producers experience substantial harm, the Free Trade Agreement (FTA) also considers the potential impact of import competition by implementing safeguard measures. The primary challenges are not centred around safeguards under the Free Trade Agreement (FTA) but rather pertain to the production sector, agricultural research, and innovation, for example, Heading (Fourth Level). The contribution should adhere to a hierarchical structure with a maximum of four levels of headings. Table 1 provides a comprehensive overview of the various levels of headings.

Objectives

- To analyze the trends of export and import ASEAN countries with India in the past years.
- To understand the significant items exported and imported from India to ASEAN Countries.

3 Methodology

3.1 Trend Analysis

Trend analysis is a method of analysis that allows traders to predict what will happen with a stock in the future. It is based on historical data about the stock's performance given in the overall trends of the market and particular indicators within the market.

$$Y = a + bx;$$
$$a = \sum y/n;$$
$$b = \sum xy/\sum x^2$$

3.2   Growth Rate

Growth Rates are the increase that a specific variable has gained within a particular period and context. For investors, this typically represents the compounded annualized growth rate of a company's revenues, earnings, dividends, and even macro concepts—such as the economy as a whole.

$$\text{Growth rate} = \frac{\text{Current Year} - \text{Previous Year}}{\text{Growth Rate Growth}} \times 100$$

3.3   Data Analysis

Table 1 indicates the trade figures in respect of the ASEAN region. India's exports to the ASEAN region increased by 23.19% during 2016–17 and 2017–18. Exports rose 9.56% in 2018–19 compared to the previous year. However, the growth rate slowed, and exports substantially decreased by − 15.82% in 2019–20, showing a downward trend. In 2020–21, the negative growth trend persisted, albeit with a lower fall of − 0.19%. A considerable recovery was seen in the following year, 2021–2022, with a growth rate of 34.43%. The growth rate in 2022–2023 was 3.95%, reflecting a slower but still upward trend in growth.

Table 2 shows the trend projection of export to the ASEAN region. Despite varied growth rates, the export trend shows a modest gain in value. The export value is expected to reach 51.4064 USD billion in 2023–24, an increase of 16.83% from the previous year. The export value will rise again to 51.6585 USD billion in 2024–2025, although at a slower growth rate of 0.49%. With a slightly higher export value of 51.9106 USD billion and a growth rate of 0.49% in 2025–2026, the trend is expected to continue.

Table 2 Trend projection of export

Year	X	X^2	Export trend (USD Billion)	% of growth
2023–24	4	16	51.4064	16.83
2024–25	5	25	51.6585	0.49
2025–26	6	36	51.9106	0.49

Table 3 conveys the trade figures for the ASEAN region for the last seven years. There have been positive and negative growth rates in the import values of India's commerce with the ASEAN region over time. Imports increased by 16.04% between 2016–17 and 2017–18, a substantial growth rate. In 2018–19, the growth rate significantly increased by 25.86% over the previous year, greatly accelerating the pace of expansion. However, imports decreased by − 6.66% in 2019–20, indicating a drop in trade. Imports fell further by − 14.36% in 2020–21, continuing the negative growth. With a growth rate of 43.57% in 2021–2022, there was a spectacular recovery, showing a considerable rise in imports. With a growth rate of 28.64%, the upward trend in growth persisted in 2022–2023. Over the years, the import levels changed, with the enormous value recorded in 2022–2023 at USD 87.57 billion. The import value that was the lowest was USD 40.62 billion in 2016–17. According to the data, India's imports from the ASEAN region varied during the seven years. The noticeable improvement in 2021–2022 and the upward trend in 2022–2023 point to more robust trade relations and higher imports. Due to the dynamic trade between India and the ASEAN region, the growth rates show that import values have undergone significant expansions and contractions.

Table 4 shows products that India exports to ASEAN countries. As per the 2017 Jan Sept report, Petroleum Oil India's 6734 million USD export of petroleum products to ASEAN nations. It suggests that India has been exporting a sizable quantity of crude oil to these nations.

Table 3 The trade figures in respect of the ASEAN region for the last seven years

India's trade with ASEAN—Years	Import (USD Billion)	% of growth
2016–17	40.62	1.77
2017–18	47.13	16.04
2018–19	59.32	25.86
2019–20	55.37	−6.66
2020–21	47.42	− 14.36
2021–22	68.08	43.57
2022–23	87.57	28.64

Source Ministry of Commerce and Industry

Table 4 Products that India exports to ASEAN countries

Product	Value (USD Million)
Petroleum oil	6734
Bovine animals meat	1861
Crustaceans	907
Iron steel flat-rolled products	750
Diamonds	689

Bovine animal meat: This item indicates the heart of India's exports from bovine animals (cattle) to ASEAN nations. The fact that this export is worth 1861 million USD suggests that India's products made from beef can find a market in the ASEAN region.

Crustaceans: This category deals with the export of shellfish, including different varieties of crabs, lobsters, and prawns. Given that this export is worth 907 million USD, it is clear that India is sending a sizable quantity of crustaceans to ASEAN nations.

Products consisting of iron and steel that have been flat-rolled are exported under this heading. Sheets, coils, and plates are a few examples of these goods. The fact that this export is valued at USD 750 million suggests that India sells substantial flat-rolled steel and iron products to ASEAN nations.

Diamonds: The export of diamonds to ASEAN nations is the subject of this item. Given that this export is worth 689 million USD, it is clear that the ASEAN region is a market for Indian diamond goods.

Table 5 indicates products India imports from ASEAN countries. Palm Oil: This line item details India's 5215 million USD import of palm oil from ASEAN nations. Several industries frequently use palm oil, including food, cosmetics, and biofuels. The high value shows India depends heavily on ASEAN nations for its palm oil supply.

Coal: This line item denotes India's coal import from ASEAN nations. The 4233 million USD value of coal imports shows that India depends on ASEAN nations for coal supplies to meet its energy demands.

Crude petroleum imports from ASEAN nations are the subject of this line item. India imports a sizable quantity of crude oil to suit its energy needs, as seen by the value of its crude oil imports, which is 1732 million USD.

Telephone Sets: This category shows the telephone sets that India imported from ASEAN nations. The value of imported telephone sets is 1289 million USD, which indicates that a sizable portion of India's telecommunications equipment comes from ASEAN nations.

Automatic data processing devices: This line item denotes importing computers and associated equipment as automated data processing devices from ASEAN nations. These imports cost 911 million USD, indicating that India depends on ASEAN nations for cutting-edge technology and computer hardware.

Table 5 Products that India imports from ASEAN countries

Product	Value (USD Million)
Palm Oil	5215
Coal	4233
Crude petroleum oil	1732
Telephone Sets	1289
Automatic data processing machines	911

4 Conclusion

The purpose of this study is to present a complete overview of the fluctuating nature of India's trade with the nations that make up ASEAN, with a particular emphasis on the patterns of export and import. This study has shed light on the dynamics of India's trade connection with the ASEAN area by analyzing the trends in export and import values over the previous few years. The investigation uncovered a few significant results. To begin, India's exports to countries in the ASEAN region have seen substantial development in recent years. Famous exports from India include petroleum oil, bovine meat, crustaceans, iron and steel products, and diamonds.

Moreover, India's exports to the ASEAN region have also increased in value. These findings bring to light India's competitive edge in the industries mentioned above and its capacity to satisfy the demand of ASEAN countries. According to the study, India imports essential things from other ASEAN countries, including coal, crude petroleum oil, telephone sets, and automatic data processing devices. Palm oil is also a critical import. These imports demonstrate India's dependence on the ASEAN region for essential goods such as energy resources, telecommunications equipment, and agricultural items. India also imports a significant amount of food from the region.

5 Scope for the Further Study

India's commerce with ASEAN nations spans various economic exchanges, including exchanging commodities and services, investment flows, and joint ventures. This trading partnership spans several industries: manufacturing, agriculture, technology, and energy. The scope also includes examining chances for improved economic cooperation, coordinating policy, and addressing difficulties that can arise while forging closer commercial ties. Studying the effects of trade agreements, tariffs, and non-tariff obstacles on the dynamics of trade between India and ASEAN countries is also part of the scope, as is identifying opportunities for sustainable growth and mutual gain.

References

1. Jobayear Ahmed, S.: Macro-economic impact of COVID 19: case story of trade-off between industrial revolution and traditional workforce in Bangladesh. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_9
2. Joseph, B.: Impact of Covid 19 on oil prices, gold prices and indian stock market. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K.(eds) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental

Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_31

3. Sen, R., Asher, M.G., Rajan, R.S.: ASEAN-India economic relations: current status and future prospects. Econ. Polit. Wkly. 3297–3308 (2004)
4. Pal, P., Dasgupta, M.: Does a Free trade agreement with ASEAN make Sense? Econ. Polit. Wkly. 8–12 (2008)
5. Chandran, D.S.: Trade complementarity and similarity between India and ASEAN countries in the context of the RTA. Available at SSRN 1763299 (2011)
6. Bhattacharyya, R., Mandal, A.: Estimating the impact of the Indo-ASEAN free trade agreement on India's balance of trade. J. Glob. Anal. **1**(1), 9–2 (2010)
7. Ohlan, R.: ASEAN-India free trade agreement in goods: an assessment. Available at SSRN 2798026 (2012)
8. Joseph, K.J.: ASEAN-India pact and plantations: realities of the myths. Econ. Polit. Wkly. 14–18 (2009)

Innovative Decisions in the Implementation of Restructuring and the Impact of Management Dynamic Capabilities on Their Efficiency

Tetiana L. Mostenska [iD]**, Milita Vienažindienė** [iD]**, Ludmila Chorna** [iD]**, Eduard Yurii** [iD]**, and Tetiana G. Mostenska** [iD]

1 Introduction

Increasing the competitiveness of an enterprise is possible only through the implementation of management decisions and the formation of appropriate behavior of managers in the implementation of the strategic development of the enterprise. Evolutionary development is accompanied by diversification of production, improvement of quality characteristics of products and a gradual increase in production and sales volumes. However, this approach to strategy formation can will result in a loss of competitive advantage and a decrease in the efficiency of the enterprise.

T. L. Mostenska (✉)
Faculty of Transport, Management and Logistics, National Aviation University, Kyiv, Ukraine
e-mail: tmosten@ukr.net

M. Vienažindienė
Department of Business and Rural Development Management, Vytautas Magnus University Agriculture Academy, Kaunas, Lithuania
e-mail: milita.vienazindiene@vdu.lt

L. Chorna
Department of Business and Rural Development Management, Zhytomyr Institute "Interregional Academy of Personnel Management", Vytautas Magnus University Agriculture Academy, Kaunas, Lithuania

E. Yurii
Department of Finance and Credit, Yurii Fedkovych Chernivtsi National University, Chernivtsi, Ukraine

T. G. Mostenska
Department of Management of Foreign Economic Activity of an Enterprise, National Aviation University, Kyiv, Ukraine
e-mail: mostik_t@ukr.net

The introduction of innovations allows the company to provide competitive advantages and develop strategic potential—it provides a revolutionary development of the enterprise, which is accompanied by greater risks and requires special management knowledge and skills.

Innovation is of utmost importance in the implementation of a development strategy. The ability to make innovative decisions and implement innovations depends on the action of many factors, which include availability of resources, life cycle stage, the level of competition in the industry, the state of development of the industry, the willingness to take risks by owners and management.

A significant share of the GNP of economically developed countries is formed by innovation, being a key source of growth. Innovations allow not only to meet the demand for products, but also form the demand of consumers, implementing new functionalities in new products, services, technologies.

To ensure competitiveness of enterprises, they must constantly make innovative changes in their products and processes. This policy allows you to retain consumers and expand markets, increase efficiency.

Innovations are often introduced by enterprises during restructuring.

2   Review of Publications

The issue of innovation, innovation management, the role of top managers in the adoption and implementation of innovative decisions, the characteristics of dynamic management abilities are actively studied by scientists. In the works of [1–3] theoretical approaches to definition of types of innovations are considered, innovative possibilities of the enterprises and approaches to an estimation of efficiency of innovations are characterized. Westall [4], Lendel [5] present the views of scientists on the relationship between management decisions and innovation efficiency, the effectiveness of innovative solutions investigate [6, 7] defines the role of personal in the implementation of innovation processes. The authors are of the opinion that dynamic managerial capabilities are the part of managerial human capital.

The issue of manager's personal responsibility in making innovative decisions is considered in the article [4].

The issue of the impact of ethical leadership on creativity and organizational innovation is discussed in the article of [8]. Problems of reconfiguration and restructuring in the process of transformation of innovation processes of the firm explores [9, 10] consider the effectiveness of accelerated innovation processes.

The work of [11] is devoted to determining the impact of interaction on the company's innovation efficiency and the relationship between the development of innovation processes and the company's innovation efficiency.

Dynamic management abilities and their role in the innovative development of enterprises have been studied in the works of [12–14].

In accordance with Zizlavsky [15] innovation management is very important for enterprises. In the author's opinion this approach allows enterprises to survive in a

dynamic environment, because the innovation management forms competitiveness through non-traditional managerial decisions.

3   Results and Discussion

Innovation is the key to the development of any enterprise. Changes in the company's environment, such as new technological trends or consumer needs, regularly require dynamic updating of the company's innovation processes. Lichtenthaler [9].

Innovative activity of enterprises contributes to the acquisition of stable competitive advantages by enterprises, provides effective strategic development, increases market stability, ensures the effectiveness of production diversification and attracting new consumers, increases the market value of the enterprise, ensures the efficiency of restructuring processes.

Due to both objective and subjective reasons, the innovation activity of Ukrainian enterprises remains low. In addition, the problems of innovative development at Ukrainian enterprises are not solved systematically, focusing on current challenges and without predicting possible changes in the development of a strategic plan.

The innovation is not about working on random ideas to see what sticks. Companies need to develop a clear point of view about where the world is going and the key trends that could impact their business. They then need to develop a clear innovation strategy that informs the types of new ideas they will invest in for the future [16].

When developing and implementing innovative solutions, a modern leader must demonstrate constructive behavior, take risks and responsibility.

Dynamic capabilities play a significant role in the implementation of innovations. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die [17, 18].

Dynamic management capabilities are essential to the effective operation of organizations. Adner [6, 19] point out that the role of managers is fundamental to strategic change and firm performance, as it is managers who determine new opportunities for companies.

Managers contribute to the development of entrepreneurship. They identify and use opportunities for the development and transformation of the resource base.

Managers must focus on the needs required by consumers and which will be included in the product or service. In addition, they are responsible for income and expenses, determining the target market, and the like.

The actions of managers should be aimed at developing a business model that best meets the requirements for creating value for customers and the organization [20].

The use of dynamic capabilities by managers allows:

- create valuable, rare, difficult to imitate and indispensable resources. Dynamic abilities are formed due to changes both inside and outside the firm, including the perception and motivation of managers:

- identify processes that create dynamic opportunities;
- increase the productivity of the firm, but this does not happen automatically [12].

Dynamic capabilities allow you to create and implement different types of innovations that promote innovation and identify both the unique nature of products and problems associated with different types of innovations (product, technology, management, etc.).

The dynamic properties of managers acquire special importance in the implementation of restructuring, since one of the goals of its implementation is the need to improve business processes.

In addition, managerial dynamic capabilities determine the role of managers in updating and transforming the firm's resource base so that it maintains and develops its competitive advantage and productivity [14].

To the greatest extent, managerial dynamic capabilities influence management decisions when creating or improving the business model of the organization or its individual structural units.

The business model is created or improved, most often during the reconstruction and should be focused on the following:

- elements of the business model must be consistent with both the internal and external environment of the organization [21]. This consistency provides the ability of managers to identify processes that create dynamic opportunities for organizational development;
- a new or improved business model should be focused on providing consumer value [22]. This is ensured by the ability of managers to create valuable, rare, difficult to imitate and indispensable resources that provide organizations with sustainable long-term competitive advantage;
- a new or improved business model should support compliance with both the internal organizational structure and the overall management model of the organization [22]. This is ensured by the manager's ability to increase the productivity of the organization.

Thus, Teece [20, p. 41] concludes that extreme business model transitions (those involving a new field of technology, a very different customer base, organizational re-engineering, or some combination of these and other disruptive changes) within an existing business are unlikely to succeed without major financial resources.

According to the authors, in addition to significant financial resources, dynamic management capabilities play a leading role in creating or improving the organization's business model. A serious problem for many organizations is that management and organizational resources do not meet the requirements of restructuring. In this case, a gradual reduction of the market segment will continue, and in the absence of the introduction of innovations (managerial, technological, product, etc.), the organization will lose in the competition.

Thus, we can conclude that it is advisable to introduce various types of innovations in the process of restructuring that correspond to the strategic goal or tactical purposes of organizational development. An important component of the successful

functioning of industrial enterprises is the level of innovativeness of production processes. However, the rate of the implementation of innovations in Ukraine is very low.

If in 2000 the share of sold innovative products (goods, services) in the total volume of sold products (goods, services) of industrial enterprises was 9.4%, in 2020 this indicator was at the level of 1.9%.

Against the background of an increase in the number of introduced new technological processes for the period 2000–2020 from 1403 to 2340, that is, by almost 67%, the number of introduced types of innovative products (goods, services) decreased more than by 3.8 times—from 15,323 units to 4066.

Expenditures on innovations of industrial enterprises in 2020 amounted to UAH 14,406.9 million, including 75.9% (UAH 11,712.2 million) spent by enterprises on the purchase of machinery, equipment and software. UAH 2843.4 million (21.1%) was spent on research and development by enterprises, of which UAH 876.3 million were internal research projects.

The objective factors that hinder the introduction of innovations in Ukraine are: insufficient supportl of state for research and development (the share of costs for innovative activities of industrial enterprises at the expense of the state budget is 2%, Fig. 1);insufficient of commercialization of state scientific research; decrease in the scientific potential of the country; predominance of the resource sector in the structure of the country's economy (the level of profitability of operating activities in 2019 in agriculture—18.6%, in industry—3.9%).

At the level of industrial enterprises, the main reasons for low innovation activity are: lack of financial resources; low willingness to take on investment risk management; insufficient level of validity of the proposed innovative solutions.

Managing innovation processes in a company is a real challenge faced by company managers [23, p. 863].

Westall [4] identified the relationship between enterprise innovation policy and the personality of the manager. At the same time, the paper states that organizations must be prepared for innovation risks. Thus, making innovative decisions in the implementation of restructuring depends, inter alia, on the managers, who plan and procedure for restructuring.

Fig. 1 Structure of financing innovative developments, million UAH, %. *Source* https://ukrstat.org/uk
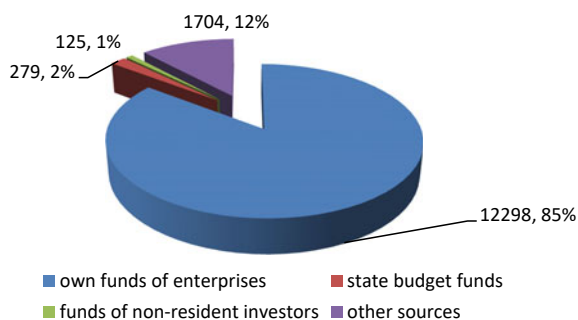
When carrying out a restructuring, it is important whether the manager is willing to take the financial, material and resource risks if a restructuring involves the implementation of innovative solutions. It is manager, performing management functions related to the improvement of business processes as a result of restructuring, determines the strategy and restructuring measures.

Thus carrying out of various types of restructuring provides for necessity of introduction of innovations in various planes of the company activity. According to [20], managers should perform three roles: operational role, which is related to the development of current activities and involves budgeting and staffing; entrepreneurial role, which involves the ability to sense and seize opportunities, manage resources and adapt the organization and its business model; the role of a leader, which requires the dissemination of the vision and values of the organization, the alignment of people with the strategy and their motivation.

Together, the entrepreneurial role and the role of the leader form "entrepreneurial management". It is these roles that determine the functions of dynamic abilities [20].

Thus, managerial dynamic capabilities allow you to recognize opportunities, develop and implement viable business models, build opportunities and guide the organization through transformation [20].

When restructuring is carried out, management mistakes are possible, namely: the proposed innovative solutions are characterized by excessive optimism; rejection of possible losses associated with miscalculations in the implementation of innovative solutions; errors in determining the resource capabilities of the enterprise; the discrepancy between the strategic intentions and the goals determined by the restructuring.

The above allows us to conclude that the actual managerial dynamic capabilities make it possible to ensure the effective implementation of the restructuring processes. Thus, managerial dynamic ability is a prerequisite for effective restructuring in today's changing environment.

Teece [20], defining managerial dynamic capabilities, notes that they include three key abilities: the ability to identify and shape opportunities and threats; the ability to use the available opportunities; the ability to transform the resource base.

However, these abilities are implemented in different ways by different managers, since each manager, due to his personal characteristics, can form his own structure of managerial dynamic capabilities. In addition, different structural units in organizations also require the use of different combinations of key abilities of management dynamic capabilities.

Making innovative decisions in the implementation of restructuring measures requires the mobilization of significant material, financial and human resources, which determines the high level of responsibility of managers. In turn, the quality of these decisions depends on the managerial dynamic capabilities of managers.

The restructuring should be based on customer needs, innovation and resource potential of the enterprise. The quality of combining these requirements is determined by the managerial dynamic abilities of managers.

Managers choose the tools for introducing innovations depending on their personal characteristics [24], including their managerial dynamic abilities.

To determine the state of use of dynamic management capabilities, the authors developed a questionnaire and conducted a survey (Table 1).

The study allows us to conclude that 40% of respondents do not have a clear understanding of the concept of "managerial dynamic capabilities". The same number of respondents tried to implement entrepreneurial skills in the process of transformation in the organization.

Decisions on restructuring, its content are made by senior management of enterprises, so only 20% of respondents said that their proposals were taken into account in the implementation of decisions in the process of restructuring. Instead, 65% of respondents participated in the development or implementation of valuable, rare, difficult to imitate or indispensable resources into the organization's activities. Such actions are typical for managers of all levels of management. 60% of respondents understand what processes in the organization create dynamic opportunities, but only 40% have suggestions on how to increase the productivity of the company in which they work.

To the question "Do you think that the implementation of innovations is carried out through restructuring by developing/improving a business model?" 75% of respondents answered positively.

The survey on the possibility of implementing managerial dynamic capabilities in organizations allows us to conclude that there is a problem with understanding the

Table 1 Answers of respondents on the implementation of managerial dynamic capabilities in organizations, % of respondents

Question	Answers		
	Yes	No	Difficult to answer
1. Do you have a clear understanding of the concept of "managerial dynamic capabilities"?	40	40	20
2. Have you tried to implement your entrepreneurial skills in the process of transformation in the organization?	40	60	–
3. Were your suggestions taken into account when making decisions in the restructuring process?	20	60	10
4. Have you participated in the development/ implementation of valuable, rare, difficult to imitate or indispensable resources in the organization's activities?	65	35	–
5. Do you understand what processes in the organization create dynamic opportunities?	60	20	10
6. Do you have suggestions for improving the productivity of the company in which you work?	40	25	35
7. Do you believe that the implementation of innovations is carried out through restructuring by developing/improving the business model?	75	15	10

definition of "managerial dynamic capabilities". At the same time, there are problems caused by the rigid formalization of the procedure for making and implementing restructuring decisions, which does not allow taking into account the proposals of middle and lower level managers when making decisions in the restructuring process.

4 Conclusion

Managerial dynamic capabilities make it possible to form and develop competitive advantages.

Different management levels are characterized by different access of managers to information, which determines, in turn, the ability to control different management decisions.

Restructuring can result in strategic changes in the organization, changes in marketing strategy (marketing, promotion, characteristics, communication channels), in the development of new products and services, acquisition or sale of assets, in decision-making on mergers or acquisitions, in determining criteria for changing the structure of the asset portfolio. In this regard, the influence of management on the strategic renewal of the organization in solving restructuring problems depends on the dynamic capabilities of managers.

References

1. Viki, T.: Six principles for creating a good corporate innovation process (2018). https://www.forbes.com/sites/tendayiviki/2018/03/26/six-principles-corporate-innovation-process/#538c971d44f4
2. Keeley, L., Walters, H., Pikkel, R., Quinn, B.: Ten Types of Innovation. The Discipline of Building Breakthroughs. Wiley, Hoboken, New Jersey. Published simultaneously in Canada (2013). http://irpublicpolicy.ir/wp-content/uploads/2018/02/97395B9B4D3A41ECD88DAB0766C3386B-irpublicpolicy.pdf
3. Welch, H., Brodie S., Jacox, M.G., Bograd, S.J., Hazen, E.L.: Decision-support tools for dynamic management. Conserv. Biol. **34**(3), 589–599 (2020)
4. Westall, T.: Innovation inside. April Strategy LLP, London, UK (2018). https://doi.org/10.5772/intechopen.74090
5. Lendel, V., Hittmár, Š., Siantová, E.: Management of innovation processes in company. Procedia Econ. Finan **23**, 861–866 (2015). https://www.researchgate.net/profile/Viliam_Lendel/publication/280017723_Management_of_Innovation_Processes_in_Company/links/55a3d7ea08ae72349bbd0568/Management-of-Innovation-Processes-in-Company.pdf
6. Adner, R., Helfat, C.E.: Corporate effects and dynamic managerial capabilities. Strateg. Manag. J.. Manag. J. **24**, 1011–1025 (2003)
7. Harris, D., Helfat, C.E.: Dynamic managerial capabilities. In: Augier, M., Teece, D. (eds.) The Palgrave Encyclopedia of Strategic Management. Palgrave Macmillan, London (2016). https://doi.org/10.1057/978-1-349-94848-2_600-1
8. Shafique, I., Ahmad, B., Kalyar, M.N.: How ethical leadership influences creativity and organizational innovation: examining the underlying mechanisms. Eur. J. Innov. Manag. **23**(1), 114–133 (2019). https://doi.org/10.1108/EJIM-12-2018-0269

9. Lichtenthaler, U.: Five steps to transforming innovation processes: continually adjusting to new environments. J. Bus. Strategy **37**(5), 39–45 (2016). https://doi.org/10.1108/JBS-08-2015-0090

10. Zhan, Y., Tan, K.H., Perrons, R.K.: A proposed framework for accelerated innovation in data-driven environments: evidence and emerging trends from China. Ind. Manag. Data Syst. **118**(6), 1266–1286 (2018). https://doi.org/10.1108/IMDS-11-2017-0542

11. Szutowski, D., Szulczewska-Remi, A., Ratajczak, P.: Managing innovation processes in industrial sector. Qualitative study. Economic Research-Ekonomska Istraživanja. **32**(1), 282–300 (2019). https://doi.org/10.1080/1331677X.2018.1553681

12. Ambrosini, V., Bowman, C.: What are dynamic capabilities and are they a useful construct in strategic management? Int. J. Manag. Rev.Manag. Rev. **11**, 29–49 (2009)

13. Ambrosini, V., Bowman, C., Collier, N.: Dynamic capabilities: an exploration of how firms renew their resource base. Br. J. Manag.Manag. **20**, 9–24 (2009)

14. Ambrosini, V., Altintas, G.: Dynamic managerial capabilities. Bus. Manag.Manag. (2019). https://doi.org/10.1093/acrefore/9780190224851.013.20

15. Zizlavsky, O.: Approaches to innovation process assessment: complex results from an exploratory investigation. Int. J. Eng. Bus. Manag., 1 (2015). https://doi.org/10.5772/62052

16. Six Principles For Creating A Good Corporate Innovation Process.: https://www.forbes.com/sites/tendayiviki/2018/03/26/six-principles-corporate-innovation-process/#538c971d44f4 (2018)

17. Zollo, M., Winter, S.: Deliberate learning and the evolution of dynamic capabilities. Organ. Sci. **13**, 339–339 (2002). https://doi.org/10.1287/orsc.13.3.339.2780

18. Eisenhardt, K.M., Martin, J.A.: Special issue: the evolution of firm capabilities. Strategic Manag. **21**(10–11), 1005–1021 (2000). https://doi.org/10.1002/1097-0266%28200010/11%2921%3A10/11%3C1105%3A%3AAID-SMJ133%3E3.0.CO%3B2-E

19. Helfat, C.E., Martin, J.A.: Dynamic managerial capabilities: review and assessment of managerial impact on strategic change. J. Manag.Manag. **41**(5), 1281–1312 (2015)

20. Teece, D.J.: Dynamic capabilities and entrepreneurial management in large organizations: toward a theory of the (entrepreneurial) firm. Eur. Econ. Rev. **86**, 202–216 (2016). https://www.sciencedirect.com/science/article/abs/pii/S001429211500183X

21. Ritter, T., Pedersen, G.L.: Digitization capability and the digitalization of business models in businessto-business firms: past, present, and future. Ind. Mark. Manag. **8b**. https://doi.org/10.1016/j.indmarman.2019.11.019

22. Birkinshaw, J., Ansari, S.: Understanding management models: going beyond "what and why" to "how" work gets done in organizations. https://www.researchgate.net/publication/268577855 (2015)

23. Lendel, V., Hittmára, Š., Siantová, E.: Management of innovation processes in company. In: 2nd global conference on business, economics, management and tourism, pp 30–31, Oct 2014, Prague, Czech Republic (2014)

24. Bollinger, S.R.: Creativity and forms of managerial control in innovation processes: tools, viewpoints and practices. Eur. J. Innov. Manag. **23**(2), 214–229. https://doi.org/10.1108/EJIM-07-2018-0153

Perceived Stress, Personality Traits on Internet Addiction Among Young Adults: A Cross Sectional Study

Anjana Sinha, Sujatha, V. R. Priyanka, Cynthia Sara James, and N. C. Kiran Babu

1 Introduction

Internet addiction refers to excessive and compulsive use of the internet that interferes with daily life, responsibilities, and social well-being spoils interpersonal relationship. It's often characterized by a loss of control over internet use, preoccupation with online activities, breaking off when not online, and negative consequences on various aspects of life, such as work, family relationships, and mental health. Common online activities that can contribute to internet addiction include excessive social media use, online gaming, streaming videos, browsing, online shopping, and gambling. The obsessive nature of these activities can lead to neglect of real-world responsibilities, social isolation, sleep disturbances, anxiety, depression, and decreased overall quality of life. Internet addiction is dysfunctional behavior associated with intense or inadequately regulated addictions, inclinations, or behaviors in relation to computer use and Internet access, resulting in disability or stress [1, 2]. It is influenced by social factors such as demographics, availability and access to the

A. Sinha (✉) · Sujatha · V. R. Priyanka · C. S. James · N. C. Kiran Babu
Department of Psychology, Kristu Jayanti College, Bengaluru, India
e-mail: anjana@kristujayanti.com

Sujatha
e-mail: sujatha@kristujayanti.com

V. R. Priyanka
e-mail: priyanka.vr@kristujayanti.com

C. S. James
e-mail: cynthiasara@kristujayanti.com

N. C. Kiran Babu
e-mail: kiranbabu@kristujayanti.com

A. Sinha
Department of Psychology, Reva University, Bangalore, India

© The Author(s), under exclusive license to Springer Nature Switzerland AG 2024
R. Khamis and A. Buallay (eds.), *AI in Business: Opportunities and Limitations*, Studies in Systems, Decision and Control 515, https://doi.org/10.1007/978-3-031-48479-7_18

internet, and biological factors such as genetics [3]. Internet addiction is linked to various personality traits, such as neuroticism where the Internet addiction is one of its primary causes [4]. People high in neuroticism tend to be internet addicts, exhibit inappropriate responses, and can cause depression [5].

The concept of perceived stress is complex and encompasses numerous causal and beneficial factors. Stressful life experiences trigger the sympathetic nervous system and the hypothalamic–pituitary–adrenal axis, altering the body's reaction and affecting the immune, metabolic, and cardiovascular systems [2, 6–8]. The importance of mental health indicators as a risk consideration for physical and psychological illnesses has recently become clear in clinical and epidemiological studies, especially in affluent societies and recently also in emerging countries. Rare causes of death such as suicide cannot fully explain the large increase in mortality in the general population, which is also linked to psychological stress. The association between mental stress and poor lifestyle may partially help explain this excess mortality from natural causes in people with mental stress [8]. Factors such as socioeconomic factors, gender impact, and sociodemographic and occupational variables are important determinants of mental health.

Personality also encompasses their attitudes, moods, and beliefs, and it is most easily observed in how they interact with other people. The study of personality has two main meanings: the persistent differences between humans and the traits that make all humans the same and distinguish the psychological human from other species [9].

Openness, conscientiousness, extraversion, agreeableness, and neuroticism are the Big Five traits of personality. Conscientiousness is organized, disciplined, and goal-oriented, but openness is a person's receptivity to experiences. Extraversion is the most well-known personality trait, with extraverts being talkative and outgoing, and drawing force from groups. Agreeability gauges a person's degree of warmth and friendliness. Unpleasant people are aloof, wary of others, and less willing to work together. Neuroticism is a personality trait linked to bad health outcomes such as anxiety and depression. People high in neuroticism tend to worry and easily fall into anxiety and depression, while people low in neuroticism tend to be emotionally stable and balanced [10].

These attributes are largely reported to a variety of operational areas, including psychopathology, academic and occupational deed, mental well-being, religion, culture, longevity, and marital success [7]. The Five Factor Model (FFM) (Big Five) is a popular tool for studying personality traits that share the following five attributes: Conscientiousness, Extraversion, Agreeableness, Openness to Experience, and Emotional Stability [11].

Internet addiction is a growing phenomenon worldwide, particularly in countries with widespread computer access and technology [12, 13]. Factors associated with Internet addiction include stress, personality traits, depression, and anxiety [14]. The objective of the current investigation is to find a connection between personality traits, Internet addiction and the perception of stress in young adults.

According to a longitudinal study by [15], adolescent internet expectancy and self-discipline acted as an intervening factor in the relationship between perceived

stress and excessive internet use. The Perceived Stress Scale (PSS) demonstrated a respectable level of reliability and demonstrated relationships with scores on life events, depressing and physical symptoms, and usage of health facilities, social anxiety, and maintaining smoking cessation. The PSS is advised as a tool for determining the degree of stress experienced as well as for examining the role of non-specifically evaluated stress in the etiology of disease and behavioural disorders.

In a survey of 888 college students, it was discovered that 49 of them were addicted to the Internet after graduation and achieved considerably higher on neuroticism/ stability, psychoticism/socialization, and lying than their regular counterparts did. These conclusions imply that neuroticism, psychoticism, and immaturity are risk personality aspects for Internet addiction. High degrees of neuroticism are associated with internet addiction, and neurotic individuals use the internet to interact with their thoughts and feelings, which increases their chance of developing depression [7].

According to a different study, higher internet usage rates and higher levels of anxiety are related to life satisfaction and anxiety [9]. According to [9], there is a direct correlation between felt stress and anxiety and both academic performance and active coping during exams [10]. Looked explored the relationship between personality traits and religiosity as protective or risk variables for young Israeli-Palestinian adults acquiring internet addiction.

The lack of studies specifically addressing the relationship between personality traits, perceived stress, and internet addiction in young adults is a study vacuum in the literature. Therefore, the present investigation is to improve early detection and prevention efforts by examining this association in Bengaluru and Thiruvananthapuram, India.

2   Method

The non-experimental correlational research design was used to understand the relationship between Big Five personality traits, perceived stress and internet addiction among 220 young adults (age group of 18–25 years). The sample comprising of 109 males and 119 females were chosen from Thiruvananthapuram and Bengaluru using convenient sampling. The participants were administered with the following questionnaires by the researchers.

Chen Internet Addiction Scale
Perceived Stress Scale
Big Five Inventory

2.1   Objectives

1. To study the relationship between Big Five Personality traits and Internet addiction among young adults.

2. To study the relationship between Perceived Stress and Internet addiction among young adults
3. To determine the influence of Personality Traits and Perceived Stress on internet addiction among young adults.

2.2 Hypotheses

H^{01}: There is no significant relationship between Big Five personality traits and Internet addiction among young adults

H^{02}: There is no significant relationship between perceived stress and Internet addiction among young adults

H^{03}: There is no significant influence of Big Five personality traits and perceived stress on Internet addiction among young adults

2.3 Variables of the Study

Dependent variable—Internet addiction

Independent variable—Big Five personality traits, Perceived stress

2.4 Ethical Considerations

The article focuses on the ethical considerations and statistical analysis methods used in a study. In terms of ethical considerations, the participants in the study were provided with informed consent before participating. They were informed about the purpose and nature of the study and were assured that their data would be kept anonymous and confidential. The data collected from the participants would only be used for research purposes.

2.5 Statistical Analysis

In terms of statistical analysis, the researchers used the Statistical Package for the Social Sciences (SPSS) 15 software. This software allowed them to perform both descriptive and inferential statistics. Descriptive statistics were used to summarize and organize the data collected in the study. Measures such as mean, median, and standard deviation were used to provide a comprehensive understanding of the data.

3 Results and Discussion

The collected data were scored, tabulated and calculated.

Table 1 shows the mean and standard deviation of internet addiction, perceived stress and personality traits. The total sample size (N) = 220 emerging adults. For internet addiction, the mean was found to be 56.2 and standard deviation was found to be 13.39. For perceived stress, the mean was 20.31 and S.D. was 6.3. For extroversion, the mean was 25.71 and S.D. was 5.93. For agreeableness the mean was 33.16 and S.D. was 4.93.For conscientiousness, the mean was 28.31 and S.D. was 5.59. For neuroticism, the mean was 24.42 and S.D. was 5.8.Finally for Openness, the mean was found to be 34.82 and standard deviation was found to be 5.57. It can be found that overall agreeableness is high compared to other personality traits (Table 2).

$H_0$1.1: There will no significant relationship between Extroversion and internet addiction among emerging adults. For Internet Addiction and Agreeableness it has a negative low correlation $r = -0.15$, $p < 0.05$ and was statistically significant at 0.05 level. So the null hypothesis was rejected, $H_0$1.2: There will no significant relationship between Agreeableness and internet addiction among emerging adults. For Internet Addiction and Conscientiousness there was a negative low correlation $r = -0.30$, $p < 0.001$ and was statistically significant. So the null hypothesis was rejected, $H_0$1.3: There will no significant relationship between Conscientiousness and internet addiction among emerging adults. For Internet Addiction and Neuroticism perfect positive correlation $r = 0.19$, $p < 0.001$ and was statistically significant. So the null hypothesis was rejected, $H_0$1.4: There will no significant relationship between Neuroticism and internet addiction among emerging adults. For Internet Addiction and Openness had negative low correlation $r = -0.14$, $p < 0.05$ and was statically significant at 0.05 level. So the null hypothesis was rejected, $H_0$1.5: There will no significant relationship between Openness and internet addiction among emerging adults (Table 3).

Agreeableness was positively related to Internet addiction. Conscientiousness was negatively related to Internet addiction [16, 17]. The correlation was calculated for the two variables, i.e. Percieved stress and Internet Addiction for 220 emerging adults which were further broken down into 101 males and 119 females and significant at $p < 0.01$ levels. As shown in Table 2. The Pearson correlation results showed that there was a perfect positive correlation between Internet Addiction and Perceived Stress $r = 271$, $p < 0.01$ Therefore, the study rejects the null hypothesis $H_0$2: There will no significant relationship between perceived stress and internet addiction among emerging adults. Over all the results shows that all the two variables are positively correlated (Table 4).

In Step 1 regression, the results indicated that the Extroversion on Internet Addiction was statistically not significant. In Step 2, it was found between Extroversion and Agreeableness on Internet Addiction, Extroversion was found to be statistically not significant and Agreeableness was found to be $B = 67.78$, $p < 0.05$. In Step 3, it was found between Extroverison, Agreeableness and Conscientiousness on Internet Addiction, Extroversion was found to be statistically not significant, Agreeableness

Table 1 Descriptive statistics of internet addiction, perceived stress and personality

N = 200	Internet Addiction	Perceived stress	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Mean	56.22	20.31	25.71	33.16	28.31	24.42	34.82
Std. deviation	13.39	6.35	5.93	4.93	5.59	5.89	5.57

Table 2 Correlation between internet addiction and personality traits

N = 220		Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Internet addiction		0.03	− 0.15*	− 0.30***	0.19***	− 0.14*
Mean	56.2	25.71	33.16	28.31	24.42	34.82
Standard deviation	13.39	5.93	4.93	5.59	5.89	5.57

* $p < 0.05$,** $p < 0.01$,*** $p < 0.001$

Table 3 Correlation between perceived stress and internet addiction

	Mean(S.D.)	Internet addiction	Percieved stress
Internet addiction perceived stress	56.22(13.39)	–	0.27***
	26.31(6.35)	0.27***	–

***$p < 0.001$

was found to be $B = 84.43$, $p < 0.01$, Conscientiousness was found to be $B = 84.43$, $p < 0.001$. In Step 4, it was found between Extroverison, Agreeableness, Conscientiousness and Neuroticism on Internet Addiction. Here Extroversion was found to be $B = 72.4$, $p < 0.05$, Agreeableness was found to be $B = 72.47$, $p < 0.05$, conscientiousness was found to be statistically not significant, neuroticism was found to be statistically not significant.

In Step5, it was found between Extroversion, Agreeableness, Conscientiousness, neuroticism and openness on internet addiction, Extroversion was found to be $B = 74.43$, $p < 0.05$, agreeableness was statistically not significant, Conscientiousness was found to be $B = 74.43$, $p < 0.001$, neuroticism was found to be $B = 74.43$, $p < 0.05$ and openness was statistically not significant. In Step 4, it was found between Extroversion, Agreeableness, Conscientiousness and Neuroticism on Internet Addiction. Here Extroversion was found to be $B = 72.47$, $p < 0.05$, agreeableness was found to be $B = 72.47$, $p < 0.05$, conscientiousness was found to be statistically not significant, neuroticism was found to be statistically not significant. In Step 5, it was found between Extroversion, Agreeableness, Conscientiousness, Neuroticism, Openness and Perceived Stress on Internet Addiction, Extroversion was found to be $B = 68.14$, $p < 0.05$, Agreeableness was statistically not significant, Conscientiousness was found to be $B = 68.14$, $p < 0.001$, neuroticism was found to be not statistically significant, openness was statistically not significant and Perceived Stress was found to be $B = 68.14$, $p < 0.05$). The above results are in concordance with the present findings.

Table 4 Stepwise regression of personality traits and perceived stress on internet addiction

Model	Unstandardized coefficients B	Std. error	t	Sig.
Step1	54.23	4.03	13.43	
Extroversion	0.077	0.15	0.505	0.614
Step 2	67.78	7.14	9.49	0.001
Extroversion	0.08	0.15	0.582	0.561
Agreeableness	− 0.41	0.18	− 2.29	0.023
Step 3	84.38	7.56	11.15	0.001
Extroversion	0.25	0.14	1.69	0.091
Agreeableness	− 0.38	0.17	− 2.20	0.029
Conscientiousness	0.77	0.15	− 4.95	0.001
Step 4	72.47	10.01	7.23	0.001
Extroversion	0.31	0.15	2.09	0.038
Agreeableness	− 0.35	0.17	− 2.02	0.044
Conscientiousness	− 0.69	0.16	− 4.30	0.001
Neuroticism	0.28	0.15	1.80	0.073
Step 5	74.34	10.18	7.30	0.001
Extroversion	0.32	0.15	2.13	0.034
Agreeableness	− 0.30	0.17	− 1.70	0.091
Conscientiousness	− 0.64	0.16	− 3.81	0.001
Neuroticism	0.31	0.16	1.97	0.050
Openness	− 0.16	0.16	− 1.00	0.316
Step 6	68.14	10.56	6.45	0.001
Extroversion	0.33	0.15	2.20	0.029
Agreeableness	− 0.28	0.17	− 1.58	0.115
Conscientiousness	− 0.54	0.17	− 3.10	0.002
Neuroticism	0.15	0.18	0.83	0.407
Openness	− 0.17	0.16	− 1.08	0.279
Percieved stress	0.33	0.16	2.02	0.044

4   Summary, Conclusion and Implication

This scientific article explores the relationship between personality traits, perceived stress, and internet addiction among young adults. Specifically, the study aims to determine if there is a significant link between personality traits (including extraversion, agreeableness, conscientiousness, neuroticism, and openness) and internet addiction, as well as whether perceived stress is related to internet addiction. For the young adults, it's is an age where they have to make complex life decisions,

career decisions, find a suitable spouse, self-focus, feeling in between, and of possibilities and these are the factors that may make them to alter their life choices, and in this day and age when lifestyle choices are quite sedentary, there are high chances of a person depending or using the internet in a way that can hamper with their day-to-day proper functioning.

Addictive behaviors can be a way for individuals to avoid feelings of anxiety or depression, or as a means of coping with daily stressors. This suggests that factors such as personality and perceived stress could play a role in an individual's internet usage and potentially lead to addiction. Study indicate that there is indeed a significant association between personality traits and internet addiction among young adults. This suggests that individuals with these traits may be more prone to developing an addiction to the internet.

Additionally, the study found a significant relationship between perceived stress and internet addiction among young adults. Higher levels of perceived stress were related with higher levels of internet addiction. This suggests that individuals who perceive themselves as experiencing more stress are more likely to turn to the internet as a coping mechanism or form of escapism.

Overall, this research highlights the importance of considering personality traits and perceived stress when examining internet addiction among young adults. These findings have implications for intervention and prevention strategies aimed at reducing internet addiction among young adults. By identifying individuals with specific personality traits or high levels of perceived stress, targeted interventions can be developed to address their unique needs and help mitigate the risk of internet addiction.

Finally, personality traits and perceived stress are related to internet addiction among young adults. The findings suggest that those with certain personality traits and higher levels of perceived stress may be at a greater risk of developing an addiction to the internet. These findings can inform the development of targeted interventions and prevention strategies to address internet addiction in this population.

5 Limitations

However, it is important to note that this study has certain limitations. The cross-sectional design of the study only captures data at a single point in time, making it difficult to establish causal relationships between variables. Longitudinal studies could provide a more comprehensive understanding of how perceived stress and personality traits contribute to internet addiction over time. The sample might not represent the entire population of young adults accurately. If participants are recruited from a specific location, the results may not be generalizable to a broader population. Study's findings could be influenced by the cultural context of the participants. Perceived stress, personality traits and internet addiction might be perceived and experienced differently across cultures, limiting the generalizability of the results to

other cultural settings. Finally, the study focuses on young adults, so the findings may not apply to other age groups. Internet addiction and its correlates might differ in children, adolescents, and older adults.

References

1. Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., Scherlis, W.: Internet paradox: a social technology that reduces social involvement and psychological well-being? Am. Psychol. **53**(9), 1017–1031 (1998). https://doi.org/10.1037/0003-066x.53.9.1017
2. Li, D., Zhang, W., Li, X., Zhen, S., Wang, Y.: Stressful life events and problematic internet use by adolescent females and males: a mediated moderation model. Comput. Hum. Behav. **26**(5), 1199–1207 (2010). https://doi.org/10.1016/j.chb.2010.03.031
3. Paez, D., Delfino, G., Vargas-Salfate, S., Liu, J.H., Gil De Zúñiga, H., Khan, S., Garaigordobil, M.: A longitudinal study of the effects of internet use on subjective well-being. Media Psychol. 1–35. https://doi.org/10.1080/15213269.2019.1624177
4. Pappas, S.: Personality traits & personality types: What is personality? livescience.com (2017). https://www.livescience.com/41313-personality-traits.html
5. Huang, C.: Internet use and psychological well-being: a meta-analysis. Cyberpsychol. Behav. Soc. Netw. **13**(3), 241–249 (2010). https://doi.org/10.1089/cyber.2009.0217
6. Cohen, S., Kamarck, T., Mermelstein, R.: A global measure of perceived stress. J. Health Soc. Behav. **24**(4), 385 (1983). https://doi.org/10.2307/2136404
7. Dong, G., Wang, J., Yang, X., Zhou, H.: Risk personality traits of internet addiction: a longitudinal study of internet-addicted Chinese university students. Asia Pac. Psychiatry **5**(4), 316–321 (2012). https://doi.org/10.1111/j.1758-5872.2012.00185.x
8. Knack, J., Towns, B.: Sticks, stones, and stress: PTSD symptoms and pain catastrophizing mediate the association between peer victimization and poor physical health. Spotlight Mental Health Res. (2019). https://doi.org/10.35831/sor/mr/skbt2019
9. Chaudhury, S., Balaji, N., Murthy, P., Kumar, D.: Perceived stress, anxiety, and coping states in medical and engineering students during examinations. Ind. Psychiatry J. **28**(1), 86 (2019). https://doi.org/10.4103/ipj.ipj_70_18
10. Agbaria, Q., Bdier, D.: The association of Big Five personality traits and religiosity on internet addiction among Israeli-Palestinian Muslim college students in Israel. Ment. Health Relig. Cult. **22**(9), 956–971 (2020). https://doi.org/10.1080/13674676.2019.1699041
11. Holzman, P.S.: Personality|Definition, types, nature, & facts. Encyclopedia Britannica (2020). https://www.britannica.com/topic/personality
12. Tsai, C., Lin, S.S.: Analysis of attitudes toward computer networks and internet addiction of Taiwanese adolescents. Cyberpsychol. Behav. **4**(3), 373–376 (2001). https://doi.org/10.1089/109493101300210277
13. Weinstein, A., Lejoyeux, M.: Internet addiction or excessive internet use. Am. J. Drug Alcohol Abuse **36**(5), 277–283 (2010). https://doi.org/10.3109/00952990.2010.491880
14. Şenormancı, Ö., Saraçlı, Ö., Atasoy, N., Şenormancı, G., Koktürk, F., Atik, L.: Relationship of internet addiction with cognitive style, personality, and depression in university students. Compr. Psychiatry **55**(6), 1385–1390 (2014). https://doi.org/10.1016/j.comppsych.2014.04.025
15. Gu, M.: A longitudinal study of daily hassles, internet expectancy, self-control, and problematic internet use in Chinese adolescents: a moderated mediation model. Pers. Individ. Differ **152**, 109571 (2020). https://doi.org/10.1016/j.paid.2019.10571
16. Agbaria, Q., Mokh, A.A.: Coping with stress during the coronavirus outbreak: the contribution of Big Five personality traits and social support. Int. J. Ment. Heal. Addict. **20**(3), 1854–1872 (2022). https://doi.org/10.1007/s11469-021-00486-2

17. Akin, A., Iskender, M.: Internet addiction and depression, anxiety and stress. Int.l Online J. Educ. Sci. **3**(1), 138–148 (2011). https://www.ajindex.com/dosyalar/makale/acarindex-142390 4412.pdf

Peculiarities of Tourism and Recreational Activities in Ukraine: Economic and Managerial Aspects

Raisa Kozhukhivska ⓘ **, Olena Sakovska** ⓘ **, Grzegorz Konieczny** ⓘ **, Paulina Kolisnichenko** ⓘ **, Liubov Kovalenko** ⓘ **, and Diana Naherniuk** ⓘ

1 Introduction

In Ukraine, the number of people engaged in tourist activities has been growing recently, which increases the proportion of natural areas covered by tourist activities. In this regard, there is an increase in recreational pressure on the nature reserve fund (natural complexes and objects characterized by special environmental, scientific, aesthetic, recreational and other values [1]). Mentioned activities lead to the degradation of the nature reserve fund, which creates a problem in preserving natural complexes and their landscape. Among the various aspects of scientific and practical research related to the management of recreational activities, a special place is occupied by the study of ecological and geographical problems arising due to this, in particular, the determination of permissible loads on the natural environment. It is worth noting that different natural complexes and their constituent elements differ significantly in their potential resistance to recreational loads. The above-mentioned aspect creates the need for more in-depth research into the issue of recreational activities in tourism and the determination of recreational load standards (critical ratios) in order to develop tourist destinations and preserve the nature reserve fund of Ukraine.

R. Kozhukhivska (✉) · O. Sakovska · L. Kovalenko · D. Naherniuk
Department of Tourism, Hotel and Restaurant Business, Uman National University of
Horticulture, Uman, Ukraine
e-mail: ray80@ukr.net

O. Sakovska
e-mail: sakovska_lena@ukr.net

G. Konieczny
WSHIU Academy of Applied Sciences, Poznan, Poland
e-mail: rektorat@wshiu.pl

P. Kolisnichenko
International Cooperation, WSHIU Academy of Applied Sciences, Poznan, Poland
e-mail: paulina.kolisnichenko@wshiu.pl

2   Literature Review

Various aspects of recreational activities have been described in the works of domestic and foreign scholars. Thus, the authors Kozhukhivska R., Sakovska O., Maliuga L. and Maslovata S. note that «The tourism industry and the sphere of recreation are constantly developing, acquiring greater importance for the economic development of Ukraine. The development of tourist and recreational zones has a positive impact on the economic growth of regions, in particular, the activities of health and cultural institutions are improving, the percentage of small and medium-sized enterprises in regions with rich tourist potential is increasing» [2, p. 5285]. Bavrovska N. and Butenko Ye. believe that «the development of the recreational sphere at the present stage is being realised by increasing the recreational potential, creating multifunctional territories of the nature reserve fund and involving them into recreational use» [3, p. 5]. Viun V. and Ivanov A. specify that «Recreational resource potential of the territory is the cumulative productivity of its recreational resources. A certain recreational area can provide recreational services only to a certain number of recreationists who are able to meet their own recreational demands. It depends upon many factors, the main of which is the availability of recreational resources» [4, p. 84]. Brusak V. notes that «The study of the impact of recreation on the microrelief of tourist routes is relatively poorly elaborated; the list of indicators that will qualitatively and quantitatively characterise the features of microrelief changes at certain stages of recreational digression remains problematic» [5, p. 112]. Hanych N., Skabara R., and Stetskyj V. point out that «Increasing of recreational and tourist activity in natural national parks has led to an expansion of the spectrum of issues related to the planning of ecological and educational trails in methodological developments, the introduction of regulatory measures to reduce the anthropogenic impact on natural systems, the introduction of a regime of recreational use of certain territories, the establishment of paid services» [6, p. 518]. Given the analysis of studies and publications about the development of the potential of territories and the use of the recreational resource base of territories, it is worth pointing out the significant importance of the analysed works. However, in our opinion, insufficient attention has been paid to the study of the impact of recreational activities on the development of tourist destinations, both in theoretical and methodological and practical aspects, so we consider it advisable to conduct a more thorough study in this regard.

3   Purpose of the Research

Purpose of the research is to analyse the impact of recreational activities on the development of tourist destinations.

The objectives of the research are: to determine the fundamental aspects of recreational and tourism activities in the territories of nature reserves and destinations; to

provide proposals, the implementation of which will help reduce the level of negative impact of recreational and tourist activities on the objects of the nature reserve fund.

4 Methodology

The basis of the research methodology is an analysis of the works of domestic scholars in the field of tourism and generalization of foreign practices in the development of tourism and recreation; the personal judgment of the authors of this article was also used. In the course of the theoretical analysis used analytical and abstract-logical research methods. The use of analytical approaches made it possible to determine the to identify the main directions of recreational and tourist activities within recreational areas The application of the methodology of empirical analysis made it possible to assess recreational activities at one of the objects of the nature reserve fund; and to develop practical proposals, the implementation of which will help reduce the negative impact of recreational activities on the objects of the nature reserve fund located on the territory of certain tourist destinations.

5 Results

During the severe economic crisis, the issue of rational use of tourism resources has become quite acute for society. Almost all of them are used spontaneously, unplanned, unregulated, without taking into account permissible capacities. As a result, under the influence of anthropogenic impacts and natural conditions, tourist sites and areas are gradually losing their original attractiveness and valuable recreational properties. In order to preserve and restore them, a set of measures is required, which is impossible without identifying the recreational capabilities of individual resources, the pressure on the territory so as not to harm it, the maximum and minimum number of tourists that the relevant territory is able to accommodate, etc. [4, c. 82].

The definition of «tourist and recreational activity» should be understood as a complex of actions based on the integrated use of raw materials, equipment, labour, technological processes, etc. The resource base for the implementation of tourism services and recreational activities is the natural, historical and cultural sites of a particular territory/destination. One of such sites might be the territory of a national nature reserve fund. On the territory of the nature reserve fund, educational development is carried out in specific areas defined by individual regulations on natural reserves, taking into account the special protection regime, size, landscape and environmental specifics of the territories. The main types of recreational and tourist activities on the territory of the nature reserve fund may include: health improvement; recreation; excursions; amateur and sport fishing; various types of tourism: children's, youth, family, social inclusive, educational, sports, religious, ecological, rural (green), extreme, etc. Recreational activities on the territory of the nature reserve

fund (NRF) of Ukraine are regulated by the following main documents: The Law of
Ukraine «On Tourism» [7], the Law of Ukraine « About the Nature Reserve Fund
of Ukraine», the Regulation on Recreational Activities within the Territories and
Objects of the Nature Reserve Fund of Ukraine, which ensures the proper organisa-
tion of recreation and tourism within the NRF [8] and other regulatory documents.
For example, the Law of Ukraine «On Tourism» defines the principles of organising
tourism as a socio-economic activity and helps to interact with tourists and the tourism
business accordingly [7, 9]; the Law of Ukraine «About the Nature Reserve Fund
of Ukraine» defines the possibilities and restrictions on the organisation of recre-
ation and tourism depending on the categories of protected areas and objects [3].
For example, tourism is prohibited in nature reserves and protected areas of national
nature reserves, biosphere reserves and regional landscape parks [9]. The Law of
Ukraine «About the Nature Reserve Fund of Ukraine» defines that «The Nature
Reserve Fund consists of land and water areas, natural complexes and objects of
which have special environmental, scientific, aesthetic, recreational and other value
and are allocated for the purpose of preserving the natural diversity of landscapes,
the gene pool of flora and fauna, maintaining the overall ecological balance and
ensuring background monitoring of the environment» [10]. According to the Law of
Ukraine «About the Nature Reserve Fund of Ukraine», the territories and objects of
the nature reserve fund (NRF) are divided into natural territories and objects, namely:
nature reserves, biosphere reserves, national nature parks, regional landscape parks,
reserves, natural monuments, protected tracts; artificially created objects—botanical
gardens, dendrological parks, zoological parks, parks-monuments of landscape art
[10, 11].

The main directions of recreational and tourist activities within the boundaries
of recreational areas and objects of NRFs (Nature Reserve Funds) are: creation of
conditions for carrying out these activities in compliance with the regime of the
NRF territories and objects; organisation and arrangement of information and tourist
centres, eco-educational trails, tourist routes, observation platforms, recreational
areas, campsites, and recreation camps; dissemination of advertising and informa-
tional information (publication in the media and on web pages of information about
recreational resources and services, as well as about subjects of recreational activities
within the NRF and/or near them); study, generalisation and implementation of the
best national and foreign experience and practices in the organisation of recreational
and tourist activities; formation of a culture of health improvement, recreation and
outdoor tourism among recreationists and local residents, as well as a careful and
humane attitude to natural and cultural heritage [9].

Among the main conditions for the development of recreation and tourism in the
nature reserve fund (NRF) is minimisation of the negative impact of tourists on natural
complexes and historical and cultural sites. Recreational and tourist use of NRF
territories and objects is possible under the condition of developing an appropriate
system of management and economic measures, taking into account the regime of
protection and use of resources located in these territories and objects established
for these territories and objects [9]. Usually, during the development of management
decisions and tourism development projects, the main factor is demand, which is the

basis for plans to increase the recreational capacity of the territory and regulatory acts. However, in the territories of the nature reserve fund, the leading role is given to environmental protection tasks. Therefore, the main condition for ensuring a balance between social and environmental interests is the regulation of the recreational load.

The recreational load should be understood as a certain number of tourists visiting a unit area of a natural complex in a certain period of time. The unit of measurement for recreational pressure is person-hours/hectare or person-day/hectare. The latter is somewhat more convenient for practical use and means that during the entire comfortable period, one person or a certain number of people rests on a 1-hectare plot for 8 h daily (accepted daylight hours) [5, p. 109]. Natural complexes and their constituent elements differ significantly in their potential resistance to recreational pressure. The resilience of a natural complex to recreational loads is its ability to withstand these loads up to a certain limit. A distinction is being made between critical (causing irreversible changes in the natural complex) and maximum permissible load (determined by the number of recreationists that does not lead to irreversible changes in the natural complex) [12, p. 56]. Thus, the edge of the recreational load of the natural complex, namely the edge after which irreversible changes occur, takes place at the stage of maximum permissible norms. At the pre-critical level, the maximum permissible load is that which does not cause irreversible changes in the natural complex. Recreational load is an indicator that reflects the overall impact of recreational activities on natural complexes. The following features should be noted with regard to the existing experience of recreational load regulation:

1. The number of vacationers (recreationalists) is considered as a source of impact that needs to be regulated. At the same time, such factors of recreational impact as recreationists' vehicles and the construction of various infrastructure facilities are not taken into account. In fact, it is not the recreational load that is being rationed, but the flow of recreationists, tourists and excursionists.
2. The following indicators are taken as a unit of measurement of recreational load: (a) the number of people who can simultaneously remain on a unit area of the territory throughout the year; (b) the number of people who can simultaneously remain on a unit area of the territory during a certain period of its exploitation; (c) the number of recreationists staying per day at recreational facilities during the season; (d) the number of tourists passing through a unit area per unit time; (e) a one-time number of vacationers per unit area, considering the total time of the type of recreation for the accounting period.
3. Recreational load standards are set differently for: (1) different types of one of the landscape components; (2) different types of landscape complexes; (3) certain types of recreational activities; (4) different functional and landscape systems; (5) different combined options.
4. For the same object, recreational load standards may differ depending on the criterion for their determination—functional, psychological or ecological. The practical application of load standards in such cases is complicated. In accordance with the first principle, the permissible recreational load is determined separately for each tourist route, based on particular natural and organisational conditions.

According to the second principle, the load is determined at the beginning and the end of the season of functioning of tourist routes. In accordance with the third principle, the load is determined by the size of each group, which is optimal in terms of psychological comfort, but not more than ten tourists and two accompanying persons.

According to the fourth principle, new tourist routes should be launched with a small load—one tourist group for two weeks. After a year of exploitation of the natural complex in such a regime, a decision can be made regarding the preservation of the recreational load or its adjustment. Currently, the most commonly used methodology for determining the impact of recreational activities on the development of tourist destinations is the methodology for determining the maximum recreational load on natural complexes ($\sum$rc) during the organisation of tourism, excursions, and mass daily recreation activities, where the main indicators are: the permissible recreational load on the plot (persons/ha), the area of the recreational plot (ha), and the recreational potential coefficient.

$$\sum rc = Rc * Sa * Erp, \tag{1}$$

where, Rc—permissible recreational load on the plot, *persons/ha;* S_a—square of the recreational area, *ha*; E_{rp}—coefficient of recreational potential.

To conduct a study to determine the impact of recreational activities on the development of tourist destinations, we selected the Nizhniosulsky National Nature Park. The park was established in 2010 and is an object of the Nature Reserve Fund of Ukraine of national importance. The park is located on the territory of Hlobyn, Orzhytsia and Semenivka districts of Poltava region, Chornobaiv district of Cherkasy region [13]. Recreational activities in the park comply with the Regulation on Recreational Activities within the Territories and Objects of the Nature Reserve Fund of Ukraine, approved by the Order of the Ministry of Environmental Protection of 22.06.2009 No. 330, registered with the Ministry of Justice of Ukraine on 22.07.2009 under No. 679/16695 with amendments and additions [8, 13].

The main areas of recreational activity on the territory of the Nizhniosulsky National Nature Park are: creating conditions for organised and effective tourism, recreation and other types of recreational activities in natural conditions in compliance with the regime of protection of natural complexes and objects; ensuring the demand of recreationists for general health-improving, cultural and educational recreation, tourism, recreational and sport fishing, in accordance with the regime of the park territory, etc.; rationale and establishment of the permissible level of anthropogenic load, including that caused by recreational activities, on the territory, natural complexes and objects of the park; organisation of advertising, publishing and information activities, environmental enlightenment among vacationers and tourists within the park; promoting the formation of an ecological culture among recreationalists and local residents, a careful and humane attitude to the national natural heritage [13]. Recreational activities are implemented by the management of the park, including: creation and functioning of recreational infrastructure; organisation

and infrastructure arrangement of tourist and excursion routes, ecological and educational paths; coordination of the park's activities of recreational entities regardless of ownership and subordination in terms of the use of natural, historical and cultural resources within the park's territories and facilities; creation and maintenance of an information bank of data on recreational facilities located within the park; participation in national and international scientific and practical conferences, congresses, seminars devoted to the development of recreation; study, generalisation and implementation of domestic and foreign experience in the organisation of recreational activities.

In accordance with the environmental legislation, the following zones are distinguished on the territory of the Nizhnysulsky National Nature Park a protected zone; a zone of regulated recreation (within its boundaries, short-term recreation and health improvement, inspection of especially picturesque and memorable places, visiting the ecological trail «Journey to Lake Sudevske» and the tourist trail «Along the Sula» are being carried out); a zone of stationary recreation (intended for accommodation of hotels, motels, campsites, and other visitor service facilities); and an economic zone [13]. Let's estimate the permissible recreational load for the Nizhnysulsky National Nature Park. It should be noted that the determination of the permissible recreational load is based on a visual assessment of the paths' digression. Based on a visual assessment of path digression, the optimal load is determined to avoid irreversible changes in the ecosystem.

To assess the impact of recreational activities on the Reserve's natural complexes, the most popular tourist ecological path, the Journey to Lake Sudevske, is monitored annually. As a rule, the ecological path is assessed twice a year—at the beginning and at the end of the season. However, it is worth noting that in 2023, due to the martial law in Ukraine and insufficient funding for the park's economic needs (in particular, three times less funds were allocated for environmental monitoring studies), the condition of a part of the route was not assessed at the beginning of the season. The level of path digression is determined by visual assessment and assignment of a digression stage (from 0 to V). Using the GPS navigator Garmin GPS MAP 65 and the Garmin Explore™[1] app, the length of path sections with varying degrees of degression is measured. The data is processed within Google Earth, where the percentage of path digression stages is calculated.

An analysis of the level of path digression conducted in early 2022 showed that by the beginning of the season the path had partially recovered from the previous tourist season, but the level of digression had increased significantly compared to the beginning of the 2021 season. For example, the share of plots with level II digression increased from 28 to 59% compared to 2021, and level 3 was assigned to 31% of the path (in 2021, it was 19%). In 2022, the share of areas with the lowest digression (Stage I) decreased from 28 to 2%. There are now plots with Stage IV, which were not present at the beginning of the 2021 season, and their share is 1.5%. The deterioration of the path was probably caused not only by an increase in anthropogenic pressure, but also by a large amount of precipitation at the beginning of the 2022 season, which led to waterlogging of the area, and, as a result, reduced the stability of the path and its ability to recover. According to the statistical and analytical documentation of

the Nizhniosulsky National Nature Park, the permissible recreational load of the territory is 30 persons per day. However, this value was estimated in 2015, when the actual load was 900 people per season, so the anthropogenic impact on the territory was lower. The permissible recreational load in 2022 was 2280 people—30 persons per day * 76 days (the length of the season in 2022). The actual load was 3865 people, which exceeds the permissible load by 1.7 times. Despite the fact that in 2020–2021, the actual daily recreational load did not exceed the permissible daily limit, the condition of the ecological path «Journey to Lake Sudevske» continues to deteriorate. This is due to the temporal heterogeneity of the load distribution. For example, the most massive visits of the routes are observed on average during 2 months—July and August, which account for 80–90% of the total recreational flow. During the peak tourist season, the actual load may exceed 60 persons/day, which causes more damage than if it were more equally distributed throughout the season with the same number of visitors. Under such conditions, it is advisable to calculate the recreational capacity of the park territory based on the determination of the average between the permissible recreational load and the ecological impact coefficient in accordance with the formula:

$$\sum \text{rtc} = \frac{\text{Rc}}{\text{Eek}},\tag{2}$$

where, Rc—permissible recreational load on the plot; E_{ek}—Ecological impact coefficient.

The coefficient of ecological impact is determined on the basis of the type of recreational environmental use: 0.01—for road recreation, 1—for off-road recreation, 2—for extractive industry recreation, 5—for biovuac recreation, 7—for transport and off-road recreation, 13—for infrastructural recreation [12, p. 57, 14]. Therefore, for the Nizhnysulsky National Nature Park, the coefficient is taken as 1, and the recreational capacity is equal to the value of the permissible recreational load—2280 people. However, the presence of certain sectors of the ecological path «Journey to Lake Sudevske» with a maximum permissible degree of damage that are not being restored by the beginning of the next season indicates the need to reduce the permissible recreational load. Considering the fact that at the beginning of the 2024 season, the part of the path with the maximum permissible degree of digression will be only 1.2%, we have made an assumption that the maximum permissible load should be reduced by 10%.

Taking into account that the actual load on the recreational territory of the Nizhniosulsky National Nature Park significantly exceeds the maximum permissible, we propose to implement the following measures: restrict access to the territory during the autumn and winter periods; allocate evenly throughout the season the daily recreational load on the territory; build wooden flooring in waterlogged areas of the paths; in order to reduce the anthropogenic impact, it is advisable to reduce the maximum number of tourists in a group; perform monitoring of the condition of the paths during the season, and if necessary, restrict visitation to the park.

6   Conclusions

At present, there is a significant impact of recreational activities on the development of tourist destinations, in particular on the territory of which there are objects of the Nature Reserve Fund, particularly wildlife sanctuaries and parks. Since national parks are an important component of the natural resource potential of the territory, they not only ensure the fulfilment of environmental protection functions, but also perform a major role in the development of recreational activities and tourism in Ukraine. Recreational activities in the nature reserve fund have a specific structure based on a balance of ecological and economical interests. At the same time, properly organised recreational and tourism activities can become an important component of environmental protection and socio-economic development of a destination and will contribute to the growth of ecological awareness of citizens through their involvement in natural and cultural values. Therefore, in order to develop tourist destinations and preserve the nature reserve fund of Ukraine, it is important to conduct continuous monitoring of the objects of the nature reserve fund, including determining the norms of recreational load on the territory, analysis of the anthropogenic load, assessment of the infrastructure development and the development of an effective territory management strategy.

Based on the conducted study, in order to reduce the level of negative impact of recreational activities on the natural environment of tourist destinations, we propose the following measures: development of a set of excursion programmes for different categories of visitors, including the organisation of demonstrations of wild animals in the natural environment; arrangement (including informational) of excursion environmental paths and tourist routes, lookout platforms, places for observation of wild animals; creation of new and modernisation of existing museums and informational centres for visitors; assessment of maximum permissible loads and identification of ways to minimise the negative impact on natural ecosystems; creating an infrastructure to ensure customer service for visitors; development and implementation of a voluntary certification system of excursion ecological paths and tourist routes in the territories of of the nature reserve fund; development of rules that regulate the behaviour of visitors in the territories of the nature reserve fund in order to ensure the safety of people and prevent damage to natural complexes and objects.

In our opinion, the main steps to reduce the negative impact of recreational activities on the objects of the nature reserve fund located on the territory of certain tourist destinations should be innovative ways and special events, in particular: conservation of biological and landscape diversity; implementation of eco- and ecological and environmental education among the population; organisation and implementation of ecotourism as a new type of tourist activity that does not harm the environment and promotes its authenticity; implementation of ecological monitoring of territories; renovation of disturbed natural objects.

Considering the results of the article, it is worth mentioning that *future research* should be aimed at identifying the main directions of development of recreational activities in Ukraine and implementing of a systematic approach to the development of tourist destinations.

References

1. The Nature Reserve Fund of Ukraine. Wikipedia: a free encyclopedia. Retrieved from https://uk.wikipedia.org/wiki/Природно-заповідний_фонд_України. Accessed 15 Aug 2023
2. Kozhukhivska, R., Sakovska, O., Maliuga, L., Maslovata, S.: The formation of a system of investment prospects of Ukrainian tourism and recreation sector enterprises on terms of benchmarking. In: Proceedings of the 33rd IBIMA Conference «Education Excellence and Innovation Management through Vision 2020», pp. 5282–5290, Apr 10–11 2019. Granada (2019)
3. Bavrovska, N.M., Butenko, Ye.V.: Use of recreational areas in the context of effective land management. MVTs «Medinform», Kyiv (2015)
4. Viun, V.H., Ivanov, A.M.: Methodology for determining the recreational loads on protected areas. Econ. Manag. **5**, 82–85 (2010)
5. Brusak, V.P.: Methodological aspects of the study of recreational digression of microrelief of tourist routes. Problems of geomorphology and paleogeography of the Ukrainian Carpathians and adjacent territories **1**(8), 108–120 (2018)
6. Hanych, N.M., Skabara, R.M., Stetskyj, V.V.: The current state and ways to intensify the tourist activity of the Buzky Gard National Nature Park. In: Proceedings from: VII International Scientific and Practical Conference «Priority Directions Of Science And Technology Development», pp. 517–523, Mar 21–23 2021. SPC «Sci-conf.com.ua», Kyiv (2021)
7. About tourism: Law of Ukraine № 325/95-ВР.: Retrieved from https://zakon.rada.gov.ua/laws/show/324/95-%D0%B2%D1%80#Text (1995). Accessed 15 Aug 2023
8. Regulations on Recreational Activities within the Territories and Objects of the Nature Reserve Fund of Ukraine: *Decree* of the Ministry of Environmental Protection and Natural Resources of Ukraine № 256. Retrieved from https://zakon.rada.gov.ua/laws/show/z1043-22#Text (2022). Accessed 15 Aug 2023
9. Recreation and tourism. Ministry of Environmental Protection and Natural Resources of Ukraine. Retrieved from https://wownature.in.ua/pro-nas/nasha-diialnist/rekreatsiia/. Accessed 15 Aug 2023
10. About the Nature Reserve Fund of Ukraine: Law of Ukraine No 2457-XII.: Retrieved from https://zakon.rada.gov.ua/laws/show/2456-12#Text (1992). Accessed 15 Aug 2023 [in Ukrainian]
11. Creation of territories and objects of the nature reserve fund as a way to preserve the national wealth of Ukraine. Ecobusiness. Retrieved from https://ecolog-ua.com/news/stvorennya-teritoriy-ta-obiektiv-prirodno-zapovidnogo-fondu-yak-shlyah-do-zberezhennya (2023). Accessed 15 Aug 2023
12. Polchaninova, I.L., Pokolodna, M.M.: Recreational complexes of the world. KhNUMH im. O.M. Beketova, Kharkiv (2021)
13. Nyzhniosulskyi National Nature Park. Ministry of Ecology and Natural Resources of Ukraine. Retrieved from https://nppns.at.ua/index/informacija_pro_park/0-19. Accessed 15 Aug 2023
14. Li, T., Liao, C., Law, R., Zhang, M.: An integrated model of destination attractiveness and tourists' environmentally responsible behavior: the mediating effect of place attachment. Behav. Sci. **13**, 264. Retrieved from https://www.mdpi.com/2076-328X/13/3/264 (2023). Accessed 15 Aug 2023

Meaning-Making Through the Lens of Cognitive Semantics: A Case Study of John Donne's 'Holy Sonnets: Death, Be not Proud'

Mohammed Al-Badawi, Wafa Abu Hatab, and Haneen AL-Amleh

1 Introduction

Studies in linguistics have long been focused on studying language and how it contributes to creating meaning. The study of construal operations has become a prominent subject of research in this field. Construal operations are people's cognitive procedures to choose and understand verbal statements in context [1]. We learn important things about the complex interplay of language, cognition, and communication by comprehending how these activities affect meaning-making.

Construal operations, a key idea in cognitive semantics, are extremely important in determining how language is interpreted and understood. These activities involve the cognitive mechanisms by which people choose and interpret verbal statements, eventually adding to the process of meaning construction [1]. Investigating construal operations within the framework of literary works enables us to dive into the complex interplay between language, cognition, and aesthetics.

In linguistics and related sciences, the study of meaning-making is extremely important. Language is a potent instrument for shaping our perceptions, cognition, and interactions with the world. We get vital insights into how language users consume and evaluate linguistic claims by investigating the fundamental mechanisms of meaning generation, notably in literary works. Exploring the meaning-building in poetry, such as John Donne's "Holy Sonnets: Death, be not Proud," helps us grasp the metaphorical language and artistic expression. Poetry uses unusual wording and metaphorical tactics to convey abstract ideas and elicit emotions. We gain a better understanding of the delicate interplay between language, cognition, and creative expression by understanding the methods through which meaning is formed in these poetic compositions.

M. Al-Badawi · W. A. Hatab · H. AL-Amleh (✉)
Zarqa University, Zarqa, Jordan
e-mail: hnamleh96@gmail.com

In addition, looking into how meaning is constructed in literature goes beyond linguistics. It benefits disciplines like literary analysis, cognitive poetics, and cultural studies. Literature offers a distinctive environment for examining the complex process of meaning-making since it is a collection of human experiences and cultural representations. Our awareness of the cultural values, ideologies, and social processes ingrained in the language is deepened by analyzing how meaning is formed in literary writings.

This study was prompted by the realization that language significantly influences social interaction and human cognition. Language is a complex system that modifies our perceptions, beliefs, and worldviews, not just a means of communication. Understanding how meaning is created and understood may shed light on how people understand their environment and offer important insights into the cognitive processes that underlie language comprehension.

We have significantly improved our knowledge of the complex interplay between language, cognition, and meaning production as a result of the contributions of Mark Johnson, George Lakoff, and Ronald Langacker. Langacker emphasizes the significance of construal operations in their claim that language is not neutral but rather affects how we perceive the world. Specificity, focusing, emphasis, and perspective are some of the verbal expressions that are constructed and interpreted during these processes. Language users can utilize these activities to enhance characteristics, accentuate elements, change prominence, and adopt various points of view in communication [1].

This study examines the significance of meaning-making using the lens of cognitive semantics, concentrating on construal operations in John Donne's "Holy Sonnets: Death, be not Proud". This poem serves as an outstanding example of how difficult concepts and feelings may be expressed through writing. To better understand the cognitive and semantic processes that support meaning-making in language, we will examine the construal procedures used in the interpretation of this poetry.

2 Literature Review

As a cutting-edge and well-liked method of language study, cognitive linguistic and semantic studies have acquired considerable popularity. Since its start in the 1980s, this multidisciplinary subject has flourished, with numerous research projects being done across several disciplines. It is regarded as a cutting-edge subject of study, and it has an impact on several other scientific fields. Its capacity to draw from a variety of disciplines makes it a very dynamic field and contributes to its wide appeal. Overall, cognitive linguistic and semantic research has fundamentally changed how we think about language and how it interacts with the brain.

3 Previous Studies

The study by Albayati [2] looked at the cognitive and semantic traits of a few poems from the romantic and neoclassical eras. The study examined how poets' linguistic choices reflected their conceptual and cognitive frameworks in expressing their thoughts and emotions. Using a cognitive semantics framework, the researcher investigated the poets' utilization of metaphor, metonymy, and other figurative language devices to convey meaning. The study also considered the literary, cultural, and historical contexts that influenced the poets' language usage and shaped their cognitive and conceptual frameworks. The findings revealed that the poets' cognitive and conceptual frameworks, shaped by their cultural, historical, and literary circumstances, significantly influenced their use of figurative language.

To better understand the connection between construal activities and language creation, [3] undertook research. They found that participants used more concrete language when the situation was judged to be closer and more abstract language when it was perceived to be further away. The study used two experiments: the first used a task that asked participants to characterize an event in two ways based on its distance, while the second used a similar task but with a different set of stimuli. Participants were more inclined to use concrete language when the event was seen to be closer and abstract language when it was perceived to be further away, according to the findings. The authors claim that these findings support the idea that language influences how a situation is perceived and that this relationship is reciprocal. Language can have an impact on how a situation is seen, but perception can also have an impact on how language is produced.

Barsalou et al. [4] study sought to comprehend how the interpretation of a concept affects how it is represented in the brain. The subjects were given ideas to consider, and the scientists used functional magnetic resonance imaging (fMRI) to monitor brain activity as the subjects created sentences related to the ideas. The study found that when people understood a thought in terms of its sensory-motor components, there was increased brain activity in the sensory-motor regions. This suggests that the interpretation of an idea affects how it is represented in the brain. The study also showed that participants produced statements more quickly and accurately when the concept was comprehended in terms of its sensory-motor components as opposed to when it was understood in abstract terms.

In their work, [5] intended to explore how construal processes affect how emotions are experienced and expressed. They discovered that how an emotion is perceived can affect the body sensations that go along with it, which in turn affects how it is expressed. Emotions are embodied experiences that include not only mental states but also physical sensations and movements. The way an emotion is experienced affects how it physically feels, which in turn influences how it manifests. For instance, when anger is experienced as a tightness in the stomach rather than a burning feeling in the chest, the resulting outburst of wrath is more internal and restrained. This study emphasizes the importance of construal operations in influencing how emotions are experienced and expressed in social interactions.

Niedenthal et al. [6] studied how gestures are perceived in social interactions, revealing that cultural and contextual factors influence their interpretation. Different cultures may interpret the same gesture as friendly or hostile. This highlights the impact of construal operations on understanding non-verbal cues in social encounters. In contrast, [7] explored how music listeners interpret their emotional responses to music. They found that the qualities of the music influenced listeners' construal of emotional experiences. Quick, peppy music was often perceived as thrilling or happy, while slow, melancholy music was associated with sadness. These findings indicate that our perception and interpretation of musically evoked emotions heavily rely on construal activities.

These investigations suggest that construal activities are essential for processing cognitive information, creating language, and experiencing emotional states. They also emphasize the need of considering how different interpretations of the same circumstance might provide divergent conclusions.

4   Data and Methodology

This study used a mixed-methods approach that used qualitative and quantitative techniques to look at the construal procedures used in John Donne's poem "Death, be not Proud." The study's main approach for gathering data was a questionnaire-based survey. The 25 individuals that were included in this study's sample group were all linguistics master's students.

The information was gathered using an established questionnaire with nine questions about the construal techniques used in the poem. Each of the three sections of the questionnaire, which each included three inquiries regarding a single construal procedure, contained three questions. Aiming to evaluate specificity, prominence, and focusing were the first and second sections respectively. The objectives of the questions were to determine how well the participant understood the particular construal procedures being taken into account.

A qualitative analysis method was used to examine the data gathered from the questionnaire. The study was carried out using a deductive methodology, and the replies were assessed against the accepted definitions of the three construal operations—specificity, prominence, and focussing. According to the type of construal activity under investigation, the replies were divided into categories, and within each category, trends and themes were found.

To make the results of the study easy to understand, tables and graphs were used to convey the findings. Tables and graphs were used to convey the findings to give a complete picture of the data, and samples from the poem were used to further illustrate the study. The analysis's results were evaluated and analyzed about earlier research on construal theory and cognitive semantics, shedding light on the numerous ways in which the poem used construal processes to construct meaning.

5   Results and Discussions

Construal Operations in Donne's 'Holy Sonnet: Death, Be not Proud'

The themes of eternity vs. mortality, courage, and the powerlessness of death are all present in Donne's "Holy Sonnet: Death, not be Proud." The poet personifies death as being unjust and savage to support his claims. The poem is examined in relation to the four mechanisms of [1] construal processes in the next subsections.

5.1   Specificity

According to cognitive linguistics, this construal operation is a conceptual procedure that enables language users to signal a specific item or event as opposed to a general one. To do this, it is necessary to draw attention to a feature of the reference point that sets it apart from other things or occurrences or makes it unusual. Additionally, it requires analyzing how the reference point relates to the current discussion and any potential ramifications for additional discussion.

According to the participants' comments, the poem does not completely specify this operation. In other words, they demonstrated strong agreement in lines 1–6, where "death" specifically specified "passing away" with a percentage of 64% and "sleep" specifically specified "slumber" with a percentage of 56%.

(1)	1	*Death*, be not proud, though some have called thee
	2	Mighty and dreadful, for thou art not so
	3	For those whom thou think'st thou dost overthrow
	4	Die not, poor Death, nor yet canst thou kill me
	5	From rest and *sleep*, which but thy pictures be
	6	Much pleasure; then from thee much more must flow

The poet tackles death directly, depicting it as a haughty force that needs to be subdued. The phrase "death" refers to the ending or annihilation of one's life. Instead of "doom" or "demise," the possibilities are limited to the idea of "passing away." The phrase "passing away" is more polite and neutral when discussing someone's demise. There are no words like "doom" or "demise" since they imply catastrophe or have ties with law and other professions.

The poet uses "sleep" as a metaphor for the brevity of existence. Closed eyelids and a suspended awareness of one's surroundings characterize sleep, which normally lasts many hours at night. Similarly, the term "slumber" connotes a relaxed and unaware mental state. However, phrases like "nap" and "snooze" have nothing to do with sleep, as the former refers to a brief time of sleep and the latter to an alarm clock.

On the other hand, in lines 8–11, "desperate men" is incorrectly specified as "hopeless men" with a percentage of 56%, knowing that the most specified item "soldiers" had a percentage of 36%.

(2)	Rest of their bones, and soul's delivery
	Thou art slave to fate, chance, kings, and *desperate men*
	And dost with poison, war, and sickness dwell
	And poppy or charms can make us sleep as well

The author adopts a more aggressive attitude and emphasizes his initial taunts of death. In other words, he refers to "chance, the king, and desperate men" as the masters of death. It's never-ending to compare ideas like "soldiers," "hopeless men," and "cynical men." This is so because each of them fits the description of being "desperate."

5.2   Focusing

This construal procedure enables language users to highlight (i.e., foreground) some elements of a reference point while underplaying (i.e., back grounding) others. This can be done by making a choice based on a variety of criteria, including salience, significance, relevance to the discourse context, or the communicative goals of the speaker. It also entails minimizing or putting other elements in the background since they are less significant, conspicuous, or pertinent in the discourse environment.

The replies showed credit for the businesses that were highlighted, but not for those who were subdued. Thus, instead of "pleasure" and "soul's delivery," "proud" is the foregrounded personification of "death" in lines 1–4, earning 56%, which is the proper choice.

(3)	*Death*, be not proud, though some have called thee
	Mighty and dreadful, for thou art not so
	For those whom thou think'st thou dost overthrow
	Die not, poor Death, nor yet canst thou kill me

Prior to that, it was said that the poet personified death as being both "proud" and "poor." The idea of pride, which is often emphasized throughout the poem, is highlighted by this. The idea that dying is a "pleasure" or perhaps has something to do with "souls' delivery" is also disproved by this.

In lines 13–14, the metaphorization of "death" being "temporary" scoring 56% is also chosen correctly, ignoring it being "eternal" and "restful".

| (4) | One short sleep past, we wake eternally |
| | And death shall be no more; *Death*, thou shalt die |

The poet's unwavering concentration on tormenting death is explained in the final sentences. Death, according to the poet, is just a short snooze after which people awaken to an eternal existence, indicating the end of death. The poem's final couplet emphasizes the transient aspect of death, contrasting it with ideas of immortality and peace. The inaccurate selection of the major subject as "waking eternally" rather than "rest and sleep" suggests a misconception, as the poem's conclusion is contained in the final couplet. The foregrounding of everlasting awakening is justified by its mention in the final couplet and its consistent presence throughout the poem, while rest and sleep are in the background.

5.3 Prominence

This technique helps language users give various levels of salience or emphasis to various features of a reference point. This entails identifying the dominant reference point and incorporating that reference point into a wider discourse framework.

It is shown in the responses that the participants agreed that concepts like "relief" and "battle" are prominently implemented in the poem. 44% prominently deduced "relief" from "pleasure" (5–6) and "battle" from "war" (9–10).

| (5) | From rest and sleep, which but thy pictures be |
| | Much *pleasure*; then from thee much more must flow |

| (6) | Thou art slave to fate, chance, kings, and desperate men |
| | And dost with poison, *war*, and sickness dwell |

One of the main concepts in this model is prominence, which is the process of emphasizing particular parts of a verbal statement based on how important or salient they are to the way language users conceptualize the situation being conveyed. In these words, the poet describes how one should feel about death, comparing it to "pleasure" in the same way as a good night's sleep does. This comparison's conclusion is related to "relief," not "happiness" or "leisure," which are not thought to be related to it. In terms of the poem's topic, "war" and "battle" do strongly match, ruling out other potential major themes like "calmness" or "profit."

However, 56% wrongly deduced "addictions" from "poppy" in line (11).

(7)	And *poppy* or charms can make us sleep as well

The poet used the word "poppy" in a metaphorical sense after continuing to mock death. The word "poppy," when used literally, refers to a plant with sedative qualities that have long been used to promote sleep. Despite the fact that it is addictive, the suggestion was made to add that "poppy" is supposed to make us sleep rather than becoming hooked or inactive.

5.4 Perspective

Language users can encode distinct views or perspectives in their language usage via the perspective construal process. These opinions are influenced by the users' geographical or socioeconomic positions as well as the social, cultural, and historical setting in which the conversation is taking place. Realizing how a position connects to the current discussion and its consequences for additional discussion is necessary for this.

Perspective may take many different shapes depending on the information being highlighted and the communicative goals of the language users. By giving a more impersonal or detached account of events or facts, one might take an objective perspective. Otherwise, people could adopt a subjective viewpoint by focusing on their feelings, ideas, or experiences. A language user can also stress different features of a situation or event, such as its chronological or physical location, its origins or effects, or its significance to society or culture, by using perspective.

The overwhelming majority of replies to the survey question on construal operation were heavily influenced by the students' comprehension and interpretation of some of the ideas addressed. Despite the alternatives being listed in the sequence A to D according to the intended understanding, option b was present in the majority of replies. Following option A, which was the most accurate response, came option C, which was closer to the right response. Only two students responded to Option D, which was an open-ended question. Option b garnered the most answers, followed by Option A and Option C, which received the fewest.

6 Results

The findings of the study revealed that the participants displayed a moderate to high level of agreement with the statements about the construal operations employed in the poem. Moreover, the analysis did not reveal any statistically significant gender differences in how the participants interpreted the construal operations, indicating that gender did not play a significant role in the interpretation of the poem. These

results shed light on how individuals construe and comprehend language, which has implications for discourse and communication. The study's findings contribute to a broader understanding of how individuals interpret and make sense of language, particularly in the context of literature.

7   Conclusion

Cognitive semantics' examination of meaning construction throws insight into the complicated cognitive procedures involved in language interpretation. Researchers utilize John Donne's "Holy Sonnets: Death, be not Proud" as a case study to illustrate how construal processes like metaphor, metonymy, and image schemas are used to create meaning. As a result of our research, it appears that comprehending these cognitive processes is essential for getting a better knowledge of literary works.

The results of this investigation have significant implications for the disciplines of linguistics, teaching, music, art, and literature. Teachers of literature and language, for instance, might utilize the knowledge from this study to create better instructional techniques that aid students in understanding literary works. The study's findings can also be used by literary critics and academics to give fresh perspectives on literary works, particularly those that have been misinterpreted or undervalued in the past. The results of this investigation also apply outside of the area of literature. Constructive procedures are frequently used in language usage across a range of situations and are not just used in literary literature. Therefore, it is possible that the study's findings may advance knowledge of language usage and meaning-making in general.

In light of how creative and metaphorical literary works may be, the study of construal processes is particularly pertinent to the study of literature. As we have seen, literary works' use of construal processes like metaphor and metonymy is essential to the development of their meaning. They enable writers to present intricate concepts and nuanced feelings in an engaging and lasting manner.

Furthermore, the knowledge gained from studying construal techniques may help us appreciate and comprehend the vast and intricate character of literary works. Constructional processes allow writers to create layers of meaning that can be studied and interpreted in a variety of ways. As a result, researching construal techniques is essential for better understanding literary works and acknowledging the creative brilliance of their authors. Construal operations analysis provides substantial insight into the cognitive processes used in literary works to construct meaning. As a result, it has far-reaching implications for a wide range of fields, including literature, art, music, education, and linguistics. Understanding these cognitive processes may lead to a more comprehensive and nuanced understanding of language usage and meaning-making in general, as well as literary writings in particular.

References

1. Langacker, R.W.: Cognitive semantics. In: The Oxford Handbook of Cognitive Linguistics, pp. 64–101. Oxford University Press (2008)
2. Albayati, M.A.: Cognitive and semantic traits of romantic and neoclassical poetry. Int. J. Humanit. Soc. Sci. **2**(7), 43–51 (2012)
3. Wolff, P., Holmes, K.J.: Linguistic relativity. Wiley Interdisc. Rev. Cognitive Sci. **2**(3), 253–265 (2011). https://doi.org/10.1002/wcs.111
4. Barsalou, L.W., Simmons, W.K., Barbey, A.K., Wilson, C.D.: Grounding conceptual knowledge in modality-specific systems. Trends Cogn. Sci. **7**(2), 84–91 (2003). https://doi.org/10.1016/S1364-6613(02)00029-3
5. Gallese, V., Lakoff, G.: The brain's concepts: The role of the sensory-motor system in conceptual knowledge. Cogn. Neuropsychol. **22**(3–4), 455–479 (2005). https://doi.org/10.1080/02643290442000310
6. Niedenthal, P.M., Barsalou, L.W., Winkielman, P., Krauth-Gruber, S., Ric, F.: Embodiment in attitudes, social perception, and emotion. Pers. Soc. Psychol. Rev. **9**(3), 184–211 (2005). https://doi.org/10.1207/s15327957pspr0903_1
7. Schubert, E., Himberg, T., Timmers, R.: Playing with emotions: chord changes and mood. Music. Sci. **17**(1), 133–149 (2013). https://doi.org/10.1177/1029864912463809
8. Langacker, R.W.: Essentials of cognitive grammar. Oxford University Press (2013)

Development and Validation of Play Behavior Scale

Karishma Begum, M. Priya, and N. C. Kiran Babu

1 Introduction

Play is a vital means of expression for children, which gives them enjoyment and a chance to learn through experiences. Play is a natural, engaging activity that promotes cognitive, physical, social, and emotional wellbeing and offers the required conditions for children to thrive and learn [1]. With the help of play, a child improves his social skills, relationships with others, self-awareness, cooperation, and negotiation abilities [2, 3]. Play is considered behaviour that varies, repeats, and recombines already functional subsequences of behaviour, including both tactics and strategies, outside of its primary context in order to develop, practice, or maintain physical or cognitive abilities and social relationships. In addition, play is the basis for developmentally appropriate practice for children, which ensures the foundation for their learning [4, 5]. In fact, play has a high degree of positive influence on the physical, socio-emotional, and cognitive development of preschool children [6]. Children's play conduct includes both social and non-social play behaviours. Social play takes place between children in pairs, in groups, and when a child is inspired to play with others. Young children tend to exhibit appropriate play behaviours and gestures with their peers when they have a suitable natural environment and a favourable play partner to play with [7]. The majority of children that engage in cooperative play, however, are popular among the children who enjoy taking the lead and directing the activities [8]. Children enjoying social play increase their cognitive functions, and accordingly, it improves their learning [9]. In contrast, young children who are shy

K. Begum (✉) · M. Priya

Department of Human Development, School of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India
e-mail: 19phhdf001@avinuty.ac.in

N. C. Kiran Babu
Department of Psychology, Reva University, Bengaluru, India
e-mail: kiranbabu@reva.edu.in

may long to play with their peers, but sometimes, due to feelings of social uneasiness and anxiety, they become trapped in the internal conflict that causes them to constantly observe other children without expressing an interest in joining them, which results in onlooker behaviour or remaining unoccupied around other children. Even children's shyness is linked to asocial behaviour, social retreat, reticence, and solitary play [10, 11]. Children learn more about themselves through experiences with peers, particularly those that involve cooperation, conflict, opposition, and pleasant conversation. Thus, playing with peers is crucial for fostering the abilities to cooperate, compromise, show empathy for others, and act altruistically. Peer friendship involves dyadic interactions with closeness and reciprocity that lead to social play. In fact, a lack of peer relationships more frequently shows up in children's non-social characteristics like social reluctance, a decline in prosocial activity, scholastic challenges, and low self-esteem [12, 13]. Moreover, children's lack of interpersonal empathy is caused by their inability to interact with others when playing [14]. Social play is crucial during a child's early years due to the close connection between social skill development, language development, and cognitive development. Children with greater cognitive and social weaknesses engage in lower levels of play behaviours such as solitary functional and onlooker play, whereas children with greater cognitive and social strengths engage in higher levels of play behaviours such as associative, constructive, and cooperative play [15].

There have been very few studies on children's play behaviour, with the majority of those studies focusing on preschoolers' play behaviour. The majority of relevant studies were undertaken in Western countries, with India having fewer. As a result, it became important to investigate the play behaviour of primary school children, with the primary goal of developing a scale.

2 Methodology

The descriptive research design was used to investigate the play behaviour of primary school children in Biswanath, Assam, covering the north, south, east, and west zones. The purpose of this research was to develop and validate a scale to assess play behaviour in primary school children. The study sample consisted of 600 children aged 6–8, comprising 309 boys and 291 girls. The sample was drawn using a simple random sampling procedure.

2.1 Objectives

1. To study and understand the concept of play behaviour and formulate a scale.
2. To establish the validity of the scale with content validity and face validity.
3. To establish reliability (test–retest method).
4. Item analysis and standardising the test for the development of norms

2.2 Procedure

1. A five-point Likert scale was developed for measuring the play behaviour of children.
2. The scale has been developed using a frequency scoring system, i.e., it measures the number of times children have engaged in social or non-social play behaviour.
3. The scale has been reviewed by experts in the field. This involved content validity, wherein the scale was sent to experts with extensive knowledge in the field, who rejected the items and offered suggestions regarding how to make the scale's language easier to understand.
4. Following this, 600 children between the ages of 6 and 8 from different primary schools were provided with the scale after it had been approved.

Inclusion criteria

1. Primary School children, irrespective of gender.
2. Age range of 6–8 years.
3. Both rural and urban children.

Exclusion criteria

1. Children aged below 6 and above 8 years.

2.3 Dimensions Used for the Development of the Play Behaviour Scale

The scale comprises both social and non-social play behaviours with seven dimensions, which were derived from the works of various psychologists. Social play behaviour includes associative, cooperative play behaviour, and games with rules. whereas non-social play behaviour includes unoccupied, solitary, onlooker play behaviour, and anxious or aggressive behaviour.

2.4 Types of Test Items

The scale was a Likert five-point scale. Every item on the scale was presented as a statement. For responding to a given item, the following response categories were provided: "Strongly Disagree", "Disagree", "Somewhat Agree", "Agree" and "Strongly Agree".

The subjects were instructed to respond to each statement by selecting from a list of available options; these options represent what they really think about the given statements. Participants rated their children using the given options. For the social play, "strongly agree" received a score of 5, while "strongly disagree" received a score of 1. In non-social play, "strongly agree" has the lowest point, 1, while

"strongly disagree" has the highest point, 5. There was no time limit for responding to the questions, although it normally took an individual 15–20 min to complete the questionnaire given to mothers of children.

3 Results and Discussion

3.1 Reliability

Table 1 shows the reliability test for overall variables of children's play behaviour. The value of Cronbach's alpha based on standardized items was found to be 0.975.

As per Table 2, the Cronbach's alpha value of unoccupied play was 0.835, while the Cronbach's alpha value based on standardized items was 0.836. The Cronbach's alpha value for solitary play behaviour was 0.874, and it was 0.875 based on standardized items. The Cronbach alpha value for onlooker play behaviour was 0.807, and the Cronbach alpha value for standardized items was 0.804. The Cronbach alpha value for associative play behaviour was 0.886, while the Cronbach alpha value for standardized items was 0.893. Cronbach's alpha value for cooperative play was 0.931, while Cronbach's alpha value for standardized items was 0.932. Cronbach' alpha was 0.839 for anxious or aggressive behaviour, and 0.835 for standardized items.

Table 1 Shows the value of Cronbach's alpha that was acquired overall for all the variables

	Reliability statistics	
Cronbach's alpha	Cronbach's alpha based on standardized items	N of Items
0.975	0.975	40

Table 2 Shows the value of Cronbach alpha that was acquired for all the dimensions

Dimensions	No. of items	Cronbach's alpha	Cronbach's alpha based on standardized items
Unoccupied play	3	0.835	0.836
Solitary play	7	0.874	0.875
Onlooker play	4	0.807	0.804
Associative play	6	0.886	0.893
Cooperative play	10	0.931	0.932
Games with rules	5	0.859	0.865
Anxious/aggressive behaviour	5	0.839	0.835

3.2 Validity

Validity entails truthfulness. Test validity refers to the degree to which a test actually reflects what it is intended to study. Test validity is also measured by the appropriateness and relevance of inferences, conclusions, and decisions based on test results. Face validity, on the other hand, refers to what the test outwardly looks to measure rather than what it actually measures. Content validity includes the use of known experts in the field rather than more rigorous statistical methods to establish whether test items appropriately evaluate defined content. For the above-mentioned validation procedure, the designed tool was sent to experts in the field who had vigorous experience in the relevant areas. The questionnaire's items had modifications and some of them were eliminated based on the feedback they provided. The experts also determined the tool's validity. The tool's face validity was established by revising the items in response to expert comments.

3.3 Norms

Standardization procedure

The norms of the present tool were prepared based on the responses of 600 each of the different respondent play behaviour in Assam, India. Therefore, covering seven major dimensions that is unoccupied play, solitary play, onlooker play, associative play, co-operative play, games with rules and anxious/aggressive behaviour. Therefore, the test takers responses of different respondents could refer to same norms for the for different dimension scores for play behaviours.

Interpretation

Interpretation has to be based on play behaviour scores and low scores on the test. If the group is sufficiently heterogeneous it is recommended that scores which is 1 S.D. above the mean should be considered to mark out the 'High play behaviours' group, and those which are 1 S.D. below the mean should be used to designate the 'Low play behaviours' group.

Based on the results of Table 3, the following norms are interpreted as low, average and high play behaviour for solitary play.

Norms for interpreting the results

Interpretation of scores

Low play behaviour	Average play behaviour	High play behaviour
15 and below raw score is considered as low play behaviour for solitary play	16–20 raw score is considered as average play behaviour for solitary play	21 and above raw score is considered as high play behaviour for solitary play

Table 3 Shows norms including raw scores, z scores and percentiles for solitary play

n-600 raw scores	Mean-19.76 z scores	SD-4.6 percentiles
9	− 2.33100	1
10	− 2.11436	1
11	− 1.89773	2
12	− 1.68109	3
13	− 1.46446	5
14	− 1.24782	8
15	− 1.03118	14
16	− 0.81455	24
17	− 0.59791	38
18	− 0.38128	44
19	− 0.16464	48
20	0.05199	53
21	0.26863	61
22	0.48526	69
23	0.70190	71
24	0.91853	73
25	1.13517	79
26	1.35181	90
27	1.56844	96
28	1.78508	98
29	2.00171	99
30	2.21835	100
31	2.43498	100

Based on the results of Table 4, the following norms are interpreted as low, average and high play behaviour for onlooker play.

Norms for interpreting the results

Interpretation of scores

Low play behaviour	Average play behaviour	High play behaviour
8 and below raw score is considered as low play behaviour for onlooker play	11–14 raw score is considered as average play behaviour for onlooker play	15 and above raw score is considered as high play behaviour for onlooker play

Table 4 Shows norms including raw scores, z scores and percentiles for onlooker play	n-600 raw scores	Mean-11.71 z scores	SD-2.98 percentiles
	5	− 2.24928	1
	6	− 1.91381	2
	7	− 1.57835	3
	8	− 1.24289	9
	9	− 0.90743	20
	10	− 0.57196	36
	11	− 0.23650	49
	12	0.09896	57
	13	0.43442	61
	14	0.76989	70
	15	1.10535	85
	16	1.44081	93
	17	1.77627	97
	18	2.11174	99
	19	2.44720	100

Table 5 represents norms of associative play behaviour and the same was interpreted based on low, average and high play behaviour for associative play.

Norms for interpreting the results

Interpretation of scores

Low play behaviour	Average play behaviour	High play behaviour
13 and below raw score is considered as low play behaviour for associative play	14–18 raw score is considered as average play behaviour for associative play	19 and above raw score is considered as high play behaviour for associative play

Based on the results of Table 6, the following norms are interpreted under low, average and high play behaviour for unoccupied play.

Norms for interpreting the results

Interpretation of scores

Low play behaviour	Average play behaviour	High play behaviour
6 and below raw score is considered as low play behaviour for unoccupied play	7–9 raw score is considered as average play behaviour for unoccupied play	10 and above raw score is considered as high play behaviour for unoccupied play

Table 5 Shows norms
including raw scores, z scores
and percentiles for associative
play

n-600 raw scores	Mean-17.41 z scores	SD-4.42 percentiles
9	− 1.89969	1
10	− 1.67376	4
11	− 1.44783	8
12	− 1.22190	12
13	− 0.99597	16
14	− 0.77004	24
15	− 0.54411	35
16	− 0.31818	40
17	− 0.09225	46
18	0.13367	55
19	0.35960	64
20	0.58553	72
21	0.81146	78
22	1.03739	87
23	1.26332	92
24	1.48925	93
25	1.71518	94
26	1.94111	94
27	2.16704	97
28	2.39297	100
29	2.39297	100
30	2.84483	100

Table 6 Shows norms
including raw scores, z scores
and percentiles for
unoccupied play

n-600 raw scores	Mean-8.44 z scores	SD-2.59 percentiles
4	− 1.71303	3
5	− 1.32750	8
6	− 0.94198	20
7	− 0.55645	37
8	− 0.17092	47
9	0.21461	58
10	0.60014	68
11	0.98567	80
12	1.37120	92
13	1.75673	96
14	2.14226	98

Table 7 Shows norms including raw scores, z scores and percentiles for games with rules

n-600 raw scores	Mean-14.25 z scores	SD-2.81 percentiles
7	− 2.57841	1
8	− 2.22261	3
9	− 1.86680	6
10	− 1.51099	8
11	− 1.15519	11
12	− 0.79938	18
13	− 0.44357	28
14	− 0.08777	43
15	0.26804	63
16	0.62385	77
17	0.97965	87
18	1.33546	94
19	1.69127	96
20	2.04708	97
21	2.75869	99
22	2.75869	99
23	3.11450	99
24	3.47030	100
25	3.47030	100

As per the results of Table 7, the following norms under low, average and high categories are interpreted for games with rules.

Norms for interpreting the results

Interpretation of scores

Low play behaviour	Average play behaviour	High play behaviour
12 and below raw score is considered as low play behaviour for games with rules play	13–15 raw score is considered as average play behaviour for games with rules play	16 and above raw score is considered as high play behaviour for games with rules play

Table 8 Shows norms including raw scores, z scores and percentiles for anxious/aggressive behavior play

n-600 raw scores	Mean-14.72 z scores	SD-3.45 percentiles
7	− 2.23496	1
8	− 1.94546	2
9	− 1.65596	6
10	− 1.36645	9
11	− 1.07695	15
12	− 0.78745	24
13	− 0.49794	35
14	− 0.20844	42
15	0.08106	51
16	0.37056	61
17	0.66007	73
18	0.94957	84
19	1.23907	88
20	1.52857	94
21	1.81808	97
22	2.10758	99
23	2.39708	100
24	2.68659	100
25	2.97609	100

Based on the results of Table 8, the following norms as low, average and high play behaviour values are interpreted for anxious/aggressive behaviour.

Norms for interpreting the results

Interpretation of scores

Low play behaviour	Average play behaviour	High play behaviour
11 and below raw score is considered as low play behaviour for anxious play	12–15 raw score is considered as average play behaviour for anxious play	16 and above raw score is considered as high play behaviour for anxious play

Based on the results of Table 9, the following norms under low, average and high play behaviour are interpreted for co-operative play.

Norms for interpreting the results

Interpretation of scores

Low play behaviour	Average play behaviour	High play behaviour
22 and below raw score is considered as low play behaviour for cooperative play	23–30 raw score is considered as average play behaviour for cooperative play	31 and above raw score is considered as high play behaviour for cooperative play

Table 9 Shows norms including raw scores, z scores and percentiles for cooperative play

n-600 raw scores	Mean-29.34 z scores	SD-7.03 percentiles
17	− 1.75494	3
18	− 1.61271	6
19	− 1.32824	8
20	− 1.18600	10
21	− 1.04377	15
22	− 0.90153	21
23	− 0.75930	26
24	− 0.61706	31
25	− 0.47483	35
26	− 0.33259	38
27	− 0.19036	45
28	− 0.04812	53
29	0.09411	57
30	0.23635	59
31	0.37858	63
32	0.52082	67
33	0.66305	73
34	0.80529	80
35	0.94752	86
36	1.08976	89
37	1.23199	90
38	1.37423	91
39	1.51646	91
40	1.65870 92	
41	1.94317	95
42	2.08540	98
43	2.22764	99
44	2.36987	99
45	2.51211	99
46	2.65434	100
47	2.65434	100
48	2.65434	100

Scoring

Options in each item of the social play behaviour scale are assigned, ranging from 5 (strongly agree) to 1 (Strongly Disagree), whereas for non-social play behaviour, it was 5 (strongly disagree) to 1 (strongly agree). The theoretical range of scores is

40–200, with a higher score indicative of a child being more engaged in social play and a lower score indicating the child is more involved in non-social play behaviour.

The current study aimed to develop a play behaviour scale for primary school children. To the researcher's knowledge, this is the first effort made on the development of such a scale in an Indian context. This scale can be used to assess the play behaviour of primary school children, which may give a clear understanding of whether a child is engaging in developmentally appropriate way in his/her play related activities which in turn able to judge the child's level of socialization with children, it can also be helpful to identify children's difficulties in participating with their peers. Considering the complexity and developmental milestones of children in the early years, play crucial role to investigate whether those who don't involve others in social play may face the dangers of suffering negative consequences in their personality. Through this scale, parents and teachers can be able to measure children's participation in social activities, and it will also help them provide an optimal environment for better learning and adjustment in school and home environment.

4 Summary, Conclusion, and Implication

Play is considered an important and integral component of a child's development. Play has been shown to address a child's needs while also enhancing their socio-emotional skills by managing their emotions, developing self-control, and exchanging strength and ideas with others. Children's cognitive development, including attention, attitudes, planning, creativity and imaginative thinking, retention, and language development, improves through play. For children to learn a wide range of abilities and concepts, it is essential to provide play-based experiences and multiple learning pathways. As a result, children with improved play skills will be more likely to socialize and exhibit greater academic achievement.

The play behaviour scale was developed in response to the increasing need for understanding children's play behaviour in early years. As mentioned above, the scale's reliability has been established and norms are set based on the response. The researcher was inspired to participate in this study because there are very limited studies in this area, and the scale's major purpose was to identify the gaps of 6–8-year-old primary school children in their play behaviour. Children from several primary schools in Biswanath, Assam, participated in the study, and the collected data were used to develop this scale.

The study overall highlights the importance of identifying the play behaviour of children, which will further assist teachers and parents in recognizing their negative or unexpected behaviour during play, thereby helping them provide an ideal learning environment for social development, cognitive, moral and motor development. The developed tool can also be utilized in preschools and primary schools to figure out the type of play activity that the child prefers. Which intern help teachers and parents to understand the importance of play in a child's overall development which also

address the child's individual needs, and create a positive play environment at home and school.

Limitations

The study was conducted with primary school children aged 6–8 years. Since the children were too young to answer the questions, with the help of their parents the questionnaire was filled and the collected data were further interpreted to get appropriate results. The data collection for the study also took a very long time. The participants in the study were from a particular location, so the results might be influenced by the socio-cultural context of the participants.

References

1. Bento, G., Dias, G.: The importance of outdoor play for young children's healthy development. Porto Biomed. J. **2**(5), 157–160 (2017)
2. Newton, E., Jenvey, V.: Play and theory of mind: Associations with social competence in young children. Early Child Dev. Care **181**(6), 761–773 (2011)
3. Rentzou, K.: The quality of the physical environment in private and public infant/toddler and preschool Greek day-care programmes. Early Child Dev. Care **184**(12), 1861–1883 (2014)
4. Frost, J.L., Sutterby, J.A.: Outdoor play is essential to whole child development. Nat. Assoc. Educ. Young Child. **72**(3), 82–85 (2017)
5. Fagen, R.M.: Animal Play Behaviour, 1st ed. New York (1981)
6. Ngozi, N.B., Vivian, O., Blessing, C.A., Cajetan, A.T.M.: Influence of play on the development of preschool children in Anambra State. J. Educ. Res. Develop. **5**, 220–226 (2022)
7. Musyoka, M.: Understanding indoor play in deaf children: an analysis of play behaviors. Psychology **6**, 10–19 (2015)
8. Mamat, N., Mustafa, M.C., Ahmad, H., Yusoff, S.I.M.: Validating the teaching, learning, and assessment quality of Malaysian ECCE instrument. Int. J. Eval. Res. Educ **10**(1), 135–141 (2021)
9. Kesäläinen, J., Suhonen, E., Alijoki A., Sajaniemi, N.: Children's play behaviour, cognitive skills and vocabulary in integrated early childhood special education groups. Int. J. Inclusive Educ. **26**(3), 284–300 (2022)
10. Coplan, R.J., Bowker, J.C., Nelson, L.J.: The handbook of solitude: psychological perspectives on social isolation, social withdrawal, and being alone, 2nd ed. Wiley (2021)
11. Aslan, M.: Turkish and American preschoolers' play, aggression and victimization behaviours in play context. Early Child Dev. Care **190**(3), 348–363 (2018)
12. Buhs, E.S., Ladd, G.W., Herald, S.L.: Peer exclusion and victimization: processes that mediate the relation between peer group rejection and children's classroom engagement and achievement. J. Educ. Psychol. **98**, 1–13 (2006)
13. Coyne, S.M., Gundersen, N., Nelson, D.A., Stockdale, L.: Adolescents' prosocial responses to ostracism: an experimental study. J. Soc. Psychol. **151**, 657–661 (2011)
14. Cordier, R., Bundy, A.: Clare hocking and Stewart Einfeld. A model for play-based intervention for children with ADHD. Aust. Occup. Ther. J. **56**, 332–340 (2009)
15. Dougan, V.F., Kaszuba, T.: Reliability and validity of play-based observations: relationship between the PLAY behaviour observation system and standardised measures of cognitive and social skills. Educ. Psychol. **19**(4), 429–440 (1999). https://doi.org/10.1080/0144341990190404

A Tax Mechanism on Tour Operators in India

M. R. Eshan , **A. Arun Prakash** , **Jaspreet Kaur** , **Rakhi Mohan** ,
and Biju M. Mathew

1 Introduction

On July 1, 2017, the ambition of every Indian citizen to implement a reform of indirect taxes known as "one nation, one tax" came reality. A non-discriminatory indirect tax that is used nationwide is the goods and services tax [1]. Modified Value Added Tax (MODVAT) was first established in India in 1986. In 1999, a proposal to have a single tax system in the form of Goods and Service Tax for the entire nation was made, and it was finally implemented on July 1st, 2017, concluding the indirect tax reform process [2].

A country's overall prosperity and expansion are aided by tourism, which not only boosts its different economic benefits and assistance but also helps to build its reputation and identity abroad. India's tourism and travel sector now contributes significantly to the nation's economic growth in addition to being a popular tourist destination [3]. According to Kumaravel et al. [4], "India had over 10 million foreign tourists, producing foreign exchange revenues of over 27.31 billion U.S. dollars in 2021, compared to 2017, the travel and tourism industry in India contributed over 178 billion U.S. dollars to the country's GDP."

The Covid-19 pandemic has mostly impacted the travel and tourism industry. According to the National Tourism Policy of India, 2022, "India has been challenged by COVID-19 [5]".

M. R. Eshan · A. Arun Prakash · J. Kaur (✉) · R. Mohan
Faculty, Kristu Jayanti College (Autonomous), Bengaluru, Karnataka, India
e-mail: jaspreetarsh@gmail.com

B. M. Mathew
State Institution of Hospitality Management, Kozhikode, Kerala, India

The tour operator (hence referred to as the "Service Provider") offers services to the final customers (the "Recipient") via a variety of counterparts, including airlines, hotels, local taxi drivers, embassies that issue visas, and many other businesses [6]. The primary sources of revenue for tour operators include domestic and international hotel reservations, airline commissions for plane tickets, the sale of tour packages, and the provision of travel-related services including passport, visa, and train reservations [7]. The results of T-Test and Hypothesis are discussed under Tables 1 and 2 shows the Chi-Square.

2 Structure of the Article

2.1 About the Research

The basic idea behind the research is whether the GST has created the impact on the tourism industry. The tourism industry which has seen a consecutive disruptions like GST implications and pandemic, still it serves at the best to the country's GDP. This research serves the purpose of finding and filtering the opportunities and challenges of GST on the pricing and procedure of travel agents and tour operators and assess the expectation of tour operators relating to the prevailing tax mechanism.

2.2 Data Collection and Tools

Data is collected from the 50 tour operator in and around Bangalore, through the questionnaire and the variable are designed in such a way it describes the tour operator's perception and beliefs of tax mechanisms on economic growth, economic expansion, job creation, etc. Incorporated tools like T-test and chi-square for hypothesis testing, correlation for variable comparison and mapping, ANOVA and Regression for the impact analysis.

2.3 Research Findings

Some of the major finding are certain tour operators are ready to bring all the sale of tour packages that have to be billed and accounted in the statement and the present tax policy if there is a timely deduction and payment to tax department, burdening the people are avoided by easy payment of tax. Overall, GST provides a wide and comprehensive coverage of input tax credit set-off as well as incorporating all other indirect

Table 1 Table showing the T-Test and hypothesis

S. No.	Variable 1	Variable 2	T stat	T critic	Hypothesis	Accept/reject
1	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS) TCS/TDS/GST is deducted and paid to Govt. on timely basis*	5.542	1.676	There is no significant relationship between the tour operators' sale of all tour packages that have to be billed and accounted for in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis
2	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): tax returns are filed regularly*	4.041	1.676	There is no significant relationship between the Tour Operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy that tax returns are filed regularly	Reject null hypothesis accepted alternate hypothesis
3	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): tax rate is very high for tourism*	5.542	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and in the present tax policy tax rate is very high for travel and tourism industry	Reject null hypothesis accepted alternate hypothesis

(continued)

Table 1 (continued)

S. No.	Variable 1	Variable 2	T stat	T critic	Hypothesis	Accept/ reject
4	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): benefits to the tourists*	5.838	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy is benefited to tourist	Reject null hypothesis accepted alternate hypothesis
5	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS) benefits to the tour operators*	5.677	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis
6	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	Opinion about present tax mechanism (GST/TCS/TDS): consumer pays the final tax/consumption tax	4.399	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy consumers pays the final tax	Reject null hypothesis accepted alternate hypothesis

Table 1 (continued)

S. No.	Variable 1	Variable 2	T stat	T critic	Hypothesis	Accept/ reject
7	Opinion about present tax mechanism (GST/TCS/ TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): single tax payment*	6.144	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy is having single tax payment	Reject null hypothesis accepted alternate hypothesis
8	Opinion about present tax mechanism (GST/TCS/ TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): more revenue is generated to country*	4.460	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy is generated more revenue to the country	Reject null hypothesis accepted alternate hypothesis
9	Opinion about present tax mechanism (GST/TCS/ TDS): all the tour packages are billed and accounted	Opinion about present tax mechanism (GST/TCS/ TDS): burden on the business people	6.361	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy is burdening the business people	Reject null hypothesis accepted alternate hypothesis

Table 1 (continued)

S. No.	Variable 1	Variable 2	T stat	T critic	Hypothesis	Accept/reject
10	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): burden on the tourists*	4.874	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis
11	Opinion about present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): improves compliance level*	5.852	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy in timely deduction and payment to the tax department	Reject null hypothesis accepted alternate hypothesis
12	Opinion about the present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): in the short term, increased cost*	6.841	1.676	There is no significant relationship between the tour operator's sales of all tour packages has to billed and accounted for in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis

Table 1 (continued)

S. No.	Variable 1	Variable 2	T stat	T critic	Hypothesis	Accept/reject
13	Opinion about present tax mechanism (GST/TCS/TDS): al the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): in long term, lesser cost*	6.497	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis
14	Opinion about the present tax mechanism (GST/TCS/TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): should there be GST on cancellation charges*	7.029	1.676	There is no significant relationship between the tour operators sale of all tour packages that have to be billed and accounted in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis

Table 1 (continued)

S. No.	Variable 1	Variable 2	T stat	T critic	Hypothesis	Accept/ reject
15	Opinion about present tax mechanism (GST/TCS/ TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): GST has less impact on domestic travel*	6.065	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis
16	Opinion about present tax mechanism (GST/TCS/ TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): tax impact more on International tours*	4.627	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis
17	Opinion about present tax mechanism (GST/TCS/ TDS): all the tour packages are billed and accounted	*Opinion about present tax mechanism (GST/TCS/TDS): input tax credit not available for tour operators*	6.148	1.676	There is no significant relationship between the tour operators sale of all tour packages that has to be billed and accounted in the statement and the present tax policy in timely deduction and payment to tax department	Reject null hypothesis accepted alternate hypothesis

Table 2 Table showing the chi-square, correlation and interpretation

S. No.	Variable considered	Chi square value	Correlation value	Interpretation
1	Nature of business * opinion about the present tax mechanism (GST/TCS/TDS) regarding all the tour packages are billed and accounted	9.841	− 0.059	The chi-square and cross tab applied between the nature of the business and the state of mind towards billing all sales of tour packages clearly states that sole proprietorship and partnership firms strongly agree to the statement
2	Nature of business * opinion about present tax mechanism (GST/TCS/TDS) TCS/TDS/GST is deducted and paid to Govt. on timely a basis	11.905	− 0.308	Sole proprietors and partnership firms strongly agree that the timely deduction and timely intervention of the government in the tax mechanism could be highly helpful
3	Nature of business * Opinion about present tax mechanism (GST/TCS/TDS) regarding tax returns are filed regularly	8.521	− 0.115	Sole proprietors and partnership firms strongly agree that the regularization of filing of tax returns can improvise the current tax mechanism
4	Nature of business * opinion about present tax mechanism (GST/TCS/TDS) is tax rate is very high for tourism	15.062	− 0.275	Sole proprietors and partnership firms strongly agree that the tax rate is very high and large corporates stand so neutral to the opinion
5	Nature of business * opinion about present tax mechanism (GST/TCS/TDS) regarding single tax payment	11.209	0.161	In spite of the common opinion of billing and accounting, all tour sales are high, and all nature of the business holders stay neutral to the single tax system, which clearly depicts the unwillingness to change
6	Nature of business * Opinion about present the tax mechanism (GST/TCS/TDS) More revenue is generated by tax to country	13.818	− 0.094	Partnership firms have strong agreement towards the revenue generation of the self and the tax paid to the government. The revenue for the government has also seen considerable change

Table 2 (continued)

S. No.	Variable considered	Chi square value	Correlation value	Interpretation
7	Nature of business * opinion about present tax mechanism (GST/TCS/TDS) is burden on the business people	12.598	0.056	When the input and output tax difference is huge and delays in the tax return policy by the government can burden the tour operators, but the business people stay neutral to the opinion
8	Nature of business * opinion about present tax mechanism (GST/TCS/TDS) in long term, lesser cost	9.613	− 0.17	Majority of the tour operators stay neutral to the opinion of long term running of business can bring down the cost, which is again surprising, the reason could be challenges faced by business operators for a long run
9	Nature of business * opinion about present tax mechanism (GST/TCS/TDS) income to CAs/tax consultants	8.589	0.023	Majority of the tour operators are sole owners or individuals consulting hence majority are customers of CA's/tax consultants
10	Annual income CY approx * Opinion about present tax mechanism (GST/TCS/TDS) regarding all the tour packages are billed and accounted	14.081	− 0.211	The survey targets all type of income groups and tax payers however most of them fall under the category of 10 lakhs to 10 crores
11	Annual income CY approx * opinion about present tax mechanism (GST/TCS/TDS) Is Tax Rate is very high for tourism	18.308	− 0.427	The opinion of the respondents is that compared to other industries, tax rate is higher
12	Annual income CY approx * opinion about present tax mechanism (GST/TCS/TDS) the benefits to the tour operators]	20.736	− 0.291	According to most of the respondents, tax mechanist is not much favourable towards the tourism sector

Table 2 (continued)

S. No.	Variable considered	Chi square value	Correlation value	Interpretation
13	Annual income CY approx * opinion about present tax mechanism (GST/TCS/TDS) more revenue is generated by tax to country	14.465	− 0.252	GST though has contributed much to the country's revenue however, GST towards tourism sector can be improvised further
14	Annual income CY approx * opinion about present tax mechanism (GST/TCS/TDS) is burden on the business people	17.577	− 0.271	There does not seem to be much burden on the business people
15	Amount of taxes paid during the year * opinion about present tax mechanism (GST/TCS/TDS) regarding tax returns are filed regularly	14.179	− 0.006	Most of the tax payers with higher income are filing the tax returns regularly
16	Amount of taxes paid during the year * opinion about present tax mechanism (GST/TCS/TDS) is tax rate is very high for tourism	22.369	− 0.124	Most of the tourist operators have the opinion that tax is higher for the tourism sector and hence most of the transactions are not accounted
17	Amount of taxes paid during the year * opinion about present tax mechanism (GST/TCS/TDS) about Tax Benefits to the tourists	9.253	0.07	Most of the respondents are not very much satisfied with the present tax structure
18	Amount of taxes paid during the year * opinion about present tax mechanism (GST/TCS/TDS) regarding single tax payment	15.503	0	Payment of single tax structure does not seem to be a feasible solution

Table 2 (continued)

S. No.	Variable considered	Chi square value	Correlation value	Interpretation
19	Amount of taxes paid during the year * opinion about present tax mechanism (GST/TCS/TDS) is burden on the business people	9.165	− 0.067	There does not seem to be much burden on the business people
20	Amount of taxes paid during the year * opinion about present tax mechanism (GST/TCS/TDS) in long term, lesser cost	10.134	− 0.168	Majority of the tour operators stay neutral to the opinion of long term running of business can bring down the cost, the reason could be challenges faced by business operators in the long run

taxes. Effective implementation of GST will lead to huge profits and overall development for both Centre and States majorly through a strong tax base and improvement in tax compliance.

2.4   Research Gap

The goal of this research project is to examine how tourism and hospitality contribute to economic growth, job creation, economic expansion, the reduction of poverty, etc. The tourist business is not a monopolistic one; rather, it is made up of numerous distinct industries that combine to form a massive tourism product, each of which has an impact on the others. As a result, the impact can be analysed while taking into account all aspects of the sector. The effect can be further broken down into different categories, such as the impact on tour operators, the cost of travel-related goods, hotels and restaurants, and the positive and negative effects of the GST on the tourist sector. According to the aforementioned literature analysis, even six years after the adoption, the study on the impact of GST on the tourism industry was not given significant priority. The current study is an attempt to know the impact of GST on Tourism sector emphasizing on travel agents and tour operators in and around Bengaluru, Karnataka.

2.5   Objectives

1. Understanding the perception of tour operators on the GST implementation.
2. Assessing the expected improvisation on taxing mechanism by tour operators.
3. Suggestions.

3 Data Analysis and Interpretation

Interpretation

- The Tour operators are ready to bill and account all the sale of tour packages in their statement of accounts, if the taxing mechanism involves improving the timely basis of deducting and paying the taxes to the government.
- The tour operators are ready to bill and account all the sale of tour packages in their statement of accounts and if the taxing mechanism involves the tax returns are filed in regular basis
- The tour operators are opinion that they are ready to bill and account all the sale of tour packages in their statement of accounts but present tax policy has fix the high tax rate for travel and tourism industry
- The tour operators opinion that by keeping all billed and account of all tour package sale will be benefited to the tourist
- The tour operators are ready to bill and account all the sale of tour packages in their statement of accounts since it will be benefited to the tour operators for tax return and not involve in any sort of legal issues
- The tour operators are opined that in the present taxation policy they ready to bill and account all the sale of tour packages in their statement of accounts and the final tax payers are costumer who purchase the tour package
- The Tour operators are ready to bill and account all the sale of tour packages in their statement of accounts, if the taxing mechanism involves single tax payment policy for all tax payers
- The tour operators opined that according to present taxation policy they are billing and accounting all the sale of tour packages in their statement of accounts which generate the more revenue to the country. The Tour operators are ready to bill and account all the sale of tour packages in their statement of accounts, but present tax policy is burden to the business people since tax rate is high.
- The tour operators are billed and accounted all the sale of tour package in their account statements and it will be a ultimate burden to the tourist since all Tax amount included in tour package which is purchased by tourist.

Interpretation

The dependent factor as per Table 3 considered for the ANOVA are respondent's opinion towards billing all tour packages and accounting all sales with 5 dependent variables namely opinion on TCS/TDS/GST is deducted and paid to Govt. on timely basis, opinion on regular filling of tax returns, opinion towards tax benefits are transferred to the consumers, opinion on revenue generation and contributing to the GDP, opinion on burden on the tourists. As per Table 3, the significance value is 0.005 which is less than 0.05, leading to rejecting null hypothesis. There is a high level of association between the dependent and independent factors.

Table 3 Table showing the test of ANOVA

	df	SS	MS	F	Significance F
Regression	5	4.956923	1.991385	3.873077	0.005388376
Residual	44	12.62308	0.514161		
Total	49	32.58			

4 Conclusion

It can be concluded from the above discussion that GST provides a wide and comprehensive coverage of input tax credit set-off as well as incorporating all other indirect taxes. Effective implementation of GST will lead to huge profits and overall development for both Centre and States majorly through a strong tax base and improvement in tax compliance. It is very much evident that GST have a positive impact on various sectors and industry. Tour operators majorly those operating international packages are forced to pay huge taxes and undergo various tax compliance procedures. Although implementation of GST requires a lot of efforts of all stake holders including Central and State Government, tour operators in the trade and industry. Thus, necessary steps should be taken for the overall wellbeing of tourists, tourism industry and the economy as a whole.

4.1 Further Scope of the Study

The tax mechanism can be digitalised at the high pace in the upcoming era, that can make this study to be conducted under the blockchain environment, IoT environment, Meta environment. If banking transaction tax takes a new uphill turn, then again the realization of tax money is quicker and easily available for perusal which could make this study to be made in developed and modernized economy and can arrive at more meaningful and resourceful decisions. Again this study can be conducted broadly across all sectors.

References

1. Kumar, S., Gupta, S.: A study on income tax payers perception towards electronic filing. J. Internet Bank. Commer. **22**(S7), 1 (2017)
2. Neog, Y., Gaur, A.K.: Tax structure and economic growth: a study of selected Indian states. J. Econ. Struct. **9**, 1–12 (2020)
3. Singh, J., Diwan, S.P., Kumar, R.: Government of India's initiatives for wider penetration of insurance during Covid-19 and growth of insurance industry. Contemp. Issues Bank. Insur. Financ. Serv. **235** (2022)

4. Kumaravel, K.S., Leonard, L., Baskar, D.C., Saravanan, S.: Linking farmers with markets through ICT Tools. Agric. Mark. India **23** (2022)
5. Adedoyin, F.F., Seetaram, N., Disegna, M., Filis, G.: The effect of tourism taxation on international arrivals to a small tourism-dependent economy. J. Travel Res. **62**(1), 135–153 (2023)
6. Ambili, S.: Goods and services tax (GST) on Tourism sector-an overview. Asian J. Multidimension. Res. (AJMR) **7**(1), 31–36 (2018)
7. Tiwari, R.K., Sanjay Srivastava, Goel, M.: Impact of goods and service tax on Tourism Industry with focus on tour operator and hotel industry. Int. J. Mech. Eng. 6(3) (2021), ISSN: 0974-5823

CSR, Technology and Empowerment

Corporate Environmental Performance as Mediating Between Innovation and Financial Performance in the Jordanian Industrial, Services, Real Estate Sectors

Maher Alnaim, Farizah Sulong, and Zalailah Salleh

1 Introduction

This research primarily focuses on corporate environmental performance (CEP), a topic that has gained more and more prominence in recent decades [30]. This subject has substantial ramifications for influencing not only corporate environmental strategies but also other policies associated with the company's financial performance. In light of this, there has been a research focus on companies transitioning from clean production to environmentally friendly and sustainable practices [31], considering the perspectives of their management, stakeholders, and shareholders regarding ecologically responsible strategies [24]. Scientific studies have identified hazardous elements that impact economic development and natural resources. Consequently, regulatory bodies are actively working to review laws dedicated to monitoring corporate environmental infractions [82]. In more recent times, the business community has faced growing criticisms, including shareholders, concerning their awareness and responsiveness to environmental impacts. Despite this growing awareness, the extent of their influence remains unclear [44].

In line with [13] contend that competitors in the realm of innovation strategy differ based on their respective sizes. Specifically, when a company expands in size, changes occur in how innovation impacts financial performance. Consequently, it

M. Alnaim (✉) · F. Sulong · Z. Salleh
Faculty of Business, Economy and Social Development, University Malaysia Terengganu, Kuala Nerus, Malaysia
e-mail: maher_alnaimi@yahoo.com

F. Sulong
e-mail: farizah.sulong@umt.edu.my

Z. Salleh
e-mail: zalailah@umt.edu.my

can be deduced that irrespective of the adoption of new technologies, as a company grows in size, the influence of innovation on financial performance intensifies. These findings bear significant implications for management, as they strive to enhance business performance by means of ongoing innovation. Moreover, the connection between innovation and financial performance generates significant interest among consulting circles and government-affiliated associations.

Past research has shown a favourable association between innovation and profitability, along with a competitive edge, especially in areas concerning process and product innovation. This connection has the capacity to result in improved financial performance [32, 43, 54]. Numerous prior studies have delved into the relationship between innovation and performance. Among these, [10, 58] have both indicated a substantial link between the two. Innovation primarily establishes stability, covering performance and other responsibilities linked to sustainable development [15]. Conversely, in other studies, [65, 67] have argued that integrating innovation into a company's operations can cater to consumer needs. On the contrary, [47] have posited that innovation can be expensive and uncertain, potentially leading to increased costs and reduced employee satisfaction. This perspective implies a negative relationship between innovation and performance.

Other studies within the same vein (such as [45, 56, 65] have uncovered that methods, procedures, and products possess the capability to eliminate or minimize emissions of pollutants, as well as the consumption of raw materials, natural resources, and energy. Conversely, the studies conducted by Lee and Min [55] and Oltra and Saint-Jean [66], along with [52], have highlighted that the influence of innovation on environmental performance is not solely reliant on research and development (R&D) endeavors, it is equally shaped by technological progress. The emergence of new technologies compels organizations to explore novel approaches to conserving the environment.

As an emerging economy, Jordan confronts challenges related to managing industrial solid waste and addressing water contamination issues stemming from the activities of industrial and service, real estate entities. The primary environmental concern facing Jordan pertains to the scarcity of water resources. Compounded by the growing population rate and the influx of refugees from Syria, this matter has become more pressing. According to findings from a survey conducted by Yoon et al. [80], the per capita availability of water resources is gradually diminishing, illustrating a notable 50–60% reduction in water availability per individual. In response to these challenges, the government has implemented various measures to control gas emissions and manage solid waste generated as by-products. This has prompted firms to seek innovation in their processes and products to maintain competitiveness in the market. Therefore, it is imperative to explore the relationship between innovation and the financial performance of Jordanian companies, all while closely monitoring their environmental concerns. Research in this field includes the study conducted by Anwar [8], which demonstrated that the business innovation model significantly influences a company's competitive advantage and overall performance.

2 Corporate Financial Performance

This term is frequently utilized within the business realm, spanning various sectors and services. In the past, a company's prosperity hinged solely on its financial performance, neglecting any other factors that might contribute to its establishment as a dominant player in the market [5, 63]. Corporate performance refers to the assessment of alterations in the financial status of a company or the outcomes stemming from the financial aspects of the enterprise resulting from management's decisions and their implementation by the workforce [51].

The primary aim of financial management is to enhance profitability, thereby increasing the stakeholders' equity. Conversely, performance pertains to a company's capacity to obtain and oversee resources through various means, with the ultimate goal of gaining a competitive advantage [2, 46]. Corporate performance holds significance within a firm's strategic management sphere, encompassing aspects like innovation. This is especially pertinent for for-profit companies, which inherently focus on catering to public demands. In essence, the financial performance of such entities is a central concern [78].

3 Corporate Environmental Performance

Over recent years, there has been an increasing focus from government sectors, policymakers, non-governmental organizations, and global corporations on the condition of the environment [42]. The aim to prevent environmental issues has significantly impacted the strategies and practices of firms, aiming to avert costly project delays. In this context, forward-thinking enterprises have come to recognize environmental issues as integral components of their business considerations, necessitating their inclusion in corporate strategies, policies, and operational approaches [6]. According to [14], a heightened commitment to environmental performance and a proclivity towards it can effectively contribute to environmental management, mitigating the occurrence of environmental accidents or disasters. This subsequently helps curtail risks related to the country's political, market, and environmental landscape. Advocates often encourage corporate managers to establish environmental policies and practices that elevate environmental performance, leading stakeholders to take into account a company's environmental stance and performance when making investment decisions [9]. The company's dedication to environmental performance may place increased emphasis on both environmental and financial performance aspects of its operations and activities, policies and approaches [28].

Scholars have shown considerable interest in the concept of corporate environmental performance over the last thirty years. However, up to now, there remains a lack of consensus among researchers and regulators regarding its precise measurement. Furthermore, defining this concept proves to be challenging due to the inherent difficulties associated with measurement [27] studies undertook a review of various

definitions of corporate environmental performance and offered a comprehensive overview of these definitions in both theoretical and empirical contexts [68]. Among these definitions, they encompassed the incorporation of energy and water usage, greenhouse gas emissions, the release of toxic substances, and instances of spillage under the environmental performance (EP) umbrella. The study highlighted [71] Interpretation defines environmental performance (EP) as the degree to which companies execute collections of environmental initiatives and accompanying management frameworks to reduce the influence of their operations on the environment. Additionally, Described EP as a multifaceted concept that encompasses elements reaching beyond the environmental impact on the biosphere. It includes effects on customers, employees, the local community, and various stakeholders [36].

4 Innovation

Businesses implement innovations partially in order to attain optimal performance [39]. While the connection between innovation and firm outcomes is undeniable, innovation has emerged as a pivotal instrument for advancing a nation's social welfare and a firm's financial growth [18]. Consequently, numerous countries strive to secure competitive advantages on a global scale through innovation [11]. Both advanced and emerging economies are utilizing innovation to propel growth and expedite their competitive edge [19].

Of particular significance, innovation pertains to effectively exploiting novel concepts and the dynamic process of acquiring knowledge from diverse sources, whether internal, external, or a combination of both [62]. The foundational work by Schumpeter [73] introduced the term, depicting it as the winds of creative destruction [34]. Schumpeter [73] proposed that innovation entails fresh outcomes that stand apart from those already in existence, addressing customer requirements. This capability empowers inventive companies to flourish by effectively creating and employing technologies, products, and methods in comparison to their rivals.

5 Innovation Types

Enterprises implement various types of innovations to improve efficiency and performance, which are broadly classified as process, product, organizational, and market innovations.

- **Product Innovation**—A novel and advanced product, characterized by its attributes and functions, encompassing improvements in technological components, product constituents, integrated software, customer-friendly characteristics, and newly integrated additional features [29].

- **Process Innovation**—Incorporating improved manufacturing technology to meet customer demand and maintain a competitive stance in the market. Process innovation additionally aids companies in achieving performance indicators that encompass, but are not limited to, operational cost reductions, improved product quality, and customer satisfaction [52].
- **Marketing Innovation**—This refers to the embrace of novel techniques and strategies in marketing, aimed at maintenance customer relationships, employing pricing strategy, and promoting products [22].
- **Organizational Innovation**—This pertains to the management of work processes within the company, such as fostering internal and external customer relationships, thereby enhancing competitive edge. This form of innovation also aids enterprises in cultivating higher levels of employee engagement, leading to improved productivity and reduced impact [3, 29].

In spite of various types of innovation, the primary focus of this study is directed towards product innovation and process innovation within the internal operations of companies. These innovations influence both the environmental performance and financial performance of industrial, services, and real estate firms.

The unprecedented global economic growth has primarily resulted in unsustainable advancements, resulting in a significant rise in the emission of pollutants [81]. Regrettably, this outcome has given rise to environmental concerns that pose threats to humanity, manifesting as climate change and environmental pollution due to population growth, industrialization, urban development, and escalating energy demands [21]. These challenges and environmental hazards imperil the foundational aspect of human existence, which is environmental sustainability, both for the present and future generations.

For the purpose of sustaining human life in an enduring manner, it becomes imperative to cultivate efficiencies in resources and energy, thus supporting economies that prioritize sustainability [77]. This approach will serve to reinforce the connections between resource consumption and economic advancement, ultimately securing a state of sustainable growth that simultaneously upholds existing environmental sustainability and economic progress. This form of sustainability is not only integral to growth, but its increasing importance has spurred the emergence of environmental technological innovation, often referred to as environmental innovations, as an alternative means of attaining environmental sustainability. Environmental innovation denotes a type of innovation driven by environmental concerns, aimed at mitigating negative environmental impacts [76].
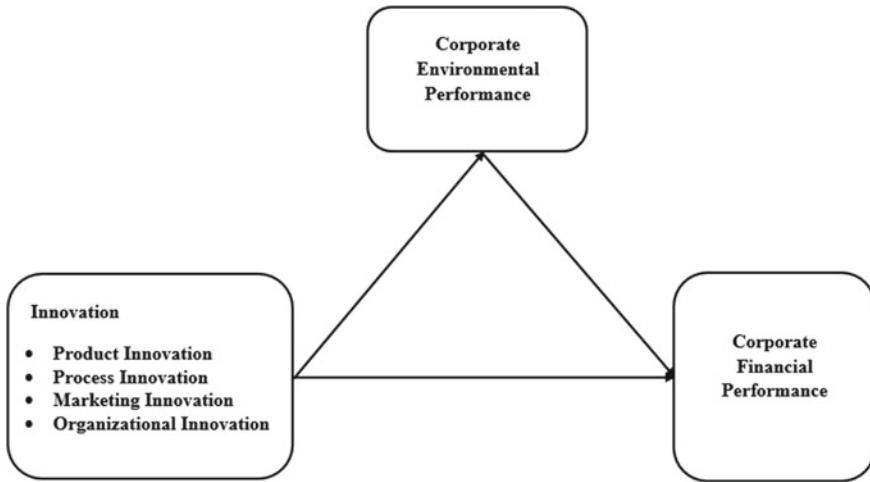
Fig. 1 Theoretical framework

6 Theoretical Framework

The primary aim of this research is to analyse how innovation affects financial performance, with environmental performance serving as the mediating variable. Both developed and developing nations institute policies aimed at safeguarding the environment, and sectors within these countries adopt diverse policies and initiatives to attain this goal, ultimately bolstering their financial performance. The rationale for investigating these dynamics can be elucidated through the use of a conceptual framework. This framework clarifies the hypothetical links among the variables being examined, encompassing the variables that are dependent, independent, and acting as mediators [17] (Fig. 1).

7 Theoretical Foundation

An appropriate theory for this study is the Natural Resource-Based View (NRBV), which is an extension of the Resource-Based View (RBV) and is attributed to the work of [40]. The fundamental (RBV) theory suggests that a company's expansion relies on the strategic administration of its existing resources. However, [40] introduced the NRBV theory as a conceptual extension, incorporating the influence of the natural environment on both competitive advantage and a company's performance outcomes. The NRBV theory fundamentally asserts the existence of three primary ecological strategies: pollution prevention through waste and effluent reduction, product stewardship involving the minimization of product lifecycle costs, and sustainable development by mitigating the environmental impacts of business

growth. Drawing from this theory, all the aforementioned factors play a pivotal role in shaping a firm's competitive advantage, especially in the context of crucial resources driven by distinct environmental considerations [4].

Moreover, within the framework of NRBV, there exists an aspect of product stewardship aimed at curbing pollution throughout the product lifecycle. In this context, stakeholders often play a role in persuading internal management to incorporate product designs that facilitate the implementation of environmental preventive measures, ultimately contributing to the company's performance improvements [49]. Consequently, NRBV emphasizes the integration of environmental strategies as a means to augment the performance of companies.

Companies with a commitment to environmental sustainability choose to disclose their environmental and social achievements in their annual reports, providing tangible evidence of the company's actual performance. This data holds significance for stakeholders. In this context, corporate boards and management should enhance their communication strategies to effectively address issues arising from the interaction between management and shareholders. Building on the aforementioned context, the research employs the Natural Resource-Based View (NRBV) and Resource-Based View (RBV) frameworks to assess the impact of corporate environmental performance on financial outcomes.

The Natural Resource-Based View (NRBV) holds notable relevance for this study, given its aim to empirically investigate how innovation strategy affects corporate financial performance, wherein environmental performance acts as the mediating factor.

8   Methodology

In this current study, the study population consists of companies active in the industrial, service, and real estate sectors, all of which are listed on the Amman Stock Exchange (ASE). There are a total of 124 firms in these sectors, accounting for 190 of the companies listed on the ASE. It's noteworthy that the remaining sectors on the ASE encompass Banking, Insurance, and Diversified Financial Services, as outlined in the ASE's 2019 records. The rationale behind focusing on the industrial, service, and real estate sectors emanates from their significant influence on the environment, their competitive reputation, their dynamic growth, and their commitment to innovation, as indicated in Jordan's Startup Economy report from 2019. This underscores the importance of these sectors' stakeholders in upholding their environmental performance. Consequently, the imperative of sustaining financial performance to ensure stability through value-added products and solutions becomes evident.

The study employed the GPower method to assess the sampling adequacy [33]. With a substantial sample size of 0.15 and a significance level of 0.05 (α level), G's power exceeded 0.95, signifying satisfactory survey power [20]. Utilizing the G*Power technique, the study determined a minimum required sample size of 138, as illustrated in Fig. 2.
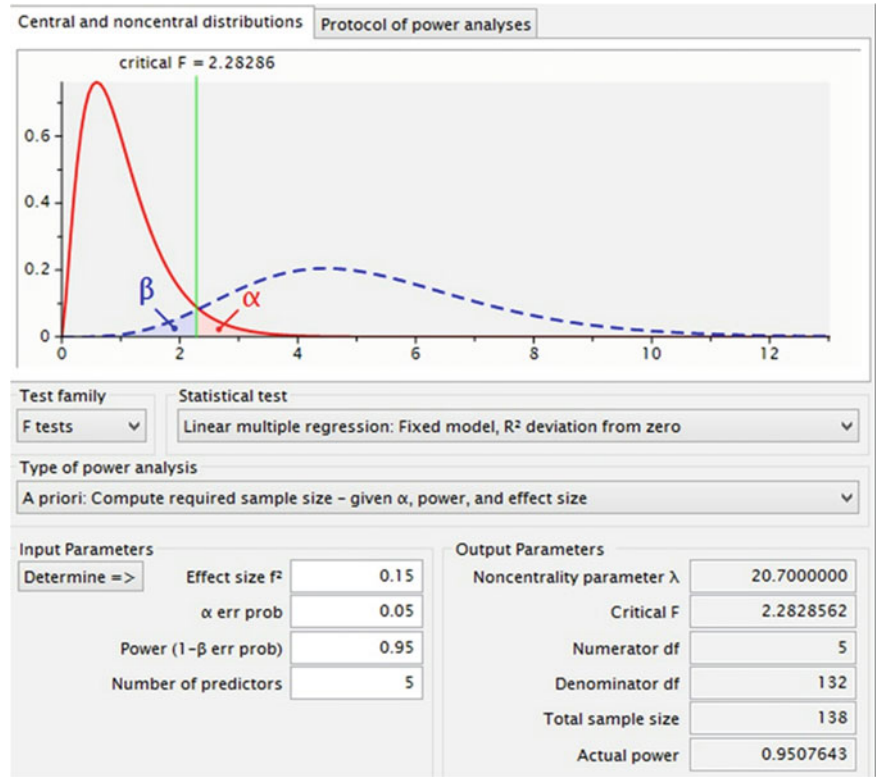
Fig. 2 G*Power—A Priori

As per Creswell's insights [23], the presence of sampling error, while inevitable, can be mitigated through the expansion of the sample size. Notably, larger samples often correlate with a reduced margin of error. Accordingly, this study utilized the methodology suggested by Krejcie and Morgan to ascertain the suitable sample size.

Drawing from the recommendations proposed by Delice [25] alongside the insights of Krejcie and Morgan [50], the total population comprises 372 respondents. These respondents encompass health, safety, and environment (HSE) managers, finance managers, and operational managers originating from the 124 firms enlisted in the ASE [7]. Hence, the fitting sample size for this study equates to 191 participants, following the guidelines of Krejcie and Morgan [50].

The respondents (managers) from each firm were then chosen by the researcher using the convenience approach. By completing the questionnaire, all industrial, service, and real estate companies in Jordan consented to take part in the present study. One employee from the human resources division helped with the distribution of the questionnaire. The aggregate number of responses received was 209, accounting for 90.8% of the distributed questionnaires that underwent subsequent analysis., and a total of 21 questionnaires were absent or not completed.

9 Results

For the analysis of the gathered data in this study, the software packages employed were SPSS and Smart PLS. In the data analysis process, SPSS (version 4) was utilized to perform a descriptive analysis. Subsequently, the study's model was tested using Smart PLS (version 4). As a causal-predictive method, Smart PLS, according to [37], permits researchers to assess the potential predictive value of their results.

According to the proposal by Ringle [70], it's recommended for researchers to conduct a normality test on the data. This is particularly important when dealing with small sample sizes, as highly skewed or kurtotic data can lead to an overstatement of bootstrapped standard errors, thereby potentially underestimating the statistical significance of path coefficients. However, it's widely acknowledged that the Smart PLS-SEM approach is characterized by more lenient assumptions regarding normality distribution and error terms [41]. We examined the data collection process for this study and assessed the normality of the collected data.

As a component of the assessment procedure within this research, the reliability of individual indicators, along with the convergence and distinctiveness validity, were all appraised. The results pertaining to the reliability of individual indicators and convergence validity are presented in Table 1. Across all items, the factor loadings ranged from 0.638 to 0.939, therefore suggesting the retention of items with loadings equal to or exceeding 0.60, as recommended by Hair et al. [38]. Moreover, both the constructs' Cronbach's alpha and composite reliability scores surpassed the suggested threshold of 0.60, following [38] guidelines. In addition, all construct values exceeded the specified cut-off point of 0.50 for Average Variance Extracted (AVE), as indicated by Matthews et al. [61], as illustrated in Table 1.

Hypothesis 1: shows IS has a positive influence in CFP (Beta = 0.295, T-Value = 4.784, P-Value = 0.000, LL = 0.164, UL = 0.147); the hypothesis was supported. The finding is consistent with previous researchers who discovered a favorable correlation between innovation strategy and corporate financial performance [12, 35, 79] therefore, it is evident that the innovation strategy positively yields impacts on financial performance in the industrial, service and real estate sectors (Fig. 3).

Hypothesis 2: shows IS has a positive influence on CEP (Beta = 0.928, T-Value = 3.838, LL = 0.411, UL = 0.638, P-Value = 0.000); the hypothesis was supported. The finding is consistent with previous researchers who discovered a favorable correlation between innovation strategy and corporate environmental performance [16, 57, 75].

Hypothesis 3: CEP has a positive influence on CFP (Beta = 0.058, T-Value = 11.143, P-Value = 0.000, LL = 0.565, UL = 0.728); the hypothesis was supported. The finding is consistent with previous researchers who discovered a favorable correlation between corporate environmental performance and corporate financial performance [28, 60]. Companies are increasingly recognizing that their environmental practices can influence their financial outcomes [1].

Hypothesis 4: CEP mediates the relationship between IS and CFP (Indirect effect = 0.326, T-Value = 8.245, LL = 0.217, UL = 0.414, P-Value = 0.000) This hypothesis was confirmed by this study, and by comparing previous studies, [74] study

Table 1 Internal consistency reliability and convergent validity

Variable	Items	Loadings	Cronbach's alpha	Composite reliability	AVE
Corporate financial performance	CFP1	0.727	0.859	0.904	0.703
	CFP2	0.683			
	CFP3	0.727			
	CFP4	0.849			
Corporate environmental performance	CEP1	0.842	0.868	0.910	0.717
	CEP2	0.805			
	CEP3	0.939			
	CEP4	0.910			
	CEP5	0.891			
	CEP6	0.679			
Innovation	IS1	0.638	0.922	0.934	0.640
	IS2	0.760			
	IS3	0895			
	IS4	0.867			
	IS5	0.918			
	IS6	0.932			
	IS7	0.931			
	IS8	0.934			

Note Items IS9 and CEP7 were eliminated because they had loading values of 0.471 and 0.371, respectively
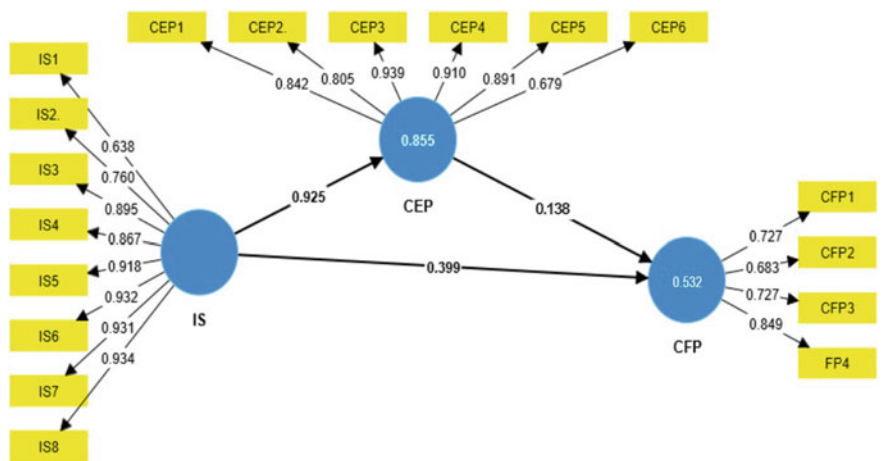
Fig. 3 Path coefficients for study model

proved that innovation has a positive impact on environmental performance, as several previous studies have also demonstrated this positive relationship [16, 57, 75]. As Well as [79] study also supports this hypothesis through its findings: Green process innovation positively influences green product innovation, and both green process and green product innovations contribute to enhancing a company's financial performance. This type of green innovation is accomplished through improved environmental performance. Furthermore, proven the positive relationship between environmental performance and financial performance through previous studies [26, 28]. The relationship between Innovation Strategy and Corporate Financial Performance is mediated by Corporate Environmental Performance, which is an interesting and important concept within the realm of business and sustainability. This perspective highlights the potential influence that environmentally responsible practices can have on a company's financial performance through the conduit of innovation.

10 Conclusion

A strong Innovation Strategy, driven by the pursuit of novel ideas, products, and processes, sets the stage for a company's competitive advantage and growth. However, the true power of this strategy often comes to fruition when coupled with a commitment to Corporate Environmental Performance [32, 48]. Corporate Environmental Performance encompasses a company's dedication to reducing its environmental impact through sustainable practices, responsible resource management, and eco-friendly initiatives. By excelling in these areas, a company not only contributes to a healthier planet but also unlocks a pathway to improved financial performance [69]. An effective Innovation Strategy leads to the creation of innovative products or services that resonate with environmentally conscious consumers. This resonance, in turn, drives demand, brand loyalty, and revenue growth [53]. However, the bridge connecting Innovation Strategy and Corporate Financial Performance is significantly strengthened when the company showcases a genuine commitment to environmental responsibility [64]. Ultimately, Corporate Environmental Performance aligns with evolving market trends that emphasize sustainability as a driver of competitive advantage and long-term success. It highlights the intricate relationship between innovation, environmental responsibility, and financial prosperity, this is in line with the study [59]. While empirical research is necessary to validate and quantify this relationship within specific contexts, the overarching message is clear: An all-approach that combines Innovation Strategy with strong Corporate Environmental Performance has the capacity to generate lasting financial benefits while promoting a more sustainable global environment.

References

1. Aguilera, R.V., Aragón-Correa, J.A., Marano, V., Tashman, P.A.: The corporate governance of environmental sustainability: a review and proposal for more integrated research. J. Manag. **47**(6), 1468–1497 (2021)

2. Al Dalaien, M.Y.M., Ibrahim, R.M., Aburumman, O.J.: Jordanian telecommunication companies success through social capital and human resources management. Solid State Technol. **63**(5), 8049–8057 (2020)

3. Al Dalaien, M., Tambi, A.M.B.A., Ibrahim, R.M.: Jordanian telecommunication companies success through human capital and social capital. Int. J. Sci. Res. Eng. Develop. **3**(3), 1335–1349 (2020)

4. Alalade, S., Oguntodu, J.: Motivation and employees performance in the Nigerian banking industry. Int. J. Econ. Comme. Manage. **3**(4) (2015)

5. Albatayneh, R.M.S.: The effect of corporate sustainability performance on the relationship between corporate efficiency strategy and corporate financial performance. Universiti Utara Malaysia (2014)

6. Ali, K., Kausar, N., Amir, M.: Impact of pollution prevention strategies on environment sustainability: role of environmental management accounting and environmental proactivity. Environ. Sci. Pollut. Res. 1–14 (2023)

7. Amman Stock Exchange.: Statistical database. Publications of the Amman Stock Exchange (ASE) (2019). https://www.ase.com.jo/en

8. Anwar, M.: Business model innovation and SMEs performance—does competitive advantage mediate? Int. J. Innov. Manag. **22**(07), 1850057 (2018)

9. Asiaei, K., Bontis, N., Alizadeh, R., Yaghoubi, M.: Green intellectual capital and environmental management accounting: natural resource orchestration in favor of environmental performance. Bus. Strateg. Environ. **31**(1), 76–93 (2022)

10. Atalay, M., Anafarta, N., Sarvan, F.: The relationship between innovation and firm performance: an empirical evidence from Turkish automotive supplier industry. Procedia Soc. Behav. Sci. **75**, 226–235 (2013)

11. Atkinson, R.: Innovation economics: the race for global advantage. In: Practicing Sustainability, pp. 123–126. Springer (2013)

12. de Azevedo Rezende, L., Bansi, A.C., Alves, M.F.R., Galina, S.V.R.: Take your time: examining when green innovation affects financial performance in multinationals. J. Clean. Prod. **233**, 993–1003 (2019)

13. Bigliardi, B.: The effect of innovation on financial performance: a research study involving SMEs. Innovation **15**(2), 245–255 (2013)

14. Caiazza, S., Galloppo, G., Lattanzio, G.: Industrial accidents: the mediating effect of corporate social responsibility and environmental policy measures. Corp. Soc. Responsib. Environ. Manag. **30**(3), 1191–1203 (2023)

15. Cao, J., Law, S.H., Samad, A.R.B.A., Mohamad, W.N.B.W., Wang, J., Yang, X.: Impact of financial development and technological innovation on the volatility of green growth—evidence from China. Environ. Sci. Pollut. Res. **28**, 48053–48069 (2021)

16. Cao, S., Nie, L., Sun, H., Sun, W., Taghizadeh-Hesary, F.: Digital finance, green technological innovation and energy-environmental performance: evidence from China's regional economies. J. Clean. Prod. **327**, 129458 (2021)

17. Cha, J.E., Serlachius, A.S., Cavadino, A., Kirby, J.N., Consedine, N.S.: Self-compassion and compassion for others: a multiple mediation study of personal values. Mindfulness, 1–13 (2023)

18. Chen, J.: Towards new and multiple perspectives on innovation. Int. J. Innov. Stud. **1**(1), 1–4 (2017)

19. Chen, J., Yin, X., Mei, L.: Holistic innovation: an emerging innovation paradigm. Int. J. Innov. Stud. **2**(1), 1–13 (2018)

20. Chin, W.W.: The partial least squares approach to structural equation modeling. Modern Methods Bus. Res. **295**(2), 295–336 (1998)

21. Choi, J., Han, D.: The links between environmental innovation and environmental performance: evidence for high-and middle-income countries. Sustainability **10**(7), 2157 (2018)
22. Chou, S.F., Horng, J.S., Liu, C.H., Yu, T.Y., Kuo, Y.T.: Identifying the critical factors for sustainable marketing in the catering: The influence of big data applications, marketing innovation, and technology acceptance model factors. J. Hosp. Tour. Manag. **51**, 11–21 (2022)
23. Creswell, J.W.: Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. Pearson Education, Inc. (2012)
24. Darnall, N., Henriques, I., Sadorsky, P.: Adopting proactive environmental strategy: the influence of stakeholders and firm size. J. Manage. Stud. **47**(2), 56–72 (2010)
25. Delice, A.: The sampling issues in quantitative research. Educ. Sci. Theory Pract. **10**(4), 2001–2018 (2010)
26. Derila, C.P., Evana, E., Dewi, F.G.: Effect of environmental performance and environmental costs on financial performance with CSR disclosure as intervening variables. Int. J. Innov. Educ. Res. **8**(1), 37–43 (2020)
27. Dragomir, V.D.: How do we measure corporate environmental performance? A critical review. J. Clean. Prod. **196**, 1124–1157 (2018)
28. Earnhart, D.: The effect of corporate environmental performance on corporate financial performance. Ann. Rev. Resour. Econ. **10**, 425–444 (2018)
29. Edwards-Schachter, M.: The nature and variety of innovation. Int. J. Innov. Stud **2**(2), 65–79 (2018)
30. Erauskin-Tolosa, A., Zubeltzu-Jaka, E., Heras-Saizarbitoria, I., Boiral, O.: ISO 14001, EMAS and environmental performance: a meta-analysis. Bus. Strateg. Environ. **29**(3), 1145–1159 (2020)
31. Eweje, G.: A shift in corporate practice? Facilitating sustainability strategy in companies. Corp. Soc. Responsib. Environ. Manag. **18**(3), 126–136 (2017)
32. Fan, F., Lian, H., Liu, X., Wang, X.: Can environmental regulation promote urban green innovation efficiency? An empirical study based on Chinese cities. J. Clean. Prod. **287**, 125060 (2021)
33. Faul, F., Erdfelder, E., Buchner, A., Lang, A.G.: Statistical power analyses using G* Power 3.1: tests for correlation and regression analyses. Behav. Res. Methods **41**(4), 1149–1160 (2009)
34. Felekoglu, B., Moultrie, J.: Top management involvement in new product development: A review and synthesis. J. Prod. Innov. Manag. **31**(1), 159–175 (2014)
35. Fernández-Portillo, A., Almodóvar-González, M., Sánchez-Escobedo, M.C., Coca-Pérez, J.L.: The role of innovation in the relationship between digitalisation and economic and financial performance. A company-level research. Eur. Res. Manag. Bus. Econ. **28**(3), 100190 (2022)
36. Gollagher, M., Sarkis, J., Clemens, B., Bakstran, L.: A framework of theoretical lenses and strategic purposes to describe relationships among firm environmental strategy, financial performance, and environmental performance. Manag. Res. Rev. (2010)
37. Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Thiele, K.O.: Mirror, mirror on the wall: a comparative evaluation of composite-based structural equation modeling methods. J. Acad. Mark. Sci. **45**, 616–632 (2017)
38. Hair Jr, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P., Ray, S., Ray, S.: Evaluation of reflective measurement models. Partial Least Squares Struct. Eqn. Model. (PLS-SEM) Using R: A Workbook, 75–90 (2021)
39. Hanaysha, J.R., Al-Shaikh, M.E., Joghee, S., Alzoubi, H.M.: Impact of innovation capabilities on business sustainability in small and medium enterprises. FIIB Bus. Rev. **11**(1), 67–78 (2022)
40. Hart, S.L.: A natural-resource-based view of the firm. Acad. Manag. Rev. **20**(4), 986–1014 (1995)
41. Henseler, J., Fassott, G.: Testing moderating effects in PLS path models: an illustration of available procedures. In: Handbook of Partial Least Squares: Concepts, Methods and Applications, pp. 713–735 (2010)
42. Hickmann, T., Elsässer, J.P.: New alliances in global environmental governance: How inter-governmental treaty secretariats interact with non-state actors to address transboundary environmental problems. Int. Environ. Agreements Polit. Law Econ. **20**, 459–481 (2020)

43. Javeed, S.A., Teh, B.H., Ong, T.S., Chong, L.L., Abd Rahim, M.F.B., Latief, R.: How does green innovation strategy influence corporate financing? Corporate social responsibility and gender diversity play a moderating role. Int. J. Environ. Res. Public Health **19**(14), 8724 (2022)

44. Joudeh, A.H.M., Almubaideen, H.I., Alroud, S.F.: Environmental disclosure in the annual reports of the jordanian mining and extraction companies. J. Econ. Fin. Account. **5**(1), 100–107 (2018)

45. Kemp, R.: Technology and the transition to environmental sustainability: the problem of technological regime shifts. Futures **26**(10), 1023–1046 (1994)

46. Khan, S.A.R., Yu, Z., Farooq, K.: Green capabilities, green purchasing, and triple bottom line performance: leading toward environmental sustainability. Bus. Strateg. Environ. **32**(4), 2022–2034 (2023)

47. Khessina, O.M., Goncalo, J.A., Krause, V.: It's time to sober up: the direct costs, side effects and long-term consequences of creativity and innovation. Res. Organ. Behav. (2018)

48. Knoppen, D., Knight, L.: Pursuing sustainability advantage: the dynamic capabilities of born sustainable firms. Bus. Strateg. Environ. **31**(4), 1789–1813 (2022)

49. Konadu, R.: Corporate Environmental Performance and Corporate Financial Performance: Empirical Evidence from the United Kingdom. Bournemouth University (2018)

50. Krejcie, R.V., Morgan, D.W.: Determining sample size for research activities. Educ. Psycholog. Measur. **30**(3), 607–610 (1970)

51. Kyere, M., Ausloos, M.: Corporate governance and firms financial performance in the United Kingdom. Int. J. Financ. Econ. **26**(2), 1871–1885 (2021)

52. Larbi-Siaw, O., Xuhua, H., Owusu, E., Owusu-Agyeman, A., Fulgence, B.E., Frimpong, S.A.: Eco-innovation, sustainable business performance and market turbulence moderation in emerging economies. Technol. Soc. **68**, 101899 (2022)

53. Lavuri, R., Jabbour, C.J.C., Grebinevych, O., Roubaud, D.: Green factors stimulating the purchase intention of innovative luxury organic beauty products: implications for sustainable development. J. Environ. Manage. **301**, 113899 (2022)

54. Le, T.T.: How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance? J. Clean. Prod. **362**, 132228 (2022)

55. Lee, K.-H., Min, B.: Green R&D for eco-innovation and its impact on carbon emissions and firm performance. J. Clean. Prod. **108**, 534–542 (2015)

56. Li, L., Msaad, H., Sun, H., Tan, M.X., Lu, Y., Lau, A.K.: Green innovation and business sustainability: new evidence from energy intensive industry in China. Int. J. Environ. Res. Public Health **17**(21), 7826 (2020)

57. Li, R., Ramanathan, R.: Impacts of industrial heterogeneity and technical innovation on the relationship between environmental performance and financial performance. Sustainability **10**(5), 1653 (2018)

58. Luo, S., Yimamu, N., Li, Y., Wu, H., Irfan, M., Hao, Y.: Digitalization and sustainable development: How could digital economy development improve green innovation in China? Bus. Strateg. Environ. **32**(4), 1847–1871 (2023)

59. Mady, K., Battour, M., Aboelmaged, M., Abdelkareem, R.S.: Linking internal environmental capabilities to sustainable competitive advantage in manufacturing SMEs: the mediating role of eco-innovation. J. Clean. Prod. **417**, 137928 (2023)

60. Manrique, S., Martí-Ballester, C.-P.: Analyzing the effect of corporate environmental performance on corporate financial performance in developed and developing countries. Sustainability **9**(11), 1957 (2017)

61. Matthews, L.M., Sarstedt, M., Hair, J.F., Ringle, C.M.: Identifying and treating unobserved heterogeneity with FIMIX-PLS: Part II–A case study. Eur. Bus. Rev. **28**(2), 208–224 (2016)

62. Muhamad Hazwan, H.: Exploring the Relationship of Innovation and Features Towards New Product Development. Universiti Utara Malaysia (2015)

63. Mukhtaruddin, M., Ubaidillah, U., Dewi, K., Hakiki, A., Nopriyanto, N.: Good corporate governance, corporate social responsibility, firm value, and financial performance as moderating variable. Indonesian J. Sustain. Account. Manag. **3**(1), 55â–64 (2019)

64. Nguyen, T.C., Nguyen, A.H., Tran, T.T.T., Nguyen, T.T.: The impact of green innovation strategy on green product development performance. J. Surv. Fish. Sci. 235–245 (2023)
65. Oltra, V., Saint Jean, M.: Sectoral systems of environmental innovation: an application to the French automotive industry. Technol. Forecast. Soc. Chang. **76**(4), 567–583 (2009)
66. Oltra, V., Saint-Jean, M.: Variety of technological trajectories in low emission vehicles (LEVs): a patent data analysis. Cahier n **2006**, 20 (2006)
67. Pisano, G.P.: You need an innovation strategy. Harv. Bus. Rev. **93**(6), 44–54 (2015)
68. Poser, C., Guenther, E., Orlitzky, M.: Shades of green: Using computer-aided qualitative data analysis to explore different aspects of corporate environmental performance. J. Manag. Control. **22**(4), 413–450 (2012)
69. Rahman, A., Ali, S.M., Jehangir, M.: The moderating effect of environmental collaboration on the green supply chain management practices and sustainability performance in construction industry's. Res. J. Soc. Sci. Econ. Rev. **4**(2), 161–173 (2023)
70. Ringle, C.M., Sarstedt, M., Straub, D.W.: Editor's comments: a critical look at the use of PLS-SEM in "MIS Quarterly." MIS Q. **36**(1), iii–xiv (2012)
71. Rowe, J., Enticott, R.: The role of local authorities in improving the environmental management of SMEs: some observations from partnership programmes in the west of England. Eco-Manag. Auditing **5**(2), 75–87 (1998)
72. Sarkis, B., et al.: A fluid-structure solver to study the relaxation of microcapsules in confined environments. 23ème Congrès Français de Mécanique CFM2017 (2017)
73. Schumpeter, J.A.: Essays: on Entrepreneurs, Innovations, Business Cycles, and the Evolution of Capitalism. In: Schumpeter, J.A., Clemence, R.V., Swedberg, R. (eds.). Transaction Publishers New Brunswick, NJ, USA (1989)
74. Seman, N.A.A., Govindan, K., Mardani, A., Zakuan, N., Saman, M.Z.M., Hooker, R.E., Ozkul, S.: The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. J. Clean. Prod. **229**, 115–127 (2019)
75. Singh, S.K., Del Giudice, M., Chierici, R., Graziano, D.: Green innovation and environmental performance: the role of green transformational leadership and green human resource management. Technol. Forecast. Soc. Chang. **150**, 119762 (2020)
76. Tidd, J., Bessant, J.R.: Managing Innovation: Integrating Technological, Market and Organizational Change. Wiley (2018)
77. Welford, R.: Corporate Environmental Management 3: Towards Sustainable Development. Routledge (2016)
78. Wu, Y., Nambisan, S., Xiao, J., Xie, K.: Consumer resource integration and service innovation in social commerce: the role of social media influencers. J. Acad. Mark. Sci. **50**(3), 429–459 (2022)
79. Xie, X., Huo, J., Zou, H.: Green process innovation, green product innovation, and corporate financial performance: Aa content analysis method. J. Bus. Res. **101**, 697–706 (2019)
80. Yoon, J., Klassert, C., Selby, P., Lachaut, T., Knox, S., Avisse, N., ..., Gorelick, S.M.: A coupled human–natural system analysis of freshwater security under climate and population change. Proc. Natl. Acad. Sci. **118**(14), e2020431118 (2021)
81. Zhang, J.: Delivering environmentally sustainable economic growth: the case of China. Asia Society Report 2–25 (2012)
82. Żelazna, A., Bojar, M., Bojar, E.: Corporate social responsibility towards the environment in Lublin region, Poland: a comparative study of 2009 and 2019. Sustainability **12**(11), 4463 (2020)

The Importance of Mentorship for Women Entrepreneurs in United Arab Emirates (UAE)

Aisha Almheiri, Ashok Chopra, and Akram Haddad

1 Introduction

In recent years, the United Arab Emirates (UAE) has witnessed a surge in entrepreneurial endeavours, with a notable rise in the contributions of women. As the UAE strives towards diversifying its economy and fostering innovation, empowering its female populace becomes imperative. Yet, despite the notable strides and the nation's commitment to gender parity, women entrepreneurs in the UAE continue to grapple with unique challenges ranging from cultural expectations to navigating traditionally male-dominated industries. Amidst these challenges, mentorship is pivotal in bridging gaps, offering guidance, and unlocking potential. This study seeks to highlight the crucial role of mentorship for women within the business environment of the UAE. By delving deep into the nuances of mentorship, its multi-faceted benefits, and its transformative potential, we hope to shed light on why mentorship for women is not just beneficial but essential for the broader socio-economic growth of the nation. The concept of mentoring, which has been around since prehistoric times, is deeply entrenched in the passing on of wisdom and insight from more seasoned persons to those eager to learn and develop [1]. Mentorship describes a bond where a seasoned individual (the mentor) offers guidance, backing, and aid to someone less versed (the mentee) in personal or career growth. Its essence lies in aiding the mentee to tackle obstacles, develop skills, and flourish in their selected career or private endeavours. Such assistance may be through counsel, coaching,

A. Almheiri (✉)
Faculty of Management, Amity Dubai, Dubai, United Arab Emirates
e-mail: aishaa@amitydubai.ae

A. Chopra · A. Haddad
Amity Dubai University, Dubai, United Arab Emirates
e-mail: achopra@amityuniversity.ae

A. Haddad
e-mail: ahaddad@amityuniversity.ae

resource allocation, or opportunity creation. While some mentorships are structured with clear objectives and timeframes, others evolve organically from work or social engagements. Distinguishing mentoring from coaching, the former is a long-term endeavour emphasizing holistic growth encompassing vast facets of one's life or profession.

In contrast, coaching targets immediate, specific objectives or issues. For female entrepreneurs, mentorship is crucial. It offers them access to the expertise, experiences, and connections of established figures in their industry. Given the specific hurdles they face, like negotiating, contending, or managing work-life equilibrium, mentors provide specialized advice and reinforcement. Furthermore, as the Harvard Business Review highlighted, mentorship enhances the likelihood of success for female entrepreneurs. This is attributed to the mentor's role in widening their industry connections, acquainting them with top practices, and offering emotional sustenance throughout their business Mentorship has always been essential to many different disciplines, from learning and training to career advancement. Mentoring is not limited to any region, culture, or field; it is a practice that is extensively adopted and utilized worldwide. It is common for children to look up to their teachers for direction, and it is no different in the workplace, where junior employees often look up to more seasoned leaders for counsel. Non-profits, government agencies, and entrepreneurial hubs have mentorship programs to help their members develop professionally and socially while sharing their experiences and insights [2].

Since women entrepreneurs in the UAE face specific hurdles and impediments to entrance, mentorship plays a significant role in this field. Researchers have shown that those women experience discrimination, a lack of financial resources, and a lack of professional contacts in the UAE.

While the UAE has made commendable strides in addressing the 'wage gap' or 'gender pay gap,' as evidenced by the September 2020 Federal Law Decree ensuring equal pay in the private sector, the landscape of entrepreneurship presents a different set of challenges for women. While structural barriers like pay disparity might be addressed legally, cultural, and systemic difficulties in entrepreneurship can persist. This is where mentorship for women entrepreneurs becomes vital. Mentorship offers guidance, industry-specific knowledge, and support in navigating these complex challenges. With the assurance of equal pay, the focus now shifts to ensuring that women entrepreneurs have the necessary tools, networks, and resources to thrive. A robust mentorship framework provides women a platform to navigate the entrepreneurial ecosystem, leverage opportunities, and overcome any subtle biases or hurdles they may encounter.

In the UAE, women are accorded the same constitutional privileges as men, encompassing education, employment, social and health benefits, and the opportunity to serve in government positions. Impressively, the UAE clinched the top spot among 132 nations in the 'Women Treated with Respect' category of the Social Progress Index 2014. To further fortify women's status and ensure gender equality, the UAE has instituted specific policies, regulations, and initiatives that safeguard women's rights and promote their active participation across societal facets [3]. In essence, mentorship isn't just a value addition; it's a transformative force that drives

growth, fosters innovation, and ensures that women are integral pillars in the UAE's entrepreneurial success story. Mentorship can help close some gaps by providing wise counsel, encouraging women to take calculated risks, and introducing them to useful contacts and resources [4].

The UAE has made significant progress in promoting Women entrepreneurship over the years. In the UAE, 77.6% of women-owned businesses (WOB) are run by people under the age of 40, according to a recent survey by NAMA Women Advancement in collaboration with UN Women In the context of women entrepreneurs, mentorship has gained popularity as a means of helping aspiring women entrepreneurs by break through personal and professional hurdles. Efforts are being undertaken to build enabling environments for women's mentorship initiatives in various regions of the world, including the United Arab Emirates (UAE). The involvement of women in economy plays a pivotal role in driving economic growth and fostering sustainable development. In recent times, there has been a significant increase in the number of businesses owned by women in the UAE, which reflects the country's commitment to empowering women across various industries. Additionally, EViews software helped to identify the women on board, board Independence, board size and size of the Company does not have an impact on ESG, Environmental, Social and Governance of the company [5]. According to UAE Ministry of Economy, the manufacturing sector accounted for approximately 41% of female-owned enterprises in the UAE that incorporated innovative technology into their operations during the year 2020 [3]. Despite the advancements in the UAE entrepreneurship female entrepreneurs face unique challenges that hinder their growth and success. These unique challenges included limited access to funding, stereotypes, and barriers to networking and establishing professional relationships, due to which, a comprehensive exploration of mentorship as a beneficial form of assistance for women is necessary [4, 6]. This research aims to examine the importance of mentorship in providing support to female entrepreneurs in the UAE. To achieve this aim, the following objectives will be pursued.

- To examine the current state of mentorship programs available for women entrepreneurs in the UAE.
- To assess the impact of mentorship on the success and growth of women-led businesses in the UAE.
- To identify the key challenges faced by women entrepreneurs in the UAE and explore how mentorship can address these challenges.
- To provide recommendations for improving and expanding mentorship initiatives for women entrepreneurs in the UAE.

The present study has significant implications for multiple stakeholders, as it will enhance the existing body of knowledge by addressing the current research gap on mentorship for women entrepreneurs within the UAE context. The results of the study will also provide significant contributions to the understanding of the status of UAE mentorship initiatives, their efficacy, and their influence on enterprises led by women. Moreover, the suggestions obtained from this research will offer

practical perspectives for enhancing current mentorship schemes and establishing novel programs customised to the distinctive requirements of women entrepreneurs.

2   Literature Review

Mentoring is essential to the development and progress of entrepreneurs all over the world. There has been a rise in the number of mentorship programmes in recent years that are aimed at helping women entrepreneurs succeed [7]. Within the context of the UAE, this literature review analyses the status of mentorship programmes for female business owners by tracking the historical development of mentorship practices from a worldwide viewpoint [8]. Research from a variety of nations has shown that mentorship can greatly improve the professional and personal growth of female business owners, providing a global perspective on the importance of mentoring [9].

Mentoring has been found to boost women's economic empowerment by boosting their confidence, entrepreneurship abilities, and connections to funding and other resources. Efforts by organisations like the Women Entrepreneurs Finance Initiative (We-Fi) of the International Finance Corporation and the Cherie Blair Foundation for Women have been instrumental in expanding mentorship opportunities for female business owners around the world [10]. Initiatives to promote mentoring among Gulf region women business owners reflect a growing awareness of mentoring's value in this region. Mentorship programmes have been introduced in countries like Saudi Arabia, Qatar, and Bahrain to bolster the economic success of women-run businesses [11]. These programmes have aimed to help women in leadership roles, improve their cultural awareness, and break down social and cultural obstacles.

Contemporarily, the UAE has a robust and active entrepreneurial ecosystem that supports an environment that is favourable for entrepreneurs and innovation. By launching several initiatives, the government supports entrepreneurs in a significant way. These consist of the creation of free zones, expedited procedures for business registration, centres for training and development, mentoring and coaching practices, and financial incentives. The recognition of the importance of mentorship programs in fostering the growth of women entrepreneurs has been acknowledged by the UAE, which has demonstrated commendable endeavours in establishing such initiatives. Jayashree, Lindsay and McCarthy (2021) revealed an instance of such a platform: the Women's Mentorship Network, established by the Dubai Businesswomen Council (DBWC) which facilitates the connection between women entrepreneurs and experienced mentors from diverse industries. This program offers major networking opportunities in addition to facilitating the sharing of knowledge and mentoring. Another initiative as per the analysis [12] that has been specifically created to help entrepreneurs in Dubai is the Dubai SME Mentorship Program which makes it easier for female business owners to work together with seasoned mentors who provide important support in areas like company expansion, strategic planning, and market

analysis [13]. Mentors have been instrumental in facilitating her ability to surmount obstacles, hone her entrepreneurial approach, and cultivate essential networks [14].

2.1 Impact of Mentorship on the Success and Growth of Women-Led Businesses

Over the past decade, UAE-based mentorship programs for women entrepreneurs have increased significantly (Lai et al. 2017). The government of the UAE has implemented numerous laws and efforts to encourage and facilitate the growth of enterprises owned and operated by women. The Dubai Women Establishment has created programs like the Badiri Business Entrepreneurship Programme and the "Women in Technology Mentorship Programme" to support women wanting to start and succeed in the business world [15]. Research has indicated that mentoring programs in the UAE have **favoured** female business owners [16]. Women entrepreneurs who have received mentoring have reported better business success, broader professional connections, and easier access to capital. The impact of mentors in empowering women and inspiring them to launch their businesses cannot be overstated. The UAE's commitment to nurturing new businesses through comprehensive support systems has significantly impacted its standing as the region's leading entrepreneurship center, influencing the women's sector to participate equitably in innovative business development.

Such efforts of the government are influential and have resulted in recognition of the influence of mentorship on the prosperity and advancement of businesses led by women in the UAE. Mentorship initiatives offer female entrepreneurs' crucial guidance, assistance, and expertise that substantially enhance their business accomplishments [17]. The provision of mentorship is a pivotal factor in improving the capacity of women entrepreneurs, as it endows them with the requisite proficiencies, cognizance, and connections to surmount obstacles, make informed choices, and capitalize on prospects. Mentors provide tailored assistance in various domains, including business strategy, financial management, marketing, and networking, catering to the unique obstacles women entrepreneurs encounter in the UAE's entrepreneurial milieu [18]. Empirical evidence suggests that women entrepreneurs in the UAE who receive mentorship exhibit a higher probability of obtaining funding, achieving more significant revenue growth, and demonstrating enhanced business sustainability compared to their counterparts who do not receive such guidance [15]. Additionally, research revealed that mentors offer valuable advice to women in navigating the intricacies of the local business environment, comprehending cultural subtleties, and accessing pertinent resources [19].

2.2 Challenges Faced by Women Entrepreneurs in the UAE and the Role of Mentorship

Women entrepreneurs operating in the UAE encounter distinct obstacles that may impede their business prosperity and expansion. Mentorship programs are deemed essential in tackling these challenges and facilitating the empowerment of women entrepreneurs in overcoming obstacles. A significant obstacle encountered by women entrepreneurs in the UAE pertains to the restricted availability of financial resources and investment prospects [20]. The absence of adequate financial backing for businesses led by women may be attributed to some challenges such as societal standards. An additional obstacle pertains to the management of familial obligations and commercial exigencies [7]. Cultural and societal expectations frequently impose supplementary demands on female entrepreneurs, rendering it arduous to effectively balance both responsibilities. Furthermore, the absence of a robust support system and restricted availability of pertinent networks and affiliations may impede women entrepreneurs in the UAE [15].

2.3 Recommendations for Improving and Expanding Mentorship Initiatives

To enhance and broaden mentorship programs for women entrepreneurs in the UAE, several suggestions can be implemented, including implementing measures to augment the availability and ease of access to mentors. Establishing mentorship networks comprising professionals from diverse industries and backgrounds can facilitate the attainment of this objective, as it enables access to a broad spectrum of expertise and perspectives [21]. Moreover, mentorship initiatives must engage in deliberate efforts to attract and advance female mentors and furnish aspiring female entrepreneurs with relatable exemplars [22]. Furthermore, it is recommended that mentorship initiatives precede pairing mentors and mentees based on their requirements, areas of focus, and alignment with the industry [23]. The efficacy of the mentorship alliance can be enhanced by providing personalized guidance and support from a mentor who is suitably matched to the mentee. While a powerful tool for guiding and advising budding entrepreneurs, mentorship is just one facet of the holistic support system that women in the UAE's business landscape require. Recently, there's a growing recognition of the value of coaching programs tailored explicitly for these women; unlike mentorship, which often focuses on sharing personal experiences and insights, coaching zeroes in on developing specific skills, honing strategic thinking, and providing actionable feedback.

Moreover, an emerging trend emphasizes the importance of "snugness" for women in business. This concept entails creating a secure, comfortable, and supportive environment where women can openly discuss challenges, share ideas, and seek guidance without fear of judgment. Such an environment can significantly enhance

their confidence and decision-making abilities. Integrating mentorship, coaching, and snugness initiatives offers a comprehensive support structure, ensuring that women entrepreneurs in the UAE are well-equipped to navigate the multifaceted challenges of the entrepreneurial world.

3   Research Methodology

The study's research methodology utilised a qualitative and quantitative research design, which involved the integration of surveys and interviews. The philosophical orientation selected for this study was interpretivism, which prioritises comprehending and construing the personal experiences and viewpoints of those who are engaged in the phenomenon under investigation [1]. Additionally, the proposed approach for this study is an inductive approach, which facilitated the exploration of novel insights and comprehension through the examination of gathered data [10]. A combination of quantitative and qualitative research methodologies was utilised to guarantee a thorough examination. The study employed a quantitative research design to collect data via surveys. The primary objective of the survey was to obtain numerical data on the frequency, trends, and consequences of mentorship for female entrepreneurs in the UAE. Conversely, the acquisition of qualitative data was executed via interviews, thereby furnishing comprehensive and intricate perspectives into the encounters, viewpoints, and individual chronicles of female entrepreneurs and mentors.

Employing primary data collection methods facilitates direct interaction with participants, thereby ensuring the accurate capture of their voices and experiences. Surveys are a good technique for gaining a comprehensive perspective that allows for the generalisation of results to a larger population [24]. On the other hand, interviews are useful for carrying out a thorough investigation and contextual awareness of the nuances and specifics of mentoring in the UAE. The process of analysing data encompasses a visual analysis approach, which entailed the utilisation of graphs, charts, and diagrams. This methodology allows the investigator to discern repetitive motifs, regularities, and correlations within the gathered information, thereby furnishing a comprehensive comprehension of the subject matter under investigation. The utilisation of visual analysis aids in the presentation of research outcomes in a succinct and comprehensible fashion, thereby augmenting their impact and communicability.

Moreover, the present study utilised purposive sampling as the sampling technique, with a focus on selecting 15 women entrepreneurs and mentors who possess prior experience with mentorship programs in the UAE. Further, the study adhered to various ethical principles to safeguard the welfare and interests of the participants. The study ensured that all participants provide informed consent, with a focus on their voluntary participation, comprehension of the study's objectives, and awareness of their entitlements to confidentiality and withdrawal. The preservation of anonymity was also be ensured through the utilisation of participant codes instead of personal identifying information. The safeguarding of data confidentiality was upheld using

secure storage and limited access. Furthermore, due consideration will be given to upholding the privacy and dignity of the participants, and any possible conflicts of interest will be revealed and handled appropriately.

4   Discussion

The study's discussion section delves into the value of mentorship for women entrepreneurs in the UAE. Using a combination of survey data and in-depth interviews, it delivers findings that fill in the gaps in our awareness of the topic at hand.

The themes in Appendix 1, revealed the need for more accessible mentorship courses for women entrepreneurs was generally acknowledged by respondents. Increasing the diversity of programmes available and working to make them widely accessible are two ways to achieve women's skills and knowledge within entrepreneurial businesses. It has been revealed in a survey (see Fig. 1 in Appendix 2) that approx. 64% of the respondents have their business in the UAE, while 27% of them denied it. In addition, 44.8% of the participants responded that they work in the manufacturing field, 36.5% claimed that they work in the retail sector and only 18.8% claimed that they work in the service industry (see Fig. 2 in Appendix 2). Moreover, findings also revealed that only 53.5% of respondents participated in mentorship program, while 28.3% of respondents denied the statement and 18.2% of them were not sure (see Fig. 3 in Appendix 2). In addition, 49.5% of the participants participated in the women's mentorship program, while 34% of respondents participated in the Dubai SME mentorship program and only 16.5% of the people participated in khalifa fund's Mashrouy initiative (see Fig. 4 in Appendix 2). Further, the need for mentorship courses to promote an accepting environment was emphasised by the participants. As, when respondents were asked how mentorship has impacted the success and expansion of their businesses, 54.6% of them gave good responses, 12.4% gave negative responses, and 33% gave neutral responses (see Fig. 5 in Appendix 2). In addition, as per the findings 43.9% of respondents claim that their mentor helped in business strategy, 49% were given assistance in financial management; 39.8% were being assisted in marketing while only 24.5% of them were being assisted in networking (see Fig. 6 in Appendix 2). Combating any ingrained gender, preconceptions and promoting equitable access to resources for women in business are two examples of how to do this. It has also been revealed from the findings that 71% of the respondents claim that they didn't faced challenges related to gender biases and stereotypes in their journey; while only 28.6% said no (see Fig. 7 in Appendix 2). In addition to this, 53.5% of people assume that mentorship assisted them in overcoming these challenges; while 31.3% said vice versa and 15.2% of them were not sure (see Fig. 8 in Appendix 2).

However, several respondents such as 28.4% of the participants of the study voiced concern over the lack of funding and services available to women company entrepreneurs (see Fig. 9 in Appendix 2). Giving people grants, loans, or other forms

of financial assistance to help them launch their businesses or grow would fall under this category. Moreover, 54.1% of the participants assumed that mentorship has been important for navigating local business environment; while 18.4% of the participants disagreed with the statement (see Fig. 10 in Appendix 2).

Furthermore, the findings also revealed that 59.2% of the participants agreed that they would recommend mentorship programs while 23.5% disagreed that they would not recommend it (see Fig. 11 in Appendix 2). In addition, findings also reveal that 48.4% of the respondents claim that mentorship programs should focus more on providing female mentors; while 24.3% disagreed with that statement and 27.4% of them were not sure regarding that statement (see Fig. 12 in Appendix 2). In addition, 44, 4% of the participants agreed that their mentorship program assisted them while 28.3% disagreed and 27.3% were neutral (see Fig. 13 in Appendix 2). Moreover, the findings also revealed that 53.1% of the participants thinks that mentorship initiatives are significant for empowerment of women entrepreneurship in UAE; while 26.5% thinks that it is somewhat important and only 20.4% of the participants claim that it is not important at all (see Fig. 14 in Appendix 2). When asked what improvements they would recommend for current mentorship programmes for women entrepreneurs in the UAE, 39.2% said they would make them more accessible and available, 12.4% said they would address and reduce gender biases in some non-governmental places and stereotypes within the mentorship programmes, 25.8% said they would offer specialised training and workshops tailored to particular industries, and 22.7% said they would give more funding and resources (see Fig. 15 in Appendix 2).

4.1 Examination of Current Mentorship Programs

This subtheme offers an extensive summary of the many UAE-based mentorship programmes catering specifically to women entrepreneurs. It delves into the myriad non-profits, government programs, and for-profit enterprises that provide mentorship possibilities [12]. The focus is on figuring out who the major actors are and what exactly these programmes are trying to accomplish. It is the purpose of this section to evaluate the accessibility and availability of mentorship programmes for women entrepreneurs in the UAE [25]. Eligibility requirements, application processes, and levels of assistance are among the topics covered. It also investigates language hurdles, geographical constraints, and cultural norms that can prevent women entrepreneurs from taking advantage of these opportunities. This investigation delves into the breadth and depth of mentorship programmes to gain insight into their impact. It looks at how well these initiatives support female business owners at varying points in their careers, from early-stage start-ups to well-established corporations [8].

4.2   Impact of Mentorship on Women-Led Businesses

This subtheme evaluates how mentoring affects enterprises run by women entrepreneurs has been analysed. Research on the effects of mentoring on female business owners draws on scholarly articles, company reports, and real-world examples [26]. The review focuses on the most important results, current trends, and unanswered questions in the field. Women-led enterprises that have been provided with mentoring services are the primary focus of this evaluation. The expansion of profits, market share, and revenue are just a few of the indicators of success that are analysed. The evaluation seeks to measure the impact and effectiveness of mentorship programmes by comparing the outcomes of women-led enterprises with and without mentorship support. This subtheme analyses and investigates the most important success variables for women business owners that can be traced back to their mentors.

4.3   Challenges Faced by Women Entrepreneurs in the UAE

The unique problems and restrictions that UAE women business owners face are discussed. Considerations including cultural norms, prejudices against women, availability of money, lack of contacts, work-life balance, and societal expectations are analysed [27]. Women business owners have their own set of problems to overcome, and this analysis helps shed light on those difficulties. In this analysis, people focus on how the highlighted challenges affect the growth and success of women-led enterprises in the UAE. It delves into the manner in which these obstacles impede business growth, restrict entry to vital resources, and prevent expansion [28]. It emphasises the significance of addressing these difficulties for the overall growth of women business owners by exploring their repercussions. The significance of mentorship is examined in helping female business owners in the UAE overcome obstacles in the industry [29]. Mentorship programmes are studied for their potential to aid women entrepreneurs in overcoming obstacles and navigating the complexity of the business world. The potential for mentorship to impart strategic guidance, create networks, boost self-assurance, and open doors to new learning possibilities are all topics covered in this investigation. However, it elucidates the distinctive difficulties encountered by women entrepreneurs in the UAE by naming such difficulties, assessing their effects, and investigating the function of mentorship. It stresses mentorship as an important tool for encouraging and assisting women entrepreneurs to overcome these barriers and achieve business growth and success.

4.4 Recommendations for Improving Mentorship Initiatives

Reference to results from (Appendix 3) findings yield significant insights, suggesting several areas of enhancement. There's a clear indication of thriving local entrepreneurial spirit, as 64% of these entrepreneurs operate within the UAE. It's crucial to bolster local business infrastructure, incentives, and policies tailored for them to maximize this potential. Given the prominence of the manufacturing (44.8%) and retail sectors (36.5%) among women entrepreneurs, offering specific training and support programs geared towards these domains would be beneficial. The advantages of mentorship are undeniable, with over half the respondents acknowledging its value. Hence, the push for more comprehensive and accessible mentorship programs is essential, especially those tailored to women, as nearly half of the participants favoured women-centric mentorships. Addressing gender biases is imperative; 71% didn't report gender-related challenges, but the remainder indicates room for improvement in ensuring an equitable business landscape. Funding concerns 28.4% of respondents, signalling the need for more robust financial support mechanisms or initiatives catering specifically to women entrepreneurs. Specialized training workshops can further amplify their success, especially for the dominant sector. As mentorship has shown positive outcomes in navigating local environments, promoting more networking opportunities for these entrepreneurs is valuable. Continuous feedback is essential to refine these programs over time. Lastly, dedicating more resources towards mentorship programs, emphasizing the provision of female mentors, can further enrich the entrepreneurial ecosystem in the UAE. Work harder to get the word out about women-focused mentoring programmes already in place in the UAE [11]. To do this, businesses can use digital platforms, collaborate with other corporate groups and networks, and run targeted advertising campaigns. It is also important to make the mentorship process easily accessible by providing several entry points for applications and interactions. Increase the variety of mentors available by soliciting their assistance from a wide range of professions, educational levels, and life experiences [4]. As a result, women entrepreneurs will have access to more information and advice. To build mentorship programmes and facilitate interactions between mentors and mentees, professionals, businesses, and successful women business owners should work together. Understand that women business owners have certain requirements and preferences. However, provide mentoring programmes with a range of options to suit the needs of entrepreneurs at various stages of their journeys [30]. Group mentoring, peer-to-peer mentoring, and other specialised mentoring programmes can all fall under this category. Similarly, give the mentors all the tools they need to help women business owners succeed by providing training programmes that teach them how to be effective guide and support systems [31]. Mentors can be made more efficient by the provision of opportunities for ongoing professional development. Moreover, encourages women business owners to connect with mentors by organising conferences, workshops, and other networking events for them to attend [32]. These digital meeting places can facilitate networking, information sharing,

Table 1 Developed themes and their analysis

Themes	Analysis
Increase the availability and accessibility of mentorship programs	There was widespread agreement among respondents that more readily available mentorship programmes for women entrepreneurs are needed. One way to accomplish this would be to increase the variety of programmes offered and work to make them widely available
Address and mitigate gender biases and stereotypes within the mentorship programs	Participants stressed the need for mentorship programmes to foster an open and accepting atmosphere. This includes combating any inherent gender stereotypes and encouraging equitable access to business resources for women in some non-governmental places
Provide more funding and resources to support women entrepreneurs	Several of those who participated in the survey expressed concern that women entrepreneurs do not receive enough funding and resources. Providing grants, loans, or other types of financial aid to help people get their enterprises off the ground or expand would fall under this category
Offer specialised training and workshops tailored to specific industries	Women entrepreneurs across sectors have varied needs and issues, hence respondents recommended giving industry-specific training and workshops. This could improve their chances of success by teaching those specialised skills and expertise in their chosen field

and cooperation. Women business owners can benefit greatly from the increased availability of mentors and the creation of mentorship alumni networks (Table 1).

5 Conclusion

In sum, the research underscores the indispensable role of mentorship for female entrepreneurs in the UAE. Delving into current mentoring initiatives, their impact on women-led businesses, and the challenges female entrepreneurs grapple with, the findings magnify the significance of mentorship in empowering these women to surmount hurdles, scale their ventures, and fortify their commitment to success. However, pivotal areas need enhancement, such as ensuring greater accessibility, fostering inclusivity, and delivering personalized mentorship approaches. Programs that emphasize these facets can better cater to the nuanced needs of female entrepreneurs, thereby propelling the growth and dynamism of the UAE's entrepreneurial ecosystem.

6 Practical and Theoretical Contribution

This research contributes to both theory and practise. Contribution to Theory and Practise. In a practical sense, it examines the current mentorship programmes in the UAE for women entrepreneurs and suggests ways in which they can be enhanced. Mentors, organisations, and politicians can learn a lot from the research done on the effects of mentoring on women-owned enterprises. In addition to making practical advice for programme design and implementation, the study contributes to the theoretical understanding of mentorship by examining its role in resolving issues unique to women business owners.

7 Future Recommendation of the Study

The study recommends doing longitudinal studies to monitor the lasting effects of mentoring on women-led enterprises in the UAE in the future. It can be useful to learn more about the precise mentoring practices and tactics that produce the most significant results. The elements that lead to the success of women business owners can be better understood if investigation was on the interplay between mentoring and other support mechanisms like access to funding and networking opportunities. Finally, it is important to prioritise continuing monitoring and enhancement of mentorship programmes based on feedback from mentees and mentors.

Appendices

Appendix 1

Themes	Analysis
Increase the availability and accessibility of mentorship programs	There was widespread agreement among respondents that more readily available mentorship programmes for women entrepreneurs are needed. One way to accomplish this would be to increase the variety of programmes offered and work to make them widely available
Address and mitigate gender biases and stereotypes within the mentorship programs	Participants stressed the need for mentorship programmes to foster an open and accepting atmosphere. This includes combating any inherent gender stereotypes and encouraging equitable access to business resources for women in some non-governmental places
Provide more funding and resources to support women entrepreneurs	Several of those who participated in the survey expressed concern that women entrepreneurs do not receive enough funding and resources. Providing grants, loans, or other types of financial aid to help people get their enterprises off the ground or expand would fall under this category
Offer specialised training and workshops tailored to specific industries	women entrepreneurs across sectors have varied needs and issues, hence respondents recommended giving industry-specific training and workshops. This could improve their chances of success by teaching those specialised skills and expertise in their chosen field

Appendix 2

See Fig. 1.

The analysis of question 1 which is about owning a business in the UAE shows that 64 respondents said yes, 27% said no and 9% responded maybe (Fig. 2).

The analysis of question no 2 which is about related to the sector of your business shows that 44.8% of respondents responded manufacturing, 36.5% said retail business and 18.8% respondents responded about services (Fig. 3).

The analysis of question 3 which is about participation in a mentor program shows that then 53.5% of respondents said yes and 18.2% responded no whereas 28.3% responded maybe (Fig. 4).

1. Do you own a business in the United Arab Emirates?
100 responses
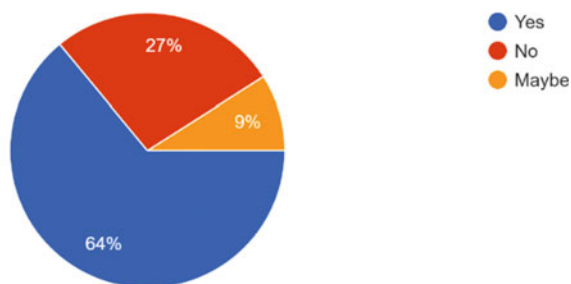
Fig. 1 Business in UAE

2. In which sector is your business?
96 responses
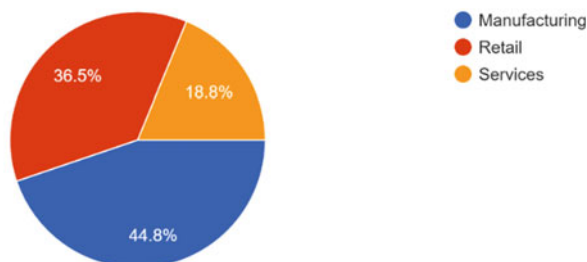
Fig. 2 Sector of business

3. Have you ever participated in a mentorship program?
99 responses
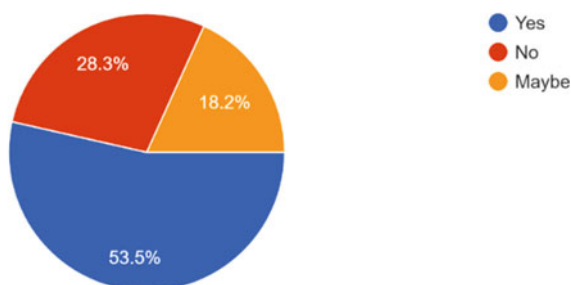
Fig. 3 Participant mentorship program

4. Which mentorship program did you participate in?
97 responses
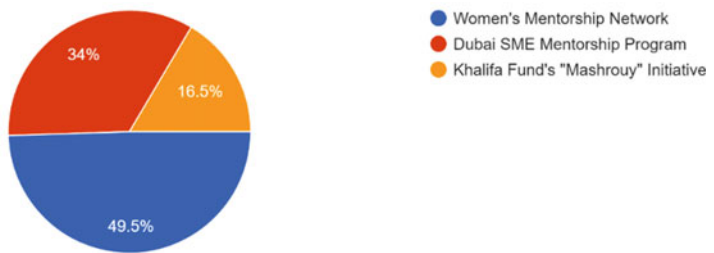
Fig. 4 Kind of participant mentorship

The analysis of question 4 which is about which mentorship program did you participate shows that 49.5% of respondents said women's mentorship network, 34% said Dubai SME mentorship Program and 16.5% said Khalifa Fund's Mashrouy Initiative (Fig. 5).

The analysis of question no 5 which is about how mentorship has affected the success and growth of business shows that, 54.6% of participants responded positively, 12.4% responded negatively and 33% responded neutral (Fig. 6).

The analysis of question no 6 which is about what areas of business the mentor provided assistance shows that 43% responded as business strategy, 49% as financial management, 39% as marketing and 24% as networking (Fig. 7).

The analysis of question no 7 which is about facing challenges related to gender biases and stereotypes in the business entrepreneurial journey shows that 71.4% of participants said no and 28.6% said yes (Fig. 8).

The analysis of question 8 which is about that how effectively the mentorship program helped to overcome the challenges shows that 53.5% responded effectively, 31.3% responded neutral and 15.2% responded ineffectively (Fig. 9).

5. How has mentorship affected the success and growth of your business?
97 responses
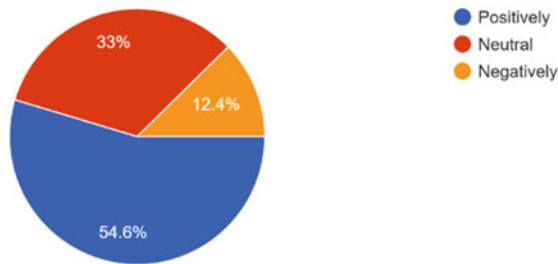
Fig. 5 Effect of mentorship on the success and growth of business

6. What areas of your business did your mentor provide assistance in? (Select all that apply)
98 responses
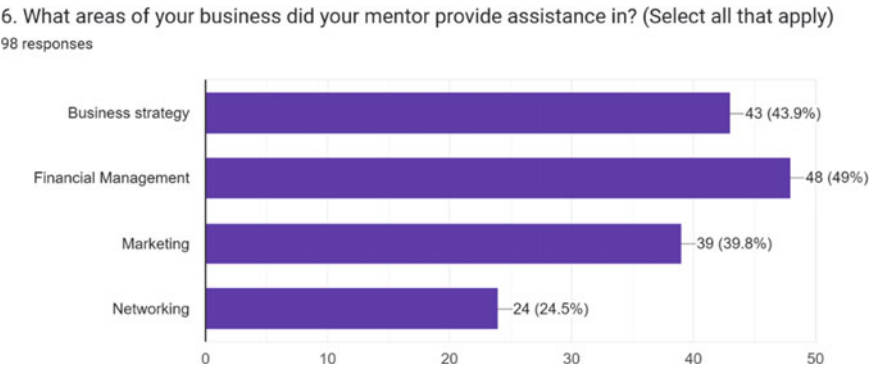
Fig. 6 Assistance in business

7. Have you faced challenges related to gender biases and stereotypes in your entrepreneurial journey?
98 responses
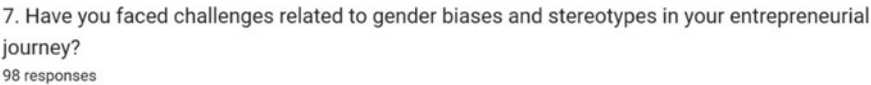
Fig. 7 Challenges in entrepreneurial journey

8. How effectively did the mentorship program help you overcome these challenges?
99 responses
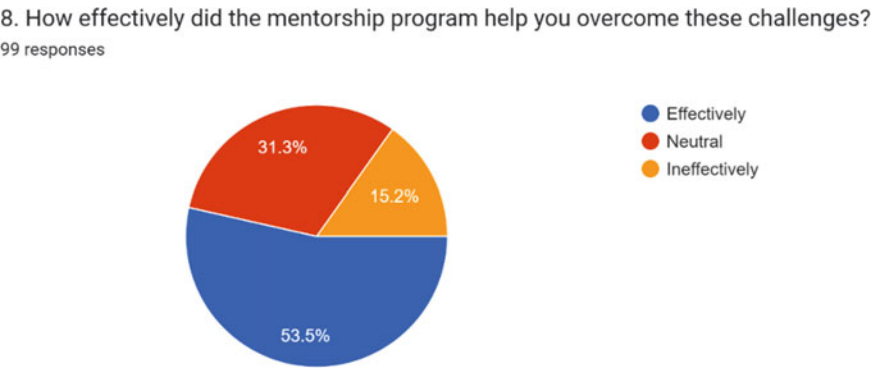
Fig. 8 Mentorship aids in overcoming challenges

9. Did the mentorship program help you secure funding or investment for your business?
95 responses
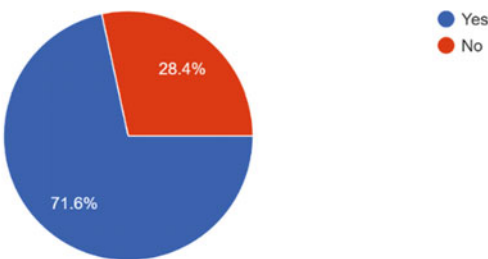
Fig. 9 Mentorship helps in securing fund

The analysis of question no 9 which is about mentorship programs that help to secure funding or investment for the business shows that 71.6% of participants said yes and 28.4% said no (Fig. 10).

The analysis of question no 10 which is about how important mentorship has been in navigating the local business environment and understanding the cultural subtleties shows that 54.1% of participants said very important, 27.6% responded somewhat and 18.4% responded not at all important (Fig. 11).

The analysis of question no 11 which is about whether would you recommend mentorship programs to other women entrepreneurs in the UAE from 98 responses shows that 59.2% responded yes, 17.3% responded maybe and 23.5% responded no (Fig. 12).

The analysis of question no 12 which is about their opinion from the respondents about the focus of mentorship programs more on providing female mentors shows that 48.4% of participants said yes, 27.4% said maybe and 24.2% said no (Fig. 13).

10. How important has mentorship been in navigating the local business environment and understanding cultural subtleties?
98 responses
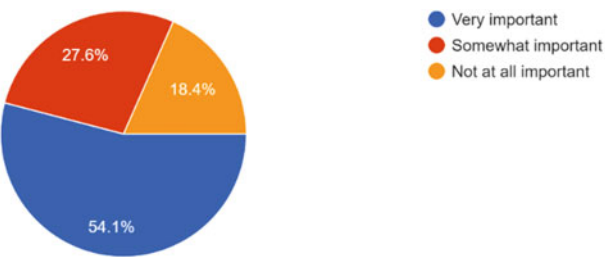
Fig. 10 The importance of mentorship in local business and cultural subtitles

11. Would you recommend mentorship programs to other women entrepreneurs in the UAE?

98 responses
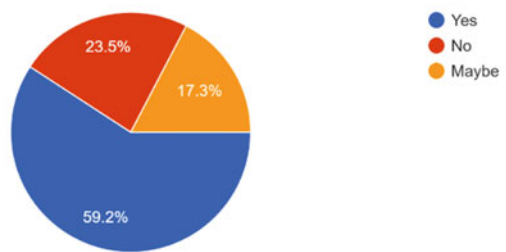
Fig. 11   Recommendations in mentorship for women

12. In your opinion, should mentorship programs focus more on providing female mentors?

95 responses
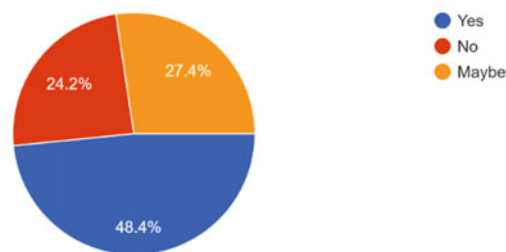
Fig. 12   Focus of mentorship programs for female mentors

13. Have the mentorship programs you participated in been adequately tailored to your specific needs and requirements?

99 responses
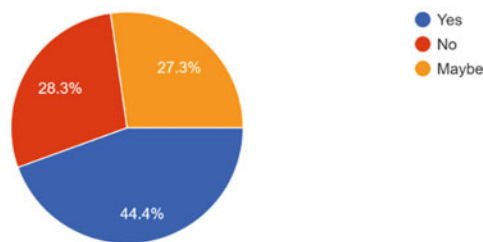
Fig. 13   The impact of mentorship on specific needs

The analysis of question no 13 which is about the mentorship programs that either respondent participated in being adequately tailored to their specific needs and requirements shows that 44.4% of participants responded yes, 27.3% responded maybe and 28.3% responded no (Fig. 14).

The analysis of question no 14 which is about how important are mentorship initiatives for the empowerment of women entrepreneurs in UAE shows that 53.1% of participants responded as extremely important, 26.5% as somewhat important and 20.4% as not all important (Fig. 15).

The analysis of question no 15 which is about what improvements would respondents suggest for existing mentorship initiatives for women entrepreneurs in UAE stated that 39.2% of participants responded as increasing the availability and accessibility of mentorship programs, 12.4% responded as addressing and mitigating gender biases and stereotypes within the mentorship programs, 25.8% showed offer specialised training and workshops tailored to specific industries and 22.7% responded as provide more funding and resources to support women entrepreneurs.

Fig. 14 Mentorship initiatives for women's empowerment

Fig. 15 Suggestion in mentorship for women entrepreneurs

Appendix 3 (Research Findings)

Topic/category	Specific detail/query	Percentage/value
Business Demographics		
Location	Businesses located in the UAE	64% yes/27% no
Business sectors	Manufacturing	44.8%
	Retail	36.5%
	Service	18.8%
Mentorship participation		
General programs	Respondents participated in mentorship programs	53.5% yes/28.3% no/18.2% unsure
Specific programs	Women's mentorship	49.5%
	Dubai SME mentorship	34%
	Khalifa fund's Mashrouy initiative	16.5%
Impact of mentorship	Business success and expansion due to mentorship	54.6% positive/12.4% negative/33% neutral
Assistance areas	Business strategy	43.9%
	Financial management	49%
	Marketing	39.8%
	Networking	24.5%
Gender-related challenges	Faced gender biases and stereotypes	71% no/28.6% yes
	Mentorship helped in overcoming these challenges	53.5% yes/31.3% no/15.2% unsure
Funding concerns	Concern over lack of funding and services for women entrepreneurs	28.4%
Local business environment	Mentorship importance in navigating local environment	54.1% important/18.4% not important
Recommendations	Would recommend mentorship programs	59.2% yes/23.5% no
	Mentorship programs should have more female mentors	48.4% agree/24.3% disagree/27.4% unsure
Mentorship effectiveness	Was their mentorship program helpful?	44.4% yes/28.3% no/27.3% neutral
Mentorship importance	Mentorship's significance for women's entrepreneurial empowerment	53.1% very/26.5% somewhat/20.4% not at all
Improvement suggestions	Make programs more accessible	39.2%

(continued)

Topic/category	Specific detail/query	Percentage/value
	Address gender biases within mentorship	12.4%
	Offer industry-specific training/workshops	25.8%
	Provide more funding/ resources	22.7%

References

1. Starcher, D.C.: Women Entrepreneurs: Catalysts for Transformation. European Bahá'í Business Forum (1996). Mitchell, A.L.: Woman-to-woman mentorship: exploring the components of effective mentoring relationships to promote and increase women's representation in top leadership roles. University of La Verne, La Verne (2018)
2. Anctil, E.: Sharing space: an examination of the relationship between child-constructed spaces and spatial empowerment in a selection of children's picturebooks (Doctoral dissertation, University of British Columbia) (2018)
3. Global Entrepreneurship Monitor (GEM): [Online] Available at: https://gemconsortium.org/economy-profiles/uae-2. Last accessed 2023/09/06
4. Sagar, G., Anand, B., Perumalla Varalaxmi, A.S., Raj, S.: The role of entrepreneurship in economic growth and development. J. Surv. Fish. Sci. **10**(1S), 5940–5955 (2023)
5. Preethi, S.J.G., Verma, K.R.: An overview of pay disparity and gender gap among selective IT employees in urban Bangalore. In: International Conference on Economics, Business and Sustainability, pp. 185–191. Springer Nature, Singapore (2023)
6. Zuñiga-Collazos, A., Castillo-Palacio, M., Montaña-Narváez, E., Castillo-Arévalo, G.: Influence of managerial coaching on organisational performance. Coach.: An Int. J. Theory, Res. Pract. **13**(1), 30–44 (2020)
7. Welsh, D.H., Kaciak, E., Minialai, C.: The influence of perceived management skills and perceived gender discrimination in launch decisions by women entrepreneurs. Int. Entrep. Manag. J. **13**, 1–33 (2017)
8. Ozasir-Kacar, S., Essers, C.: The regulatory environment for migrant and women entrepreneurs. Int. Migr. **61**(2), 107–122 (2023)
9. The Official Portal of the UAE Government: [Online] Available at: https://u.ae/en/about-the-uae/human-rights-in-the-uae/women-rights-in-the-uae. Last accessed 2023/08/06
10. Mona Ataya | eTrade for Women Advocate: [Online]. Available at: https://etradeforall.org/et4w_member/mona-ataya/. Last accessed 2023/06/07
11. Mullen, C.A., Klimaitis, C.C.: Defining mentoring: a literature review of issues, types, and applications. Ann. N. Y. Acad. Sci. **1483**(1), 19–35 (2021)
12. Mogaji, E., Nguyen, N.P.: Managers' understanding of artificial intelligence in relation to marketing financial services: insights from a cross-country study. Int. J. Bank Market. **40**(6), 1272–1298 (2022)
13. Bolton-King, R.S.: Student mentoring to enhance graduates' employability potential. Sci. Justice **62**(6), 785–794 (2022)
14. Mounzer, L.: ICT impact on female entrepreneurs in Lebanon and UAE. In: The Palgrave Handbook of Gender, Media and Communication in the Middle East and North Africa, pp. 531-549. Springer, Cham (2023)

15. Al-Ali, H.S.A.A.: The Experience of Female Entrepreneurs in the UAE. University of Exeter, Exeter (2019)
16. Janiszewski, C., van Osselaer, S.M.: The benefits of candidly reporting consumer research. J. Consum. Psychol. **31**(4), 633–646 (2021)
17. Bastian, B.L.: Empowerment against all odds: women entrepreneurs in the Middle East and North Africa. In: Entrepreneurship: Concepts, Methodologies, Tools, and Applications, pp. 1975–1987. IGI Global (2017)
18. Al-Qahtani, M., Zguir, M.F., Ari, I., Koç, M.: Female entrepreneurship for sustainable economy and development—challenges, drivers, and suggested policies for resource-rich countries. Sustainability **14**(20), 13412 (2022)
19. Tahir, R., Raza, A.: Motivations of the female entrepreneurs to start online businesses in the UAE. Int. J. Innov. Technol. Manag. **17**(07), 2050047 (2020)
20. Ventura, A.M., Morillas, L., Martins-Loução, M.A., Cruz, C.: Women's empowerment, research, and management: their contribution to social sustainability. Sustainability **13**(22), 12754 (2021)
21. Lai, D.W., Shankar, J., Khalema, E.: Unspoken skills and tactics: essentials for immigrant professionals in integration to workplace culture. J. Int. Migr. Integr. **18**, 937–959 (2017)
22. Mkhwanazi, N.: An investigation of InvoTech business incubation programme and its effect on entrepreneurs (Doctoral dissertation) (2023)
23. Giacumo, L.A., Chen, J., Seguinot-Cruz, A.: Evidence on the use of mentoring programs and practices to support workplace learning: a systematic multiple-review. Perform. Improv. Q. **33**(3), 259–303 (2020)
24. Remaker, D.N., Gonzalez, M.M., Houston-Armstrong, T., Sprague-Connors, G.: Women of color and mentorship in graduate training. Train. Educ. Prof. Psychol. **15**(1), 70 (2021)
25. Ghak, T.E., Zarrouk, H.: Opportunities and challenges facing SMEs' access to financing in the UAE: an analytical study. In: Contemporary Research in Accounting and Finance: Case Studies from the MENA Region, pp. 311–328 (2022)
26. Nate, S., Grecu, V., Stavytskyy, A., Kharlamova, G.: Fostering entrepreneurial ecosystems through the stimulation and mentorship of new entrepreneurs. Sustainability **14**(13), 7985 (2022)
27. Akanji, B., Mordi, C., Ajonbadi, H.A.: The experiences of work-life balance, stress, and coping lifestyles of female professionals: insights from a developing country. Empl. Relat.: Int. J. **42**(4), 999–1015 (2020)
28. Schermerhorn Jr, J.R., Bachrach, D.G.: Management. John Wiley & Sons (2023)
29. Al Naqbi, S., Vidhyasri, G.: Exploring women's leadership experiences: challenges, successes, and the role of support networks. In: CONFERENCE 2023
30. Kunaka, C., Moos, M.N.: Evaluating mentoring outcomes from the perspective of entrepreneurs and small business owners. Southern Afr. J. Entrep. Small Bus. Manag. **11**(1), 1–11 (2019)
31. Thirumagal, P.G., Tirkey, A., Suresh, S.: Moderating effect of board size and board independence between women on board and ESG. In: International Conference on Economics, Business and Sustainability, pp. 16–25. Springer Nature, Singapore (2023)
32. Queirós, A., Faria, D., Almeida, F.: Strengths and limitations of qualitative and quantitative research methods. Eur. J. Educ. Stud. (2017)

Frugality, Altruism, and Consciousness for Sustainable Consumption Amongst Adults in India

N. C. Kiran Babu, Mansi Agarwal, Insha Aimen, Lovely Alex, Nutan Burman, and Hetvi Savla

1 Introduction

In an ever-changing world, where civilizations face issues like climate change, resource depletion, and social inequities, comprehending the dynamics between consumer behaviour, environmental sustainability, and societal well-being is of significant interest.

In light of the relevance of such behaviours, this study aims to investigate the interaction of frugality, altruism, and consciousness in influencing sustainable consumption practices among adults in India. Researchers and policymakers are seeking ways to promote more responsible and conscientious consumption patterns. By comprehensively examining these factors, the study contributes to the development of

N. C. Kiran Babu (✉) · M. Agarwal · I. Aimen · L. Alex · N. Burman · H. Savla
Department of Psychology, Alliance University, Anekal, Bangalore, India
e-mail: kiran.nc@alliance.edu.in

M. Agarwal
e-mail: 22mpla31@kristujayanti.com

I. Aimen
e-mail: 22mpla03@kristujayanti.com

L. Alex
e-mail: 22mpla29@kristujayanti.com

N. Burman
e-mail: 22mpla14@kristujayanti.com

H. Savla
e-mail: 22mpla42@kristujayanti.com

strategies and interventions that can guide individuals, businesses, and policymakers toward fostering a more sustainable and responsible future.

2 Literature Review

The idea of frugality has its origins in Asian sub-continents and is a key and distinctive component of a sustainable lifestyle. It calls for decreased consumption and, consequently, reduced behavioural practices that have an adverse effect on the "availability and sustainability of natural resources." [25] Frugal behaviour is defined as a purposeful and intentful decision that goes beyond just economic conditions and financial scenarios [21] which encompasses a range of self-regulated consumer actions involving disciplined and mindful purchasing, as well as effective utilization of existing products and services. These behaviours span across diverse practices such as seeking value and economical options, curbing consumption, maximizing the utility of products, maintaining goods for extended use, considering future needs in material purchases, reutilizing, renovating, rehashing, and refurbishing [10, 18].

A Structural Equation Model (SEM) study, exploring the influence of Austerity (frugal behaviour) on sustainable behaviour during travel revealed there was no significant influence [14]. However, in a parallel study, contrary to earlier assumptions, it was found that frugality was a statistically significant predictor of sustainable consumption for leisure travellers and business travellers [8].

Sustainable consumption is not easily defined as the meaning of the term 'sustainability' is constantly redefined. Today, it might stand for buying cotton bags instead of plastic. Similarly buying an electric vehicle is also considered sustainable but so is forgoing vehicles and buying a cycle. Given the flexible nature of the term, Sustainable Consumption may be all of these practices that intersect and influence a variety of consumer-related behaviours that evolve over time. Consuming products right, less, or differently all count under Sustainable consumption [13].

A 2011 study highlighted that Frugality works as a moral restraint on consumption instead of an economic one. It does not originate from a scarcity of resources but from a conscious choice against the accumulation of needless possessions and the waste that follows. Frugality in this sense extends beyond managing resources and drives towards a system of personal principles related to the responsible use of resources [9].

Moreover, the social implications of frugality and consciousness extend beyond environmental considerations. Engaging in frugal behaviours fosters a sense of community and shared purpose, as individuals embrace collaborative consumption [3]. Conscious consumption, informed by an understanding of social inequalities, prompts individuals to support ethical production and fair labour practices [11].

Studies demonstrate that India has historically embraced a positive outlook towards frugality and resource limitations. However, this acceptance appears to stem primarily from financial motives, distinguishing it from global counterparts who also prioritize environmental aspects in their pursuit of frugality [33]. Therefore, this

paper delves into the interplay between frugality and consciousness of sustainable consumption, considering their implications across the environmental, social, and economic dimensions.

While understanding Consciousness of Sustainable Consumption, one has to factor in the rationale that must have crossed the consumers' minds, beliefs and values. Studies investigating sustainable consumption (otherwise known as pro-environmental behaviour) state that individuals who are conscious about consuming environmentally safe products are found to be more altruistic [23, 29] in contrast to those who exhibit higher levels of egoism. This study mentions how individuals inclined towards altruism perceive environmental concerns as a matter of moral significance while their counterparts perceive them as 'too difficult' and 'pointless' and are thus unwilling to pay more in taxes or for products that would protect the environment [16].

A 2021 study concluded that altruism was a strong predictor of sustainable consumption [14]. It found that altruism not only influenced sustainable behaviour during travel but also had a positive relationship with sustainable consumption suggesting that people who were altruistic at home displayed the same behaviour while traveling abroad. Additionally, sustainable consumers were more willing to pay for sustainable destinations. A similar study found that Altruism was a significant predictor of sustainable travel behaviour for not only business travellers but also leisure travellers. Furthermore, it was altruistic tendencies of the travellers in their everyday life, that were the strongest predictors of sustainable consumption while traveling [8].

Understanding the profiles of 'green consumers', individuals who are conscious about their consumption, is important as research states that Altruism might be one of the leading predictors for Environmentally Conscious Consumer Behaviour (ECCB) [30]. This aligns with the findings of previous literature [29] and gives a conclusive result for a prior study with similar variables [26].

By Exploratory Factor Analysis, four sustainable actions have been identified under Sustainable behaviour which includes Frugality, Pro-ecological behaviour, Equitable behaviour and Altruism [2, 5–7, 32]. The study concluded that while these four actions acted as determinants, there is a need to reshape the education system for the business field, incorporating sustainability in both formal and informal education [17].

Frugal innovation (FI), a concept built on the idea of frugality promises to provide quality solutions within resource-constrained environments that are affordable for low-income consumers highlighting the notion of 'doing more with less' [22]. FI has been described using various terms such as 'jugaad', disruptive, bricolage, cost, and grassroots innovation [15, 24]. However, the concept lacks a strong theoretical foundation, leading to a convoluted conceptualization that hinders both research and practical application [4, 15]. Despite the multitude of perspectives, there are common themes that emerge in defining FI. These include adaptability, affordability, resource scarcity, accessibility, and sustainability [28]. Since identifying an FI remains a challenge, scholars have proposed various criteria, such as substantial cost reduction, core functionalities, and optimized performance level, which would distinguish an FI from

other types of innovations [28, 35]. While the lack of a universal definition has not hindered the development and application of FI, it does underscore the need for a standardized approach [15].

The current study examines altruistic tendencies, frugality and sustainable consumption from a psychological lens. It would be intriguing to explore if individuals who are naturally frugal may be more inclined to engage in sustainable behaviours since these actions might be perceived as beneficial for themselves and others. It could provide insights into potential intervention strategies that leverage altruism to promote sustainable consumption.

3   Methodology

This study aims to examine the dynamic interrelationships and understand the interactions between Frugality, Altruism, and Consciousness for Sustainable Consumption (CSC) amongst adults in India.

3.1   Objectives

1. To investigate the relationship between Altruism, Frugality and CSC.
2. To explore if there is any relationship between Frugality and the economic, social and environmental dimensions of CSC.
3. To understand the impact of Altruism on Frugality.
4. To understand the impact of Frugality on CSC and its dimensions (economic, social and environmental).

3.2   Hypotheses

H_1: There is a significant relationship between Altruism and Frugality and CSC.

H_2: There is a significant relationship between frugality and the economic, social and environmental dimensions of CSC.

H_3: There is a significant impact of altruism on frugality.

H_4: There is a significant impact of frugality on CSC and its dimensions (economic, social and environmental).

3.3 Study Design

To examine the interconnections between Frugality, Altruism, and CSC, a correlational and Linear Regression Design was used.

3.4 Population and Sample

Individuals ranging between the age group of 18–35 were included and a non-probability convenient sampling was used. A sample of 332 individuals was collected, of which males ($N = 102$), females ($N = 226$), non-binary ($N = 1$) and genderqueer ($N = 1$) were included.

3.5 Procedure

The participants were briefed about the outline, aims and methods of the study and guidelines pertaining to the self-report questionnaires and informed consent was taken. Data of 332 participants was scanned and coded in Microsoft Excel 2019 and the data was imported into Statistical Software for Social Sciences (SPSS) version 20 for the analysis phase. This encompassed the utilization of descriptive statistics, Pearson correlation coefficient, and simple linear regression.

3.6 Tools

See Table 1.

1. **Frugal Behaviour Scale**: FBS was developed by Lastovicka et al. in 1999. This 6-item scale measures frugal behaviour on a 7-point Likert scale. The scale was assessed for nomological and discriminant, convergent and divergent validities

Table 1 Tools used for the study

S. No.	Variable	Tools	Author
1	Frugality	Frugal behaviour scale	Lastovicka et al. [18]
2	Altruism	Adapted self-report altruism scale	Witt and Boleman (2009)
3	Consciousness for sustainable consumption	Consciousness for sustainable consumption scale	Balderjahn et al. [1]

which were reported to be decent. The Cronbach's alpha value was reported to be 0.80.

2. **Adapted Self Report Altruism Scale**: ASRAS is the adapted version of Altruistic Personality Scale (1981), originally developed by P. C. Rushton. The adapted version was developed by Peter Witt and Chris Boleman in 2009. ASRAS is a 5-point scale containing 14 items which assesses intentions pertaining to altruistic behaviour.

3. **Consciousness for Sustainable Consumption Scale**: CSCS measures the consciousness for sustainable consumption of consumers with regards to three interrelated dimensions viz. to environmental, social and economic dimensions. The scale was developed by Balderjahn et al. in 2013 and has 19 items, with a seven-point Likert scale. The Cronbach's alpha of all the three dimensions of CSCS was above 0.8.

3.7 *Variables*

- Independent Variables: Frugality, Altruism
- Dependent Variables: Consciousness for Sustainable Consumption

3.8 *Ethical Considerations*

The study followed a meticulous procedure in alignment with established research ethics. Participants were provided with a comprehensive overview of the study's nature, objectives, and goals, and their informed consent was obtained. Participants were assured of the voluntary nature of their involvement and their prerogative to withdraw at any point. Emphasis was placed on upholding confidentiality and utilizing collected data solely for research purposes.

4 Results and Discussion

Data from 332 participants was assessed, entered into Microsoft Excel and analysed through SPSS 20. Socio-demographic details like age, gender, academic qualification, marital status, employment status, socio-economic status, chronic illnesses in the family and nationality were taken into consideration.

With reference to Table 2, scales demonstrated varying means and standard deviations in the sample. The mean score for CSC was 95.47 ($SD = 21.547$), indicating a high level of this attribute among participants. Frugality exhibited a mean score of 29.74 ($SD = 4.433$), Altruism had a mean score of 37.02 ($SD = 8.113$), and Economic, Social and Environmental domains of CSC yielded a mean score of (M

Table 2 Descriptive statistics showing mean and standard deviation values of the participants' data

	Mean	Std. deviation
CSC	95.47	21.547
Frugality	29.74	4.433
Altruism	37.02	8.113
Economic	53.59	12.298
Social	25.04	8.216
Environment	16.84	5.940

$= 53.59$, $SD = 12.298$; $M = 25.04$, $SD = 8.216$; $M = 16.84$, $SD = 5.940$) respectively. These results suggest varying levels of consumer behaviour attributes within the sample.

Table 3 displays a positive correlation emergent between CSC and frugality (r $= 0.316$, $p < 0.01$), indicating that individuals with a stronger inclination towards frugality also exhibited higher levels of CSC. However, no significant correlation was found between altruism and CSC (r $= 0.015$, $p > 0.01$), suggesting that altruistic tendencies did not significantly correlate with CSC in this sample. In the analysis of correlations in Table 3, frugality demonstrated significant relationships with certain subscales of CSC. Frugality was positively correlated with the economic subdomain of CSC (r $= 0.330$, $p < 0.01$), suggesting that individuals with stronger frugal tendencies were more likely to consider economic factors in their CSC. Significant although statically weak correlations were observed between frugality and the social (r $= 0.205$, $p > 0.01$) or environmental (r $= 0.179$, $p > 0.01$) subscales of CSC, indicating that frugality exhibits significant linear associations with all dimensions of CSC.

As displayed in Table 4, a series of simple linear regression analyses were conducted and standardized beta coefficients for frugality and each respective dependent variable are presented, along with the t-values and p-values. The model summaries provide insight into the variance explained by frugality in each case. The overall model fits, represented by the F-values and associated *p*-values, indicating the significance of frugality as a predictor.

Table 3 Pearson correlation between all the variables and sub-variables

	CSC	Frugality	Altruism	Economic	Social	Environment
CSC	1					
Frugality	0.316**	1				
Altruism	0.015	0.230**	1			
Economic	0.833**	0.330**	0.022	1		
Social	0.829**	0.205**	0.058	0.433**	1	
Environment	0.755**	0.179**	0.022	0.354**	0.728**	1

Note ** $p < 0.01$

Table 4 Simple linear regression to assess the impact of-altruism on frugality; frugality on CSC; frugality on economic domain of CSC; frugality on social domain of CSC; frugality on environmental domain of CSC

Independent Variable	Dependent variable	Statistics		
		Standardized beta	t-value	Model summary
Altruism	Frugality	0.230	22.631 4.287	R square = 0.050 F = 18.667 Sig < 0.001
Frugality	Consciousness for sustainable consumption	0.316	6.041	R square = 0.097 F = 36.491 Sig < 0.001
Frugality	Economic	0.330	6.344	R square = 0.106 F = 40.241 Sig < 0.001
Frugality	Social	0.205	3.796	R square = 0.039 F = 14.408 Sig < 0.001
Frugality	Environment	0.179	5.853	R square = 0.106 F = 10.941 Sig = 0.001

The standardized beta coefficient for Altruism was statistically significant (β = 0.230, t (332) = 22.631, $p < 0.001$), indicating a positive association between Altruism and Frugality. The analysis of the model summary revealed that Altruism accounted for 5.0% of variance in Frugality ($R^2 = 0.050$). The overall model fit was statistically significant (F 1, 332) = 18.667, $p < 0.001$, suggesting that Altruism significantly predicts Frugality (Table 4).

The standardized beta coefficient for Frugality was statistically significant (β = 0.316, t(332) = 6.041, $p < 0.001$), indicating a positive and significant association between Frugality and Consciousness for Sustainable Consumption. The analysis of the model summary revealed that Frugality accounted for 9.7% of variance in Consciousness for sustainable consumption ($R^2 = 0.097$). The overall model fit was statistically significant (F(1, 332) = 36.491, $p < 0.001$), indicating that Frugality significantly predicts Consciousness for Sustainable Consumption (Table 4).

The standardized beta coefficient for Frugality was statistically significant (β = 0.330, t(332) = 6.344, $p < 0.001$), indicating a positive association between Frugality and Economic behaviour. The analysis of the model summary revealed that Frugality explained 10.6% of variance in Economic behaviour ($R^2 = 0.106$). The overall model fit was statistically significant (F(1, 332) = 40.241, $p < 0.001$), suggesting that Frugality significantly predicts Economic behaviour (Table 4).

The standardized beta coefficient for Frugality was found to be statistically significant (β = 0.205, t(332) = 3.796, $p < 0.001$), indicating a positive association between Frugality and Social behaviour. The analysis of the model summary indicated that Frugality accounted for 3.9% of the variance in social behaviour ($R^2 = 0.039$).

The overall model fit was statistically significant (F(1, 332) = 14.408, $p < 0.001$), suggesting that Frugality significantly predicts social behaviour (Table 4).

The standardized beta coefficient for Frugality was found to be statistically significant (β = 0.179, t(332) = 5.853, $p < 0.001$), indicating a positive and significant association between Frugality and Environmental behaviour. The analysis of the model summary indicated that Frugality accounted for 10.6% of the variance in Environmental behaviour ($R^2 = 0.106$). The overall model fit was statistically significant (F(1, 332) = 10.941, $p < 0.001$), suggesting that Frugality significantly predicts Environmental behaviour (Table 4).

The analysis revealed varying levels of consumer behaviour attributes within the sample. Frugality was positively correlated with CSC (r = 0.316, $p < 0.01$), particularly its economic subdomain (r = 0.330, $p < 0.01$). Altruism significantly predicted frugality (β = 0.230, $p < 0.001$), explaining 5.0% of its variance. Frugality emerged as a significant predictor of CSC (β = 0.316, $p < 0.001$), explaining 9.7% of its variance. Moreover, frugality significantly predicted economic (β = 0.330, $p < 0.001$), social (β = 0.205, $p < 0.001$), and environmental (β = 0.179, $p < 0.001$) behaviours (Table 4).

The results of this study provide valuable insights into the complex interplay between frugality, altruism, consciousness, and sustainable consumption (CSC) among adults in India. The positive correlation between frugality and CSC echoes prior research highlighting frugality as a key component of a sustainable lifestyle [25]. Individuals demonstrating frugal tendencies are more likely to engage in mindful purchasing, resourceful utilization, and responsible consumption practices [10, 18, 20]. This is consistent with the idea that reduced consumption aligns with the principles of sustainability by curbing the adverse effects on natural resources' sustainability [25].

Interestingly, while altruism significantly predicted frugality in the current study, it didn't exhibit a significant correlation with CSC. This finding contradicts previous assumptions that altruism is directly associated with pro-environmental behaviour [23, 29]. However, the study's outcomes align with the assertion that frugality is more rooted in moral restraint than economic necessity [11]. The positive association between altruism and frugality underscores the idea that conscious resource use might be driven by an ethical consideration against accumulation of needless possessions [9]. Another possible explanation for this could be an "unmediated affect-behaviour link" in which one's affect has some influence over their altruistic behaviour; however, once these behaviours are repeated, thoughts and beliefs dictate behaviours more than affect. Furthermore, individuals who are altruistic in the moment because they strongly feel about helping others, might not show much consciousness towards sustainable consumptions in everyday life as other thoughts, beliefs might take precedence over their feelings [27].

Moreover, the study provides evidence for the differential impact of frugality across dimensions of CSC. Frugality's significant relationship with the economic domain of CSC indicates that individuals inclined towards frugality are likely to consider economic factors when making consumption choices. Suggesting that frugality impacts personal financial decisions and further extends to broader

consumption behaviours, aligning with economic concerns in the context of sustainability [14].

Statistically weak correlations between frugality and the social and environmental domains of CSC highlight the complexity of sustainable consumption behaviours. Frugality might not inherently translate into social or environmental consciousness, underscoring the multifaceted nature of sustainable consumption [14].

The findings of this study emphasize the relevance of conscious consumption and ethical considerations. Individuals with altruistic tendencies are likely to perceive environmental concerns as moral imperatives rather than burdensome or impractical [16]. This aligns with the notion that altruistic inclinations foster a sense of responsibility towards social justice and equitable resource distribution [3, 11].

5   Summary, Conclusion and Implications

In conclusion, this study provides valuable insights into the relationship between frugality, altruism, consciousness, and sustainable consumption among adults in India. Frugality's positive correlation with CSC and its distinct influence on economic behaviour highlight its role in shaping responsible resource use. Altruism's impact on frugality underscores the potential of intrinsic motivations in driving sustainable consumption behaviours. The study contributes to a nuanced understanding of the factors influencing sustainable consumption and provides a foundation for developing strategies to promote sustainable and socially responsible behaviours in a changing world.

This study facilitates a deeper understanding of the aspects that drive sustainable consumption behaviour. It sheds light on how such behaviours influence individuals' choices towards consumption patterns. The findings offer insights for policymakers and marketers aiming to promote sustainable consumption. Moreover, this study evidences to the pre-existing data that facilitate insights in similar domains.

It is suggested by the authors that upcoming studies could further explore the gaps in socio-economic differences and explore the effects they can have on the aforementioned variables. Understanding the gender difference in altruism and its further impacts on CSC could be focused upon.

References

1. Balderjahn, I., Buerke, A., Kirchgeorg, M., Peyer, M., Seegebarth, B., Wiedmann, K.-P.: Consciousness for sustainable consumption: scale development and new insights in the

economic dimension of consumers' sustainability. AMS Rev. **3**(4), 181–192 (2013). https://doi.org/10.1007/s13162-013-0057-6

2. Bamberg, S., Möser, G.: Twenty years after Hines, Hungerford, and Tomera: a new metanalysis of psycho-social determinants of pro-environmental behaviour. J. Environ. Psychol. **27**(1), 14–25 (2007)

3. Belk, R.: You are what you can access: sharing and collaborative consumption online. J. Bus. Res. **67**(8), 1595–1600 (2014). https://doi.org/10.1016/j.jbusres.2013.10.001

4. Bhatti, Y.A., Ventresca, M.: How can 'frugal innovation' be conceptualized? In: Said Business School Working Paper Series, Oxford (2013)

5. Corral-Verdugo, V., Montiel-Carbajal, M.M., Sotomayor-Petterson, M., Frías-Armenta, M., TapiaFonllem, C., Fraijo-Sing, B.: Psychological wellbeing as correlate of sustainable behaviours. Int. J. Hisp. Psychol. **4**(1), 31 (2010)

6. Corral-Verdugo, V., García, F.I., Tapia-Fonllem, C., Fraijo-Sing, B.: Sustainable behaviours and perceived psychological restoration. Acta invest. psicol. **2**(2), 749–764 (2012)

7. Corral-Verdugo, V., Frías-Armenta, M.: The sustainability of positive environments. Environ. Dev. Sustain. **18**(4), 965–984 (2016)

8. Dodds, R., Holmes, M.: Who walks the walk and talks the talk? Understanding what influences sustainability behaviour in business and leisure travellers. Sustainability. **14**, 883 (2022). https://doi.org/10.3390/su14020883

9. Evans, D.: Thrifty, green or frugal: reflections on sustainable consumption in a changing economic climate. Geoforum **42**(5), 550–557 (2011). https://doi.org/10.1016/j.geoforum.2011.03.00

10. Goldsmith, R.E., Reinecke Flynn, L., Clark, R.A.: The etiology of the frugal consumer. J. Retail. Consum. Serv. **21**(2), 175–184 (2014). https://doi.org/10.1016/j.jretconser.2013.11.005

11. Gram-Hanssen, K.: Conceptualizing ethical consumption within theories of practice. J. Consum. Cult. **21**(3), 432–449 (2021). https://doi.org/10.1177/14695405211013956

12. Haider, M., Shannon, R., Moschis, G.P.: Sustainable consumption research and the role of marketing: a review of the literature (1976–2021). Sustainability, **14**(7), 3999 (2022). https://doi.org/10.3390/su14073999

13. Hinton, E., Goodman, K.: Sustainable consumption: developments, considerations and new directions. In: Redclift, M., Woodgate, G. (Eds.) International Handbook of Environmental Sociology, 2 edn. Edward Elgar, Cheltenham (2010)

14. Holmes, M.R., Dodds, R., Frochot, I.: At home or abroad, does our behaviour change? Examining how everyday behaviour influences sustainable travel behaviour and tourist clusters. J. Travel Res. **60**(1), 102–116 (2021). https://doi.org/10.1177/0047287519894070

15. Hossain, M., Hossain, M.: Frugal innovation: a systematic literature review. SSRN (2016). https://doi.org/10.2139/ssrn.2768254

16. Knez, I.: Is climate change a moral issue? Effects of egoism and altruism on pro-environmental behaviour. Curr. Urban Stud.. Urban Stud. **4**, 157–174 (2016). https://doi.org/10.4236/cus.2016.42012

17. Kumari, R., Bhalla, G.S.: Frugality, altruism, pro-environmental and equity indicating sustainability behaviour of business students. Int. J. Adv. Innov. Res. **8**(3) (2021). ISSN 2394-7780

18. Lastovicka, J.L., Bettencourt, L.A., Hughner, R.S., Kuntze, R.J.: Lifestyle of the tight and frugal: theory and measurement. J. Consum. Res.Consum. Res.. **26**, 85–98 (1999). https://doi.org/10.1086/209552

19. Mishra, S., Malhotra, G., Chatterjee, R., Kareem Abdul, W.: Ecological consciousness and sustainable purchase behaviour: the mediating role of psychological ownership. Asia Pac. J. Mark. Logist.Logist. **35**(2), 414–431 (2023)

20. More, A.B.: Implementing digital age experience marketing to make customer relations more sustainable. In: Nayyar, A., Naved, M., Rameshwar, R. (eds.) New Horizons for Industry 4.0 in Modern Business. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-20443-2_5

21. Muiños, G., Suárez, E., Hess, S., Hernández, B.: Frugality and psychological wellbeing. The role of voluntary restriction and the resourceful use of resources/Frugalidad y bienestar psicológico. *El papel de la restricción voluntaria y el uso ingenioso de recursos.* Psyecology **6**, 169–190 (2015). https://doi.org/10.1080/21711976.2015.1026083

22. Pandey, P., Panchal, M.: Food sustainability in India—a challenge. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_17

23. Park, J., Ha, S.: Understanding pro-environmental behaviour. Int. J. Retail Distrib. Manag. **40**(5), 388–403 (2012). https://doi.org/10.1108/09590551211222367

24. Radjou, N., Prabhu, J.C., Ahuja, S.: Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth, 1st edn. Jossey-Bass, San Francisco (2012)

25. Rishi, P.: Frugality and innovation for sustainability. In: Managing Climate Change and Sustainability through Behavioural Transformation. Sustainable Development Goals Series. Palgrave Macmillan, Singapore (2022). https://doi.org/10.1007/978-981-16-8519-4_4

26. Roberts, J.A.: Will the real socially responsible consumer please step forward? Bus. Horiz. January-February, 79–83 (1996)

27. Smith, S.M., Haugtvedt, C.P., Petty, R.E.: Attitudes and recycling: does the measurement of affect enhance behavioural prediction? Psychol. Mark. **11**(4), 359–374 (1994). https://doi.org/10.1002/mar.4220110405

28. Soni, P., Krishnan, R.T.: Frugal innovation: aligning theory, practice, and public policy. J. Indian Bus. Res. **6**(1), 29–47 (2014)

29. Stern, P.C., Dietz, T., Guagnano, G.A.: The new ecological paradigm in social-psychological context. Environ. Dev. **27**(6), 723–743 (1995). https://doi.org/10.1177/0013916595276001

30. Straughan, R.D., Roberts, J.A.: Environmental segmentation alternatives: a look at green consumer behaviour in the new millennium. J. Consum. Mark.Consum. Mark. **16**(6), 558–575 (1999). https://doi.org/10.1108/07363769910297506

31. Suárez, E., Hernández, B., Gil-Giménez, D., Corral-Verdugo, V.: Determinants of frugal behaviour: the influences of consciousness for sustainable consumption, materialism, and the consideration of future consequences. Frontiers (2020). https://doi.org/10.3389/fpsyg.2020.567752

32. Tapia-Fonllem, C., Corral-Verdugo, V., Fraijo-Sing, B.:. Sustainable behaviour and quality of life. In: Handbook of environmental psychology and quality of life research (pp. 173–184). Springer, Cham (2017)

33. Tiwari, R.: Frugality in Indian context: what makes India a lead market for affordable excellence? (2017) https://doi.org/10.1007/978-3-319-46392-6_3

34. Villanthenkodath, M.A., Gupta, M., Saini, S., Sahoo, M.: Impact of economic structure on the environmental Kuznets Curve (EKC) hypothesis in India. J. Econ. Struct. **10**(1) (2021). https://doi.org/10.1186/s40008-021-00259-z [Original source: https://studycrumb.com/alphabetizer]

35. Weyrauch, T., Herstatt, C.: What is frugal innovation? Three defining criteria. J. Frugal Innov. **2**(1) (2016). https://doi.org/10.1186/s40669-016-0005-y

Resistant to Change, Self-efficacy, Awareness, and Perceptions of Price on the Use of Digital Banks as Complementary Banks

Michael Christian [iD]**, Henilia Yulita** [iD]**, Eko Retno Indriyarti** [iD]**, Suryo Wibowo** [iD]**, Sunarno Sunarno** [iD]**, and Pangestu Arifin** [iD]

1 Introduction

To sustain its performance as a public service provider, digital banks must also comprehend the demands, advantages, and simplicity of use of a service. This explains why it is important to detect and comprehend market orientation in order to ensure long-term business survival [1]. Particularly with the advent of digital banks, particularly in Indonesia, integration of technological competence and user experience is a crucial capital that digital banks must be able to deliver as service providers [2, 3]. This suggests that several influencing variables influence the decision to utilize a digital bank.

The analysis of prior study data sought to explain this. Digital banks are said to help customers by lowering operational expenses [4]. If you look closely, this will fade away as more and more players join this digital bank. When it comes to company adjustments or dynamics, digital banks will aim to cut expenses as much as possible to draw public attention. Other findings indicate that lifestyle and social characteristics determine the use of digital banking [5]. This aspect appears to be still prominent in Indonesia. These elements, however, did not persist long, as did altering trends that might have an influence on lifestyle.

M. Christian (✉) · H. Yulita · P. Arifin
Universitas Bunda Mulia, Jakarta, Indonesia
e-mail: michaelchristianid@gmail.com

E. R. Indriyarti
Universitas Trisakti, Jakarta, Indonesia

S. Wibowo
Universitas Persada Indonesia YAI, Jakarta, Indonesia

S. Sunarno
Universitas Tama Jagakarsa, Jakarta, Indonesia

Technical concerns like as security of usage might also influence decisions to utilize digital banks [6]. However, for young users, for example, this may disappear due to the idea that digital banks, particularly those with large names, have a qualified security factor [7]. Furthermore, the younger generation appears to be more accepting of embracing new technology. However, in this situation, user literacy and capacity to utilize digital banking must be investigated further. Based on the foregoing, this study focuses on young users with the goal of investigating the drivers of digital banking decisions as evaluated by aspects such as resistance to change, self-efficacy, awareness, and pricing perception.

2 Literature Review and Hypothesis Development

2.1 *Resistant to Change*

The evolution of bank service techniques from traditional to digital influences the probability of a behavioral shift while utilizing bank services. This appears to promote digital banks as complementary banks. This implies that traditional banks remain the primary option for users for a variety of reasons. Along with this, businesses must have the knowledge and aptitude to absorb market specifics in order to compete in dynamic business developments [8]. In this instance, it is critical to be able to raise public awareness and understanding [9], particularly about the availability of digital banks and their services. This is due to unwillingness to change, rather than the simplicity or benefits of using digital banking [10]. However, some people are hesitant to change, particularly when it comes to the use of digital banking. Aside from these explanations, this study suggests the following hypothesis (H):

H1:Resistant to change significantly affects the actual use.

H2:Resistant to change, which is moderated by self-efficacy, significantly affects actual use.

H3:Resistant to change, which is moderated by awareness, significantly affects actual use.

H4:Resistant to change, which is moderated by perceptions of price, significantly affects actual use.

2.2 *Self-efficacy*

The term "self-efficacy" refers to a user's level of confidence in utilizing technology [10], which in this context applies to the usage of digital bank services. This explains, in part, why people feel a sense of comfort while using technology. User discontent or switching to rivals can be caused by obstacles or problems in usage [11], especially with the proliferation of services that might affect individual decisions [12].

In contrast to the findings of study, which indicate that individual capacity to use is not always regarded in terms of ease of use.

When a service or technology becomes a need, whether or whether it is simple to use becomes secondary [13]. As a result, the self-efficacy aspect in this situation has to be investigated further, particularly in gauging decisions to utilize digital banks, by posing the following hypothesis:

H5:Self-efficacy significantly affects the actual use.

2.3 Awareness

Knowledge is directly connected to the amount of capacity to use digital technology in technology adoption [14]. The way a digital bank's services are exposed to the public is a key aspect in raising public awareness. One method is to employ adverts to increase the efficacy of service content information [15]. Public knowledge of a service or product might lead to increased usage intentions [16, 17]. Thus, awareness appears to have an essential role in molding decisions to utilize digital banks in this scenario, which promotes the submission of the following hypotheses:

H6:Awareness significantly affects the actual use.

2.4 Perceptions of Price

Individuals will evaluate switching expenses when making this decision [18]. Using digital bank services incurs additional internet use and transaction costs. This price will, of course, be added to the fixed costs of utilizing digital banking services. As a result, the study's findings indicated that cost influences usage intention [19]. These expenses can also be an impediment to recruiting users [20]. With the evolution of pricing perceptions on the use of technology, particularly digital banks, it is required to do more research by positing the following hypothesis:

H7:Perceptions of price significantly affect actual use.

2.5 Actual to Use

In layman's terms, real usage refers to the act of using. This also explains why people utilize technology or services in the first place. In a sense, this is similar to using the term interest, which constantly conveys that this behavior is intimately tied to practical usage [21, 22]. The same thing is said when behavioral intentions impact the actual use of bank services [23]. Based on the description above, this study suggests the following conceptual framework, as shown in Fig. 1.
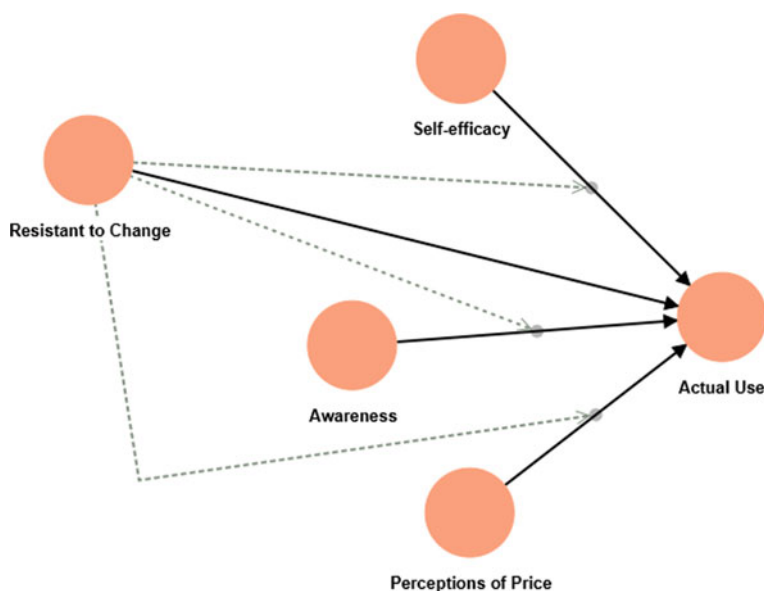
Fig. 1 Research conceptual framework

3   Methods

Structural equation modeling (SEM) may be used to examine structural models. Furthermore, this quantitative investigation employs PLS-SEM, which allows for the analysis of SEMs with complex and diverse constructs, indicators, or interactions [24]. SmartPLS 4, which can analyze SEM models with relatively tiny indication sizes, was used in this work as the analysis tool. In this study, data was collected from participants via a survey utilizing a questionnaire. A Likert scale of 1 (strongly disagree) to 5 (strongly agree) was used to create the questionnaire. Participants in this study satisfy the requirements of being persons aged 17–30 in Jakarta who have a digital bank as a complementary bank. The number of items multiplied by 10 yields the minimum sample size [25]. This research included 19 elements, as stated in Table 1. From the distribution of questionnaires from May to September 2022, 263 participant questionnaires that were eligible for processing were acquired.

4   Results and Discussion

The distribution of participant profiles in this study, which comprised most female participants (more than 60%), is shown in Table 2. Furthermore, individuals aged 21–25 years predominated, accounting for about 56% of the total. The most popular brand among participants, notably digital bank Jenius, with a total of more than 30%.

Table 1 Variable measurement

Variable	Item
Resistant to change [10, 19]	Keen to learn more about every new technical advancement from the digital bank
	Technological advancements, particularly those linked to digital banking, have made people's lives better
	Belief in the digital bank's services for my financial transactions
	Enjoys experimenting (trying out different aspects of these digital bank services)
Self-efficacy [10, 19, 26]	Have faith in or a willingness to utilize the digital bank for connected reasons
	I am not worried about utilizing the digital bank right away if I am provided with instructions
	Not worried about utilizing the digital bank if someone or others may be questioned if they are having difficulty using it
Awareness [19, 27]	Obtain adequate knowledge about the digital bank's offerings
	Obtain adequate information on the benefits of the digital bank
	Obtain adequate knowledge on how to utilize the digital bank
	No information concerning the digital bank was ever provided
Perceptions of price [19, 26, 27]	Being aware that I will be charged a fee for utilizing the digital bank transaction
	When using these digital bank transactions, Internet data prices will be high
	The additional services charged for digital bank transactions are costly
	The digital bank transaction fees are a financial strain for me
	The overall charge for doing digital bank transactions is higher than that of other types of banks
Actual use [19, 28]	I frequently use the digital bank
	Digital banks are used more often than traditional forms of banks
	Making use of the digital bank as my principal means of financial transactions

Looking at the research period, this is fair because this digital bank was one of the first digital banks to enter Indonesia, thus it attracted a lot of attention and interest from the public, especially the young. This was also reinforced by participants' experience with digital banks, with more than half using digital banks that were not too old, particularly less than a year. Surprisingly, the findings of this study reveal the primary rationale for the usage of digital banks, namely convenience of use. The existence of financial technology is designed to make its users' lives easier. Furthermore, this convenience element is followed by the aspect of having promotions that may be

enjoyed by users and networks of friends or family who have utilized digital banking extensively and are not falling behind, particularly trends.

This study's reliability and validity tests were based on many test findings, as indicated in Table 3. Items that do not fulfil the specifications must be removed and reconditioned. Greater than 0.7 composite reliability (CR) results imply that all variables are dependable (CR > 0.7). Furthermore, Cronbach's alpha (CA) values larger than 0.7 on all variables and average variance extracted (AVE) values greater than 0.5, as well as the cross-loading of each item on the variable, explain why all variables are pronounced valid.

The findings of hypothesis testing in this study are shown in Table 4. The influence of resistance to change on actual usage is significant ($P < 0.05$). This study demonstrates how reluctance to change affects actual use while also saying that H1 is accepted. Meanwhile, the impact of resistance to change as a moderator in the moderating effect with self-efficacy and awareness as moderators had no influence on actual usage ($P > 0.05$). According to this finding, H2 and H3 are rejected. Unlike other moderating effects that utilize price perception to gauge resistance to change, this effect has a substantial influence ($P < 0.05$) when used to measure actual usage. These findings show that price perception has a moderating influence on reluctance to change in actual use, while also indicating that H4 is acceptable. Other findings

Table 2 Participants' demographics

Description		N	%	Description		N	%
Gender	Female	164	63.36%	How long have you been using online banking?	Less than a year	137	52.09%
	Male	99	37.64%		1 year	67	25.48%
Age	17–20	101	38.40%		2 years	32	12.17%
	21–25	147	55.89%		3 years	8	3.04%
	26–29	15	5.70%		More than 3 years	19	7.22%
Brand of digital bank used	Jenius	82	31,18%	The primary reason you choose this digital bank	Simple to use	68	25.86%
	Jago	38	14.45%		There are several promos	58	22.05%
	LINE Bank	37	14.07%		Many friends or family members utilize	55	20.91%
	Blu	33	12.55%				
	Digibank	13	4.94%				
	Seabank	29	11.03%				
	Neo bank	23	8.75%				
	Permata bank	6	2.28%				
	Others	2	0.76%				

Table 3 PLS-algorithm

Variable	Item	CR	CA	AVE	RESIST	SEFF	AWR	PRICE	AUE
Resistant to change	RESIST1	0.883	0.864	0.707	0.848	–	–	–	–
	RESIST2				0.831	–	–	–	–
	RESIST3				0.849	–	–	–	–
	RESIST4				0.835	–	–	–	–
Self-efficacy	SEFF1	0.823	0.787	0.695	–	0.857	–	–	–
	SEFF2				–	0.835	–	–	–
	SEFF3				–	0.808	–	–	–
Awareness	AWR1	0.904	0.902	0.836	–	–	0.926	–	–
	AWR2				–	–	0.900	–	–
	AWR3				–	–	0.917	–	–
Perceptions of price	PRICE2	0.941	0.940	0.846	–	–	–	0.903	–
	PRICE3				–	–	–	0.934	–
	PRICE4				–	–	–	0.918	–
	PRICE5				–	–	–	0.925	–
Actual to use	AUE1	0.806	0.776	0.696	–	–	–	–	0.728
	AUE2				–	–	–	–	0.925
	AUE3				–	–	–	–	0.837

indicate that self-efficacy and awareness had no effect on actual usage ($P > 0.05$). These outcomes indicate that H5 and H6 are rejected. Strengthening the findings of price perceptions as a moderator, price perceptions can also have a major influence on actual use as a direct effect.

The coefficient of determination reveals that the independent variables used to evaluate actual usage (resistance to change, awareness, self-efficacy, and pricing perceptions) contribute 39.5%. According to the findings of this study, resistance to change has a direct influence on the adoption of digital banks as complementary banks. This explains why the decision to utilize a digital bank as a complementary bank would be highly influenced by individuals' proclivity to accept or reject change. The habit or ease of existing use is the most important element in this scenario. These findings confirm the hypothesis of comparable results [10] and refute contrary evidence [19]. It is feasible if the individual believes that the apparent benefits are not comparable to a shift from past behavior that has previously offered a sense of comfort and created a habit. Furthermore, this is reinforced by the study's later findings, which show that price perceptions are effective in lowering resistance to transition to actual usage. Similarly, the findings on other direct consequences where reluctance to change affects the adoption of digital banks as complementary banks are similar. This study confirms the findings of numerous previous investigations [19].

Table 4 Hypothesis testing

Path	Standard deviation	T statistics	P values	Remarks
Resistant to change → Actual use	0.092	4.314	0.000	H1 accepted
Resistant to change × Self-efficacy → Actual use	0.082	1.094	0.274	H2 rejected
Resistant to change × Awareness → Actual use	0.083	1.234	0.217	H3 rejected
Resistant to change × Perceptions of Price → Actual use	0.066	2.262	0.024	H4 accepted
Self-efficacy → Actual Use	0.087	0.997	0.319	H5 rejected
Awareness → Actual Use	0.088	0.175	0.861	H6 rejected
Perceptions of Price → Actual Use	0.063	6.587	0.000	H7 accepted

In this scenario, self-efficacy has no discernible influence on actual use of digital banking. These findings are consistent with earlier investigations [10], but they are also distinct from previous studies [19]. This means that an individual's capacity to utilize digital banking services, whether high or poor, has no impact on the decision to use digital banking. In this scenario, digital banking as a complementary bank is considered as one of the necessities that might help young people's mobility, particularly in performing payment transactions.

Similarly, consider the concept of consciousness. The availability of digital banking as a complementary bank does not explain whether or not individuals must be aware of it in order to utilize it, since various research have concentrated on ease of use for technological features [29, 30]. This explains why individuals under 30 in this study have additional consideration factors to support the usage of digital banking that are not related to awareness. On the other hand, it is thought that the knowledge factor in this scenario is insufficient to persuade participants to utilize digital banks as complementary banks. As previously stated, barrier issues and pricing perceptions might boost the usage of digital banks. Other considerations to examine in this scenario are the quality of digital bank services. As is well known, pleasure may have an impact on consumption behavior. Users will create long-term usage intentions if they are happy with the services supplied [31].

Based on the findings of this study, a decision-making model for utilizing digital banks as a complementary bank for young users under the age of 30 residing in large cities may be offered, as illustrated in Fig. 2.

Fig. 2 Framework for results
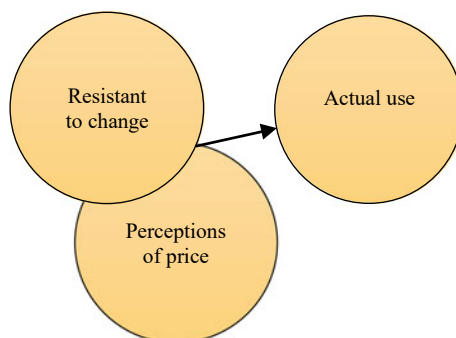
5 Conclusion

The findings of this study show that reluctance to change is a strong driving element in the choice to utilize digital banking at a young age (under 30 years old). This demonstrates that adopting a new trend in financial technology, such as digital banks, especially as a complementary bank, is difficult when it comes to shifting habits of utilizing existing bank services. Banks in general have also introduced online services such as internet banking, mobile banking, and text banking. In its current form, a digital bank as a complementary bank must be able to offer better benefits to attract attention and impact the interest in using it among youthful customers. Furthermore, the perceived cost element that arises while utilizing digital banks and digital banking services might impact judgments concerning the actual use of digital banks. This is an important concern for young users since there will be an additional expenditure when utilizing a digital bank as a complementary bank.

5.1 Limitations and Suggestions for Future Research

The study's limitation is that it focuses on factors that do not include habit or comfort of usage as independent or moderating variables. This is similar to the findings of this study, which found that resistance to change had an effect on actual usage. As a result, these factors provide input for future study. Research regions that are concentrated on a single large city might be considered in future research. Furthermore, the age requirement for respondents might be expanded to a more mature age to give insight from the perspective of participants who are already established or have used credit cards for a longer period of time.

References

1. Christian, M., Dewi, D., Rembulan, G.D., Indriyarti, E.R., Wibowo, S., Yuniarto, Y.: Business performance determinants of salted fish distribution in Kapuk during the COVID-19. J. Distrib. Sci. **19**(6), 29–39 (2021). https://doi.org/10.15722/jds.19.6.202106.29

2. Fang, J., Guo, X.: Design of bank service products based on AI digital human technology. In: 2021 International Conference on Digital Society and Intelligent Systems (DSInS), 2021 pp. 40–44. https://doi.org/10.1109/DSInS54396.2021.9670620

3. Harjanti, I., et al.: IT Impact on business model changes in banking era 4.0: case study Jenius. In: 2019 2nd International Conference of Computer and Informatics Engineering (IC2IE), 2019, pp. 53–57. https://doi.org/10.1109/IC2IE47452.2019.8940837

4. He, D., You, K., Li, W., Wu, J.: Determinants of technology adoption: evidence from the Chinese Banking Industry. Emerg. Mark. Financ. Trade **57**(11), 1–23 (2019). https://doi.org/10.1080/1540496X.2019.1678027

5. Alalwan, A.A., Dwivedi, Y.K., Rana, N.P.: Factors influencing adoption of mobile banking by Jordanian bank customers: extending UTAUT2 with trust. Int. J. Inf. Manage. **37**(3), 99–110 (2017). https://doi.org/10.1016/j.ijinfomgt.2017.01.002

6. Yaseen, S.G., El Qirem, I.A.: Intention to use e-banking services in the Jordanian commercial banks. Int. J. Bank Mark. **36**(3), 557–571 (2018). https://doi.org/10.1108/IJBM-05-2017-0082

7. Nuzulita, N., Subriadi, A.P.: The role of risk-benefit and privacy analysis to understand different uses of social media by Generations X, Y, and Z in Indonesia. Electron. J. Inf. Syst. Dev. Ctries. **86**(3), 1–17 (2020). https://doi.org/10.1002/isd2.12122

8. Christian, M., Haris, K., Indriyarti, E.R., Wibowo, S., Sunarno, S.: Service distribution strategy on business performance of Padang Restaurants in North Jakarta. J. Distrib. Sci. **19**(12), 57–69 (2021). https://doi.org/10.15722/jds.19.12.202112.57

9. Shaikh, A.A., Alharthi, M.D., Alamoudi, H.O.: Examining key drivers of consumer experience with (non-financial) digital services—an exploratory study. J. Retail. Consum. Serv. **55**(102073), 1–10 (2020). https://doi.org/10.1016/j.jretconser.2020.102073

10. Christian, M., Yulita, H., Yuniarto, Y., Wibowo, S., Indriyarti, E.R., Sunarno, S.: Resistant to technology and digital banking behavior among Jakarta's generation Z. In: 2023 International Conference on IT Innovation and Knowledge Discovery (ITIKD), 2023, pp. 1–6. https://doi.org/10.1109/ITIKD56332.2023.10099594

11. Lee, K.-W., Tsai, M.-T., Lanting, M.C.L.: From marketplace to marketspace: investigating the consumer switch to online banking. Electron. Commer. Res. Appl. **10**(1), 115–125 (2011). https://doi.org/10.1016/j.elerap.2010.08.005

12. Indriyarti, E.R., Christian, M., Yulita, H., Ruminda, M., Sunarno, S., Wibowo, S.: Online food delivery app distribution and determinants of Jakarta's Gen Z spending habits. J. Distrib. Sci. **20**(7), 73–86 (2022). https://doi.org/10.15722/jds.20.07.202207.73

13. Hu, P.J., Chau, P.Y.K., Sheng, O.R.L., Tam, K.Y.: Examining the technology acceptance model using physician acceptance of telemedicine technology. J. Manag. Inf. Syst. **16**(2), 91–112 (1999). https://doi.org/10.1080/07421222.1999.11518247

14. Sadowski, B.M.: Advanced users and the adoption of high speed broadband: results of a living lab study in the Netherlands. Technol. Forecast. Soc. Change **115**(1), 1–14 (2017). https://doi.org/10.1016/j.techfore.2016.09.009

15. Christian, M., Pardede, R., Indriyarti, E.R.: Generation Z in Jakarta's attitude towards COVID-19 Ad distribution on YouTube. J. Distrib. Sci. **20**(3), 13–22 (2022). https://doi.org/10.15722/jds.20.03.202203.13

16. Alnsour, M.: How to Retain a Bank Customer: A qualitative study of Jordanian Banks relational strategies. Int. J. Mark. Stud. **5**(4), 123–131 (2013). https://doi.org/10.5539/ijms.v5n4p123

17. Alnsour, M., Al-Hyari, K.: Internet banking and Jordanian Corporate Customers: issues of security and trust. J. Internet Bank. Commer. **16**(1), 1–15 (2011)

18. Christian, M., Yulita, H., Girsang, L.R., Wibowo, S., Indriyarti, E.R., Sunarno, S.: The impact of cashless payment in application-based transportation on Gen Z User Behavior in Jakarta.

In: 2023 International Conference on IT Innovation and Knowledge Discovery (ITIKD), 2023, pp. 1–6. https://doi.org/10.1109/ITIKD56332.2023.10100198

19. Anouze, A.L.M., Alamro, A.S.: Factors affecting intention to use e-banking in Jordan. Int. J. Bank Mark. **38**(1), 86–112 (2020). https://doi.org/10.1108/IJBM-10-2018-0271

20. Bhattacherjee, A., Park, S.C.: Why end-users move to the cloud: a migration-theoretic analysis. Eur. J. Inf. Syst. **23**, 357–372 (2014). https://doi.org/10.1057/ejis.2013.1

21. Al-Emran, M., Arpaci, I., Salloum, S.A.: An empirical examination of continuous intention to use m-learning: an integrated model. Educ. Inf. Technol. **25**(4), 2899–2918 (2020). https://doi.org/10.1007/s10639-019-10094-2

22. Joo, Y.J., Kim, N., Kim, N.H.: Factors predicting online university students' use of a mobile learning management system (m-LMS). Educ. Technol. Res. Dev. **64**(4), 611–630 (2016). https://doi.org/10.1007/s11423-016-9436-7

23. Ahmad, S., Bhatti, S.H., Hwang, Y.: E-service quality and actual use of e-banking: explanation through the technology acceptance model. Inf. Dev. **36**(4), 503–519 (2019). https://doi.org/10.1177/0266666919871611

24. Hair, J.F., Risher, J.J., Sarstedt, M., Ringle, C.M.: When to use and how to report the results of PLS-SEM. Eur. Bus. Rev. **31**(1), 2–24 (2019). https://doi.org/10.1108/EBR-11-2018-0203

25. Hair, et al.: Multivariate Data Analysis, 7th ed. Pearson Education Limited, Harlow (2014)

26. Kaur, S.J., Ali, L., Hassan, M.K., Al-Emran, M.: Adoption of digital banking channels in an emerging economy: exploring the role of in-branch efforts. J. Financ. Serv. Mark. **26**, 107–121 (2021). https://doi.org/10.1057/s41264-020-00082-w

27. Indriyarti, E.R., Christian, M., Yulita, H., Aryati, T., Arsjah, R.J.: Digital bank channel distribution: predictors of usage attitudes in Jakarta's Gen Z. J. Distrib. Sci. **21**(2), 21–34 (2023). https://doi.org/10.15722/jds.21.02.202302.21

28. Christian, M., et al.: Generation YZ's E-healthcare use factors distribution in COVID-19's third year: A UTAUT modeling. J. Distrib. Sci. **21**(7), 117–129 (2023). https://doi.org/10.15722/jds.21.07.202307.117

29. Rawashdeh, A.: Factors affecting adoption of internet banking in Jordan. Int. J. Bank Mark. **33**(4), 510–529 (2015). https://doi.org/10.1108/IJBM-03-2014-0043

30. Rodrigues, L.F., Costa, C.J., Oliveira, A.: How does the web game design influence the behavior of e-banking users? Comput. Human Behav. **74**, 163–174 (2017). https://doi.org/10.1016/j.chb.2017.04.034

31. Christian, M., Wibowo, S., Indriyarti, E.R., Sunarno, S., Yuniarto, Y.: Do service quality and satisfaction affect the intention of using application-based land transportation? A study on generation YZ in Jakarta BT—the implementation of smart technologies for business success and sustainability: during COVID-19 Crises in D. In: A. Hamdan, H.M. Shoaib, B. Alareeni, R. Hamdan (eds.) The implementation of smart technologies for business success and sustainability, pp. 737–746. Springer International Publishing, Cham (2023). https://doi.org/10.1007/978-3-031-10212-7_60

Indicator of Social Impact Measurement in Microfinance: A Thematic Review

Siti Saffa' Shaharuddin, Nur Harena Redzuan, and Romzie Rosman

1 Introduction

1.1 Background

The invention of microfinance was a major turning point in the history of poverty reduction and economic development. According to Muneer and Khan [8], microfinance has the potential to become a useful instrument in the reduction of poverty as well as the accumulation of household debt for the financially undeserved. People who do not have access to financial resources such as savings and checking accounts, credit cards, or loans are considered financially undeserving [11]. This is because they are part of a high-risk group, and their survival is solely dependent on a fluctuating daily income. Therefore, with the microfinance products, it can help alleviate poverty by providing the means for low-income individuals and those who are excluded from traditional banking systems to start or expand businesses, create income-generating opportunities, and build financial assets by giving them access to the loan grant. This can also be accomplished by providing access to credit, savings, and other financial products. Since its inception, microfinance has been regarded as a potential development tool for combating poverty by increasing the asset base among the poorest [1, 2, 7].

Professor Muhammad Yunus, who was awarded the Nobel Prize, is regarded as the father of microfinance because he was the first person to put the microfinance idea into practise in the 1970s. Since then, many organisations in many countries, particularly in developing nations, have adopted microfinance as a significant tool in the fight against poverty and the enhancement of rural economies. Considering that microfinance is seen as one of the most effective ways to break the cycle of poverty,

S. S. Shaharuddin (✉) · N. H. Redzuan · R. Rosman
Institute of Islamic Banking and Finance (IIiBF), International Islamic University Malaysia,
Kuala Lumpur, Malaysia
e-mail: saffashaharuddin227@gmail.com

Islamic microfinance has emerged as a response to the unmet financial needs of low-income Muslim communities worldwide [5]. It is based on the principles of Islamic finance, which prohibit charging or paying interest (riba) and require that transactions be based on shared risk and profit-sharing principles. Islamic microfinance offers an ethical and inclusive financial system that is accessible to all, regardless of their religion, social status, or economic status, and offers an alternative to conventional microfinance.

Because Islamic microfinance offers an ethical and inclusive financial system that is accessible to all, the development of Islamic microfinance has been driven by the increasing demand for Islamic financial services and the need to address the financial exclusion of low-income Muslim communities [9]. It has gained momentum in the last decade because, compared to the conventional motivation of maximising profits, Islamic microfinance is a more morally sound practise [1]. Additionally, many international organisations and development agencies have recognised the potential of Islamic microfinance in promoting financial inclusion and poverty reduction and have provided support for its development. Islamic microfinance has shown positive impacts in several past literature reviews. According to Diniyya [4], Islamic microfinance can make a significant contribution to the country's GDP, and can therefore play a crucial role in promoting socioeconomic development. That means that through its ability to provide financial services to underprivileged individuals and communities, Islamic microfinance has the potential to foster economic development and contribute to the country's GDP, ultimately helping to create a more prosperous and sustainable society.

1.2 Problem Statement

In addition to assessing the potential positive aspects of microfinance and Islamic microfinance, it is essential to thoroughly evaluate their social impact on relieving the difficulties experienced by borrowers who are genuinely impoverished. Despite the initial optimism surrounding these programs, researchers have raised important questions about their overall effectiveness in truly uplifting the socioeconomic conditions of the most vulnerable individuals. Inadequate healthcare, limited educational opportunities, shattered family bonds, unequal resource distribution, inadequate infrastructure, social exclusion, and a lack of promising job opportunities are just a few of the many causes of the hardcore poor's ongoing cycle of chronic deprivation. To assess the degree to which microcredit efforts are tackling these complex concerns and producing noticeable changes in the lives of the extreme poor, a strong and sophisticated social impact measuring approach is essential. Data that track changes in health outcomes, educational achievement, community cohesiveness, gender equality, and overall quality of life should be included in this assessment in addition to economic data. This will help them make wise decisions, improve their strategies, and make sure that these programmes are actually helping marginalised communities break the cycle of poverty and promote sustainable development.

1.3 Research Significance

As a result, this study embarks in a critical analysis with the goal of identifying the most relevant indicators for impact measurement. In order to identify the concrete and beneficial effects resulting from MFs and IMFs, it is crucial to examine the important indicators for assessing the effectiveness of microfinance and Islamic microfinance initiatives. The primary objective of this paper is to clarify the main indicators that have been highlighted in recent literature as a way to assess the efficiency of MFs and IMFs throughout the five-year period from 2018 to 2023.

1.4 Research Question and Objective

This research aims to identify the indicator demonstrated the efficiency of microfinance and Islamic microfinance. A thematic review of the literature on social impact measurement of microfinance and Islamic microfinance is done to achieve the study's goal. In light of this, the discussion that follows aims to answer the following key issue: (RO1) What are the indicators or dimensions that measures and demonstrate the efficiency and results of initiatives in microfinance and Islamic microfinance?

2 Research Methodology

2.1 Background Theory

The term thematic review using ATLAS.ti 23 as the tool as being introduced by Zairul [13] is implemented because the method of this study applies thematic analysis procedure in a literature review. Clarke and Braun [3] define thematic analysis is a process of identifying the pattern and construct themes over thorough reading on the subject. The following step is to identify the pattern and construct category to understand the trend of social impact measurement publication. The tenets of the research are to analyse and interpret the findings for the recommendation of future research in social impact measurement subject. The selection of literature was performed according to several selection criteria: (1) publication from 2018–2023, (2) Have at least keyword; impact, microfinance and Islamic microfinance and (3) Focusing on in the context of microfinance. This criteria for the selected keywords are presented in Table 1. Generally, the decision to limit in the context of microfinance was made to help and focus to define what the suitable indicator in order to measure the impact of MFs and IMFs.

The literature search was conducted for the years 2018 and 2023, utilizing the SCOPUS database. The initial keywords search dated 5th June 2023 yielded 678 articles from SCOPUS. This approach will be using Scopus engine as a database.

Table 1 Search strings from Scopus

SCOPUS	First step keyword search	"Impact" "microfinance" "Islamic microfinance" AND (LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018)) AND (LIMIT-TO (LANGUAGE, "English"))	678 results
	Second step keyword search	"Impact" "microfinance" "Islamic microfinance" AND (LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018)) AND (LIMIT-TO (OA, "all")) AND (LIMIT-TO (EXACTKEYWORD, "Microfinance") OR LIMIT-TO (EXACTKEYWORD, "Islamic Microfinance")) AND (LIMIT-TO (LANGUAGE, "English"))	62 results; inclusion criteria: open access and English, keywords: microfinance and Islamic microfinance

The reasons behind choosing Scopus database are because Scopus database is a large and diverse collection of scholarly literature that covers a wide range of fields of study, making it a valuable resource for researchers who need to access information from multiple disciplines. According to Vijayan et al. [12] also, Scopus is extremely effective for information systems researchers who need to analyse the data with the latest research in their field. Furthermore, according to Vijayan et al. [12], Scopus includes papers that have been indexed and ranked by both the Institute for Scientific Information and Scopus. This means that the database is a trustworthy source of high-quality research that has been acknowledged and cited by other scholars. As a result, the study's authors decided to use the Scopus database to ensure that they had access to the most relevant and credible information for their research.

During the screening process for the SCOPUS database, 616 articles were excluded as they were either open access or not written in English, and keywords: microfinance and Islamic microfinance. Consequently, a total of approximately 62 articles were included in the first step of the study. The second step involved downloading all the articles and subsequently eliminating any books or publications that were not available online and not review a review articles. Furthermore, articles that presented preliminary findings, relied solely on anecdotal evidence, or failed to adequately address the impact of microfinance and Islamic microfinance were also excluded. Some articles were found to be incomplete, while others had broken links or duplicated content. These articles were likewise excluded from the study. Hence, the final total of articles that will be review and analysis by using Atlas.ti is 40 articles. The visual representation of the procedural overview is presented in Fig. 1.
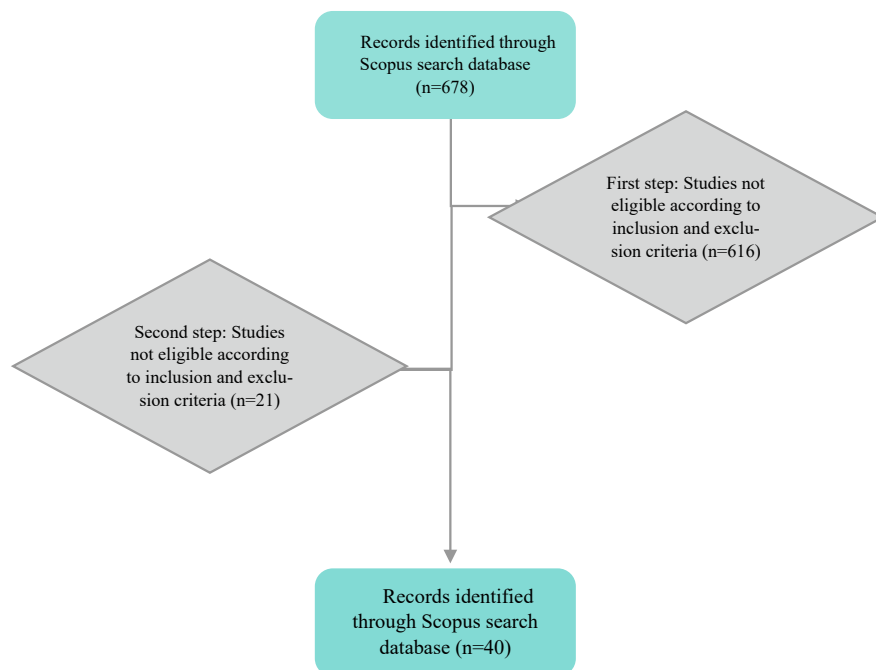
Fig. 1 Inclusion and exclusion criteria in the thematic review

3 Results and Discussions

The main conclusions of the thematic review are reported in this section.

3.1 Word Cloud Frequencies of the Study

Word cloud frequencies are critical in defining the essential components of a thematic review study. For example, they contribute in identifying the essential topics and subjects within the research field, highlighting significant notions such as microfinance, development, financial aspects, Islamic microfinance, and microfinance institutions (MFIs). Second, by prioritising relevant research, these word frequencies highlight the relevance and importance of specific terms, guiding the literature review process. This ensures that the research focuses on the most significant aspects of microfinance and its impact on socioeconomic development and poverty eradication. Furthermore, word cloud frequencies can be utilised to map the research environment, allowing researchers to evaluate current trends and knowledge gaps in microfinance. They visually convey textual material in a straightforward manner, assisting researchers in creating clear review objectives and effectively recognising
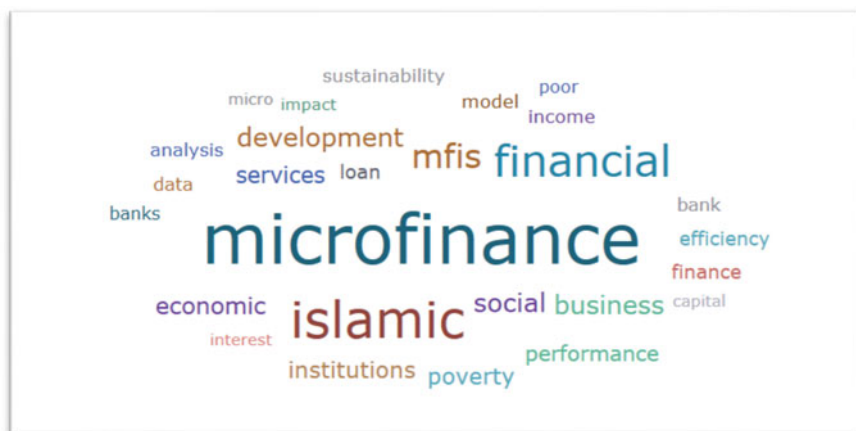
Fig. 2 Word cloud generated from 40 articles

emergent themes. The word cloud derived from a curated collection of 40 articles through the utilization of Atlas.ti 23 is illustrated in Fig. 2.

The word cloud generated from 40 articles on microfinance and Islamic microfinance provides significant insights into the key themes and concepts covered in this discipline. These phrases, taken together, give a full picture of the multidimensional nature of microfinance operations and the social impact measurement they provide. Evaluation and synthesisation of the material included within the word cloud in this part, reflecting light on the different dimensions and implications associated with social impact measurement in microfinance.

Themes and Analysis:

1. **Microfinance and Islamic Microfinance**

Inevitably, these terms hold prominent positions within the word cloud, emphasizing the major subject of the study. Microfinance entails the facilitation of financial services to individuals who have limited access to such resources, typically requiring modest loan amounts. The integration of Islamic concepts introduces an ethical and religious aspect to endeavours aimed at promoting financial inclusivity.

2. **Social and Impact**

The inclusion of these terminologies highlights the underlying pattern of the research, which is to investigate the societal impacts of microfinance efforts. This entails examining the impact of microfinance interventions on many dimensions of individuals' lives, particularly those from socioeconomically disadvantaged backgrounds.

3. **Sustainability and Efficiency**

The incorporation of the concepts of "sustainability" and "efficiency" emphasises the significance of not only delivering financial services, but also guaranteeing the

long-term viability and efficacy of these endeavours. This implies the need to take into account both the social and economic aspects of sustainability.

4. **Poverty and Poor**

The recurrent occurrence of these terminologies indicates the core focus of microfinance programmes, which is to cater to individuals and communities experiencing poverty and economic adversity.

5. **Development and Economic**

The combination of the terms "development" and "economic" indicates the involvement of microfinance in facilitating wider economic development, specifically in disadvantaged regions.

6. **Services, Loan, and Bank**

The previously mentioned phrases encompass the functional elements of microfinance, with a particular focus on the delivery of monetary services, lending activities, and the involvement of financial institutions.

7. **Data, Analysis, and Model**

These terms highlight the analytical aspect of the research, indicating an emphasis on analysis based on data and potentially the creation of frameworks for evaluating social impact.

8. **Interest and Income**

The use of the terms "interest" and "income" may suggest an analysis of the financial implications associated with microfinance, encompassing aspects such as interest rates and the financial health of borrowers.

9. **Performance and Capital**

These terms refer to the assessment of the comprehensive performance and financial elements of microfinance institutions, potentially suggesting a comprehensive evaluation of their operations.

3.2 Themes of Indicators

1. **Theme 1**: Financial and Economic Well-Being

The first theme as shown in Fig. 3, "Financial and Economic Well-Being," examines the relationship between financial well-being and the impact of microfinance and Islamic microfinance schemes. This theme emphasises on products that improve individuals' and communities' financial situations. Possessing financial assets and

resources enables individuals to engage in economic activities, which benefits communities. This topic correlates with our objective of researching microfinance and Islamic microfinance success indicators. Examining the literature on social impact measurement reveals that financial empowerment and equality play crucial roles. Economic progress drives inclusive growth, which empowers marginalised individuals and addresses societal issues such as destitution and living standards. The research also demonstrates how promoting financial literacy, inclusion, and management enhances decision-making and financial well-being, thereby connecting financial progress to overall accomplishment. Furthermore, the interaction between profitability and investment demonstrates how economic growth and wealth creation relate to the efficacy of these efforts, which aligns with our objective of identifying success indicators.

2. **Theme 2:** Education and Skill Development

The "Education and Skill Enhancement" as a second theme as shown in Fig. 4 stands out as a key discovery in our investigation of indicators for the effectiveness of microfinance and Islamic microfinance. This concept emphasises the significance of education and the acquisition of new skills in the process of propelling individual and societal advancement. Individuals who participate in digital upskilling and training are better prepared for a technological landscape that is always evolving. On the other hand, education not only transmits knowledge but also stimulates personal and professional growth, which in turn opens doors to a variety of job prospects.
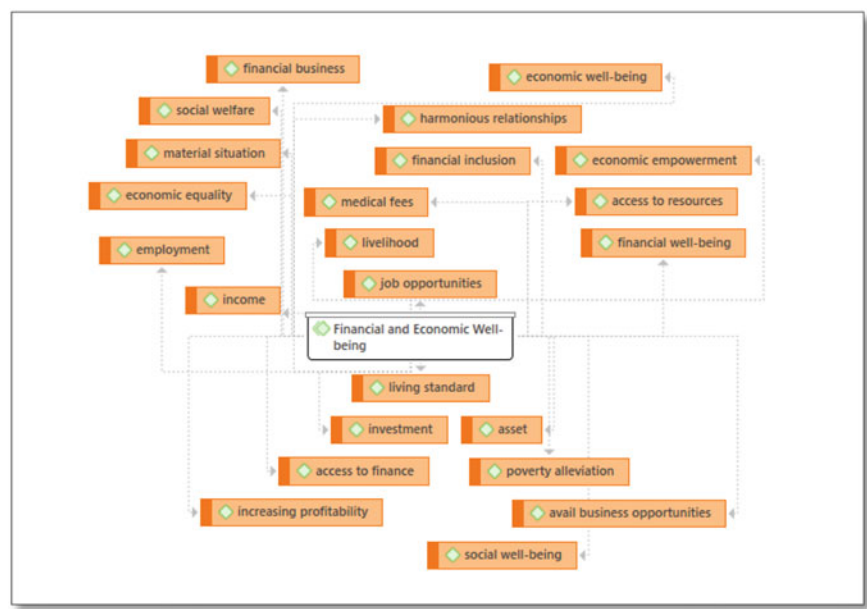
Fig. 3 Financial and economic well-being
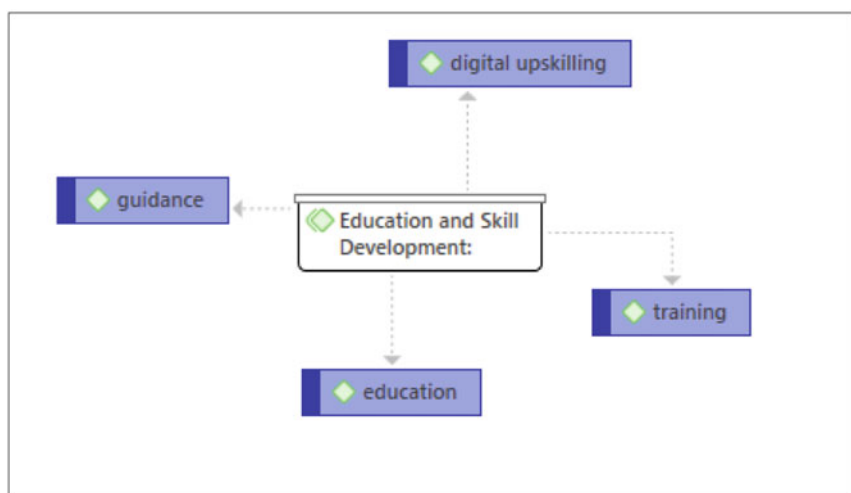
Fig. 4 Education and skill development

This topic also places an emphasis on the fact that investing in education and the development of one's skills enables individuals and groups to effectively contribute to the economy, which in turn promotes innovation and progress.

3. **Theme 3**: Health and Well-Being

The third theme as shown in Fig. 5 is centred around the topic of "Health and Well-being." The aforementioned theme emphasises the significance of both individual and community health and well-being, elucidating crucial factors that enhance the beneficial outcomes of such efforts. The theme also highlights the correlation between healthcare accessibility, medical facilities, and positive health outcomes, including reduced infant mortality rates and improved general quality of life. The significance of nutrition in influencing physical well-being and long-term health is of utmost importance. Furthermore, the underlying theme explores into the impact of fostering constructive relationships and cultivating a serene familial environment on an individual's mental and emotional welfare. These projects contribute to fostering the development of healthier and more productive communities by addressing health-related concerns, resulting in significant social and economic advantages.

4. **Theme 4:** Family and Social Empowerment

Theme 4, "Family and Social Empowerment," is shown in Fig. 6. This theme illustrates the significant importance of families and social factors in enabling individuals and communities, with a focus on important elements that enhance the positive results of these initiatives which is microfinance and Islamic microfinance. Families are widely acknowledged as nurturing environments that play a crucial role in supporting
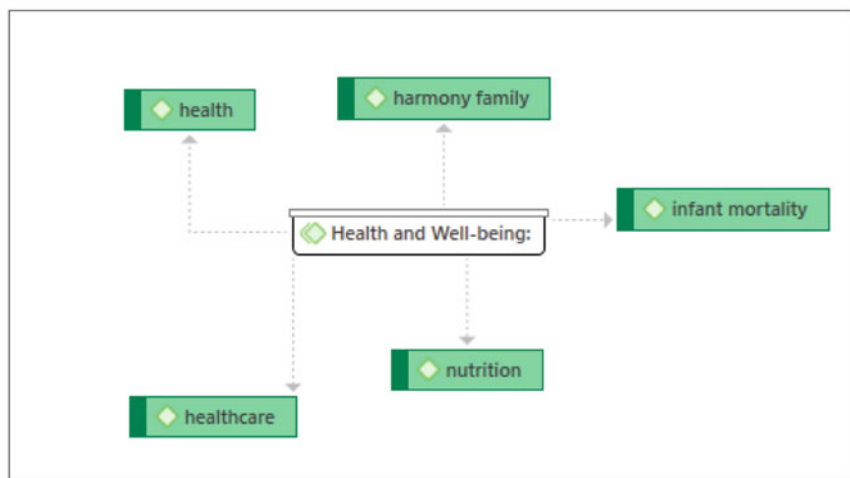
Fig. 5 Health and well-being

the development of individuals. Moreover, they have the potential to foster gender equality and empower women by facilitating fair and inclusive decision-making processes within both family and broader social settings. Moreover, the implementation of beneficial religious practises provides individuals with spiritual guidance, while the promotion of women's empowerment and inclusive decision-making plays a crucial role in fostering resilient societies, sustainable progress, and social cohesion. The aforementioned findings shed light on the significant correlation between microfinance, Islamic microfinance, and the empowerment facilitated by family and social dynamics, hence offering vital insights into their overall effectiveness and favourable results.
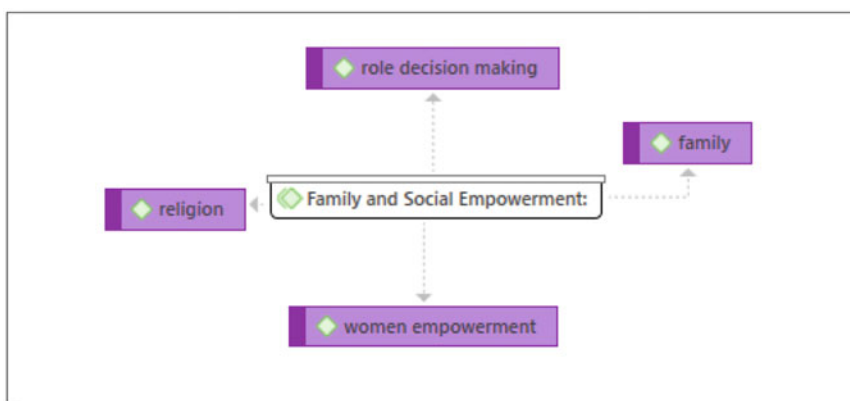
Fig. 6 Family and social empowerment

4 Conclusion, Limitation and Future Research

In conclusion, this paper appropriately summarises the core aspects of the thematic review and the nuanced features investigated in the research. Moreover, this paper provides a synthesis of the selected topics and indicators, so presenting a full comprehension of the social effect measurement in microfinance and Islamic microfinance efforts. The dimensions of "Financial and Economic Well-being," "Education and Skill Development," "Health and Well-being," and "Family and Social Empowerment" are closely connected to the indicator of social impact measurement. These indicators serve as a structure for assessing the various dimensions of microfinance interventions. This paper examines the ways in which these themes contribute to economic progress, the empowerment of individuals, the well-being of communities, and the cohesion of society. These characteristics are crucial in the measuring of social effect.

This work summarises the thematic review well and highlights nuanced elements, yet it has limitations. The scope may exclude relevant social effect indicators in microfinance and Islamic microfinance. Using existing literature may create bias, and thematic analysis may limit quantitative and qualitative data investigation. An empirical methodology that includes multiple regions and people and uses quantitative and qualitative methodologies could better assess indicators in future studies. Innovative methods like longitudinal studies or cross-disciplinary cooperation could reveal themes' influence. Examining how indicators interact with cultural, economic, and regulatory aspects could improve knowledge and a more comprehensive framework for analysing microfinance and Islamic microfinance social impact.

References

1. Begum, H., Alam, A.F., Mia, M.A., Bhuiyan, F., Ghani, A.B.A.: Development of Islamic microfinance: a sustainable poverty reduction approach. J. Econ. Admin. Sci. **35**(3), 143–157 (2019)
2. Bent, B.B.: The impact of microfinance on poverty reduction and women empowerment. In: Rais Collective Volume–Economic Science (pp. 72–86). Scientia Moralitas Research Institute (2019)
3. Clarke, V., Braun, V.: Teaching thematic analysis: overcoming challenges and developing strategies for effective learning Associate Professor in Sexuality Studies Department of Psychology Faculty of Health and Life Sciences University of the West of England Coldharbour Lane Br. Univ West England **26**, 120–123 (2013)
4. Diniyya, A.A.: Development of waqf based microfinance and its impact in alleviating the poverty. Ihtifaz: J. Islamic Econ., Finan., Bank. **2**(2), 107–124 (2019)
5. El Khatib, A.S., Lisboa, N.P.: The Financial Performance of Islamic Microfinance Institutions. Anais (2019)
6. Melian-Melian, J.A., Martin-Gutierrez, J.: Design and usability of learning objects applied in graphic expression. Comput. Appl. Eng. Educ. **26**(5), 1134–1149 (2018). https://doi.org/10.1002/cae.21946
7. Mohamed, E.F., Fauziyyah, N.E.: Islamic microfinance for poverty alleviation: a systematic literature review. Int. J. Econ., Manag. Account. **28**(1), 141–163 (2020)

8. Muneer, F., Khan, F.: Impact of Qard-al-Hasan (interest-free loan) program in reducing multidimensional poverty: an evidence from the southwest Bangladesh. Int. J. Islamic Middle Eastern Finan. Manag. **15**(6), 1072–1087 (2022)

9. Salaudeen, A.O., Zakariyah, H.: Challenges Hindering Islamic Microfinance Banks' sustainable financial inclusion: a case of Al-Hayat Microfinance Bank in Ogun State, Nigeria. El Barka: J. Islamic Econ. Bus. **5**(1), 24–50 (2022)

10. Tantatsanawong, P., Kawtrakul, A., Lertwipatrakul, W.: Enabling future education with smart services. In: Proceedings—2011 Annual SRII Global Conference, SRII 2011 (2011). https://doi.org/10.1109/SRII.2011.63

11. The World Bank: Financial Inclusion: financial inclusion is a key enabler to reducing poverty and boosting prosperity (2022). Retrieved from: https://www.worldbank.org/en/topic/financialinclusion/overview

12. Vijayan, S.S., Arunkumar, V.R., Renjith, V.R.: Scopus metrics of top-rated inter and multidisciplinary Open Access (OA) Library and Information Science (LIS) Journals. Knowl. Manag. High. Educ. Inst. **305** (2022)

13. Zairul, M.: A thematic review on student-centred learning in the studio education. J. Crit. Rev. **7**(02), 504–511 (2020). https://doi.org/10.31838/jcr.07.02.95

Persuasive Strategies in English Political Discourse: A Critical Discourse Analysis of Biden's Speech on the End of War in Afghanistan

Wafa Abu Hatab, Mohammad Al-Badawi, and Saif Aldeen Alsmadi

1 Introduction

Politics by its very nature is linked to the ability to co-opt rather than coerce. In other words, politics involve shaping the preferences of others through appeal and attraction. To achieve this goal politicians, tend to apply non-coercive means to persuade their subordinates, societies, allies, and even their enemies.

The language phenomena of persuasion is seen as a characteristically people's behaviour. This language phenomenon's precise meaning continues to be debated and many theories were developed to clarify this term. According to Andersen [1], persuasion is an interpersonal skill whereby an individual aims for a specific reaction from his audience.

Fairclough [8], in describing his Political Discourse Analysis (PDA) paradigm, postulated that persuasion aims to shape and lead the audience's views, attitudes, and emotions toward a specific political ideology. As a result, persuasion plays a major role in political discourse. It is seen to be crucial for a politician to grow in their political life. According to Khawaldeh and Abu Hatab [11], "Politicians use discourse structures and linguistic properties to make their political goals and appeals more persuasive and acceptable when they deliver speeches to support their political stands." Speeches given on various occasions by monarchs, presidents, leaders, or other prominent members of society are regarded as the most remarkable factor, and linguists have long been committed to evaluating such texts through

W. A. Hatab · M. Al-Badawi · S. A. Alsmadi (✉)
Zarqa University, Zarqa, Jordan
e-mail: 20209227@zu.edu.jo

W. A. Hatab
e-mail: whatab@zu.edu.jo

M. Al-Badawi
e-mail: mbadawi@zu.edu.com

different analytical approaches. The most notable is Fairclough's [8] model of critical discourse analysis (CDA), that will be the one utilized in this study.

The goal of this paper is to give a comprehensive discourse analysis of persuasion, governance, and political perspectives in Biden's presidential speech on the withdrawal of US forces from Afghanistan. The significance of this study arises from the applicability of CDA, which is regarded as a plausible method of political discursive practice. According to Chapman and Routledge [5], The CDA accomplishes its goal by giving a qualitative examination for political literature—particularly politicians' speeches—while tying the structure of texts to the social and political setting.

2   Literature Review

Researchers have long been drawn to exploring the art of persuasion from different perspectives and settings. For example, in the middle of the Middle Eastern war's continuation, Rashidi and Souzandehfar [13] looked at the campaign speeches of two American presidential nominees. It discovered some of the methods of persuasion applied, such as evidentiality, exaggeration, implicature, satire, lexicalization, division, presupposition, ambiguity, and exploitation as Van Dijk's [15] classify them. Additionally, throughout the debates, the nominees for each party used a variety of argumentative strategies to promote their positions. All of which seemed to be powerful instruments for convincing and explanation.

Additionally, Biria and Mohammadi [4] used the same model for comparing the inaugural speeches of two succeeding presidents, George W. Bush and Barack Obama. The investigation sought to discover the possible ideologies, rhetorical tactics, and linguistic devices employed to portray the presidents' political ideas. The findings revealed that each president used a variety of rhetorical devices to persuade the audience, such as the employment of both positive and negative self-presentations, as described by Dijk. The analysis reached the conclusion that language, power, and ideology are intertwined in complicated ways.

President Obama's employment of clichés and metaphorical expressions as a political persuasive strategy while appealing to the Latino community was noted by Cirugeda and Ruiz [6] using the Corpus Model to Critical Metaphor Analysis. The data showed how President Obama used Aristotle's pathos persuasive approach by making a number of psychological appeals to the Latino community, including those for motion, equality, citizenship, and appreciation. Also highlighted by the researchers was his constant resort to mental metaphors, which include embodiment, reiteration symbolism, and synaesthesia. Results did, however, point to his proclivity for using division as a persuasive method—as described by [16]-considering that he aligned his case to the people from Hispanic origins.

Donald Trump's sexist vocabulary and worldview, which he used to characterize and minimize women, was examined by Darweesh and Abdullah [7] centralized around structure, linguistic, and discoursal persuasive methods, the study relied

on a hybrid of Mill's [12] and Van Dijk's (2006) critical discourse analysis methods. Results demonstrated how Trump's image of women was consistent with his belief of male dominance over females. The authors further asserted that his statements meant to stigmatize, neglect, and ridicule females.

Using CDA and corpus linguistics, Jenson et al. [10] addressed the discursive patterns of Clinton's rhetoric throughout her presidential campaign, examining a triad of topics: sexual references, persuasion strategies, and characteristics of exclusion and inclusion. Results revealed her language was perceived as being quite neutral when it comes to gender relations. Additionally, she created a variety of powerful rhetorical themes, such as reiteration intertextuality, seductiveness, and compliments. Deixis and pronouns were also skilfully employed in the social-communicative role to portray people exclusively and inclusively.

Rodríguez Alayo [14] also looked at Hillary Clinton's speeches, but from a different angle—the self-representation in public discourse as seen through the lens of the (CDA) paradigm. In-depth analysis of Hillary Clinton's political persona, as well as the way she was portrayed in the mainstream press during the election, was the goal of this study. To that aim, it was predicted that a feminist CDA technique would reveal discrimination based on gender in context and speech. Results revealed that because women are now firmly entrenched in all spheres of society, prejudice against women had significantly decreased. Furthermore, findings showed how Clinton relied on a number of means reinforce her reputation as a credible candidate.

3 Methodology

The current study qualitatively examines President Joe Biden's English political discourse, analysing the three dimensions of Discourse using Fairclough's [8] Critical Discourse Analysis (CDA) model. Accordingly, the study will be divided into three stages; text analysis (description), processing analysis (interpretation), and social analysis (explanation). The study will provide answers to two specific questions. First, what persuasive strategies are used in English Political Discourse in Biden's speech on the occasion of US forces' withdrawal from Afghanistan? Second, what are the ideological beliefs, power distribution, and persuasive capabilities of Joe Biden?

The data for this study was gathered from US President Joe Biden's speech on the End of the War in Afghanistan, delivered at 3:28 p.m. EDT on AUGUST 31, 2021 at the White House State Dining Room. The video and script for the speech under examination were downloaded from the official websites of The White House and Basic Cable Business News Channel (CNBC). President Joe Biden was the only speaker in this speech, which lasted for 26 min and consisted of 3244 words. The data analysis process contained the description, interpretation, and explanation of the discourse according to the Fairclough model.

4   Results and Discussion

The speech delivered by US President Joe Biden on the End of the War in Afghanistan was analysed using Fairclough's CDA model, whereas the data provided were analysed according to the three levels of Discourse: the level of description, the level of interpretation, and the level of explanation.

4.1   Text Analysis (The Description Level)

At the description level, micro-level analysis is applied to all linguistic aspects in accordance with the desired results of the overall research purpose. Vocabulary items, grammatical constructions, and discourse are examples of such elements. This level of study is an introductory point for determining President Joe Biden's ideological positions.

According to Fairclough, the text's vocabulary elements are ideologically significant. President Biden's choice of words revealed his ideology regarding how he handled the topics addressed in the respective speech, such as confrontation with China and Russia, new word strategies, revolutionizing US national interests, and so on. For the critical observer, it appeared as if it had a golden opportunity that he intended to exploit to communicate implied messages to the audience as well as other countries such as Russia and Chania.

His word choice, for example, reflects the ideals he adopts. As he puts it, integrating United States citizens under crucial common national interests. To do so, he kept mentioning facts and statistics about US casualties during the war on Afghanistan to elicit feelings of fear and grief, he stated "after 20,744 American servicemen and women injured, and the loss of 2461 American personnel" [2] also he said, "18 veterans, on average, who die by suicide every single day in America".

Furthermore, to achieve this ideology he equivocates the audience with the thought of the vague future and not thinking much about the past, to make his decision sound more future-oriented and thus persuasive, for example, he mentioned in various places the change of world strategies and challenges with other nations, he stated "The world is changing" [2] and elsewhere, he stated, "We're engaged in a serious competition with China. We're dealing with the challenges on multiple fronts with Russia" [2] and also stated "We're confronted with cyberattacks and nuclear proliferation".

His choice of words indicated that he and his administration had already adopted the change in ideologies that he was attempting to persuade the rest of the country to assume. For example, on multiple occasions, he referred to the group that took over Afghanistan after the US withdrawal as "The Taliban" implying that they are no longer terrorists or rebels as they were previously referred to in US discourse, as in his statement "The Taliban has made public commitments" [2] and elsewhere he stated, "the former President signed an agreement with the Taliban". Even his word choice demonstrated that the old foe is not only a friend today, but they also share common

enemies and goals with the US, as he stated in "the Taliban wouldn't attack any American forces" [2] and also said, "they did it knowing ISIS-K terrorists—sworn enemies of the Taliban".

It is clear that President Biden is good at using metaphors as powerful persuasive devices, allowing him to manipulate and twist audiences' thoughts in such a manner that he actively stimulates their imaginative faculty. In doing so, the audience member engages their imagination and creates unique mental representations to facilitate to evoke of specific expressive values of the subject proposed.

For example, he discusses one event involving war casualties and characterizes sadness as a bodily load that overburdens the human person, stating, "We see it in the grief borne by their survivors" [2]. and elsewhere, he stated, "It's time to look to the future," [2] where he symbolizes the United States' future as a material thing that is very accessible, and American citizens can see that future by simply turning their heads in the right direction. Other than that, to persuade those who disagree with the end-of-war decision and want the war to continue, he visualized the United States of America as human, and this human is more likely to be a soldier who never rests or gives up, he stated, "The United States will never rest" [2]. These instances, and many more, revealed the speaker's constant use of figurative speech was to boost language persuasiveness and manipulate the audience's perceptions.

In terms of Grammatical processes, here we refer to the way meanings are encoded in the clause and how different types of processes are represented in language to show the speaker's point of view.

The determined declarative voice may reflect the politicians' purposeful, deliberate, and manipulative choices by the attempt to obfuscate the agent of the action in some situations while emphasizing it in others. The explicit change in attention is achieved by using specific grammatical constructions, for example, passivization, where the agents may seem to dominate the subject positions in certain statements. Biden recognized and strategically used such language. For example, he said, "this is the way the mission was designed" (Biden 2021). In this statement, he did not want to indicate who designed this decision but rather sought to place the audience under the de facto that it was already made. And just as in his statement "we were left with a simple decision," [2], he was trying to emphasize how this crucial decision was made due to a mysterious, overpowering force.

Another useful linguistic tool employed by politicians to appeal to authoritative assertions or arguments is reported speech. According to the analysis, Biden appeared to use reported speech or cite authoritative people regularly. He said, "General McKenzie said, this is the way the mission was designed" [2]. Also, he reported from the last administration: "The previous administration's agreement said that if we stuck to the May 1st deadline that they had signed on to leave by, the Taliban wouldn't attack any American forces," [2]. Elsewhere, he cited statisticians "Researchers at Brown University estimated would be over $300 million a day for 20 years in Afghanistan" [2]. Furthermore, in his speech, he quoted President Abraham Lincoln, whom the American people regard as a heroic figure: "what President Lincoln called their last full measure of devotion" [2]. Echoing other people's statements is a strategy used by Biden to emphasize his trusting attitude and realism.

As a result, by reporting others, he was able to affirm and strengthen his favourable traits while also achieving a high degree of persuasion.

Guo [9] defines evidentiality as a linguistic category that is about the speaker's expression of the source of information. The linguistic forms of evidentiality are termed evidential or evidential markers. In this speech, evidentiality was skillfully used to strengthen the credibility of the speakers' arguments. Under that assumption, Biden appeared to offer rational evidence to prove his ideas, linking his statements to an intellectual source, by utilizing an embedding clause and the verbs "think" and "believe" as in the following lines. He stated, "I don't think enough people realize how much we've asked of the 1% of this," [2] he further said, "I believe this is the right decision".

Modality is the phenomenon of using language to discuss potential situations. Grammatically, it is conveyed using modal auxiliaries; will, can, may, might, and so on, as well as particular tenses or adverbs. The examination of the relevant speech showed that Biden used a wide range of epistemic and obligational modalities by employing modals, particular verbs, and adverbs. Modals appeared as the modal verbs "must, should, have to, need to, and had to". In terms of Adverbs, the speaker repeatedly used "clearly, and in fact". While The verbs utilized to serve this purpose were "think, believe, and wish". The speaker's utilization of these methods creates a powerful compelling persona. Here, the persuasion impact is achieved by power and authority relationships. For instance, the following modals "must, have to, should, and had better" demonstrate President's institutional and societal power over an issue with which he may persuade the audience. For example, when discussing the shift in American foreign policies, he used the Modal "have to" stating, "We have to shore up America's competitive[ness] to meet these new challenges in the competition for the twenty-first century." In addition, he used the modal "must" in the following lines on the same issue: he stated, "First, we must set missions with clear, achievable goals—not ones we'll never reach." [2].

President Biden carefully used pronouns to elicit a powerful persuasive effect. For example, when mentioning his activities as the strong Democrat president of the United States, he utilized the first-person pronoun (I). which was often utilized to highlight egoism and personification. For example, he stated, "But I still instructed our national security team to prepare for every eventuality" [2], and also said "I take responsibility for the decision." Reference [2], and stated, "As Commander-in-Chief, I firmly believe the best path to guard our safety and our security lies in a tough, unforgiving, targeted, precise strategy that goes after terror where it is today, not where it was two decades ago". Similarly, he uses the pronoun (we) in addition to referring to himself as a group member. And to indicate entirely to his group and to exclude another group of people. In other words, it was utilized to stress group membership, unity, and collectively.

In the following utterance, He utilized the inclusive pronoun "we" twice emphasizing solidarity and unity: he stated, "We have to shore up America's competitive[ness] to meet these new challenges. And we can do both: fight terrorism and take on new threats that are here now and will continue to be here in the future" [2].

The third-person plural pronoun (they) was also used deftly in this speech, in many cases, there were no antecedents in the context to which the pronoun (they) could be referred. for example, he said "They ask: Why don't we just keep doing what we were doing?", and elsewhere, he stated, "If we stuck to the May 1st deadline that they had signed on to leave by" [2]. It was done on purpose to undermine the credibility of those who opposed the draft resolution, and the political abilities of the previous presidential administration, making him appear more convincing than they were.

4.2 The Interpretation Level

The interpretation level in Fairclough's model is concerned with the relationship between text and interaction, with the text viewed as an outcome of a production process and as a resource in the process of interpretation. Based on that, the researchers used this level of analysis to link the text, participants (the speaker, medium of communication, and audience), discourse style, and social practices to arrive at appropriate situational interpretations of the speech.

In brief, the total process of Discourse interpretation combines text interpretation and contextual interpretation. Interpretation of texts deals with the production of utterance surface structures, utterance meaningfulness, coherent groups of utterances, and coherent texts. Analysts in the interpretation of context develop Discourse's situational and intertextual contexts interpretations. Other aspects, such as speech acts, should be included as it connects the text to its context.

The text interpretation already began with the ability of each of the interpreters -the speaker, medium of communication such as a journalist, and spectators—to interpret the phonetics of the uttered words and transform them into coherent sentences.

This level of analysis is initiated by a relevant interpretation of context. The president of the United States of America, Joe Biden (speaker), and the audiences detailed below were the main participants in this speech. President Joe Biden was newly elected at the time he delivered this speech, which is regarded not only as one of his few speeches as an official president of the United States at the time, but also as one of the most important; because this speech was designed to fold an old era of US policies and declare new ideologies that he wished to introduce. Because Biden intended to send implicit messages to other countries and regimes, his audiences included everyone on the planet, not just Americans.

In terms of power distribution, it is undeniable that Biden, president of the United States, wields enormous authority over the general populace. On top of that, his strengths include an extended record as a political figure with vast knowledge of diplomacy and global issues., not to mention that he served as Vice President of the United States for eight years in a row after serving as a United States Senator from Delaware for 35 years.

Fairclough defines social order as being manifested institutionally or socially. Any credible interpretation must include the role of ideology and the distribution of power

relations in defining social order. The effect of ideology on people's understanding of critical issues, such as those effectively addressed in this speech, is the basis for this significance. For example, ending the war on Afghanistan his statement "I take responsibility for the decision" [2], he also addressed the issue of the change of the international strategies and thus the US strategies, where he said, "This is a new world" (Biden 2021), also stated, "Our strategy has to change too" [2], he added "The fundamental obligation of a President, in my opinion, is to defend and protect America—not against threats of 2001, but against the threats of 2021 and tomorrow." [2]. and finally, the challenges with other countries he stated "We're engaged in a serious competition with China. We're dealing with the challenges on multiple fronts with Russia. We're confronted with cyberattacks and nuclear Proliferation" [2].

The intertextual analysis highlights works' dependency on social and historical events, with the intertextual context centred on determining the event a text corresponds to, in addition to hence what may be acknowledged as a common ground or presupposed amongst participants. To reach plausible readings of the speech in question, the speaker and even the audience should use intertextuality. Biden stated, "We're confronted with cyberattacks" [2], Using the term "cyberattacks" without relating it to its historical and social contexts, such as Russian meddling in the 2016 US presidential election, would not be a sound interpretation.

A presupposition is an implicit assumption about the world or underlying belief about an utterance whose truth value is assumed in discourse. In doing so, the audience's minds are opened to persuasion, which is the speaker's intention. By attributing to their past understanding, Biden was able to shape audiences' perceptions of the material and steer them to what he wanted them to believe. He stated, "It was time to be honest with the American people again," [2], assuming the audience is aware of his earlier devotion and pledges to end the war. Furthermore, he assumes elsewhere that the American people are aware that he has lost his son in one of the American wars. He said "Maybe it's because my deceased son, Beau, served in Iraq for a full year," [2], making his decision sound more sympathetic.

4.3 Explanation Level

According to Fairclough, this is the stage that relates to the analysis of the sociocultural environment in which a discursive practice materializes and how it may affect it and vice-versa. Fairclough assumes that when aspects of members' resources are drawn upon as interpretative procedures in the production and interpretation of texts, they are thus reproduced. Depending on what is above, the basic goal of the explanation stage is to visualize discourse as an element of a societal process or practice and what reproductive effects discourses can impact on those structures in their sustenance or their change. For the analysis of social practice (explanation), [8] offers some useful questions that can be asked about a certain discourse under research, as follows:

Social Determinants: What Power Relations at Institutional, Situational, And Societal Levels Help Shape This Discourse? Institutionally, Biden arrived at this speech with unique assets of power. He is a very politically experienced individual who has been the Vice President of the United States for eight years in a row after serving as the United States Senator from Delaware for 35 years. At the situational level, this speech was delivered after seven months of assuming his position, at that time, the Trump administration had already reached an agreement with the Taliban to withdraw all US personnel by May 1, 2021. On top of that, he had to deal with two distinct priorities: gaining control of the twin pandemic and economic crises confronting America at the expense of pursuing the broad change that progressives seek. Biden was chastised at the time for reusing several officials who had served under Barack Obama. When it comes to the social level, to reach their feelings and wants, Biden, engages with the vision of Americans regarding sensitive social issues such as family struggles, the future of young people, social security, economic issues, and so on.

Ideologies: What Elements of Member Resources Are Drawn Upon Have an Ideological Character? Investigations revealed that President Biden throughout this speech encoded multiple ideologies when he tackled the following issues. To begin, consider the decision of ending the war in Afghanistan and its consequences. Regarding this issue, he began his speech by bragging about the successful evacuation of US troops, diplomats, American citizens, Afghan agents, and citizens of allies and partners, stating, he stated, "We completed one of the biggest airlifts in history" [2], and elsewhere, he said, "The extraordinary success of this mission was due to the incredible skill, bravery, and selfless courage of the United States military and our diplomats and intelligence professionals" [2]. Then he began to legitimize the decision he had already made to end the war in Afghanistan, and he skilfully employed some strategies to persuade the audience of this decision. He tried to arouse grief feelings toward the human casualties that American families have been suffering, for example, he stated, "after 20,744 American servicemen and women injured, and the loss of 2461 American personnel, including 13 lives lost just this week, I refused" [2].

Second, regarding the new policies for confronting America's economic crises, he hit two birds with one stone by highlighting the economic costs of that war to support his views in this particular, for example, he said "After more than $2 trillion spent in Afghanistan—a cost that researchers at Brown University estimated would be over $300 million a day for 20 years in Afghanistan" [2].

Third, on the issue of challenges and competition with other countries, he attempted to persuade Americans of a significant shift in his country's international strategies, as evidenced when he stated, "We're engaged in a serious competition with China. We're dealing with the challenges on multiple fronts with Russia" [2].

Last but not least, a very significant Ideology that Biden has known even before becoming President, and was quite obvious in this speech, is his support for women's rights. This was used skilfully to achieve unanimous consent; for example, he repeated the phrase "men and women" several times as he said, "And still, the men and women of the United States military, our diplomatic corps, and intelligence

professionals did their job and did it well, risking their lives not for professional gains but to serve others" [2].

Effects: How Is This Discourse Positioned in Relation to Struggles at The Situational, Institutional, And Societal Levels? Are These Struggles Overt or Covert? Is This Discourse Normative concerning Member Resources or Creative? Does It Contribute to Sustaining Existing Power Relations or Transforming Them? In terms of dealing with the struggle at the situational level, this speech was delivered at the White House's State Dining Room, and it has a very deep message that can be decoded if the normal locations for such addresses are considered. George W. Bush, for example, announced the invasion of Afghanistan on October 7, 2001. From the White House Treaty Room, where most such remarks took place. Dining rooms are frequently where achievements are celebrated and honoured in political and military protocols.

Second, in dealing with the institutional struggle, this speech demonstrated that Biden desired to demonstrate authority and supremacy over his government. In this regard, he appeared at some time as judge and jury of his country's political and diplomatic process. He reiterated this several times throughout his speech, he stated, "I take responsibility for the decision" [2], elsewhere, he stated, "The fundamental obligation of a President, in my opinion, is to defend and protect America—not against threats of 2001, but against the threats of 2021 and tomorrow" [2], finally when he said, "I refused to continue in a war that was no longer in the service of the vital national interest of our people" [2].

Regarding dealing with the struggle at the societal level, while this speech was intended to address the war in Afghanistan, Biden demonstrated his involvement in social concerns as well as his ingenuity in presenting appealing and realistic answers that represented his beliefs and attitudes, since such concerns immediately affect people's lives and interests. For example, he often mentioned the safety of American people who had social affiliation in Afghanistan, as in him stating "And for those remaining Americans, there is no deadline. We remain committed to getting them out if they want to come out" [2], and in when he said, "We will continue to work to help more people leave the country who are at risk".

5   Conclusion

The study revealed that Biden demonstrated a strong ideological attitude on all of the issues tacked in the respective speech such as the socio-economic challenges, the drastic change of American policy towards Taliban, and the race with China and Russia. He employed various strategies to achieve a high level of persuasiveness such as choice of vocabulary, grammatical constructions, and figurative language Also, the interpretive analysis revealed that he used other techniques to achieve a cohesive and coherent discourse, such as presuppositions and intertextuality, Second, the macro-level analysis revealed that Biden constantly demonstrated his creativity in

offering compelling and feasible answers to social issues, which aided in portraying his views and decisions as rational and compassionate.

References

1. Andersen, K.E.: Persuasion: Theory and Practice. Allyn and Bacon, Boston (1971)
2. Biden, J.: The White House Website. Remarks by President Biden on the End of the War in Afghanistan. https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/08/31/remarks-by-president-biden-on-the-end-of-the-war-in-afghanistan (2021). Retrieved Nov 12 2022
3. Biden, J.: CNBC website. Biden says the era of U.S. nation building is over as he marks the end of the Afghanistan war. https://www.cnbc.com/2021/08/31/biden-addresses-the-end-of-the-us-war-in-afghanistan.html (2021). Retrieved Nov 23 2022
4. Biria, R., Mohammadi, A.: The socio pragmatic functions of inaugural speech: a critical discourse analysis approach. Journal of Pragmatics (2012)
5. Chapman, S., & Routledge, C.: Key Thinkers in Linguistics and the Philosophy of Language, 1st edn.. Oxford University Press (2005)
6. Cirugeda, I., Ruiz, R.: Persuasive rhetoric in Barack Obama's immigration speech: pre- and post-electoral strategies. Camino Real, **5**, 81–99 (2013)
7. Darweesh, A.D., Abdullah, N.M.: A critical discourse analysis of Donald Trump's sexist ideology. J. Educ. Pract. (2016)
8. Fairclough, N.: Critical Discourse Analysis: The Critical Study of Language. Longman Publishing, York, NY (1995)
9. Guo, J.: A contrastive study of Evidentiality in English and Chinese MA Thesis Abstracts. In: Proceedings of the 6th International Conference on Education, Language, Art and Inter-cultural Communication (ICELAIC 2019)
10. Jenson, I., Jakobsen, I.K., Pichler, L.H.: A critical discourse study of Hillary Clinton's2015/2016 presidential campaign discourses (Master dissertation, Aalborg University, Denmark) (2016).
11. Khawaldeh, S., Abu Hatab, W.: King Abdullah II Anti-Terrorism Ideology: A Critical Discourse Analysis Perspective. International Journal of Linguistics (2018)
12. Mills, S.: Language and Sexism. Cambridge University Press, Cambridge (2008)
13. Rashidi, N., Souzandehfar, M.: A critical discourse analysis of the debates between Republicans and Democrats over the continuation of war in Iraq. J. Linguist. Intercultural Educ. (2010)
14. Rodríguez Alayo, W.: A critical discourse analysis on the (self) representation of Hillary R. Clinton in public discourse. [Trabajo Fin de Máster] (2016)
15. van Dijk, T.A.: Politics, Ideology, and Discourse. Longman, York (2004)
16. van Dijk, T.: Lucrecia Berrone de Blanco. Ideología: Una aproximación multidisciplinaria (Ideology: A multidisciplinary approach). Barcelona/Buenos Aires: Gedisa (1999) (Trans.)

Observing Shareholder Influence on Stakeholder Interests: An Analysis and Roadmap for Future Inquiry

M. Chandrakala and **Ch. Raja Kamal**

1 Introduction

In today's complex business landscape, the dynamics between shareholders and stakeholder interests have garnered significant attention. As corporate governance models evolve and societal expectations heighten, the influence shareholders wield over stakeholder welfare becomes a subject of paramount importance. With the prevailing doctrine of "shareholder value maximization" deeply entrenched in executive mindsets, it becomes imperative to delve into the multifaceted ways in which shareholders impact diverse stakeholder groups and their corresponding interests.

This paper embarks on a comprehensive exploration of the intricate relationship between shareholders and stakeholders, seeking to uncover the underlying mechanisms and effects that characterize this interaction. By scrutinizing existing research and augmenting it with fresh insights, we aim to provide a holistic perspective on the intricate tapestry of shareholder-stakeholder dynamics.

2 Review of Literature

Scholars are increasingly required to offer methodical proof regarding how various shareholders affect stakeholders' welfare. As "maximising shareholder value has become so deeply engrained in executives' mindsets" [1], The right to make formal demands on businesses and their executives belongs to shareholders. In contrast to many other stakeholders who do not hold shares, shareholders can frequently speak with executives face-to-face to express their concerns, submit proposals and vote on resolutions to make their preferences known, and sell their shares to punish

M. Chandrakala (✉) · Ch. Raja Kamal
Kristu Jayanti College Autonomous Bengaluru, Bengaluru 560077, India
e-mail: drchandrakala2107@gmail.com

management when their demands are not met [2]. As a result, managers are required to consider a wider range of stakeholder interests when making company choices [3]. The make-up of the shareholder base of their companies will probably affect how they cater to those interests.

Additionally, arguments on the trade offs between shareholder and stakeholder interests and the purpose of the firm have attracted a lot of scholarly attention in recent years, frequently under the terminology of shareholder versus stakeholder primacy [1, 4]. Nevertheless, in contrast to the early proponents of shareholder primacy who contend that shareholders have a single objective purpose of profit maximisation [5]. The qualities and inclinations of various shareholders vary significantly, according to recent studies, with some prioritising long-term societal rewards. A systematic review can offer a fresh perspective on these conversations by mapping different shareholders and summarising results on how they differentially affect different stakeholders. This will help to show where shareholder and stakeholder interests overlap and where they do not. With this in mind, we ask: How does the influence of different shareholders affect how companies attend to the interests of their stakeholders? Our review answers this question from a multi-shareholder and multi-stakeholder perspective. Specifically, we synthesize and critically assess the growing body of research on the role that different categories of shareholders play in shaping corporate practices and policies that can either advance or undermine stakeholders (hereafter "stakeholders"). We By using a broad definition of "impact," we may include research that look at both activist shareholder strategies (such proposals or private meetings) and nonactivist trends in our evaluation (e.g., active or passive changes in ownership). Scholars in the domains of management, sociology, finance, and accounting have been examining how the interests of various types of stakeholders, such as communities, customers, and creditors, are impacted by the effect that shareholders have on corporate actions. However, because of the different theoretical frameworks and methodologies that are applied in different fields, this body of research is fragmented and in urgent need of a comprehensive review.

3   Conceptualizing the Influence of Shareholders on Different Stakeholder Groups and Interests

Conceptualizing the influence of shareholders on different stakeholder groups and interests involves understanding how shareholders' actions, decisions, and interests impact various stakeholders within and outside of a company. Here's a conceptual framework that outlines the dynamics of this influence:

3.1 Shareholder Influence Mechanisms

Voting Power: Shareholders exercise their influence through voting on important corporate matters, such as board appointments, mergers, and major policy changes.

Ownership Stake: Shareholders' ownership of shares grants them a financial interest in the company's performance, leading to the desire for increased stock value and dividends.

3.2 Stakeholder Groups

Employees: Shareholders' decisions can affect employee welfare through executive compensation, labor policies, and workplace conditions.

Customers: Shareholders' interests in profit maximization can impact pricing strategies, product quality, and customer service.

Suppliers: Shareholder-driven cost-cutting initiatives might influence the terms of supplier contracts and relationships.

Communities: Shareholders' influence can shape a company's engagement with local communities, social impact initiatives, and philanthropy.

Government and Regulators: Shareholders' actions may trigger regulatory responses or influence policy decisions affecting the business environment.

3.3 Interests of Different Stakeholder Groups

Short-Term Financial Returns: Shareholders often prioritize maximizing short-term returns, which might conflict with the long-term interests of other stakeholders.

Ethical and Social Considerations: Shareholders' focus on profitability may conflict with stakeholders' interests in ethical behavior, social responsibility, and sustainability.

Employee Well-being: Shareholder pressure for cost reduction could impact employee benefits, training, and job security.

Product Safety and Quality: Shareholders' drive for profit could influence product quality and safety standards.

Environmental Impact: Shareholders' focus on profits might lead to environmentally unsustainable practices if not aligned with stakeholders' concerns about environmental impact.

3.4   Alignment and Conflicts

Alignment: In some cases, shareholder interests align with those of stakeholders. For instance, strong financial performance can lead to increased employee satisfaction and community support.

Conflicts: Conflicts arise when shareholder pursuit of financial gain contradicts the interests of other stakeholders. Balancing these interests is a challenge.

3.5   Corporate Governance and Regulation

Board of Directors: Shareholders' influence in electing board members affects corporate strategy and oversight.

Regulatory Environment: Shareholders' actions can prompt regulatory changes that impact stakeholder interests.

3.6   Communication and Transparency

Shareholder Engagement: Companies may engage with shareholders to understand their concerns, enhancing alignment with stakeholder interests.

Transparency: Open communication about decisions and their implications for stakeholders can mitigate conflicts.

3.7   Social Responsibility and Ethical Leadership

Responsible Investment: Some shareholders prioritize investing in companies with strong social and environmental practices, shaping corporate behavior.

Ethical Leadership: Companies that prioritize ethical leadership may align shareholder interests with broader stakeholder concerns.

3.8   Balancing the Equation

Strategic Decision-Making: Effective corporate strategies consider both shareholder value and stakeholder interests for long-term sustainability.

Ethical Decision Frameworks: Companies can develop ethical decision frameworks that weigh the interests of all stakeholders in strategic choices.

4 Major Concepts

Stakeholders and Shareholders: Stakeholders are individuals or groups who are directly or indirectly affected by a company's actions and decisions. Shareholders, on the other hand, are individuals who own shares in the company and have a financial interest in its success.

Stakeholder Theory: This theory suggests that businesses have an ethical and social responsibility to consider the interests of all stakeholders, not just shareholders. It challenges the traditional view that the primary purpose of a company is to maximize shareholder value.

Agency Theory: This theory explores the potential conflicts of interest between shareholders (principals) and management (agents). It examines how management decisions might deviate from shareholder interests and seeks to align these interests through mechanisms like executive compensation.

Corporate Social Responsibility (CSR): Many companies are now adopting CSR initiatives to address the concerns of various stakeholders, such as environmental sustainability, employee well-being, and community engagement, beyond just maximizing profits.

Corporate Governance: The structure and processes that govern a company can influence how well shareholder and stakeholder interests are balanced. Effective corporate governance mechanisms aim to ensure accountability and transparency.

5 Trends and Research Directions

5.1 Balancing Stakeholder Interests

Research often focuses on strategies and mechanisms that companies can use to effectively balance the interests of shareholders with those of other stakeholders. This includes exploring the impact of CSR initiatives, stakeholder engagement, and ethical decision-making frameworks.

5.2 Measurement and Reporting

There is a growing emphasis on measuring and reporting non-financial performance, such as social and environmental impact. This helps in assessing a company's commitment to various stakeholder interests.

5.3 Institutional Investors

The role of institutional investors (e.g., pension funds, mutual funds) in influencing company behavior is a significant area of study. These investors can use their voting power to influence corporate policies related to stakeholder concerns.

5.4 Ethics and Transparency

Research examines how companies can uphold ethical standards and be transparent in their operations, which can enhance trust among stakeholders and shareholders alike.

5.5 Regulatory Landscape

Changes in regulations and corporate governance codes also influence how companies consider stakeholder interests. Research might explore the impact of regulatory changes on corporate behavior.

6 Balancing Shareholder and Stakeholder Interests

Investigate strategies that companies use to balance both shareholder and stakeholder interests.

Analyze cases of successful or unsuccessful attempts to align these interests.

Discuss the challenges and dilemmas companies face when trying to satisfy both groups.

6.1 Corporate Governance and Regulation

Examine how corporate governance structures impact the relationship between shareholders and stakeholders.

Discuss the role of regulations and codes of conduct in shaping companies' approach to stakeholder interests.

6.2 *Corporate Social Responsibility (CSR) Initiatives*

Explore how CSR initiatives and sustainability practices address stakeholder concerns.

Assess the imp act of CSR on shareholder value and company performance.

6.3 *Measurement and Reporting*

Discuss methods of measuring and reporting both financial and non-financial performance to stakeholders.

Analyze the effectiveness of different reporting mechanisms in conveying a company's commitment to stakeholders.

6.4 *Ethical Considerations and Transparency*

Examine the ethical dimensions of shareholder-stakeholder dynamics.

Explore how transparency in decision-making and operations influences both groups.

7 Future Research Directions

Propose potential areas for further inquiry within the field.

Identify gaps in the existing literature and suggest avenues for future research.

8 Conclusion

The influence of shareholders on different stakeholder groups and interests forms a critical nexus within the modern corporate landscape. Through a comprehensive review of relevant literature, it becomes evident that this intricate relationship has profound implications for corporate governance, ethical decision-making, and long-term sustainability.

The synthesis of research underscores both the alignment and conflicts that arise from the interplay of shareholder aspirations and stakeholder expectations. While shareholders are driven by the pursuit of financial returns, stakeholders encompass a diverse array of interests, ranging from employees' job security to communities' well-being, and from customers' satisfaction to environmental sustainability.

The harmonization of these often divergent interests demands a nuanced approach. Corporate governance mechanisms, including transparent communication channels and robust ethical frameworks, emerge as indispensable tools to navigate this complex terrain. Moreover, the emergence of responsible investing and Environmental, Social, and Governance (ESG) considerations redefines the concept of value, compelling companies to integrate societal and environmental concerns into their strategies.

Nevertheless, challenges persist. Short-term profit pressures may inadvertently jeopardize long-term stakeholder interests. The potential for conflicts necessitates a delicate balance between maximizing shareholder value and embracing a broader responsibility to society.

As the corporate landscape evolves, the roadmap for the future beckons us to explore uncharted territories. Avenues for further research include evaluating the effectiveness of stakeholder engagement strategies, understanding the impact of technological disruptions on these dynamics, and examining the regulatory implications of stakeholder-oriented governance models.

Ultimately, the influence of shareholders on diverse stakeholder groups and interests is a testament to the evolving paradigm of corporate purpose. The convergence of economic prosperity, social responsibility, and environmental stewardship is the crucible in which businesses redefine their roles in a rapidly changing world. By recognizing the complexities, embracing the challenges, and fostering alignment among shareholders and stakeholders, corporations can navigate this intricate landscape to forge a more equitable, sustainable, and resilient global business ecosystem.

References

1. Goranova, M., Ryan. L.V.: The corporate objective revisited: the shareholder perspective. J. Manage. Stud. **59**(2), 526–554
2. Fox, J., Lorsch, J.W.: What good are shareholders. Harvard Bus. Rev. **90**(7/8), 48–57 (2012)
3. Harrison, R.L., Reilly, T.M., Creswell, J.W.: Methodological rigor in mixed methods: An application in management studies. J. Mixed Methods Res. **14**(4), 473–495 (2020)
4. Inkpen, A.C., Sundaram, A.K.: The endurance of shareholder value maximization as the preferred corporate objective. J. Manage. Stud. **59**(2), 555–568 (2022)
5. Sundaram, A.K., Inkpen, A.C.: The corporate objective revisited. Organ. Sci. **15**(3), 350–363 (2004)
6. Freeman, R.E.: Strategic Management: A Stakeholder Approach (1984)
7. Jensen, M.C., Meckling, W.H.: Theory of the firm: managerial behavior, agency costs and ownership structure (1976)
8. Donaldson, T., Preston, L.E.: The stakeholder theory of the corporation: concepts, evidence, and implications (1995)
9. Fama, E.F., Jensen, M.C.: Separation of ownership and control (1983)
10. Clarkson, M.B.: A stakeholder framework for analyzing and evaluating corporate social performance (1995)
11. Carroll, A.B.: A three-dimensional conceptual model of corporate social performance (1979)
12. Achleitner, A.-K., Bazhutov, D., Betzer, A., Block, J., Hosseini, F.: Foundation ownership and shareholder value: an event study. RMS **14**, 459–484 (2020)

13. Acharya, V., Xu, Z.: Financial dependence and innovation: the case of public versus private firms. J. Financ. Econ.Financ. Econ. **124**, 223–243 (2017)
14. Agrawal, A.K.: Corporate governance objectives of labor union shareholders: evidence from proxy voting. Rev. Financ. Stud. **25**, 187–226 (2012)
15. Agrawal, A., Lim, Y.: Where do shareholder gains in hedge fund activism come from? Evidence from employee pension plans. J. Financ. Quant. Anal. (2021)
16. Aguinis, H., Glavas, A.: What we know and don't know about corporate social responsibility: a review and research agenda. J. Manag. Manag. **38**, 932–968 (2012)
17. Ahmadjian, C.L., Robbins, G.E.: A clash of capitalisms: foreign shareholders and corporate restructuring in 1990s Japan (2005)
18. Am. Sociol. Rev. **70**, 451–471. 424 J. Manag./January 2023
19. Altemose, J.R., McCarty, D.A.: Organizing for democracy through faith-based institutions: the industrial areas foundation in action. Forging Radical Alliances Across Difference: Coalition Politics for the new Millennium 133–145 (2001)
20. Antoni, M., Maug, E., Obernberger, S.: Private equity and human capital risk. J. Financ. Econ., JFE Spec. Issue Labor Financ. **133**, 634–657 (2019)
21. Atanassov, J.: Do Hostile takeovers stifle innovation? Evidence from antitakeover legislation and corporate patenting. J. Financ.Financ. **68**, 1097–1131 (2013)
22. Atkinson, L., Galaskiewicz, J.: Stock ownership and company contributions to charity. Adm. Sci. Q. **33**, 82–100 (1988)
23. Azar, J., Duro, M., Kadach, I., Ormazabal, G.: The big three and corporate carbon emissions around the world. J. Financ. Econ. **142**, 674–696 (2021)
24. Bansal, P., DesJardine, M.R.: Business sustainability: it is about time. Strateg. Organ.. Organ. **12**, 70–78 (2014)
25. Bansal, P., Song, H.-C.: Similar but not the same: differentiating corporate sustainability from corporate responsibility. Acad. Manag. Ann. **11**, 105–149 (2017)
26. Bena, J., Ferreira, M.A., Matos, P., Pires, P.: Are foreign investors locusts? The long-term effects of foreign institutional ownership. J. Financ. Econ. **126**, 122–146 (2017)
27. Berrone, P., Cruz, C., Gomez-Mejia, L.R., Larraza-Kintana, M.: Socioemotional wealth and corporate responses to institutional pressures: do family-controlled firms pollute less? Adm. Sci. Q. **55**, 82–113 (2010)
28. Connelly, B.L., Haynes, K.T., Tihanyi, L., Gamache, D.L., Devers, C.E.: Minding the gap: antecedents and consequences of top management-to-worker pay dispersion. J. Manag.Manag. **42**, 862–885 (2016)
29. Connelly, B.L., Hoskisson, R.E., Tihanyi, L., Certo, S.T.: Ownership as a form of corporate governance. J. Manage. Stud. **47**, 1561–1589 (2010)
30. Connelly, B.L., Lee, K.B., Tihanyi, L., Certo, S.T., Johnson, J.L.: Something in common: competitive dissimilarity and performance of rivals with common shareholders. Acad. Manag. J. **62**(1), 1–21 (2019)
31. Connelly, B.L., Shi, W., Zyung, J.: Managerial response to constitutional constraints on shareholder power. Strateg. Manag. J.. Manag. J. **38**, 1499–1517 (2017)

An Empirical Research on Community Businesses in Emerging Markets in the Age of the Internet

Sanjeev Chauhan , **Arti Singh** , **Ibha Rani** , **and Ch Raja Kamal**

1 Introduction

Technology like the Internet and smartphones are changing the face of globalization. There is now a global monetary and informational system made possible by computers and cutting-edge ICTs Limna et al. [12]. Machine learning and large data sets demonstrate that the virtual and physical worlds coexist. Both Helbing et al. [8] and Limna [11] cite this study. Citizenship in the digital realm extends beyond the mundane. Digital competence is required for effective use of ICT, financial transactions, and other technological applications. Contributions, volunteer work, and environmental protection are all examples of social responsibility.

In order to increase national income, social economists study topics including household and business spending Sharma [22], Suwanik et al. [28]. Community businesses benefit from public sector involvement and digital citizenship. The economic success of individuals and families is the lifeblood of every civilization, making trade difficult. Communities as a whole are influenced by their infrastructure, culture, traditions, way of life, and social environment. Local enterprises strengthen the economy. Many once-thriving countries have experienced economic collapse due to domestic policies, political instability, and involvement by global superpowers. Countries that rely only on exports tend to ignore domestic demand Nuanchuen [18], Barr [1]. The social economy, which prioritizes its constituents before profit, has an impact on long-term sustainability Nez [19].

S. Chauhan
Institute of Business Management, GLA University, Mathura, India
e-mail: sanjeev.chauhan@gla.ac.in

A. Singh (✉) · I. Rani · C. Raja Kamal
Department of Commerce, Kristu Jayanti College (Autonomous), Bangalore, India
e-mail: artisingh2501@gmail.com

C. Raja Kamal
e-mail: rajakamal@kristujayanti.com

There are many community businesses because even in a bad economy, communities need support from all economic sectors. Companies with a social mission must consider more than just the bottom line. Local expertise is vital to the success of local enterprises. Local businesses in 3rd world countries study e-citizenship and social economy. This study looks at how community businesses improve the social economy by influencing variables including household income, productivity, resource use, participation, and long-term viability.

2   Literature Review

It's possible that families may benefit by eating healthily and saving money. A nation's macroeconomic health is affected by factors such as the standard of living of the populace, unemployment rates, the trade deficit, and the international balance of payments Sijtsema et al. [23], Suttisomboon et al. [27]. Research in economics, finance, and development increasingly centers on familie's financial situations since they are the primary units of production, consumption, and investment. Mishra [15] and Chitiga-Mabugu [4].

People band together to start businesses. Entrepreneurs in the area may benefit from social resources, organizations, and networks. To secure their own futures, locals organize into cooperatives. Local companies get access to both customers and personnel. Local enterprises improve community finances, resource availability, and property rights Petcho et al. [20]. Bridge the gap between the local and national markets by investing in rural community entrepreneurs. Local businesses improve the local economy, resource management, capital allocation, and respect for tradition and history. Local companies are the backbone of every nation's economy.

Considerations of socioeconomic status are important Bouchard [2], Subiyakto et al. [25]. It affects social structures, economies, equity, and long-term viability Milotay [14]. Economic and social concerns. According to Liger et al. [10], private, formally formed enterprises and networks produce market and non-market goods and services in a democratic and participatory manner. Profits or surpluses from social economy initiatives are distributed to participants not in the form of money but in response to their needs. Employment, social inclusion, democratic involvement, and community development have all benefited from the work of non-profit or third-sector social economy groups Noya and Clarence [17]. The social economy consists of privately owned businesses and networks that are locally rooted and practice democratic, participatory decision-making. Charities do good for the community. Businesses large and small are joining the expanding social economy. EU GDP: 6–8%. It's good for business and fosters a sense of community. Since the seventeenth century Milotay [14], the social economy has included social relationships, community, growth, and socio-political empowerment.

Income, education, employment, community safety, and social support all have an impact on health and longevity, as shown by the University of Wisconsin's County Health Rankings [5]. These have an impact on well-being, housing, access to care, and

mental health. Education, gainful employment, and supportive relationships are all crucial to living a long life. Housing, education, childcare, nutrition, and healthcare are all impacted by one's income. Savings and investment are impacted by unemployment during economic downturns. Nez et al. (2020) analyzed how businesses in the social economy can equalize the workplace for women. Social economy groups help women get work and security by removing discriminatory barriers. A theoretical model for social economy organizations that includes organizational dedication, a knowledge-centered culture, and training was established by Cardoso et al. [3] and empirically confirmed. Knowledge management in businesses operating in a social economy should develop training programs centered on a culture of knowledge. In 2018, Felice advocated for a social market economy to benefit society at large. People are able to express their autonomy, compassion, and responsiveness to future events without the government getting in the way thanks to the bridge that is civil society. Exchanges on all levels of government, business, and culture should be encouraged by civil society. Government and business have the backing of the public. Markets and governments have the backing of civil society.

There is no clear distinction between "technological readiness" and "digital readiness" in the literature. These expressions have several meanings. Being ready to embrace and make the most of digital tools is essential. Technology adoption may be influenced by factors such as age, competence, experience, and attitude Terdpaopong and Kraiwanit [29]. Some people may be less tech-savvy as a result of age or other circumstances. Digital natives those under the age of 34 and non-digital natives those aged 34 and over had their cognitive ages compared by Yang and Shih [30]. Natives and non-natives of the digital age both noted improved efficiency, simplicity, and fluidity.

3 Methodology

Research with numbers. Questionnaires with no space for free-form answers. The questionnaire's foundation was solid research. Limsangpetch et al. [13] pre-tested 30 respondents using their questionnaire. Authenticated measurement tools. The testing confirmed the precision of the measurement tools. According to Siripipatthanakul et al. [24], the validity of an instrument depends on the researcher's conceptual framework. There is a 95% confidence level in the vast majority of polls. In order to be 95% accurate, a convenience sample has to collect data from 385 cases Jandawapee et al. [9]. This assumes a sample error of 5%. The sample size was 721 persons. Inadvertent testing.

The effect of several independent factors on a dependent variable is examined by means of many regression. Moore et al. [16] explain that multiple regression may be used to predict a dependent variable based on a set of independent factors. Research was performed using a multiple regression model. Online communication channels such YouTube, Line, Facebook, Pinterest, Podcast, Blog, WhatsApp, and Instagram were analyzed together with technological preparedness, social economy,

demographic characteristics like education, age, income, residency, and gender using a dummy variable with male 1 and female 0, and gender. Average monthly household income and prior year social activity (joining or not participating) served as the dependent variables in this study.

4 Results

The average and standard deviation for both the technical preparedness and social economics scores are shown in Table 1. With an average technical readiness score of 6.28 out of 10, the social economy averaged 44,250.

Table 2 summarizes the data about age in terms of frequency, percentage, proportion, and weight. About two-thirds of respondents (60.3%) were less than 25 years old, while 18.1% were between the ages of 25 and 34, 6.0% were between the ages of 35 and 44, 3.9% were between the ages of 45 and 54, and 2.7% were older than 55.

Table 3 presents the educational frequency, percentage, proportion, and weight scores. Eighty-one percent of those who participated had a bachelor's degree or above. In addition, 16.2% of respondents had completed some college or higher, 1.9% had completed graduate school, and 1.8% had not completed high school.

The data on collinearity are shown in Table 4. Since the tolerance is not close to zero and the VIF is less than ten, multicollinearity is not an issue while analyzing this set of independent variables [26].

Table 1 Results for technical preparedness and the social economy, as well as their means and standard deviations

Category	N	Mean	Standard deviation
Tech-ready Definition	721	7.28	1.735
Subsidized market	721	33,251.11	21,355.993

Source Primary Data

Table 2 Age distribution in terms of frequency, percentage, proportion, and value

Age	Percent	Weight score
< 25 Years old	68.3	1.000
25–34 Years old	18.1	0.161
35–44 Years old	6.0	0.086
45–54 Years old	3.8	0.056
> 55 Years old	1.7	0.040
Total	100.0	

Source Primary Data

Table 3 The educational frequency, percentage, proportion, and score

Education	Percent	Weight score
Lower than high school	2.8	1.122
High school diploma	26.2	1.233
Bachelor's degree	81.2	2.111
Master's degree or higher	2.9	1.124
Total	100.0	

Source Primary Data

Table 4 Multicollinearity of demographic parameters, tabulated

Variable	Collinearity statistics	
	Tolerance	VIF
Tech-ready definition	0.962	1.040
Residence	0.808	1.238
Monthly save	0.559	1.788
Age	0.838	1.193
Gender	0.953	1.070

Source Primary Data

The online communication collinearity data are shown in Table 5. This set of independent variables may also be analyzed without worrying about multicollinearity since the tolerance does not approach 0 and the VIF does not surpass 10.

Coefficients of determination are shown in Table 6. $R^2 = 0.588$, therefore the investigated independent factors account for around 58.8% of the total variance in the dependent variable. An R-squared value of 0.583 indicates that about 58.3% of the variance is explained after adjustments have been made.

Table 5 Multicorrelation (Online meeting places)

Variable	Collinearity statistics	
	Tolerance	VIF
Blogs	0.735	1.36
Facebook	0.57	1.753
YouTube	0.418	2.394
Podcasts	0.881	1.135
WhatsApp	0.637	1.569
Pinterest	0.837	1.195
Line	0.864	1.158
Instagram	0.482	2.075

Source Primary Data

Table 6 Coefficients of correlation and regression

Model	R	R-Squared	Adjusted R-Square
1	0.778*	0.577	0.573

Source Primary Data

The asterisk shows the significance level

The predicted values of the social economy's coefficients are listed in Table 7. There was a 0.000 predictability between the social economy dependent variable and any of the independent factors.

Table 8 demonstrates, at the 0.00 level, a positive relationship between social economy and X8, X10, X13, X14, and X15. The negative correlation between (X9), (X11), and (X12) suggests that the use of Line, WhatsApp, and podcasts may help to foster a thriving social economy. From this, we may get the formula:

Table 7 Forecast coefficients for the social economy

Model		Sum of squares	df	Mean square	F	Sig
1	Regression	56.535	4	6.061	115.336	0.000b
	Residual	35.603	716	0.056		
	Total	65.136	720			

Source Primary Data

Table 8 Represents social economy (internet-based communication services) coefficients

Model		Unstandardised coefficients		Standardised coefficients Beta		
		B	Std. error	Beta	t	Sig
1	(Constant)	9.238	0.220		84.292	0.000
	Blogs (X15)	0.266	0.034	−0.224	−2.828	0.005
	Facebook (X14)	0.266	0.062	0.243	2.864	0.004
	YouTube (X13)	0.036	0.052	0.042	0.624	0.465
	WhatsApp (X11)	−0.008	0.050	−0.008	−0.269	0.865
	Podcasts (X12)	−0.063	0.048	−0.053	−2.320	0.286
	Pinterest (X10)	0.222	0.032	0.264	3.964	0.000
	Line (X9)	−0.023	0.038	−0.024	−0.588	0.556
	Instagram (X8)	0.449	0.084	0.289	5.323	0.000

Source Primary Data

Table 9 Represents the social economy variable's coefficients

Model		Unstandardised coefficients		Standardised coefficients Beta		
		B	Std. error	Beta	t	Sig
1	(Constant)	8.218	0.071		115.34	0.000
	Age (X3)	0.009	0.001	0.22	7.153	0.000
	Technological readiness (X1)	0.031	0.006	0.134	5.124	0.000
	Age (X3)	0.009	0.001	0.22	7.153	0.000
	Facebook (X14)	0.066	0.033	0.054	2.019	0.000
	Pinterest (X10)	0.106	0.022	0.143	4.747	0.000
	Instagram (X8)	0.42	0.044	0.27	9.531	0.000
	Residence (X6)	0.102	0.021	0.132	4.776	0.000
	Instagram (X8)	0.42	0.044	0.27	9.531	0.000

Source Primary Data

The negative positive connections with the social economy are shown in Table 9 for (X8), (X3), (X6), (X1), (X10), and (X14). Therefore, social media platforms like Instagram, age, housing, technological readiness, Pinterest, and Facebook all contribute to a better economic climate. The form of these equations is as follows:

5 Conclusion

This research analyzed the effects of rural company expansion on the local economy. Instagram (X8), age (X3), place of residence (X6), technical preparedness (X1), Pinterest (X10), and Facebook (X14) all have positive and negative effects on the social economy, according to the multiple regression model. The social economy grows in response to factors such as age, housing, technology literacy, Pinterest, and Facebook usage. The social economy is boosted by platforms like Instagram, Pinterest, YouTube, Facebook, and blogs (X8-X15). Damage to the social economy is caused by Line, WhatsApp, and podcasts (X9–X12). Technological readiness affects Serbia's worldwide competitiveness, according to Radivojevi et al. [21]. Income, education, employment, community safety, and social support all have an effect on health and longevity, as shown by the University of Wisconsin's County Health Rankings [5]. According to Nez et al. (2020), the social economy's potential impact on SDGs is gaining attention because of its people-centered focus. Revenue and productivity at the national level are affected by the social economy, as shown by Di Maggio and Notarstefano [6]. Social policy, common good management, and initiatives to boost job creation, startup activity, social cohesion, and community business all find fertile ground in the social economy's experimental lab. Businesses in the social economy often work together to volunteer and raise money. Therefore,

governments, administrations, and institutions should back community businesses that expand the social economy since they fuel the community and help society. The literature on social economies in developing countries benefits from the work of community entrepreneurs. The results may encourage researchers to pursue new avenues of inquiry. Social economy innovation may emerge from studies of online business communities in developing nations.

Inspire communities and groups of individuals to create enterprises that sustain social and communal initiatives. Mix up the ages to see more people sign up. Although the scope of this study is limited to local companies with an impact on the social economy, further studies may look at other factors such as resident's propensity to remain in the area, the impact local firms have on the economy, and the level of participation in civic life. Future studies might benefit from using qualitative approaches like interviews or focus groups in addition to the self-administered questionnaire used in this study.

References

1. Barr, C.: A post Covid-19 agenda for nonprofit and social economy research. Canad. J. Nonprofit and Soc. Econ. Res. **11**(1), 4–4 (2020). https://doi.org/10.22230/anserj.2020v11n1a373
2. Bouchard, M.J.: Social innovation, an analytical grid for understanding the social economy: the example of the Quebec housing sector. Serv. Bus. **6**(1), 47–59 (2012). https://doi.org/10.1007/s11628-011-0123-9
3. Cardoso, L., Meireles, A., Peralta, C.F.: Knowledge management and its critical factors in social economy organizations. J. Knowl. Manag. **16**(2), 267–284 (2012). https://doi.org/10.1108/13673271211218861
4. Chitiga-Mabugu, M., Henseler, M., Mabugu, R., Maisonnave, H.: Economic and distributional impact of COVID-19: evidence from macro-micro modelling of the South African economy. South African J. Econ. **89**(1), 82–94 (2021). https://doi.org/10.1111/saje.12275
5. County Health Rankings.: Social & Economic Factors (2022). Retrieved from: https://www.countyhealthrankings.org/explore-health-rankings/county-health-rankings-model/health-factors/social-economic-factors
6. Di Maggio, U., Notarstefano, G.: Social and civil economy for a new paradigm of development: statistics needs and data availability in EU. The Italian J. Econ. Demographic and Stat. Stud. **73**(1), 41–50 (2019)
7. Felice, F.: Civil economy in the social market economy: a theoretical perspective. J. for Markets and Ethics **6**(1), 87–98 (2018). https://doi.org/10.2478/jome-2018-0030
8. Helbing, D., Frey, B.S., Gigerenzer, G., Hafen, E., Hagner, M., Hofstetter, Y., . . . Zwitter, A.: Will democracy survive big data and artificial intelligence?. In: Towards Digital Enlightenment, pp. 73–98. Cham, Springer (2019)
9. Jandawapee, S., Siripipatthanakul, S., Phayaphrom, B., Limna, P.: Factors influencing intention to follow the preventive COVID-19 protocols among Thai people. Int. J. Behav. Anal. **2**(1), 1–15 (2022). https://doi.org/10.31838/hiv21.02.06
10. Liger, Q., Stefan, M., Britton, J.: Social economy. European parliament (2016). Retrieved from: http://www.europarl.europa.eu/studies
11. Limna, P.: Artificial Intelligence (AI) in the hospitality industry: a review article. Int. J. Comput. Sci. Res. **6**(6), 1–12 (2022) Advance Online Publication
12. Limna, P., Kraiwanit, T., Siripipatthanakul, S.: The growing trend of digital economy: a review article. Int. J. Comput. Sci. Res. **6**(6), 1–11 (2022). https://doi.org/10.25147/ijcsr.2017.001.1.106

13. Limsangpetch, V., Siripipatthanakul, S., Phayaphrom, B., Limna, P.: Modelling knowledge management on business performance through mediating role of organisational innovation among IT Staff in Bangkok Thailand. Int. J. Behav. Anal. **2**(2), 1–17 (2022)
14. Milotay, N.: What future for the social economy? Europ. Parliamentary Res. Serv. **659**(336), 1–12 (2020)
15. Mishra, M.K.: The world after COVID-19 and its impact on global economy. Kiel, Hamburg: ZBW—Leibniz Information Centre for Economics (2020)
16. Moore, A.W., Anderson, B., Das, K., Wong, W.K.: Combining multiple signals for biosurveillance. In: Handbook of Biosurveillance, pp. 235–242. (2006).https://doi.org/10.1016/B978-012369378-5/50017-X
17. Noya, A., Clarence, E.: The social economy: building inclusive economies, local economic and employment development (LEED) (Eds.). Paris, OECD Publishing (2007)
18. Nuanchuen, J.: Guidelines for developing sustainable community enterprises with local wisdom: case study of community enterprises in Nakhon Phanom Province and Sakon Nakhon Province. Thai National Defence College, Thailand (2018)
19. Núñez, R.B.C., Bandeira, P., Santero-Sánchez, R.: Social economy, gender equality at work and the 2030 agenda: theory and evidence from Spain. Sustainability **12**(12), 5192 (2020). https://doi.org/10.3390/su12125192
20. Petcho, W., Szabo, S., Kusakabe, K., Yukongdi, V.: Farmers' perception and drivers of membership in rice production community enterprises: evidence from the central region Thailand. Sustainability **11**(19), 5445 (2019). https://doi.org/10.3390/su11195445
21. Radivojević, V., Krstić, B., Stanišić, T.: The role of technological readiness in the global competitiveness of Serbian economy. Facta Universitatis. Series: Econ. Organiz. **15**(1), 111–123 (2018). https://doi.org/10.22190/fueo1802111r
22. Sharma, E.: A review of corporate social responsibility in developed and developing nations. Corp. Soc. Responsib. Environ. Manag. **26**(4), 712–720 (2019)
23. Sijtsema, S.J., Snoek, H.M., Van Haaster-de Winter, M.A., Dagevos, H.: Let's talk about circular economy: a qualitative exploration of consumer perceptions. Sustainability **12**(1), 1–15 (2019). https://doi.org/10.3390/su12010286
24. Siripipatthanakul, S., Limna, P., Sriboonruang, P., Kaewpuang, P.: Applying the TPB and the UTAUT models predicting intentions to use telemedicine among Thai people during the COVID-19 pandemic. Int. J. Comput. Sci. Res. **6**(6), 1–23 (2022). https://doi.org/10.25147/ijcsr.2017.001.1.107
25. Subiyakto, B., Jumriani, J., Abbas, E.W., Muhaimin, M., Rusmaniah, R.: Community economic empowerment through the existence of thematic village. The Innov. Soc. Stud. J. **4**(1), 01–10 (2022). https://doi.org/10.20527/iis.v4i1.6368
26. Sulaiman, M.S., Abood, M.M., Sinnakaudan, S.K., Shukor, M.R., You, G.Q., Chung, X.Z.: Assessing and solving multicollinearity in sediment transport prediction models using principal component analysis. ISH J. Hydraul. Eng. **27**(sup1), 343–353 (2021). https://doi.org/10.1080/09715010.2019.1653799
27. Suttisomboon, V., Na-Nakorn, S., Angkavanich, S.: Knowledge and understanding of the principles of economy, society, art and culture of the nation, morality leads society. In: Unit 9, RU 100 Teaching Materials. Bangkok, Ramkhamhaeng University (2001)
28. Suwanik, S., Chantarat, S., Rittinon, C., Samphantharak, K.: Financial economics of Thai households: Scan (behaviour) through five databases (2017). Retrieved from: https://www.pier.or.th/abridged/2017/13/
29. Terdpaopong, K., Kraiwanit, T.: The technology readiness of Thai governmental agency. The J. Asian Finan. Econo. Bus. **8**(12), 431–441 (2021)
30. Yang, K.-C., Shih, P.-H.: Cognitive age in technology acceptance: at what age are people ready to adopt and continuously use fashionable products? Telematics Inform. **51**, 101400 (2020). https://doi.org/10.1016/j.tele.2020.101400

Navigating Work from Home: A Study on Its Implications for Family Life and Work-Life Balance

Aasha Sujit● **and B. Harani**●

1 Introduction

The integration of technology into every facet of modern life has not only transformed industries but has also redefined the nature of work itself. The Information Technology (IT) sector, as a driving force behind this technological revolution, has undergone a remarkable evolution in recent years. One of the most significant changes has been the widespread adoption of work from home option among IT professionals, which has become a hallmark of the industry. As IT professionals increasingly transition from traditional office spaces to remote work environments, the dynamics of their careers, as well as their personal lives, have taken on new dimensions.

The advent of remote work in the IT sector has ushered in a paradigm shift that transcends geographical barriers and conventional office norms. Remote working has brought in flexi time, which refers to the flexibility in timing of work which is also called as schedule flexibility or temporal flexibility [12]. Many working people currently feel that there is not enough balance between work and personal life in the workplace [10]. This transformation has been driven by technological advancements, changing attitudes toward work, and the recognition that productivity and innovation can thrive beyond the confines of a physical office. This trend has been further accelerated by global events that have necessitated a reimagining of traditional work arrangements.

Work from home offers a plethora of advantages for IT professionals. It provides flexibility in managing work schedules, eliminates the need for daily commutes, and allows professionals to tailor their work environments to their preferences. However, this shift also brings about unique challenges such as managing the boundary between work and personal life.

A. Sujit (✉) · B. Harani
REVA University, Bangalore, India
e-mail: aashasujit17@gmail.com

2   Structure of the Study

3   Review of Literature

Through an extensive review of the existing literature, this research situates the phenomenon of remote work within a broader context. The literature review synthesizes studies examining the Work from home- A new Virtual Reality: [13] the influence of flexible work arrangements on work-life balance [6], and the evolving nature of family dynamics in the face of technological advancements [7]. By integrating these strands of research, this study underscores the need for a holistic examination of the implications of remote work on the family unit.

3.1   Flexible Work Arrangements and Work-Life Balance

Gajendran and Harrison [6] explored the relationship between flexible work arrangements and work-life balance. They highlighted that remote work arrangements offer individual's greater flexibility in managing their work and personal responsibilities. However, they cautioned that remote work might lead to an "always-on" mentality, blurring the boundaries between work and personal life and potentially causing work-life conflict.

3.2   Technology's Influence on Family Dynamics

Radesky et al. (2016) discussed technology's influence on family dynamics. While not solely focused on remote work, their findings are relevant to the discussion

of work from home. They observed that technology, including remote work tools, can both facilitate and disrupt family interactions. While technology can enable flexibility, it can also lead to the intrusion of work into family time.

3.3 Work from home- A new Virtual Reality

Tunk and Kumar [13] examined that work from home has its different influence on job performance, work dependence, work life balance, social interaction, supervisor's role and work environment. The study revealed that job performance, social interaction and supervisor's role related hypothesis are refuted. The study tries to bridge the gap between the existing research done in past during normal course of time and current pandemic.

4 Objectives

 i. To discover and analyse the factors that encourage work-life balance through the possibility of working from home.
ii. To evaluate the implications of family life through work from home option.

5 Statement of the Problem

Global society is undergoing a significant transition as a result of the advancement of information technology. The information technology industry is known for its lengthy working hours and irregular work patterns because they also serve international clients. This disrupts family life by bringing about health hazards, stress, culture shock, and change. To help employees overcome this, various work options are offered to them, such as flexible scheduling and work from home. Because there are so many options available, workers are freed from the monotony of their regular jobs and are able to spend quality time with their family. In light of the examination above, one of the factors supporting work-life balance has been identified as flexible work from home. Hence research on Navigating Work from Home: A Study on its Implications for.

Family Life and Work-Life Balance has been conducted.

6 Theoretical Background

6.1 Work from Home

The phenomenon of remote work, also known as telecommuting or working from home, has gained substantial attention in recent years due to its transformative impact on traditional work arrangements and its potential implications for various aspects of individual well-being and organizational functioning.

Historically, the concept of work-life balance has been intertwined with the separation of work-related activities from personal life. Traditional office structures delineated clear temporal and spatial boundaries, fostering a distinct separation between professional endeavors and familial interactions. Remote workers are more committed to the organization, are more enthusiastic about the job [5] However, the advent of remote work has reshaped this dichotomy, dissolving the geographical confines of work and propelling individuals into a fluid environment where work and family coexist within the same physical space.

6.2 Personal and Professional Life

The work-family balance is one of the largest issues in the workplace today, particularly given the difficulties in juggling childrearing and job/career prospects brought on by the development and normalization of dual-income households over the past two decades [4]. Technological interruptions are associated with child problem behaviors [8]. Although working from home has many advantages, other research emphasizes the potential for increased stress especially parental stress can lead to subsequent child maltreatment [2]. Such stress has brought on by the inability to distinguish and maintain the boundaries between work and family domains. Some studies concentrate on the opportunity that work from home jobs present to better perform both work and home roles. It is also seen that family friendly policies and support at the departmental level, for both men and women, might encourage more women to apply to the executive ranks [3].

6.3 Quality of Family Life

The family unit serves as a fundamental pillar in the complicated tapestry of human existence, tying together shared sentiments, ties, and experiences that mould our lives. The idea of "quality of family life" develops as a crucial cornerstone of wellbeing as societies change and dynamics adjust, reflecting the complex interplay between personal fulfilment and family harmony. The new arrangements like flexible work arrangements have challenged the work life balance [14].

The quality of family life encompasses a multifaceted blend of emotions, interactions, roles, and aspirations that coalesce to define the well-being and satisfaction of family members. This concept extends beyond mere cohabitation; it encapsulates the nuanced dynamics of communication, support, shared values, and the adaptability that families navigate as they traverse the intricate journey of life together.

7 Methodology

The current study is an empirical investigation using both primary and secondary sources of information. 287 IT professionals were selected as respondents who made up the primary data, which was gathered through a structured questionnaire. Only IT professionals from Bengaluru in the Indian state of Karnataka are included in the study.

The newspaper and websites were used to get the secondary data.

8 Tools for Analysis

The analysis of variance and Z test were used in this investigation as a statistical method. Using analysis of variance and Z test in regard to factors influencing work-life balance with the possibility of working from home and quality of family life are analyzed.

9 Data Analysis and Interpretation

9.1 Analysis Based on Two Sample Means (Z-TEST)

When two groups, like groups based on type of family such as nuclear family and Joint family are to be compared on their Mean values the test based on normal distribution (Z- test) is applied.

Influence of Type of family on Constructs

The type of responsibilities for any individual may differ and may be influenced due to the type of family. There are advantages and disadvantages in both type living; that is joint family and nuclear family. These advantages and disadvantages may influence the Quality of Family Life and Work Life Balance of the respondents. So to find out in general, how the type of family influence all the constructs understudy the following analysis is carried out:

Null Hypothesis

Table 1 'Z' test for constructs—classification based on type of family

Constructs	Type of family	Mean	Zo	Significance	Remark
Work from home (WFH)	Nuclear	49.8108	−2.728	0.007	Significant
	Joint	52.6308			
Quality of family life (QFL)	Nuclear	39.3604	−4.049	0.000	Significant
	Joint	43.4923			
Work life balance (WLB)	Nuclear	49.7703	−4.702	0.000	Significant
	Joint	54.9538			

Respondents belonging to both Joint and Nuclear family give on an average same level of opinion on the constructs Work from Home, Quality of Family Life and Work Life Balance under study.

Alternate Hypothesis:

Respondents belonging to both Joint and Nuclear family do not give on an average same level of opinion on the constructs Work from Home, Quality of Family Life and Work Life Balance under study.

Analysis:

The analysis from Table 1 shows that for all the constructs the analysis significance is less than 0.05, the level of significance is fixed. The Null Hypotheses is rejected. This indicates that both Joint and Nuclear family do not give on an average same level of opinion on the constructs Work from Home, Quality of Family Life and Work Life Balance under study.

From the mean values of Work from Home, Quality of Family Life and Work Life Balance, it is found that respondents belonging to joint family have significantly higher opinion than that of the respondents belonging to nuclear family.

9.2 Analysis of Variance (Anova)

When comparing at least two groups, the mean values of the groups should be used as the foundation. The technique of analysis of variance (ANOVA) is used. The respondents to this study are also divided on the basis of number of dependents such as none, dependents ranging from 1 to 3 and dependents more than 3.

Influence of number of dependents on Constructs:

Null Hypothesis:

Respondents with different numbers of dependents have expressed on an average same level of opinion on the constructs under study.

Alternate Hypothesis:

Respondents with different numbers of dependents do not express on an average same level of opinion on the constructs under study.

Table 2 ANOVA table—classification based on number of dependents

		N	Mean	Std. Deviation	F	Sig	Inference
Work from home	Nil	88	49.4318	6.66574	2.677	0.071	Not Significant
	1 to 3	147	50.3673	8.06572			
	Above 3	52	52.4038	6.35628			
	Total	287	50.4495	7.41267			
Quality of family life	Nil	88	40.5227	6.93977	0.192	0.826	Not Significant
	1 to 3	147	40.0340	7.40549			
	Above 3	52	40.6538	8.35695			
	Total	287	40.2962	7.42793			
Work life balance	Nil	88	50.0000	7.76227	2.974	0.053	Not Significant
	1 to 3	147	50.6667	8.06933			
	Above 3	52	53.3269	8.44294			
	Total	**287**	**50.9443**	**8.10100**			

Analysis:

From the Table 2 it is seen that the analysis significance for all the constructs are greater than the level of significance (0.05), hence the null hypothesis is retained. This implies that, respondents with different numbers of dependents have expressed on an average same level of opinion on the constructs under study.

Influence of Number of Children on Constructs:

Null Hypothesis:

Respondents with different numbers of children have expressed on an average same level of opinion on the constructs under study.

Alternate Hypothesis:

Respondents with different numbers of d children do not express on an average same level of opinion on the constructs under study.

Analysis:

Keenly examining the ANOVA analysis from Table 3, it is found that the analysis significance for the constructs Work from Home, Quality of Family Life and Work Life Balance are lesser than 0.05, the fixed level of significance and hence the Null Hypothesis is rejected. It is concluded that respondents with number of children have significantly different level of Work from Home, Quality of Family Life and Work Life Balance.

10 Summary of Findings

i. According to the research, respondents belonging to joint family have significantly higher opinion than that of the respondents belonging to nuclear family.

Table 3 ANOVA tables—classification based on number of children

		N	Mean	Std. Deviation	Sig	Sig	Inference
Work from home	No children	111	49.811		5.302	0.001	Significant
	One	98	50.878				
	Two	50	53.16				
	Three and above	28	46.643				
Quality of family life	Total	287	50.45				
	Total	287	47.889				
	No children	111	40.351		3.264	0.022	Significant
	One	98	40.235				
	Two	50	42.24				
	Three and above	28	36.821				
	Total	287	40.296				
Work life balance	No children	111	49.766		8.138	< 0.001	Significant
	One	98	50.837				
	Two	50	55.54				
	Three and above	28	47.786				
	Total	**287**	**50.944**				

ii. According to the study, respondents with different numbers of dependents have expressed on an average same level of opinion on the constructs under study.

iii. According to the research, respondents with number of children have significantly different level of Work from Home, Quality of Family Life and Work Life Balance.

11   Conclusion

In conclusion, work-life balance gives a wider spectrum of employees the possibility of greater flexibility and choice. Work from home is one option that firms give their employees as a way to support this. It has recently become the new norm across many industries, but it is especially common in the IT sectors.

The research suggests that respondents who belong to joint families tend to have a significantly higher opinion compared to respondents from nuclear families. This implies that individuals living in joint family setups might have more positive views on the constructs under study. However, the specific constructs or topics being referred to are not mentioned.

The research finds that respondents with different numbers of dependents and children exhibit significantly different levels of opinion on Work from Home, Quality of

Family Life, and Work-Life Balance. This implies that the number of dependents and children on the respondents have influenced their perceptions and attitudes toward these constructs. In summary, the research indicates that the family structure (joint vs. nuclear), the number of dependents, and the number of children can influence respondent's opinions on various constructs.

12 Suggestions

i. Since respondents from joint families tend to have a significantly higher opinion compared to respondents from nuclear families, it might be beneficial to explore the factors contributing to this difference.
ii. The significant differences in opinion based on the number of dependents and children suggest that family size can influence perceptions of Work from Home, Quality of Family Life, and Work-Life Balance. To address this, exploring of the specific challenges and benefits faced by respondents with varying numbers of dependents or children can also be studied.

13 Future Research

This research has made an attempt to study the constructs work from home, quality of work life and work life balance and the implication of quality of work life and work life balance through work from home. A deeper research into these areas of research, may provide a more comprehensive understanding of how family structure, dependents, and the number of children impact respondent's opinions and experiences. This information can be used to develop targeted interventions or policies aimed at improving the well-being and work-life balance of individuals within different family contexts.

References

1. Chung, G.S.K., Chan, X.W., Lanier, P., Wong, P.Y.J.: Associations between work–family balance, parenting stress, and marital conflicts during COVID-19 pandemic in Singapore. J. Child Fam. Stud. **32**(1), 132–144 (2023)
2. Chung, H., Jaga, A., Lambert, S.: Possibilities for change and new frontiers: introduction to the work and family researchers network special issue on advancing equality at work and home. Commun. Work Family **25**(1), 1–12 (2022)
3. Cox, S.: Having it all? Strategies of Women Corrections Executives to Maintain a Work Life Balance. Taylor & Francis, pp. 310–318. (2021)
4. Duxbury, L., Halinski, M.: Dealing with the "Grumpy Boomers": re-engaging the disengaged and retaining talent. J. Org. Change Manage. **27**(4), 660–676 (2014)

5. Felstead, A., Henseke, G.: Assessing the growth of remote working and its consequences for effort, well-being and work-life balance. New Technol. Work. Employ. **32**(3), 195–212 (2017)

6. Gajendran, R.S., Harrison, D.A.: The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences. J. Appl. Psychol. **92**(6), 1524 (2007)

7. Gegenfurtner, A.: Testing the gender similarities hypothesis: differences in subjective task value and motivation to transfer training. Human Res. Dev. Int. **23**(3), 309–320 (2020)

8. McDaniel, B.T., Pater, J., Cornet, V., Mughal, S., Reining, L., Schaller, A., Drouin, M.: Parent's desire to change phone use: associations with objective smartphone use and feelings about problematic use and distraction. Comput. Human Behav. 107907 (2023)

9. Metselaar, S.A., den Dulk, L., Vermeeren, B.: Teleworking at different locations outside the office: consequences for perceived performance and the mediating role of autonomy and work-life balance satisfaction. Rev. Public Personnel Admin. **43**(3), 456–478 (2023)

10. Pratiwi, H.I., Wahyuningsih, S.H.: Mapping the work-life balance research landscape: a bibliometric analysis. Multidisciplinary Rev. **6**(2), 2023014–2023014 (2023)

11. Renard, K.: Perceptions of work–life balance and co-worker support promote teleworker well-being: survey of the swiss public sector. **29**(77), 75–99 (2023)

12. Shirmohammadi, M., Au, W.C., Beigi, M.: Remote work and work-life balance: lessons learned from the covid-19 pandemic and suggestions for HRD practitioners. Hum. Resour. Dev. Int. **25**(2), 163–181 (2022)

13. Tunk, N., Kumar, A.A.: Work from home-A new virtual reality. Current Psychol. 1–13 (2022)

14. Vyas, L.: "New normal" at work in a post-COVID world: work–life balance and labour markets. Policy and Soc. **41**(1), 155–167 (2022)

Perspectives of Human Resources Professionals on AI's Role and Impact in the Recruiting Process

Svitlana Kozhemiakina (ID)**, Larysa Lutay** (ID)**, Oksana Marukhlenko** (ID)**, Tatyana Oklander** (ID)**, Oksana Zhus** (ID)**, and Nataliia Serohina** (ID)

1 Introduction

In today's highly competitive job market, it may be difficult for businesses to find and hire qualified candidates. The talent acquisition team, like any other, must constantly weigh the benefits of quantity above quality. This makes it difficult for businesses to fill open positions with qualified people and to keep the costs associated with recruiting constant. Human resources workers also have to deal with the stress and time commitment of doing a variety of tasks every day.

The rise of the digital age has made the incorporation of technology into routine business procedures a must. With a global shortage of skilled workers and rising competition for top talent, businesses that fail to keep up with technology advances risk failing to recruit and retain top employees. Luckily, these problems may sometimes be solved by introducing new technological systems into the company. Technology adoption across the HR value chain is assisting businesses with pre- and post-employee engagement, applicant selection, recruitment process customization, and automation of HR professional's daily responsibilities, etc. With the advent of new business models and the digital era, competition for talent has intensified, making it imperative for organizations to use cutting-edge HR solutions such as artificial intelligence (AI) and cloud-based technologies.

Minsky [1] Artificial intellect: A Foundation for a New Discipline (1968) defines AI as "the scientific study of designing machines to perform tasks that would normally require a high level of intelligence in a human." The field of computer science that

S. Kozhemiakina (✉) · O. Marukhlenko
Borys Grinchenko Kyiv University, Kyiv, Ukraine
e-mail: s.kozhemiakina@kubg.edu.ua

L. Lutay
Pavlo Tychyna Uman State Pedagogical University, Uman, Ukraine

T. Oklander · O. Zhus · N. Serohina
Odessa State Academy of Civil Engineering and Architecture, Odesa, Ukraine

includes artificial intelligence is often cited as one of the top three technological advancements of our time. It draws from several fields, including computer science, biology, psychology, linguistics, and many more besides. Due to its ability to learn on its own, artificial intelligence is increasingly able to take on and successfully complete human-like activities. These aspects of AI are very useful in fields like healthcare, education, infrastructure, finance, etc. Neural networks, machine learning, predictive analytics, deep learning, etc. are all included under one umbrella term. One or more of these words may be implemented to accomplish the desired operational aim of the company enterprise. All of these branches of AI are presently being employed in the telecom business, the performance of high-tech behaviors, etc., where activities requiring intelligence and analysis are to be carried out.

Human resources (HR) operations may benefit greatly from the use of AI in modern businesses. As a result, HR processes including hiring, payroll, talent acquisition, policy access, and reporting may all be enhanced. Human resources experts agree that AI will have far-reaching effects on businesses and will enhance working conditions for all employees.

According to Bhardwaj [2], in reality, only a tiny percentage of the applications an organization receives are even somewhat competitive. He continued by saying that AI helps HR schedule and coordinate new hire onboarding as well as scan, screen, and choose candidates. He concludes by speculating that AI may help businesses with both forecasting and meeting their future workforce demands. Ahmed [3] said that the days of manually sorting through hundreds of resumes and profiles on internet job boards to find the best candidates for open positions would soon be over, and that AI would replace such labor-intensive operations. He went on to discuss how AI lessens the HR manager's burden while also boosting efficiency in the workplace.

According to the yoh.com blog There is a plethora of candidates but they don't have the appropriate credentials, and recruiters are losing the best ones to their competitors. Third, giving the interviewees a poor experience, Slow recruiting procedure and little internet presence 4. According to the findings of Dimple et al. [4], the automation of recruitment using AI apps in HRM is led by problem-solving and data-driven function control.

Dessler [5] noted that using AI-based recruiting tools would make the process easier, despite the fact that AI will continue to replicate mistakes made in the past. According to Niehueser and Boak's [6] research, AI increases productivity and efficiency. According to Sarah Fister Gale [7] HRD is crucial to an organization's success and requires cutting-edge technology like AI to be competitive throughout the company's life cycle. Moreover, the recruiter is a human being, which means they are subject to prejudice and error. To counteract this, we may use AI in the hiring process to establish objective standards and make better informed judgments about the applicants. The purpose of this research is to get an understanding of how artificial intelligence is used in the recruitment process. Knowing the goals and difficulties of the recruiting process, as well as the general public's view of artificial intelligence's place in it, is essential.

2 Importance of AI in the Job Search

Artificial intelligence (AI) is one of the most talked-about HR topics since it's altering the status quo. In order to incorporate human interactions in a variety of human resource operations, including recruiting, the response of HR enquiries, and the creation of individualized learning experiences, several well-known businesses, like Google and IBM, are building virtual assistants like Chabot's. According to research published in 2018, Joshbersin [7] discovered a new class of intelligent Chabot's may facilitate intelligent and simpler interactions. Human resource operations are predicted to be profoundly altered by the introduction of AI in the following three ways: The development of user-friendly interfaces, AI, and predictive algorithms. It's crucial to a company's hiring operations since it streamlines and automates otherwise laborious tasks. Artificial intelligence (AI) systems created specifically for use in HR departments may streamline processes like candidate screening, sourcing, and the identification of the best possible hires from a vast pool of applicants. Some examples of applications and functions are as follows:

- Beyond the scope of key words;
- Tailor-made solutions;
- New hire orientation
- Acceptance of an offer,
- Individualized learning and growth,
- Candidate re-engagement.

Table 1 shows AI Innovative Techniques used in different stages of recruitment process.

3 Literature Review

According to Jia et al. [8] the introduction of AI (also known as machine intelligence) has been motivated by a desire to create "thinking machines" that are capable of mimicking human intelligence and behavior. While algorithms may have trouble making fair and suitable conclusions without the help of AI, randomization may be a beneficial addition to the decision-making process. When AI is integrated with various business functions such as HR, finance, operations, marketing, etc., it can help businesses make more objective decisions, foster a more equitable workplace, and better deal with risks and uncertainties (Jarrahi, Shweta Jain,). According to Christopher McFadden's argument, on-demand services like Uber, Ola, Zomato, etc., have benefited greatly from the incorporation of AI features. Clearly, only 10% of corporations are making extensive use of AI right now, but by 2020, that number is predicted to rise to 36%. 9 Despite technological progress, Fraij and Laszlo [9] and Harver [10] stress that firms still have a significant barrier in adapting to new technologies. According to Abdeldayam et al. businesses must use conversational AI

Table 1 AI innovative techniques used in different stages of recruitment

Screening programs with intelligence	In order to eliminate inefficiency and restore order, candidate screening software may be used to centralize and visualize the whole process
Chatbots for hiring	An automated messaging tool, a recruitment chatbot may guide potential employees through your company's employment site and through the application process
Recorded chat videos	An in-person interview may be replicated using a live video chat. You will be asked questions by an individual or panel of interviewers in real time
Boosting one's reputation	Effectively conducting interviews is a key component of the augmentation approach
Analyzing candidate's voices using a natural language processing algorithm	Information may be entered into the system through text/character recognition and speech/voice recognition; natural language processing (NLP) aids these applications in making sense of the inputted data
Superior competency evaluations	A competence test, also known as a competency assessment, is a procedure wherein one's skills are formally evaluated in relation to a set of standards
Text enhancement	Authoring job descriptions is made easier with an enhanced authoring platform. All members of your target audience will be interested in the job postings you write
Automating task aboard	By streamlining and automating tasks like employee background checks, paperwork, offer letter creation, training and meeting scheduling, document tracking, and the distribution of company policies and login information, artificial intelligence aids recruiters in performing the on-boarding functions of recruitment

for HR transactions if they want to stay competitive in the modern global economy. In order to improve HR productivity, businesses should use AI to handle routine administrative tasks. According to Jain [11] many businesses now employ these tools in their human resources operations.

According to Strohmeier and Piazza [12, 13] HRM is one of the functional areas that has begun to utilize via AI applications and has received a wide range of AI utilization implications. Human Resource Performance Evaluation (Zhang et al. 2012) [14], Employee Selection (Chien and Chen 2008) [8, 15], Employee Turnover (Sexton et al. 2005) [16], Emotional Involvement Prediction (Lucia-Casademunt et al.

2013) [17],and Employee Assignment (Karatop et al. 2015) [18] are just some examples of HRM functions where AI has been successfully implemented. The study topic of AI in HRM is relatively developing and undeveloped compared to other domains, according to Stroh Meier and Piazza [12, 13] as well as Tambe et al. (2019) [19]. Srivastava (2018) [20] chimes in to say that AI saves the HR manager time and energy by automating recruiting and handling the hiring of upper and middle management. He went on to say that AI is useful to businesses since it aids in personnel planning and productivity analysis. According to Jauhari (2017) [21], the significance of Chabot in recruiting has expanded with the introduction of AI and neural networks, which in turn transformed the hiring procedures. Human resources professionals benefit from AI technologies and chatbots since they streamline processes like candidate communication, follow-up, screening, and selection, automated email dispatching, etc. In their study, Geetha and Reddy (2018) [22] discovered that AI helps keep data correct, saves money, and saves time throughout the recruiting process. According to Qamar et al. (2019) [23, 24], h managers need to upgrade their knowledge and abilities to effectively implement technological change and adapt to the new realities presented by AI-enabled HR services. The initial step on the AI route involves making judgments based on algorithms, but progress has been sluggish in addressing difficulties related to personnel management at this stage. The complexity of HR phenomena, data issues from HR operations, fairness and legal limits, and employee attitudes to AI management are the four reasons why cited by Tambe et al. (2019).[20] Because of the potential for adverse consequences on employee behavior, we are also aware of the constraints imposed by a top-down, optimization approach to HR choices.

4 Methodology

Using a self-designed online questionnaire, this descriptive study collected data from 101 h professionals working in a variety of businesses in and around Bengaluru, India (KMO and Barlett's test of sample adequacy = 0.841). The statements for each variable were measured using a 5-point likert scale, with 1 representing strongly disagreeing and 5 representing strongly agreeing.

The questionnaire's three scales are designed to measure, respectively, (1) the role of AI in the recruitment process (6 statements, cronbach's alpha = 0.678), (2) candidates' preferences of AI in the recruitment process (6 statements, cronbach's alpha = 0.825), and (3) AI's role in the recruitment process (9 statements). Through confirmatory component analysis, we found that the statements used to create each scale had a chi-square goodness-of-fit test value of 67.4, with a p value of less than 0.001.

The following assertions have been used to quantify the impact of AI in recruitment (AIR): Reduce hiring costs (AIR 3), boost recruiter efficiency (AIR 4), boost employee productivity (AIR 5), boost employee retention (AIR 6), automate screening to cut down on bias and errors (AIR 7), enhance corporate training and streamline employee onboarding (AIR 8), and reveal new insights on talent (AIR 9).

Analyze interviews, facial expressions, and word choice to evaluate applicant mood and engagement (RE1), and Create personalized feedback reports on top performers (RE2) are several ways that AI's impact on recruiting has been quantified. Image and post scanning and analysis on social media to boost recruiting (RE2).

Recruitment effectiveness 3 (RE3) is boosted by scanning candidate's work samples, resumes, and other application documents.

While artificial intelligence (AI) is the future of recruiting techniques (RE5), it cannot replace the importance of a personal touch (RE6), and chatbots and virtual assistants are becoming an increasingly feasible means for workers to acquire real-time responses. After that Candidate interest in the use of artificial intelligence (AI) in the hiring process has been quantified through, Candidates appreciate having their CVs screened by a computer (HRAI3), interviews conducted by a computer (HRAI4), pay negotiations conducted by a computer (HRAI5), and the time and money spent on the process reduced (HRAI6). Descriptive statistics, one-way analysis of variance, correlation, and simple linear regression were used to analyze the data in SPSS.

Objectives of the study

- To understand the significance of AI in human resources and the hiring procedure.
- The goal of this survey is to determine how different segments of the HR workforce see the use of AI in the hiring process.
- The goal of this study is to quantify the recruiting process's sensitivity to and adaptability to applicant preferences for the use of artificial intelligence.

Hypothesis

Hypothesis 1: There is a significant difference between AI in the recruitment process with various subsets of HR staff hiring process.

Hypothesis 2: There is a significant impact of Artificial intelligence's role and preference of AI on Recruitment Process.

Profile of the HR Personnel

It turns out that 64% of respondents are men and 36% are women; 51% of respondents are between the ages of 31 and 40; 36% are between the ages of 31 and 50; 13% are between the ages of 41 and 50; and 56% of respondents have less than 5 years of experience, 33% have 6 to 10 years of experience, and 11% have more than 10 years of experience.

5   Analysis and Interpretation

Descriptive Statistics

For objective 1, which was to learn about the value of AI in the HR department and the hiring process, we calculated the mean, standard deviation, and number of replies for each statement to see how widely they were agreed upon (Tables 2, 3 and 4).

Analysis of Variance (Anova)

Table 2 Artificial intelligence in the HR function and recruitment

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
AIR1	0	0	3	38	38	3.3615	0.5537
AIR2	0	0	3	36	63	3.5887	0.5386
AIR3	0	3	5	15	77	3.3077	0.7310
AIR4	0	0	8	36	36	3.3836	0.6331
AIR5	0	3	18	36	33	3.3051	0.8338
AIR6	0	36	13	38	33	3.7336	1.3383
AIR7	0	0	5	63	31	3.3563	0.5386
AIR8	0	3	10	31	36	3.3077	0.7663
AIR9	0	8	15	33	33	3.0356	0.8038

[*] Values are in % *Source* Primary Data

Table 3 Artificial intelligence is used currently in the recruitment process

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
RE1	0	10	9	53	29	3.0001	0.9995
RE2	3	3	5	57	33	3.1292	0.9739
RE3	0	9	15	37	31	3.1027	0.9302
RE4	0	5	9	51	37	3.1795	0.7905
RE5	0	0	10	53	37	3.2573	0.7373
RE6	0	10	10	39	31	3.0010	0.9177

[*] Values are in % *Source* Primary Data

Table 4 Application of AI in the present recruitment process

Statements	SDA	DA	Neutral	A	SA	Mean	Std. Dev
HRAI1	0	31	13	31	37	3.8718	0.1833
HRAI2	0	8	10	51	31	3.0513	0.1373
HRAI3	0	31	8	31	31	3.7153	0.1975
HRAI4	0	37	15	13	37	3.1795	0.3031
HRAI5	0	31	15	15	38	3.3077	0.3050
HRAI6	0	15	10	33	31	3.8973	0.1733
HRAI7	0	0	10	57	33	3.3308	0.1003

Source Primary Data

Therefore, the alternative hypothesis is accepted, namely that there is a significant difference on artificial intelligence technologies in the recruitment process across demographic profiles of respondents, including age and gender, and work experience (Table 5).

Table 5 ANOVA table

Source of variation between groups	Gender		Age		Work experience	
	Between groups	Within groups	Between groups	Within groups	Between groups	Within groups
SS	111.2033	30.7738	77.7135	41.1303	92.0065	43.4893
Df	1	76	1	76	1	76
MS	111.2033	0.3062	77.7135	0.5412	92.0065	0.5722
F	271.272					
p-Value	0.0000		0.0000		0.0000	
Hypothesis	Accepted		Accepted		Accepted	

Source Primary Data

Simple Linear Regression Analysis

Results of regression analysis (Table 6) reveals that overall regression model is fit at 0.05 significant level; prediction on Recruitment Process is significantlypredicted by AI in Recruitment- and Candidate's preference of AI inRecruitment—HRAI process and candidate's preference of AI inRecruitment is highly impacting predictor, followed by AI in Recruitment.

The subsequent regression model is based on the findings of linear regression analysis.

$$\text{Studys Predictive Model}: \mathbf{y} = \boldsymbol{\alpha} + \boldsymbol{\beta}\,\mathbf{X}1 + \boldsymbol{\beta}\,\mathbf{X}2 + \mathbf{SE}$$

whereas, y = Recruitment Process (RE); α = Constant; X1 = AI in Recruitment (AIR) and X2 =

Candidate's preferences of AI in Recruitment (HRAI) process.

$$\mathbf{RE} = \boldsymbol{\alpha} + \boldsymbol{\beta}\mathbf{AIR} + \boldsymbol{\beta}\mathbf{HRAI} + \mathbf{SE}$$
$$\mathbf{RE} = \mathbf{1.865} + \mathbf{0.239AIR} + \mathbf{0.354HRAI} + \mathbf{0.408}$$

This leads us to accept the null hypothesis and instead consider the evidence for the alternative hypothesis, namely that the use of AI in the recruitment process (AIR) and candidate's preferences for HRAI have had a major effect on the recruitment process.

Table 6 Regression analysis

ANOVA		Multiple R	R Square	Coefficients			t Stat		p-value		Hypothesis
F Stat	p value			Intercept	AI R	HRAI	AI R	HRAI	AI R	HRAI	Accepted
12.2	< 0.011	0.6393	0.3076	1.965	0.23	0.353	1.9	3.93	0	< 0.01	

Source Primary Data

6 Findings and Discussions

According to descriptive data, the vast majority of HR professionals believe that AI helps make HR operations and hiring decisions more efficient. Regression analysis confirmed that AI is a strong predictor of success in the recruiting process, while ANOVA showed that HR worker's perspectives on AI varied considerably across gender, age, and work experience.

Employee's perspectives on AI technology are identified across age, gender, and years of experience in the workforce, and a null hypothesis is accepted. According to the results of the regression analysis, the independent variable successfully predicted the dependent variable. Therefore, the alternative hypothesis is adopted, which states that AI and cloud computing have an effect on the organization's hiring practices.

In addition, companies across all sectors and industries would benefit from allocating more resources into the recruiting process and hiring people who are adept in artificial intelligence. Employees may learn about the value of AI in recruiting and the impact it can have on the company's ability to attract and retain top talent via the provision of workshops and trainings in AI technology.

It is recommended to incorporate artificial intelligence into the overall tasks of the company along with recruitment as it will improve the quality of work in the company as the application of AI can increase the employee productivity and helps in employee retention and to make the work easier and faster. It's important for the organization to keep things personal throughout the hiring process, since there are certain skills that machines just can't replicate, such as the capacity to take calculated risks. It has been recommended that the corporation use AI not only for hiring purposes, but also for customer service, invoicing, detecting security breaches, etc.

7 Conclusion

The primary goal of the research was to shed light on the importance of AI technologies to the human resources department and the hiring procedure. The research highlighted the many applications of AI across the recruiting process and demonstrated its value to HR experts in locating top candidates. The organization's processes have evolved significantly thanks to AI. From the first stages of the hiring process (such as resume screening) all the way through to employee retention, this tool is indispensable. The most notable advantages of AI were found to be in the enhancement of work quality and the reduction of mundane jobs. It is crucial in molding a potential employee's impression of the organization. Recruitment costs may be lowered and employee output can be raised with the aid of AI. One major roadblock for AI is that no matter how sophisticated it becomes, it will never be able to completely replace the human element in the hiring process. According to the results of the research, AI plays a crucial role in the HR department, and the vast majority of workers agree that the firm relies heavily on AI for its present hiring procedures. Data were obtained

through online method, therefore although the study's findings may be useful, they may be limited to HR professionals in and around Bengaluru and not necessarily representative of the HR landscape at large. Future research may take the form of an analytical and comparative study across businesses, and the applications of AI to human resources can be investigated further. The primary goal of the research was to shed light on the importance of AI technologies to the human resources department and the hiring procedure. The research highlighted the many applications of AI across the recruiting process and demonstrated its value to HR experts in locating top candidates. The organization's processes have evolved significantly thanks to AI. From the first stages of the hiring process (such as resume screening) all the way through to employee retention, this tool is indispensable. The most notable advantages of AI were found to be in the enhancement of work quality and the reduction of mundane jobs. It is crucial in molding a potential employee's impression of the organization. Recruitment costs may be lowered and employee output can be raised with the aid of AI. One major roadblock for AI is that no matter how sophisticated it becomes, it will never be able to completely replace the human element in the hiring process. According to the results of the research, AI plays a crucial role in the HR department, and the vast majority of workers agree that the firm relies heavily on AI for its present hiring procedures. Data were obtained through online method, therefore although the study's findings may be useful, they may be limited to HR professionals in and around Bengaluru and not necessarily representative of the HR landscape at large. Future research may take the form of an analytical and comparative study across businesses, and the applications of AI to human resources can be investigated further.

References

1. Minsky, M. (Ed.).: Semantic information processing. The MIT Press (1968). https://mitpress.mit.edu/9780262516853/semantic-information-processing/
2. Bhardwaj, R.: How AI is revolutionizing human resource functions. Entrepreneur (2019). https://www.entrepreneur.com/article/325715
3. Ahmed, O.: Artificial intelligence in HR. Int. J. Res. Anal. Rev. **5**(4), 971–978 (2018). http://www.ijrar.org/IJRAR1944797.pdf
4. Dimple, A., Bersin, J., Lahiri, G., Schwartz, J., V., E.: The rise of the social enterprise. Deloitte Insights (2018)
5. Dessler, G.: Human resource management (16th ed.). Pearson (2020). https://www.pearson.com/us/higher-education/program/Dessler-My-Lab-Managementwith-Pearson-e-Text-Access-Card-for-Human-Resource-Management-16th-dition/PGM2569070.html
6. Niehueser, W., Boak, G.: Introducing artificial intelligence into a human resources function. Ind. Commer. Train. **52**(2), 121–130 (2020)
7. Joshbersin.: AI in HR: A real killer app. HR Technology (2018). https://joshbersin.com/2018/06/ai-in-hr-a-real-killer-app/
8. Jia, Q., Guo, Y., Li, R., Li, Y., Chen, Y.: A conceptual artificial intelligence application framework in human resource management. In: Chang, F.-K., Li, E.Y., & (eds) (2018)
9. Fraij, J., Laszlo, V.: Artificial intelligence impact on the recruitment process. Int. J. Eng. Managem. Sci. (IJEMS) **6**(1) (2021). https://doi.org/10.21791/IJEMS.2021.1.10

10. Harver.: 11 innovative uses of AI in recruitment in 2020 (2020). https://harver.com/blog/ai-in-recruitment-2020/
11. Chien, C.-F., Chen, L.-F.: Data mining to improve personnel selection and enhance human capital: a case study in high-technology industry. Expert Syst. Appl. **34**(1), 280–290 (2008)
12. Sexton, R.S., McMurtrey, S., Michalopoulos, J.O., Smith, A.M.: Employee turnover: a neural network solution. Comput. Oper. Res. **32**(10), 2635–2651 (2005)
13. Lucia-Casademunt, A.M., Ariza-Montes, A., Becerra-Alonso, D.: Exploring emotional involvement in workplace by applying artificial neural networks: European study. Actual Problems of Econ. **143**(5), 376–385 (2013)
14. Karatop, B., Kubat, C., Uygun, O.: Talent management in manufacturing system using fuzzy logic approach. Comput. Ind. Eng. **86**, 127–136 (2015)
15. Tambe, P., Cappelli, P., Yakubovich, V.: Artificial intelligence in human resources management: challenges and a path forward. Calif. Manage. Rev. **61**(4), 15–42 (2019)
16. McFadden, C.: 7 amazing ways companies use AI to recruit employees. Interesting Engineering (2019). https://interestingengineering.com/7-amazing-wayscompanies-use-ai-to-recruit-employees
17. Anupam, A.: How AI and machine learning will impact HR practices, December 18 Vccircle.com (2017). Retrieved from https://www.vccircle.com/how-ai-andmachinelearning-will-impact-hr-practices
18. Geetha, R., Reddy, BhanuSree: Recruitment through artificial intelligence: a conceptual study. Int. J. Mech. Eng. Technol. **9**(9), 901–910 (2018)
19. Yusra Qamar, Y., Agrawal, R.K., Samad, T.A.: An exploratory analysis of artificial intelligence applications in human resource management. J. Enterprise Inform. Managem. **34**(5), 1339–1370 (2021)
20. Yusra Qamar, Y., Agrawal, R.K., Samad, T.A., ChiappettaJabbour, C.J.: When technology meets people: the interplay of artificial intelligence and human resource management. J. Enterp. Inf. Manag. **34**(5), 1339–1370 (2021). https://doi.org/10.1108/JEIM-11-2020-0436
21. Brych, V., Manzhula, V., Halysh, N., Kalinichuk, N., Reznik N., Hrynchak, I.: Modeling the dynamics of living standards based on factors of the remuneration system. In: 2021 11th International Conference on Advanced Computer Information Technologies (ACIT), pp. 420–423. (2021)
22. Reznik, N.P.: Orhanizatsiyno-ekonomichnyy mekhanizm zaluchennya investytsiy v ahropromyslovyy kompleks Ukrayiny. Economics APC.№7. pp. 70–77. (2013)
23. Reznik, N.P., Popov, V.M., Podplietnii, V.V., Popova, S.P.: Financial support for the development of joint territorial communities. Test Eng. Manag. (2020). http://www.scopus.com/inward/record.ur1?eid=2-s2.0-85082999646&partnerID=MN8TOARS
24. Reznik, N., Brych, V., Bytsyura, L., Halysh, N., Kosylo, K., Goran, T.: Features of the energy efficiency management system of the enterprise. J. Adv. Res. Dynam. Control Syst. **12**(7), 412–418 (2020)

An Analysis of the Development, Current State, and Future Prospects of Mobile Communications for the Travel and Hospitality Industries

Tsypko Victoria , **Shcherbakova Nadiia** , **Ivanchuk Svitlana** ,
Tyshchenko Svitlana , **Chernyshova Taisiia** , **and Sakovska Olena**

1 Introduction

When compared to 4G, 5G features a five-fold reduction in latency, ten-fold reduction in connected devices, one-thousand-fold reduction in mobile data, one-100-fold reduction in user data rates, and one-100-fold reduction in battery life [4]. In particular, 5G ensures a superior user experience, very low end-to-end latency, and increased connectivity, accelerated data transfer, decreased prices, and decreased inter-device latency [5]. In addition, 5G is designed with the user in mind [6]. Users may take use of 5G's capabilities, which include superior mobile communications, improved conventional mobile service capabilities, and the integration of formerly separate networks into a unified whole [7]. These benefits have opened the door for the general population to try out a totally wireless society [4]. 5G has applications in a wide variety of industries and fields [8]. Virtual and augmented reality (AR) that is very seamless are two such instances [9]. experiences, Streaming ultra-high-definition films in real-time, automated production in factories, computerized farming, mobile healthcare, and "smart" city planning are all examples. New mobile communication technology and features are influencing changes in the hospitality and tourist sectors. Academic study on "tourism/hospitality and technology" has been rare despite the extensive use of mobile communication technologies by the

T. Victoria · S. Nadiia · I. Svitlana
National Transport University, Kyiv, Ukraine

T. Svitlana · C. Taisiia
Polissia National University, Zhytomyr, Ukraine

S. Olena (✉)
National University of Horticulture, Uman, Ukraine
e-mail: sakovska_lena@ukr.net

hospitality industry. For example, Law et al. [10] collected studies on mobile technology published in Hotel and Travel magazines between 2002 and 2017, then sorted them into distinct categories from the vendor's and traveler's points of view.

The papers Dorcic et al. [11] read between 2012 and 2017 that was geared for travelers, app creators, and businesses. This research is in favor of using mobile communication technology in the hospitality and tourist industries. Rapid progress in technology has left universities behind. Previous assessments only went as far as 4G, therefore no research has been done on the potential expansion of 5G. Second, there is a lack of consideration for other books in the tourist and hospitality field. Using content analysis and the existing literature, our study fills in these two gaps in our understanding of 5G. If we can fill up these gaps in our knowledge, we can better evaluate studies including 1G-5G mobile communications in the hotel and tourist industries. The impact of mobile technology on the hospitality and tourist industries is the focus of this study. There are three aims of this study, which is unusual for empirical research. This study provides a comprehensive review of the literature on the topic of mobile communication technology's usage in the hotel and tourist industry, focusing on its most recent uses and the acceptance it has garnered from various stakeholders. Second, the purpose of this research was to provide more information on this subject for academics and entrepreneurs [12]. Knowledge deficiencies are not what this study aims to address [10, 11], not so much to provide new ideas or viewpoints, but to research the possible effects of 5G mobile communication technology on the tourism and hospitality industries. As a result, further study of mobile communication technology in the travel and hospitality sectors is needed, and here is where the theoretical direction and practical value of comes in.

2   Methodology

Content analysis [13] is used because working directly with the text enhances researcher's capacity to develop actionable ideas and insights. Data collection, data encoding, data analysis, and data interpretation information [14] are the study's four main stages, which are methodical and stringent in nature. As a result, content analysis may be used for quantitative and qualitative studies, and it can be addressed inductively or deductively [15]. Content analysis has been argued to be either a quantitative or qualitative method in the academic world. This study supports the claims of Camprub et al.'s [16] interpretation analyzing material as a hybrid approach. Content analysis mainly contributes three positive outcomes. To begin, the analysis's flexibility makes it possible to extract the relevant statistics from the text and apply them appropriately. Second, it's easy to get your hands on the tools that make computerized text analysis possible and easy to use [17]. Third, researcher demand bias and informant recall are both eliminated when using content analysis samples bias [18] since Most of them come from cold, hard facts. The study employs and is inspired by the techniques of systematic literature review Kitchenham et al. [19] and data

coding developed by Kim et al. [20]. Below, we detail the process of doing a content analysis.

2.1 Inclusion and Exclusion Criteria

In literature screening, a researcher reads each potential article for analysis and decides whether or not it meets three inclusion criteria.

The articles included must be on mobile communications and hospitality/tourism in order to guarantee the scientific quality and rigor of the evaluated material. The article's title, abstract, and keywords all had references to mobile communication technologies (such as mobile communications, 1G-5G, and mobile technologies) and hospitality/tourism (such as hotels, tours, and restaurants). The researchers then examine the full article to make sure the studies included are relevant to the study's subject; the possibility of individual bias in the selection process [22] is reduced by utilizing the consensus of two researchers to decide which studies to include. In the end, 108 articles were collected for further examination.

2.2 Data Encoding

The material was then coded by one researcher and reviewed by another to ensure accuracy. When disputes occurred among the researchers, they talked it through and settled it. The following information was taken from each publication for this study:

3 Data Analysis and Interpretation

Hidden Messages The study's content analysis and interpretation are based on the following research questions, which were informed by the gathered literature and its coded data. (1) how different fields of study and mobile communication systems have influenced tourism and hospitality and vice versa.

- Mobile communication studies in the hotel and tourist industry have been increasingly published on an annual basis.
- The geographical and disciplinary spread of studies focusing on mobile communication in the hospitality and tourist industries;
- Methods, data, and acceptance of theory/models used in studies;
- Each generation of mobile communication technologies and the sectors or applications they assist within the hospitality and tourist industries.

4   Findings

Table 1 shows that just 42 of the magazines we looked at had anything to do with the hotel, restaurant, sporting event, or tourism businesses. There are 39 distinct technologically applied disciplines that fall under the umbrella of computer science, information systems, engineering science and technology, and telecommunications. Thirteen of the compositions are also concerned with travel or the geography of the world. There were 38 works that used 5G as a foundation for their research. There seems to have been an uptick in studies focusing on mobile communications in the hospitality and travel sectors. This area of study, however, has a lot of room for growth compared to others.

4.1   *Utilizing Study Techniques and Theoretical Frameworks*

Table 2 provides a synopsis of the publication's methodologies, data sources, and theoretical models. In this section, studies were done from the viewpoints of tourists (n = 50), those not involved in the hospitality industry (n = 58), and everyone else (n = 108). Only 30 out of the 108 papers really make use of any kind of theory or theoretical model. There are 50 studies in the field of hospitality and tourism, 24 of which are theoretically grounded. Only six of the 58 studies that are not related to tourism and hospitality have any kind of theoretical underpinnings. There are a total of 23 different theories and models used in the articles, with the technology acceptance model (TAM; n = 5) being the most common.

Table 1   Demonstrates the evaluated literature

Research background	Frequency	Percentage (%)
Topics for studying the tourism, leisure, and recreation industries	51	38.98
Engineering, science, technology, and communications systems	30	36.12
Science, technology, and the study of transportation and transportation geography	14	12.14
Other (City Planning, Business, Economics, Agriculture, Computer Science, Journalism, Political Science, Education, and Public Administration), and Related Fields	13	12.69
Total	108	100.00

Source Segmented by Researcher

Table 2 Research strategies and theoretical frameworks that have been put into practice

	The study of travel and leisure		Different fields of study		Total	
	F	%	F	%	F	%
Methods based						
Strategies for using methods qualitative	20	40.00	23	39.66	43	39.81
In terms of quantity	23	46.00	7	12.07	30	27.78
Methods of a mixed kind	7	14.00	28	48.28	35	32.41
Information that is primary data	25	50.00	8	13.80	33	30.56
Information that is primary Secondary data	19	38.00	18	31.03	37	34.26
Modeling and acting out	0	0.00	14	24.14	14	12.96
Data of a mixed kind	6	12.00	18	31.03	24	22.22
Theories and corresponding theoretical models						
Technology adoption/acceptance model	5	10.00	0	0.00	5	4.63
Complex model of probability	1	2.00	0	0.00	1	0.93
Structure for understanding the interplay between technology, organization, and setting	1	2.00	0	0.00	1	0.93
Acceptance and use of technology: a unified framework	0	0.00	1	1.72	1	0.93
Promoting the theory of activation	1	2.00	0	0.00	1	0.93
Co-creation value theory	1	2.00	1	1.72	2	1.85
Values, attitudes, and behaviors, with some tweaks	1	2.00	0	0.00	1	0.93
Adoption framework based on value	2	4.00	0	0.00	2	1.85
Lag model for the distribution of quantizes	0	0.00	1	1.72	1	0.93
Theories of social cognition	1	2.00	0	0.00	1	0.93
Self-awareness and mental-state theory	0	0.00	1	1.72	1	0.93
Theory of the expanded self	0	0.00	1	1.72	1	0.93
Maslow's needs scale	0	0.00	1	1.72	1	0.93
Rational choice theory	1	2.00	0	0.00	1	0.93
The predictive model of behavior	1	2.00	0	0.00	1	0.93
Empirically-based research	1	2.00	0	0.00	1	0.93
Theory of the spreading of new ideas	1	2.00	0	0.00	1	0.93
A structure tailored to big data	1	2.00	0	0.00	1	0.93
To model with agents	1	2.00	0	0.00	1	0.93

Source Segmented by Researcher

4.2   Function/Application Classification

The hospitality and tourist industries have been revolutionized by mobile phone communication. The classifications and uses of functions are discussed in this article. The paper-based mobile communication system is outlined in Table 3. Intelligent transportation/Internet of cars; traveler self-service; tourist information systems [23], willingness and intent to use mobile communication technology, tourism/restaurant/ hospitality management and marketing, From the early days of studies on hotels and tourism, and mobile communications have endured through several iterations of mobile communication systems. Using 4G for high-speed rail and virtual tourism may be really exciting. This is how hotels and travel have adapted to the rise of mobile phones.

Table 2 shows that 81 (75%) of the 108 papers we reviewed were relevant to our inquiry, and that only 12 (11.11%) adopted a genuinely global perspective. Of the 43 articles covering Asia, 18 deal specifically with China, 8 with Japan, and 8 with South Korea. Europe, including Spain (n = 7) and Switzerland (n = 4), ranked second (n = 24). It is mostly due to the United States of America (n = 10) that North America came in at No. 3 among all continents (n = 11). Africa was the topic of four investigations, Oceania of three, and South America of one. The findings imply that as the usage of mobile communication technology spreads, researchers should expand their scope to cover hitherto unexplored areas or countries.

5   Analysis and Repercussions

5.1   Research Perspectives on Communication Technologies in the Travel and Tourism Industry

Mobile communication studies and infrastructure have an effect on the hospitality and tourist industries. Keep an eye out for additional timely studies. The study of mobile communication technologies in the hospitality and tourist industries benefits from the use of disciplines. These looked examined the connection between hotels and tourists using mobile phones. The hotel and tourism industry uses less mobile data. This encourages further study of mobile communication technologies, time spent online, and tech use in the hospitality and tourism industries.

Hospitality and tourism are compared in this study. In-depth scientific research is made possible by solid data bases. The employment of theories in the study of tourism and hospitality is on the rise. Unlike studies in the social sciences, technological applications are free to focus on either processes or concepts. Literature employed TAMs, utility TAMs evaluate the prevalence of mobile communication technologies in the hotel and tourist industries. This article has solid backing from scholarly sources. Popularity has not changed TAM's inability to investigate. Finally, reliable publications should emphasize theoretical models, theory-guided practice,

academic rigor, and research. Theoretical model frameworks and foundations must be developed for communication technology in the hospitality industries. Studies in the fields of hospitality and tourism might be qualitative or quantitative. The methodological basis of literature might be strengthened by learning from many areas, combining qualitative and quantitative approaches, and making the most of their benefits.

5.2 Tourism and Hotel Industry Response to Successive Generations of Mobile Communication Technology

This study examines hospitality and tourism mobile communication. Mobile communication altered hospitality and tourism. 3G provides mobile hotspots[25], self-service travel smart transportation and navigation. Long-range gazing helps blind mobility. 3G improves hotel holidays 3G may boost tourism and hospitality. 3G may boost billion-dollar network tourism. Finally, 3G teaches hotel and attraction mobile device consumers privacy.

4G improves hotel-guest mobile communications. 4G and 3G networks enable travelers watch more movies, purchase online, and book faster. Mobile app marketing and hotel management may benefit from faster data delivery. Lee, Hwang, and Hyun used 4G restaurant mobile applications for advertising, demand management, customer interactions, and capacity planning.

IoT and IoV embraced 4G early. Jing, Han, Meng, Jiang, Lin, and Chen built intelligent transportation employing lines, historic buildings, user monitoring, and mobile applications. 4G-enabled automobiles did not raise flow control management system expenses. 4G allows remote hotel concierges and VR tourism.

Virtual tourism demands real-time video, images, and information. Faster, more reliable data transport helps. AR, VR, MR, and HP may help visitors. 4G increases hotel-robot interactions Smartphones alter tourism. Ecotourism uses 4G networks creatively.

Mobility and 4G high-speed rail. 5G may outperform 4G in hotels and tourism. 5G impacts many. 5G networks outperform 4G in speed, bandwidth, reliability, and latency. These benefits make IoT and IoV "Internet of Everything" (IoE) hotel and tourism applications. 5G links cars, roads, people, and infrastructure in congested areas.

5.3 The Impact of Emerging Mobile Communication Technologies on the Hospitality and Tourism Industries

The second objective of this research is to analyze how emerging mobile communication technologies will change the hospitality and tourist industries. Mobile communication system iteration time suggests the 5G era will begin in the 2020s and last through the 2030s.

5.3.1 Changes in the Flow of Tourist Services

New 5G technologies and their supply-side effects dominate academic study. IoT will improve personalized and tailored service with COVID-19. Hospitality regions badly impacted by the pandemic may use IoT to make real-time choices on hotel occupancy, guest dining alternatives (e.g., outside dining), major events, and cruise line arrangements. 5G latency eliminates VR dizziness and boosts VR industry growth. Tourists may explore immersive beautiful sites anytime, anyplace with 5G networks, HD, 4 K/8 K, and panoramic video. Tourist services will be improved by self-service gadgets and robotics. 5G will also impact travel habits. Technology reduces travel costs and increases frequency. Travelers will have real-time access to better transit, accommodation, and beautiful sites. This access enhances the trip experience, boosting demand.

5.3.2 Improved Quality Free Time

Early 5G. Terminal items are rare and commercialized slowly. Travelers may only notice minor changes. Technology will improve product quality and traveler experience, boosting leisure time and quality. AI will grow and enhance productivity. Robots will save time and boost tourism. IoT will meet new tourist expectations. IoT may enhance tourism. Smart tourism is enhanced by this technology. Information sharing increases cyber security threats. Since tourism and hospitality started using mobile technologies, user security and privacy have improved. Tourism and hospitality cyber security research will continue as mobile communication technology grows. 5G technology lets diners view ultra-high-definition video and chat on social media while waiting in line.

5.3.3 5G Applications Will Be More Diverse

Tourism and hospitality will benefit from fifth-generation mobile communication technology. Outdoors, technology will be employed. VR/AR, AI, and human–computer interaction may enhance cultural and tourist experiences. 5G networks in tourist intelligent transportation improve safety, reliability, operational efficiency, and

autonomous automobile travel. Thus, travelers may avoid traffic and route planning, while travel service providers can save money. Fifth-generation mobile communication will enhance scenic site management. 5G networks can help scenic sites monitor, react, and resolve crises in real time. Market need is met by live streaming and remote interpretation of virtual tourism.

6 Conclusions and Prospects

This study examines hotel and tourism mobile communication. This research examines mobile communication generational transitions. Travel, hospitality, and 5G. Results will follow. Hotel and tourism articles included 39 of 108. Each corporation uses actual data, but theoretical models seldom. Since 3G, all hotel guests have phones. Mobile technology benefits hotels and tourism. Mobile tech will shape travel and housing.

Finally, future mobile communications. Mobile communications in 5G will increase tourist production, leisure time and quality, and application possibilities through the "Internet of Everything." Like 3G, 5G and mobile technologies will evolve over time. 5G mobile communication may cause these and other developments. Beyond-5G mobile communication technologies thrill the people. Thus, 5G commercialization is only beginning, whereas 6G development is just beginning worldwide. Mobile communications increase performance, architecture, and reliability. 5G impacts hotels and others. The hotel and tourism industry develop mobile tools for users. Businesses and consumers should optimize mobile communications, whether 5G, 6G, or earlier standards. Mobile technology affects individuals, corporations, governments, and service providers.

Client-focused level connected interaction, ubiquity of the intelligent kernel, and all-area mobile communication services are some ways this trend will affect tourism and hospitality. Mobile communication technology allows suppliers to quickly capture customer needs and supply market-adapted products and services, benefiting social structure transformation, high-quality economic development, and environmental sustainability. If 6G expands the digital twin, medical tourism might improve diagnosis, treatment planning, simulation, and testing. Mobile technology improves government services, yet deep intelligence and IT confront administrative agencies. Protect online conversations. Each new generation of mobile communication technology must comply with society standards and legal or ethical criteria. Service providers must innovate and explore new network topologies as corporate applications and mobile communications technology performance needs grow.

References

1. . Routray, S.K., Sharmila, K.P.: 4.5G: A milestone along the road to 5G. In: Proceedings of the International Conference on Information Communication and Embedded Systems, Chennai, India, 27–28 February (2014)
2. Fadhil, H.M., Dawood, Z.O.: Evolutionary perspective of mobile communication technologies. In: Proceedings of the 2018International Conference on Computer and Applications (ICCA), Beirut, Lebanon, 25–26 July 2018, pp. 80–84. (2018)
3. Panwar, N., Sharma, S., Singh, A.K.: A survey on 5G: the next generation of mobile communication. Phys. Commun. **18**, 64–84 (2016)
4. Kumar, A., Gupta, M.: A review on activities of fifth generation mobile communication system. Alex. Eng. J. **57**, 1125–1135 (2018)
5. Jain, A.K., Acharya, R., Jakhar, S., Mishra, T.: Fifth generation (5G) wireless technology "Revolution in telecommunication. In: Proceedings of the 2018 Second International Conference on Inventive Communication and Computational Technologies(ICICCT), Tamil Nadu, India, 20–21 April 2018; pp. 1867–1872. (2018)
6. Kumar, S., Agrawal, T., Singh, P.: A future communication technology: 5G. Int. J. Future Gener. Commun. Netw. **9**, 303–310 (2016)
7. Selinis, I., Katsaros, K., Allayioti, M., Vahid, S., Tafazolli, R.: The race to 5G era. LTE and Wi-Fi. IEEE Access **6**, 56598–56636 (2018)
8. You, X., Zhang, C., Tan, X., Jin, S., Wu, H.: AI for 5G: research directions and paradigms. Sci. China Inf. Sci. **62**, 21301 (2018)
9. Batalla, J.M., Krawiec, P., Mavromoustakis, C.X., Mastorakis, G., Chilamkurti, N., Negru, D., Bruneau-Queyreix, J., Borcoci, E.: Efficient media streaming with collaborative terminals for the smart city environment. IEEE Commun. Mag. **55**, 98–104 (2017)
10. Law, R., Chan, I.C.C., Wang, L.: A comprehensive review of mobile technology use in hospitality and tourism. J. Hosp. Mark. Manag. **27**, 626–648 (2018)
11. Dorcic, J., Komsic, J., Markovic, S.: Mobile technologies and applications towards smart tourism—State of the art. Tour. Rev. **74**, 82–103 (2019)
12. Chen, S., Law, R., Xu, S., Zhang, M.: Bibliometric and visualized analysis of mobile technology in tourism. Sustainability **12**, 7975 (2020)
13. Guo, S., Wang, L., Xie, Y., Luo, X., Zhang, S., Xiong, L., Ai, H., Yuan, Z., Wang, J.: Bibliometric and visualized analysis of stem cellstherapy for spinal cord injury based on web of science and citespace in the last 20 years. World Neurosurg. **132**, e246–e258 (2019)
14. White, M.D., Marsh, E.E.: Content analysis: a flexible methodology. Libr. Trends **55**, 22–45 (2006)
15. Elo, S., Kyngas, H.: The qualitative content analysis process. J. Adv. Nurs. **62**, 107–115 (2008)
16. Camprubí, R., Coromina, L.: Content analysis in tourism research. Tour. Manag. Perspect. **18**, 134–140 (2016)
17. Duriau, V.J., Reger, R.K., Pfarrer, M.D.: A content analysis of the content analysis literature in organization studies: research themes, data sources, and methodological refinements. Organ. Res. Methods **10**, 5–34 (2007)
18. Gaur, A., Kumar, M.: A systematic approach to conducting review studies: an assessment of content analysis in 25 years of IBresearch. J. World Bus. **53**, 280–289 (2018)
19. Kitchenham, B., Brereton, O.P., Budgen, D., Turner, M., Bailey, J., Linkman, S.: Systematic literature reviews in software engineering—a systematic literature review. Inf. Softw. Technol. **51**, 7–15 (2009)
20. Kim, Y., Kim, B., Kim, Y., Wang, Y.: Mobile communication research in communication journals from 1999 to 2014. New Media Soc. **19**, 1668–1691 (2017)
21. Mehraliyev, F., Chan, I.C.C., Choi, Y., Koseoglu, M.A., Law, R.: A state-of-the-art review of smart tourism research. J. Travel Tour. Mark. **37**, 78–91 (2020)
22. Law, R., Leung, D., Au, N., Lee, H.A.: Progress and development of information technology in the hospitality industry. CornellHosp. Q. **54**, 10–24 (2012)

23. Gelashvili, V., Martínez-Navalón, J.G., Herrera Enríquez, G.: How stress and anxiety when using mobile restaurant reservation Apps influence user's satisfaction and trust. J. Indian Bus. Res. (2021)
24. Huang, C.M., Lee, C.H., Zheng, J.R.: A novel SIP-based route optimization for network mobility. IEEE J. Sel. Areas Commun. **24**, 1682–1691 (2006)
25. Chevillat, P.R., Schott, W.: Broadband radio LANs and the evolution of wireless beyond 3G. IBM J. Res. Dev. **47**, 327–336 (2003)
26. Nadiia, R., Yusuf, I., Yaroslav, K.S., Nataliia, B., Mykola, S., Olha, B.: Systems thinking to investigate the archetype of globalization. In: Alareeni, B., Hamdan, A. (eds.) Financial Technology (FinTech), Entrepreneurship, and Business Development. ICBT 2021. Lecture Notes in Networks and Systems, vo.l 486. Springer, Cham (2022). https://doi.org/10.1007/978-3-031-08087-6_9
27. Gupta, S.K., Dongul, E.S., Reznik, N.P., Lohia, D., Kamboj, N.: The effect of economic pro-growth initiatives on the recent increase in economic development in the USA millennial entrepreneurs. In: AIP Conference Proceedings, vol. 2413, pp. 040011 (2022). https://doi.org/10.1063/5.0079113
28. Reznik, N.P.: Development of small forms of management: problems and prospects in the regional agro-industrial complex. Naukovyi visnyk Khersonskoho derzhavnoho universytetu. Ser.: Ekonomichni nauky, Iss. **11**(3), 32–37 (2015)
29. Alekseieva, K.A., Melnyk, L.V., Ostapchuk, A.D., Horská, E., Reznik, N.P.: Theoretical and methodological approaches to development of the concept of digital economy. Test Eng. Manag. (2020). https://www.scopus.com/inward/record.url?eid=2-s2.0-85083002183&partnerID=MN8TOARS

ICT, Technology and Business

Ways in Which TQM, SCM Methods, and Operational Prowess Affect Company Performance

Liliana Horal , **Svitlana Onyshchenko** , **Andriy Korniyenko** , **Sofiia Dub** , **Halyna Yermak** , **and Petro Hryniv**

1 Introduction

SC management emphasizes seamless organization-wide integration of value-creating activities. SC management eliminates waste, manages inventory, and maximizes synergies. The company also competes well globally. Thus, SC management prioritizes management initiatives to integrate value-creating activities throughout the firm. Product kind, integration degree, industry, etc. determine the approach. The goal is to build cross-organizational ties. Inter and intra-SC relationships let employees use their skills and integrate tasks. SC management has failed worldwide. Despite considerable resource consumption, some firms failed. Because SC doesn't prioritize relationship building and practice integration. Companies also neglect other operating competencies.

The resource-based approach states that SC member's competencies and resources in a given context create and maintain competitive advantage [15]. These resources/capabilities drive a firm's success [27]. Several forms of study are based on the theory that organizational resources differentiate competitive advantage. Firms must combine operations with numerous SC members to manufacture high-quality, low-cost goods. This competitive market requires operational activity integration to succeed. Firms must build and employ core resources to generate competencies that competitors cannot copy [18]. Research shows that enterprises with identical operational capability in the same market might perform differently. Operational capacity benefits suppliers, customers, and the company. However, there is little research on how SC management affects firm performance and operations capability. Results are inconclusive. The present study addresses this gap by examining how operational

L. Horal (✉) · A. Korniyenko · S. Dub · P. Hryniv
Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine
e-mail: liliana.goral@gmail.com

S. Onyshchenko · H. Yermak
National University Yuri Kondratyuk Poltava Polytechnic, Poltava, Ukraine

capacity and SC management techniques affect business performance. Operations capacity supports SC management techniques, according to literature. SC management methods also influence performance-operations capability relationships. The structure of the paper is as follows starting with brief Introduction to the topic, followed by review of the literature, Methodology, statistics, results, and debate follow. The paper concludes with research limitations and implications.

2 Literature Review

NPDD and SC management are linked, according to various research. Johnson, and Cullen [19] suggested that NPDD may provide suppliers and buyers a competitive edge. Prester and Palčič found that global sourcing affects NPDD intensity and revenue percentage. Early supplier engagement in NPDD improved performance. These changes lowered time, cost, and quality.

Information-sharing networks in the competitive environment could make long-term relationships between customers, firms, and suppliers essential and widespread in SC management and product innovation in food processing and distribution [22]. Govindan and Fattahi [14] studied market entrance SC investments and product demand characteristics. Results showed that enterprises evaluate product diversity, unpredictability, market growth, and contribution margins while investing in SC. Borge and Bröring [8] created a conceptual model of product technology transfer success factors using organizational theory. Researchers found that product technology transfer is most successful when transferred technology matches organizational connections between source and receiver.

In this competitive global economy, firms concentrate on key strengths. Organizations manage supplier relationships and buying to get a competitive edge [7]. Supply base management is how organizations employ supplier's procedures, competencies, and technology for competitive advantage [17]. Supply base management also involves how firms integrate materials, transportation, logistics, and production [23, 28]. Managing major suppliers has decreased numerous corporation's supply bases. Purchasers see suppliers as extensions. Supplier–buyer interactions help both parties [21]. Coordination and mutual benefit boost buying businesse's dependency on suppliers.

Due to growing dependency, supplier performance and competence may impact buying firm performance. Thus, shipment delays and poor quality may occur. For other firms, supplier performance or capacity may improve quality and advanced technology integration by involving suppliers sooner. Suppliers may participate earlier in product design to make it cost-effective, find alternative solutions, choose the best technology, and review design [25]. Focusing on internal capabilities requires significant external supplier dependency. This supports engineering and design support nonbasics. Thus, organizations may announce that particular capabilities have been replaced by others for successful supplier management.

This research study identified 10 supply base management methods to increase supplier performance (Appendix I, part III). These include supplier information exchange, quality assurance procedures, and site inspections. SC management interpretations vary in literature. It integrates SC operations to offer consumer value. SC management has focused on supply base or logistics management despite the necessity to integrate logistics, transportation, and buying with production.

SCM coordinates value chain logistics [1]. Organizations may handle demand uncertainty by extracting things from SC and putting them out for prediction. This helps manage demand unpredictability and inventories [24]. Like integrated logistics systems. Supply emphasis resembles supply base optimization and supplier integration with production and product development.

SC management suggests streamlining the supplier base for supplier relationship management [26]. It involves strategic supplier connections, objective attainment, and early PDP supplier participation. Companies may become agile by focusing on key strengths and outsourcing non-essential tasks. Agility helps the company meet client needs. The company might also employ supplier's experience, efficiency, capacities, and technologies.

In literature, numerous corporations decreased key competences and gained competitive advantage. These organizations limited their supply base to manage key supplier relationships for mutual benefit. Supplier capabilities may cut product development time. It also boosts quality and technology integration [9]. Outsourcing may make firms more dependent on its partners. To be competitive, SCs must be well-managed. The research hypothesized:

H1: Operational capabilities influence organizational performance.
H2: Operational capabilities influence supply chain processes.
H3: Supply chain practices affect business performance.
H4: Supply chains Mediates operational capabilities-organizational performance.

TQM literature abounds. Anecdotal or descriptive research dominates. Thus, quality management program rollout is less guided. Until the 1980s, quality management's determinant remained unknown. Quality and performance have been studied for years. Internal and external coordination, visionary leadership, employee satisfaction, and process management affect quality management.

These characteristics affect client happiness, according to studies. Other research have shown comparable structures that improve product quality. Quality management methods have little effect on corporate performance. Wilson and Collier shown that leadership drives quality management (Malcolm Baldrige National Quality Award. The MBNQA framework represents variables correctly, including TQM variables, according to research. The constructions match other research.

Kawalla et al. [20] underlined that quality certification helps businesses compete. Quality is strategic and must be handled throughout the SC. Automotive component providers examined buyer–supplier quality assurance processes. Every SC company was urged to prioritize quality assurance. Tizroo et al. evaluated SC management and TQM, including performance assessment and operational flexibility. SC management, quality management, and other topics may be researched. Ameer [2] examined

SC management-TQM relationships. The researchers observed that conventional SC management models fail to account for TQM initiatives.

Peng et al. noted the relationship between SC management and quality management. TQM and SC management are linked. A modern quality management company chooses reliable suppliers. Competent suppliers are invited to collaborate on product design and development. The business with inferior capabilities, supplier reputation, and improvement needs might also be invited. The literature links TQM to company performance [4, 16]. TQM and business performance have been examined from several angles. TQM develops competences and distinctive resources, which create the association, according to the resource-based approach. Competences like this boost corporate performance and competitiveness.

The neoclassical effect of competition on integrative TQM framework development was utilized. Quality investments increased consumer satisfaction in competitive markets. Andrade et al. [3] used behavioral science. Management, leadership, and customer focus affect operational success, according to study. Quality dimensions, competence, and business strategy equivalence affect performance. The foregoing debate yielded the following hypothesis:

H5: Operational capabilities influence organizational performance.

H6: Total quality management depends on operational competencies.

H7: TQM improves organizational performance.

H8: TQM links operational capabilities to organizational performance.

3 Methodology

The research investigates the structural link between OPC, TQM, SCP, and OP. The research achieved its goals using survey-based technique. The random sample response rate is 54%, greater than Dikko [10] minimum. The population of the study is all stock exchange-listed manufacturing firms, whereas the sample is exporting manufacturing firms. Personal visits in January 2023 presented questionnaires to Indonesian stock exchange-listed industrial enterprises. The most robust structural equation modelling approach, SEM-PLS, is applied for analysis. Data analysis findings follow. OP has fifteen pieces, OPC has ten, SCP has ten, and TQM has twelve.

4 Research Findings

SEM-PLS has SM and MM models. MM defends this study's theoretical foundations. The outer model (MM model) map is shown below. Table 1 shows the study items' convergent validity, showing their relationship. All goods exceed Basheer et al. [6] 0.70 outside loading threshold. In this study's reliability analysis, Cronbach's alpha, cross-validation (CR), and average variance explained (AVE) fall below the minimal allowed value. All scores over the threshold confirm question convergent validity.

Table 1 Convergent validity

Items	Loadings	Alpha	CR	AVE
OP15	0.868			
OP14	0.880			
OP13	0.843			
OP12	0.861			
OP11	0.883			
OP10	0.818			
OP9	0.882			
OP8	0.886	0.860	0.863	0.668
OP7	0.833			
OP6	0.826			
OP5	0.832			
OP4	0.812			
OP3	0.644			
OP2	0.668			
OP1	0.666	0.868	0.862	0.612
OPC11	0.866			
OPC10	0.880			
OPC9	0.866	0.848	0.868	0.666
OPC8	0.886			
OPC7	0.846			
OPC6	0.886			
OPC5	0.863			
OPC4	0.802			
OPC3	0.846			
OPC2	0.866			
OPC1	0.826			
SCP10	0.838			
SCP9	0.812			
SCP8	0.823			
SCP7	0.821			
SCP6	0.846			
SCP5	0.820			
SCP4	0.806			
SCP3	0.816			
SCP2	0.820			
SCP1	0.821			
TQM11	0.666			

Table 1 (continued)

Items	Loadings	Alpha	CR	AVE
TQM10	0.660			
TQM9	0.826			
TQM8	0.808			
TQM7	0.816			
TQM6	0.826			
TQM5	0.826			
TQM4	0.804			
TQM3	0.863			
TQM2	0.846			
TQM1	0.826			

Table 2 Discriminant validity

	OP	OPC	SCP	TQM
OP	0.894			
OPC	0 0.830	0.898		
SCP	0.830	0.814	0.896	
TQM	0.838	0.893	0.866	0.866

The study's validity was determined using the criteria proposed by Tzempelikos and Gounaris. The Fornell-Larcker criterion was used to define the correlation between the variables, and the HeterotraitMonotrait ratio (HTMT) was employed to verify discriminant validity. All of the diagonal values are larger than the smaller values, hence there is no validity problem, as shown by the findings (Table 2).

The structural model, which describes the underlying causal connections between and among the variables, is established after the MM's evaluation. To calculate the route coefficients, the bootstrapping method is used. Table 3 displays the outcomes of the shortest routes. A positive sign for beta, t-statistics more than 1.64, and probability values less than 0.05 indicate that each of the direct pathways from OPC to OP, OPC to SCP, OPC to TQM, and SCP to OP is statistically significant and positive.

5   Result and Outcomes

Significant route linkages for new product design and capabilities development affect firm performance directly and indirectly. Manufacturers create and develop new products. Competitive business environments shorten product lifespans. Generic alternatives are developed when patents expire. To be competitive, you must launch high-quality, innovative items before competitors.

Table 3 Path analysis

	(M)	(O)	(STDEV)	P Values	(|O/STDEV|)
OPC➜ OP	0.808	0.805	0.058	0.000	15.698
OPC➜ SCP	0.816	0.815	0.066	0.000	10.881
OPC➜ TQM	0.895	0.893	0.019	0.000	56.999
SCP➜ OP	0.506	0.503	0.125	0.001	3.251
TQM➜ OP	0.565	0.566	0.120	0.000	3.895
OPC➜ SCP➜ OP	0.291	0.288	0.095	0.001	3.056
OPC➜ TQM➜ OP	0.516	0.516	0.108	0.000	3.856

Effective SC management is crucial for organizations developing new product and capability designs. Part simplification, concurrent engineering, and value analysis improve company performance. New technologies need expertise, finance, risk-taking, and specialized understanding. Due to client expectations and expanding product offers, corporations struggle to launch new items quickly and competitively. Key suppliers are crucial to product design and development. Thus, knowledgeable suppliers should be cultivated. Firms may commit by harmonizing expectations, strategies, and objectives. Kot et al. [22] similarly showed a favorable relationship between supply chain practices and company performance. Thus, data cannot indicate that enterprises should prioritize internal quality. Previous research have shown that concentrating on customer demands and supplier quality may improve business performance [4, 5, 16]. The QM program includes product development, supplier certification, customer engagement in product development, and customer satisfaction initiatives.

6 Conclusion

The research has limitations. This study's conceptual model ignores performance. Market structure, ownership structure, and company governance from industrial organization, finance, and organizational behavior literatures have not been examined. Longitudinal data can assess the model's short- and long-term effects [12]. Longitudinal data may also explore how factors affect performance. Operations capabilities should also be examined in relation to SC. Eckstein et al. [11]. This report advised governments to prioritize supply chain and quality management to boost company performance. This research will aid export-related manufacturing organizations by examining how supply chain and quality management strategies affect firm performance.

A model that modifies operations capabilities and performance yields impressive results. The model's dynamic formulation eliminates the effect of stable variables. The model uses lagged variables to identify the cause. Future research should examine logistics and buying capabilities. Product and process quality may help companies

compete globally. Organizations must improve more than quality. Organizations are essential to business since they cannot operate alone. Customer, manufacturer, and supplier outcomes support this idea. To attain development and financial goals, incorporate these components. The research also links certain behaviors to corporate success. This may not happen if corporate procedures are not coordinated or limited financial resources are directed to favorable results.

References

1. Agrell, P.J., Lundin, J., Norrman, A.: Supply chain management: horizontal carrier coordination through cooperative governance structures. Int. J. Prod. Econ. **194**, 59-72 (2017)
2. Ameer, M.S.: Total quality management practices and supply chain management: understanding linkages from the logistics sector of Pakistan. SEISENSE J. Managem. **1**(4), 22–28 (2018)
3. Andrade, J., Mendes, L., Lourenço, L.: Perceived psychological empowerment and total quality management-based quality management systems: an exploratory research. Total Quality Managem. Business Excellence **28**(1–2), 76–87 (2017)
4. Anil, A.P., Satish, K.: Enhancing customer satisfaction through total quality management practices–an empirical examination. Total Quality Managem. Bus. Excellence **30**(13–14), 1528–1548 (2019)
5. Baraniecka, A.: How to measure the social capital in a supply chain?. Actalogistica **3**(4), 23–30 (2016)
6. Basheer, M., Siam, M., Awn, A., Hassan, S.: Exploring the role of TQM and supply chain practices for firm supply performance in the presence of information technology capabilities and supply chain technology adoption: a case of textile firms in Pakistan. Uncertain Supply Chain Managem. **7**(2), 275–288 (2019)
7. Bezecný, J., Besta, P., Sezima, T., Stoch, D., Janovská, K., Malčic, T., Drastich, A.: Evaluation of supplier's quality and significance by methods based on weighted order. ActaLogistica **6**(1), 1–4 (2019)
8. Borge, L., Bröring, S.: Exploring effectiveness of technology transfer in interdisciplinary settings: the case of the bioeconomy. Creativity and Innov. Managem. **26**(3), 311–322 (2017)
9. Chang, J.: The effects of buyer-supplier's collaboration on knowledge and product innovation. Indus. Market. Managem. **65**, 129–143 (2017)
10. Dikko, M.: Establishing construct validity and reliability: pilot testing of a qualitative interview for research in takaful (Islamic Insurance). Qualitative Report **21**(3) (2016)
11. Eckstein, D., Blome, C., Henke, M.: The performance impact of supply chain agility and supply chain adaptability: the moderating effect of product complexity. Int. J. Prod. Res. **53**(10), 3028–3046 (2015)
12. Foged, M., Peri, G.: Immigrant's effect on native workers: new analysis on longitudinal data. Amer. Econ. J.: Appl. Econ. **8**(2), 1–34 (2016)
13. Goldbach, I.R., Ślusarczyk, B.: Supply chain management in SMEsPolish and romanian approach. Econ. Sociol. **11**(4), 142 (2018)
14. Govindan, K., Fattahi, M.: Investigating risk and robustness measures for supply chain network design under demand uncertainty: a case study of glass supply chain. Int. J. Prod. Econ. **183**, 680–699 (2017)
15. Gupta, G., Tan, K.T.L., Phang, C.S.C.: Resource-based view of information systems: Sustainable and transient competitive advantage perspectives. Australasian J. Inform. Syst. **22** (2018)
16. Gutierrez-Gutierrez, L.J., Barrales-Molina, V., Kaynak, H.: The role of human resource-related quality management practices in new product development. Int. J. Oper. Prod. Managem. (2018)

17. Henry, K.L.: A review of Get out: on white terror and the black body. Equity and Excellence in Educ. **50**(3), 333–335 (2017)
18. Hirunyawipada, T., Xiong, G.: Corporate environmental commitment and financial performance: moderating effects of marketing and operations capabilities. J. Business Res. **86**, 22–31 (2018)
19. Johnson, J.L., Cullen, J.B.: Supplier and customer involvement in new product development stages: implications for new product innovation outcomes. Int. J. Innov. Technol. Managem. **15**(01) (2018)
20. Kawalla, C., Ligarski, M., Hoeck, M.: Supply chain quality management of automotive components. ZeszytyNaukowe. Organizacja i Zarządzanie/PolitechnikaŚląska (133 Management in Industry and Services), 69–83 (2019)
21. Kemboi, C.: Supply chain management practices, customer satisfaction and customer loyalty. Supply Chain Managem. **9**(02) (2016)
22. Kot, S., Haque, A., Baloch, A.: Supply chain management in Smes: global perspective. Montenegrin J. Econ. **16**(1), 87–104 (2020)
23. Kovács, G., Gubán, M.: Planning of optimal fuel supply of international transport activity. Periodica Polytechnica-Transp. Eng. **45**(4), 186–195 (2017)
24. Köteles, T., Tihanyi, L., Szunyog, I., Kis, L.: Specific features of natural gas supply in some EU countries. Acta Tecnología **4**(3), 45–57 (2018)
25. Liu, Z.: Structuring and managing supply network: a review of current literature and conceptual framework. In: Operations and Service Management: Concepts, Methodologies, Tools, and Applications, pp. 170–182. IGI Global.
26. Lutende, D.D.: The impact of supplier relationship management on supply chain performance in telecommunication industry: a case of tigo. The University of Dodoma (2018)
27. Mikalef, P., Pateli, A.: Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: findings from PLS-SEM and fsQCA. J. Business Res. **70**, 1–16 (2017)
28. Nowicka-Skowron, M., Nowakowska-Grunt, J., Brzozowska, A.: A logistics system in management of flows in the area of agribusiness. Actalogistica **5**(3), 87–92 (2018)
29. Olena, A., Reznik, N., Dmytro, S.: Organizational and economic mechanism of the development of foreign economic activity of industrial production. In: Alareeni, B., Hamdan, A., Elgedawy, I. (eds.) The Importance of New Technologies and Entrepreneurship in Business Development: In The Context of Economic Diversity in Developing Countries. ICBT 2020, LNNS, vol. 194. Springer, Cham (2021). https://doi.org/10.1007/978-3-030-69221-6_77
30. Petrushka, I., Yemelyanov, O., Petrushka, T., Koleshchuk, O., Reznik, N.: Influence of energy-saving technology changes on the agro-industrial enterprises innovativeness in terms of digitalization. Int. J. Adv. Sci. Technol. **29**, 2489–2496 (2020)
31. Reznik, N.P.: «Efficiency of derivatives in the world stock markets». Collection of scientific works of the Taurian state-owned agrotechnological university (economic sciences) vol. 2, pp. 147–151. (2016)

The Utilization of Information and Communication Technology (ICT) on SMEs Performance: The Mediating Role of Financial Innovation

Fivi Anggraini, Vivie De Selva, and Daniatti Putri

1 Introduction

The presence of the small and medium enterprise (SMEs) ecosystems has an important role in Indonesia's national economic growth. SMEs contribute around 60% to the national gross domestic product (GDP) and absorb around 97% of the workforce in Indonesia. Based on 2020 Statistic Indonesia (BPS) data, there are more than 64.2 million SMEs spread throughout the country. However, the Covid-19 pandemic that hit Indonesia in March 2020 rocked the national economy. SMEs are one of the affected business sectors. Based on a report from Bank Indonesia 2021, as many as 87.5% of SMEs were affected by the Covid-19 pandemic. Around 93.2% of them were negatively affected from the sales side due to several factors. Technological developments are increasingly rapidly currently driving economic growth and innovation for SMEs. The use of information communication and technology (ICT) is a model of a new approach to job creation, with a network site that allows people to interact through innovation [1]. ICT is an important requirement for driving economic growth to survive in today's global business environment [2]. Several researchers from various countries have conducted studies on the impact of ICT on SME performance, including [3] in Lebanon, [1] in Kenya, and [4] in China. In Indonesia alone, similar studies have also been conducted by [5] and [6]. Besides, the performance improvement of SMEs by using of ICT, another innovation is also needed in the financial sector. Financial innovation is an action taken to create new financial instruments related to financial markets and technology so that these innovations can produce optimal performance [7]. Financial innovation is defined as the skills of SMEs in using digital-based financial products and services for operational and investment efficiency [8]. Financial innovation aims to help SMEs reducing the need for financial payments that involve direct interaction so that transactions can be

F. Anggraini (✉) · V. De Selva · D. Putri
Faculty of Economics and Business, Universitas Bung Hatta, Padang, Indonesia
e-mail: fivianggraini@bunghatta.ac.id

415

realized quickly and efficiently [9]. The positive impact of financial innovation on the performance productivity of SMEs has become the focus of research in various countries, including Nigeria, China, Pakistan, and Indonesia [10, 11] and [5].

It can be deduced that the previous studies have been limited to exploring of the direct correlation between ICT, financial innovation, and SME performance. As there is a research gap that can be filled-in. Therefore, objective of this study is to investigate financial innovation's role as an intermediary between ICT utilization and SME performance in Indonesia. The findings of this study are expected to emphasize the significance of integrating ICT and financial innovation into SME business processes, so that serve as pivotal factors in enhancing SME performance within the Indonesian context. The article's structure is organized as follows: Sect. 1 comprises the introduction, Sect. 2 explores literature review concerning ICT's impact on SME performance and financial innovation, Sect. 3 outlines the study's method, Sect. 4 presents the results and discussion, and finally, Sect. 5 provides the conclusion.

2 Literature Review

2.1 Use of ICT on SME Performance

During the Covid-19 pandemic, the use of information and communication technology (ICT) has become the main factor driving the development of entrepreneurship [3]. Today's business must have the ability to optimally utilize ICT by integrating it into organizational strategy, to create a competitive advantage in the global business environment [2]. The use of ICT in the process of business transactions in the form of electronic commerce in buying and selling processes such as e-commerce and m-commerce [12]. Today's industry has widely adopted data applications with modern technology [13]. The goal of implementing this technology is to achieve sustainable organizational performance. As a result of this, ICT plays a role in supporting SME operations effectively and efficiently. ICT has a role in increasing the productivity of companies as well as expanding their market share [3]. ICT and SME performance involves a series of mutually supportive elements, which ultimately have a positive impact on improving SME performance [14]. This occurs through increased speed, accuracy, and precision in business processes. Research conducted by [12] proves that the use of ICT on business performance such as [15] and [1] stated that the use of ICT can reduce time for administrative tasks and increase focus on core activities that improve SME performance.

H1: The use of information communication and technology (ICT) has a significant effect on the performance of SMEs.

2.2   Use of ICT for Financial Innovation

ICT is considered to contribute mainly to strengthening the financial system, developing and introducing various products with innovative ICT-based finance [16]. ICT can influence financial innovation including increasingly sophisticated payments [17]. Financial innovation is a new financial service model developed through ICT [18]. Financial innovation is the first driver of financial markets and market transactions, the emergence of financial innovation is driven by the presence of ICT throughout the global economy [9, 19]. ICT is related to changes in financial innovation, with the introduction and dissemination of financial innovation services, institutions, and instruments [20]. ICT facilitates immediate responses to the latest data and financial innovations enabling accelerated transfers of funds between physically distant markets [6].

H2: Information Communication and Technology (ICT) has a significant effect on financial innovation.

2.3   Financial Innovation on SMEs Performance

Financial innovation is an act of creating new financial instruments related to financial markets and technology to improve organizational performance [7]. Financial innovation helps SMEs minimize the need for face-to-face payments, and make transactions faster and more efficient [9]. Financial innovation has a positive and significant effect on the performance of SMEs in Nigeria [10]. Likewise, research [9, 21, 22] and [23]stated that financial innovation was able to improve the skills of SMEs in using the latest digital financial products and services for operational and investment efficiency so that it had an impact on the performance of SMEs. Various financial innovation products are used by SMEs as a strategic tool to be able to compete globally, thus improving their financial performance and maintaining efficiency and effectiveness in the market [24].

H3: Financial innovation affects the performance of SMEs.

2.4   Financial Innovation as Mediating the Relationship Between the Use of ICT on the Performance of SMEs

Information and Communication Technology (ICT) has a significant role in driving financial innovation for Small and Medium Enterprises (SMEs) [23]. Financial innovation is a concept of a new financial service model developed through the application of ICT. The existence of financial innovations in the form of digital applications for SMEs can manage their financial transactions more efficiently [10]. This digital application helps in tracking income, expenses, and cash flow, thereby enabling SME

owners to make better decisions based on accurate data. Various financial innovation products have been implemented by SMEs as a strategic tool to maintain competitiveness with competitors, improve financial performance and maintain efficiency and effectiveness in the market [3, 13] and [25]. Observations on financial innovation practices indicate that there is a mediating effect on the relationship between technology and business performance in Malaysia [26].

H4: ICT influences the performance of SMEs with financial innovation as a mediating variable.

3   Method

The study's target population encompassed small and medium enterprises (SMEs) officially registered at the Office of Cooperatives and SMEs in Bukit Tinggi municipality of West Sumatra province, Indonesia. The research employed a random sampling technique categorized as simple random sampling. Data collection occurred through the implementation of survey methods. The analysis of the data employed Partial Least Squares Structural Equation Modeling (PLS-SEM). ICT serves as a digital platform that amplifies opportunities for entrepreneurial endeavors through tools like the Internet, mobile technologies, and social computing. The assessment of ICT utilization among SMEs was conducted using tools derived from reference [27]. To measure the construct underlying the data, 19 question items for ICT adoption were formulated, employing a Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree). Indicators such as sales growth, gross profit, return on investment, and employee growth were utilized, following the framework in reference [28]. A set of 14 question items was designed to quantify these performance aspects, adopting a Likert scale that spanned from 1 (strongly disagree) to 5 (strongly agree). Financial innovation pertains to actions undertaken to introduce novel financial instruments interconnected with financial markets and technology, ultimately aimed at yielding positive performance outcomes, as explained by reference [7]. The questionnaire employed for exploring this variable was adapted from references [7, 8], and [24], featuring 10 questions evaluated on a Likert scale that ranged from strongly agree (5) to strongly disagree (1).

4   Results and Discussion

A total of 215 questionnaires were directly distributed to female-owned SMEs within the samples. Among these, complete responses were received from 210 out of 215 participants, while 5 respondents provided incomplete answers, leading to their exclusion from the analysis. Thus, the number of questionnaires considered for this study totaled 210. Analyzing the characteristics of the respondents who participated in the questionnaire, the majority, which accounts for 167 respondents or 79.5%,

were SME business proprietors, with the remainder being staff members. In terms of educational background, a substantial portion of respondents, totaling 139 individuals or 66.2%, possessed a high school level education. Only 2 respondents, comprising a mere 1.0%, held a Master's degree or above. The age bracket of 36 to 45 years encompassed 58 respondents, constituting 27.6% of the participants. Regarding the nature of their businesses, the primary focus of women's SMEs was on the fashion sector, with 60 respondents or 28.6%, followed by culinary businesses with 49 respondents or 23.3%. In the realm of financial innovations, the most commonly utilized methods were mobile banking (m banking) by 112 respondents or 53.3%, followed by SMS banking and QRIS, each accounting for 37 respondents or 17.6%.

Validation of the measurement model encompassed an assessment of loading factors, Cronbach's alpha composite reliability, and average variance extracted (AVE) for all indicators (Table 1). All the indicators were confirmed to be valid and aligned with the recommended criteria [29], demonstrating a satisfactory level of reliability, as indicated by outer loading values exceeding 0.7. Factors with loading values below the recommended 0.7 threshold were excluded. The outcomes of the measurement model are presented in Table 1. Discriminant validity of the concept was evaluated through the utilization of cross-loading and Fornell-Larcker criteria, as elucidated in reference [30]. Table 2 presents the result of discriminant validity. It can be stated that the indicators used in this study have good discriminant validity in compiling their respective variables [31].

Figure 1 shows the Smart PLS output results. Based on the results of testing the data for hypothesis 1 in Table 3, the use of ICT has a significant impact on the performance of SMEs. These findings indicate that ICT adoption has the potential to provide benefits in the development of SME businesses. The findings from this study are in line with the results of previous studies conducted by [13, 15], and [3], which argued that the implementation of digital technology in SMEs can improve their performance and contribute to achieving a competitive advantage. However, this study differs from the results of previous studies conducted by [2, 6], and [12] which stated that the use of ICT has no significant effect on the performance of SMEs. The test results for hypothesis 2 proves that ICT has a significant effect on financial innovation. The results of this study support research [19, 16, 20] that the use of ICT and financial innovation contributes to strengthening the financial system, developing and introducing various products with innovative ICT-based finance. The results of this study are different from [32] and [4] ICT has a positive but not significant effect on financial innovation.

The results of testing hypothesis 3 states that financial innovation has a significant impact on the development of SME performance. With financial innovation, SMEs can minimize face-to-face payments and be able to use a more efficient payment system. Therefore, financial innovation has an important relationship in improving the performance and level of competition of SMEs. The results of this study support research [10, 22 and 21]. However, in contrast to research [8], digital financial innovation has no relationship or no effect on SME performance. The result of testing hypothesis 4, proves empirically the role of financial innovation in mediating the relationship between the use of ICT on the performance of SMEs. These finding states

Table 1 The result of the measurement model

Constructs	Factor loading	Cronbach's alpha	Composite reliability	AVE
Rule of thumb	**> 0.7**	**> 0.7**	**> 0.7**	**> 0.5**
Information communication and technology (ICT)		0.918	0931	0.574
It is necessary to increase the speed of the internet network as a component of information technology. (ICT12)	0.778			
Business profits increase due to the use of information and communication technology. (ICT13)	0.779			
Provide fast responses to consumers for using ICT. (ICT15)	0.744			
M-commerce makes purchases and payments using the application on the smartphone. (ICT17)	0.786			
The use of information communication technology must be owned by entrepreneurs. (ICT3)	0.742			
Often uses information communication technology and information systems. (ICT4)	0.704			
Interested in using the latest information technology to improve business. (ICT5)	0.765			
Likes to receive the latest developments in information and communication technology. (ICT7)	0.735			
Interest in increasing knowledge in the field of information communication technology. (ICT8)	0.782			
Enthusiastic in finding the latest technology for business. (ICT9)	0.761			
SME performance		0.883	0911	0.631
I need high productivity. (PRF10)	0.756			

(continued)

Table 1 (continued)

Constructs	Factor loading	Cronbach's alpha	Composite reliability	AVE
I need to produce better business performance than business competitors. (PRF11)	0.808			
I need consistent market growth. (PRF12)	0.772			
In general, I need business performance is always increasing. (PRF14)	0.813			
I am satisfied that increased employment growth has accelerated regional economic growth. (PRF8)	0.764			
I need high efficiency in operation. (PRF9)	0.850			
Financial Innovation		0.929	0.940	0.637
Reducing risk and facilitating transaction activities in a business. (FIN10)	0.749			
Facilitate SMEs to access financial institutions that are more transparent and accountable. (FIN2)	0.835			
Providing a very fast financial service process. (FIN3)	0.845			
Providing added value for customers on an international scale, saving time, space and effort, and being able to compete globally. (FIN4)	0.865			
Encouraging effectiveness and more stable business financial circulation. (FIN5)	0.733			
Serving people who have not been served by the traditional financial industry. (FIN6)	0.783			
Expand sales access globally. (FIN7)	0.753			

Table 1 (continued)

Constructs	Factor loading	Cronbach's alpha	Composite reliability	AVE
Using digital payment systems (Internet Banking, M-Banking, SMS Banking) for sales transactions. (FIN8)	0.822			
Using digital wallets (DANA, Shoop pay, OVO, Go pay, E-Wallet, E-Money, Q-RIS) for buying and selling transactions. (FIN9)	0.786			

Source SEM-PLS, processed (2023)

Table 2 Discriminant validity

	ICT	FINC	PRF
ICT	0.758		
Financial innovation	0.700	0.798	
SME performance	0.638	0.585	0.795

Note ICT, information communication and technology; FINC, financial innovation; PRF, performance
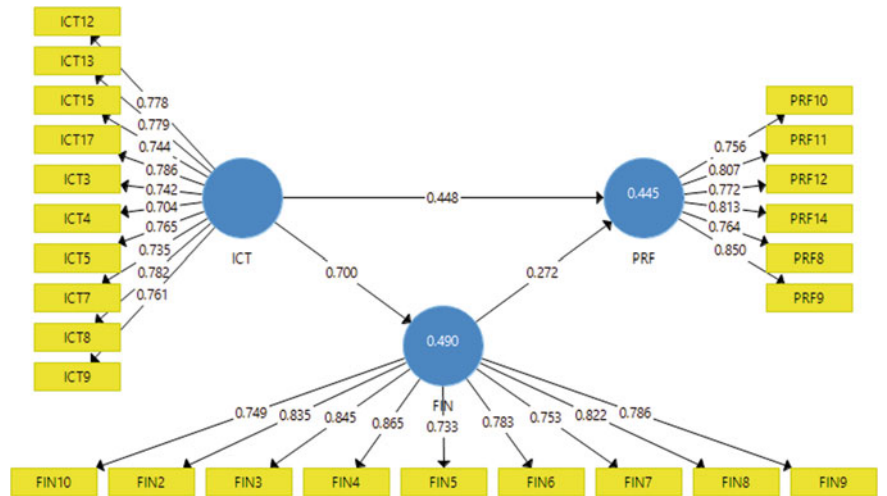
Fig. 1 SmartPLS outputs

Table 3 Hypothesis testing results

Direct Paths	Coefficients	Means	SD	t-Values	p-Values	Results
ICT➔ PRF	0.448	0.453	0.077	5782	0.000	**H1** Accepted
ICT➔ FI	0.700	0.706	0.028	24,655	0.000	**H2** Accepted
FI ➔ PRF	0.272	0.273	0.088	3.176	0.002	**H3** Accepted
Indirect Paths						
ICT➔FI➔PRF	0.190	0.192	0.059	3.241	0.001	**H4** Accepted

Note ICT, information communication and technology; FINC, financial innovation; PRF, performance

that the use of ICT as a disseminator of information and communication and financial innovation as a form of digital payment intermediary can improve the superior performance of SMEs. These results support research [] and [26, 33] that digitization of technology and financial innovation can attract potential customers to improve performance.

5 Conclusion

This research succeeded in proving a direct relationship between the use of information communication and technology (ICT) and financial innovation on the performance of SMEs. Furthermore, testing of financial innovation mediation succeeded in proving the relationship between the use of information communication and technology (ICT) on the performance of SMEs. The further study recommends an increase in the sample size and more specific sectors such as SMEs in the automotive, fashion, handicraft, and tour and travel industries, and also gender. Additionally, it is also suggested to include other variables such as intellectual capital, entrepreneurial orientation, and company strategy to understand the impact on SMEs performance.

References

1. Chege, S.M., Wang, D., Suntu, S.L.: Impact of information technology innovation on firm performance in Kenya. Inform. Technol. Developm. **26**(2), 316–345 (2020)
2. Okundaye, K., Fan, S.K., Dwyer, R.: JImpact of information and communication technology in Nigerian small-to-medium-sized enterprises. J. Econ. Finan. Administ. Sci. **24**(47), 29–46 (2019)

3. Yunis, M., El-Kassar, A.N., Tarhini, A.: Impact of ICT-based innovations on organizational performance: the role of corporate entrepreneurship. J. Enterprise Inform. Managem. **30**(1), 122–141 (2017)

4. Lee, C.C., Wang, C.W., Ho, S.J.: Financial innovation and bank growth: the role of institutional environments. North Amer. J. Econ. Finance **53**(March), 101195 (2020)

5. Kurniawan, M.A., Iskandar, Y.: The effect of technology adaptation and government financial support on sustainable performance of MSMEs during the COVID-19 pandemic. Cogent Business and Managem. **10**(1), (2023)

6. Octavia, A., Indrawijaya, S., Sriayudha, Y., Heriberta, Hasbullah, H., Asrini.: Impact on e-commerce adoption on entrepreneurial orientation and market orientation in business performance of smes. Asian Econ. Finan. Rev. **10**(5), 516–525 (2020)

7. Guarto, M., Thohary, R., Verawaty, V.: Building SME performance through financial innovation. Jurnal Keuangan dan Bisnis **20**(2), 1–17 (2022)

8. Ganlin, P., Qamruzzaman, M.D., Mehta, A.M., Naqvi, F.N., Karim, S.: Innovative finance, technological adaptation and SMEs sustainability: the mediating role of government support during the covid-19 pandemic. *S*ustainability (Switzerland) **13**, 16 (2021)

9. Anggraini, F., Puttri, D., Nabila, H.: Linkage of entrepreneurial orientation on business performance of women entrepreneurs and mediation role of competitive advantage. Jurnal Management dan Kewirausahaan **10**(1), 71–78 (2022)

10. Effiom, L., Edet, S.E.: Financial innovation and the performance of small and medium scale enterprises in Nigeria. J. Small Bus. Entrepreneurship **34**(2), 141–174 (2022)

11. Shehzad, K., Zaman, U., José, A.E., Koçak, E., Ferreira, P.: An officious impact of financial innovations and ICT on economic evolution in China: revealing the substantial role of BRI. Sustainability **13**, 8962 (2021)

12. Isa, F.M., Muhammad, N.M.N., Ahmad, A., Noor, S.: Effect of ICT on women entrepreneur business performance: case of Malaysia. J. Econ. Bus. **4**(1), 137–146 (2021)

13. Anggraini, F., Puttri, D., Novianti ,N., Helmi, S.: Effect of women's entrepreneurship practices on information communication technology (ICT) adoption during the Covid-19 pandemic: a case study in West Sumatra, Indonesia. J. Econ. Finan. Managem. Stud. **06**(06), 2954–2963 (2023)

14. Fatimah, S., Azlina, N.: The influence of information technology and innovation on the performance of small and medium enterprises. Study on Online-based SMEs Dumai (in Indonesian). Jurnal Riset Akuntansi Dan Perbankan **15**(1), 6 (2021)

15. OngShar, Y.Y.O., Habidin, N.F.H., Salleh, M.I.S.: The relationship between women's entrepreneurship practice. ICT Adoption and Bus. Perform. Malaysia and Indonesia **39**(4), 530–547 (2020)

16. Comin, D., Nanda, R.: Financial development and technology diffusion. IMF Econ. Rev. **67**(2), 395–419 (2019)

17. Marszk, A., Lechman, E.: Technological forecasting and social change reshaping financial systems : the role of ICT in the diffusion of financial innovations–recent evidence from European countries. Technol. Forecast. Soc. Change **167**(February), 120683 (2021)

18. Hsueh, S.C., Kuo, C.H.: Effective matching for P2P lending by mining strong association rules. In: Proceedings of the 3rd International Conference on Industrial and Business Engineering—ICIBE 2017, pp. 30–33. New York, USA, ACM Press (2017)

19. Kyle, A.S., Lee, J.: Toward a fully continuous exchange. Oxford Rev. Econ. Policy **33**(4), 650–675 (2017)

20. Lechman, E., Marszk, A.: Technological forecasting and social change ICT technologies and financial innovations: the case of exchange traded funds in Brazil, Japan, Mexico, South Korea and the United States. Technol. Forecast. Soc. Change **99**, 355–376 (2015)

21. Mu'min, W.O.R.: The effect of community financial technology innovation on the development of city small and medium enterprises (UKM)in Baubau. (in Indonesian). Entries, **4**, 156–175 (2022)

22. Najib, M., Ermawati, W.J., Fahma, F., Endri, E., Suhartanto, D.: Fintech in the small food business and its relation with open innovation. J. Open Innov.: Technol. Market and Complexity **7**(1) (2021)

23. Igun, S.E.: Strategic impact of ICT on modern day banking in Nigeria. Int. J. Strategic Inform. Technol. Appl. (IJSITA) **5**(4), 78–93 (2014)
24. Mehta, A.M., Ali, A., Saleem, H., Qamruzzaman, M., Khalid, R.: The effect of technology and open innovation on women-owned small and medium enterprises in Pakistan. J. Asian Finan. Econ. Bus. **8**(3), 411–422 (2021)
25. Khalifaturofi'ah, S.O.: Inovasi Keuangan Perbankan Di Indonesia. Prosiding Senama **2**, 11–20 (2019)
26. Kulathunga, K.M.M.C.B., Ye, J., Sharma, S., Weerathunga, P.R.: How does technological and financial literacy influence SME performance: mediating role of ERM practices. Information, **11**(6), 297 (2020)
27. Hoque, Md. R., Mohammad Saif, A.N., AlBar, A.M., Bao, Y.: Adoption of information and communication technology for development: a case study of small and medium enterprises in Bangladesh. Inform. Developm. 1–15 (2015)
28. Oni, O., Agbobli, E.K., Iwu, C.G.: Entrepreneurial orientation and performance of the small business in Vryburg Region Northwest Province South Africa. J. Rev. Global Econ. **8**, 63–71 (2019)
29. Hair, J.F., Black, B., Babin, B.: In: Multivariate Data Analysis. 8th ed. Upper Saddle River, New Jersey USA, Pearson Prentice Hall (2018)
30. Fornell, C., Larcker, D.F.: Structural equation models with unobservable variables and measurement error: algebra and statistics. J. Market. Res. **18**, 382–388 (1981)
31. Chin, W.W.: How to write up and report PLS analyses. In: Esposito Vinzi, V., Chin, W.W., Henseler, J., Wang, H. (eds.) Handbook of Partial Least Squares: Concepts, Methods, and Applications, pp. 655–690. Springer, Heidelberg, Dordrecht, London, New York (2010)
32. Zavolokina, L., Dolata, M., Schwabe, G.: FinTech transformation: how IT-enabled innovations shape the financial sector. In: Enterprise Applications, Markets and Services in the Finance Industry: 8th International Workshop, FinanceCom 2016, Frankfurt, Germany, Revised Papers 8, pp. 75–88. Springer International Publishing (2017)
33. Remmiya Rajan, P., Dinesh, A.: Darken phase of MSME due to Covid 19 in India. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS (2023). Contributions to Environmental Sciences Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_19

Proposing a Novel Performance Management Framework for Malaysian Non-profit Organisations: Towards Achieving Sustainability

Salina Kassim, Niaz Makhdum Muhammad, Kartina Md Ariffin, Nur Farhah Mahadi, Syarah Syahira Mohd Yusoff, and Nor Saremah Salleh

1 Introduction

Measuring business performance is important because it gives insights into corporate goals and how well they have been met. It helps businesses attract investors since they keep an eye on a company's overall performance while deciding whether to start, continue, or end an investment. It is frequently observed that the ultimate dependent variable of interest and a topic that is widely discussed in the management discipline is gauging a firm's performance [3].

Research on the usefulness of performance measurement of non-commercial businesses or non-profit organisations (NPOs), particularly social institutions, is still lacking. This is because NPOs do not normally prioritise the commercial objective, as their funding requirements come from various voluntary sources. However, according to [15], maintaining a social goal and running a successful business can be complementary and useful endeavours for these NPOs.

NPOs must exhibit effective management and desirable performance, just like commercial enterprises, in order to fulfil their obligation to a variety of stakeholders. However, especially when taking Malaysian perspectives into account, there are still just a few research on the performance measurement of NPOs. The objective of this study is to create a framework for measuring the performance for the NPOs by mainly following the examples of business entities. This entails examining the models and indicators of the performance measurement framework to determine its relevance and need, as well as focusing on any potential implementation problems.

S. Kassim (✉) · N. M. Muhammad · K. M. Ariffin · N. F. Mahadi · S. S. M. Yusoff
IIUM Institute of Islamic Banking and Finance, Selangor, Malaysia
e-mail: ksalina@iium.edu.my

N. S. Salleh
Kulliyyah of Information and Communication Technology, IIUM, Selangor, Malaysia

On the back of these issues, the current study aims to achieve several specific objectives:

(i) To identify the prevalence of performance measurement frameworks in the commercial entities, specifically in Malaysia.

(ii) To explore the effects of the performance measurement frameworks on organizational performance.

(iii) To analyse the factors that determine the choice of performance measurement frameworks in the NPOs.

(iv) To examine the challenges faced by NPOs in implementing a performance measurement framework.

2 Structure of the Article

This article has four main sections. The first section highlights the objectives of this study and gives a brief introduction about the usefulness of performance measurement for NPOs. The next section focuses on the methodology used in this study. The next chapter discusses the concepts of performance management frameworks, clarifies why these frameworks are useful for NPOs, and proposes a novel PMF for NPOs. Finally, this paper concludes with a summary of the outcomes of this study and offers some recommendations, as well as future implications.

3 Method

This study adopted a qualitative research approach. As defined by Denzin and Lincoln [1], "Qualitative research is multimethod in focus, involving an interpretative, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them."

A Systematic Literature Review (SLR) approach has been adopted in this study. Source articles were collected from peer-reviewed journals and conference proceedings. A variety of research databases, like Mendeley, Scopus, Google Scholar, etc., were used for finding source articles. Different keywords were used for searching the articles, like 'Performance Measurement Framework', 'Performance Measurement Framework for Commercial Firms', 'Performance Measurement Framework for Non-Profit Institutions', 'Performance Measurement Framework in Malaysia', 'Challenges of Implementing Performance Measurement Framework', etc. Only the articles published in the last ten years, and written in English language, were selected for this study.

After reviewing the titles and abstracts of the 57 possibly pertinent papers that the initial search turned up, 24 papers were excluded from the study. After the

remaining 33 were examined, 13 papers were excluded because they lacked relevance and comprehensiveness. Ultimately, 20 publications that met all requirements were included in this study.

4　Results and Discussion

4.1　A Brief Overview of the Performance Measurement Framework

Lebas (1995, as referenced in [6] defined performance measurement as the process of quantifying and disclosing the efficacy and efficiency of the actions taken to achieve organisational objectives. Performance measurement also refers to the selection and application of both qualitative measures (items that can be quantified based on satisfaction) and quantitative measures (items that can be quantified based on measurement units) [6].

A performance measurement framework (PMF) is a group of performance measures used to evaluate an organization's performance on a certain task [8]. It is a crucial tool for enhancing the efficiency and effectiveness of organisations. A company often requires multiple experts and high technical competencies in order to bring success to a specific project, and a performance measurement framework can be useful to gauge the success in this regard in pursuit of a higher competitive edge [8].

As argued by [12], a performance measurement framework can be a tool for predicting a business' success or failure. The direction and profitability of a firm are negatively impacted if there are limitations or impediments to implementing a performance measurement system in the organization's practice. This emphasises how important performance measuring frameworks are in guiding a business toward success.

4.2　Performance Measurement Framework for Business Firms

A company's performance can be evaluated using a variety of criteria. The business gains a lot by choosing the best performance measurement technique. The literature utilises both "objective" and "perceived" measurements to assess a firm's performance. Subjective measures are used to assess business performance using primary data obtained through survey and questionnaire techniques [3]. Usually, secondary data, such as financial data, is used as an objective metric. According to [3], market, accounting, and hybrid metrics are the three categories of objective

metrics utilised by businesses to evaluate their performance. Financial performance and market performance are the next two categories for objective measures.

Frameworks for performance measurement are utilised all around the world and come in a wide range of shapes and sizes. Each performance measurement system or instrument has its own underlying concepts, definition, traits, benefits, and drawbacks. Researchers are still trying to find ways to show the advantages and good qualities of their models, despite the fact that each one of the present models has some distinctive properties of its own. According to [12] and [13], the Balanced Scorecard (BSC) is regarded to be the most widely used PMF in commercial organisations, especially SMEs. The BSC has received a high scale preference rating from a number of specialists due to its difference from other models. Tactics and objectives are the focus of the BSC strategy, which also emphasises them heavily. It is a methodology that considers upcoming missions in addition to past firm accomplishments [12]. The balanced scorecard for social companies needs to be changed, according to [13], in order to integrate social objectives, extend the financial perspective to emphasise sustainability, and restrict the consumer perspective to include the perspectives of many stakeholders.

According to [8], there is evidence in the literature to support the positive impact that applying a performance measurement framework (PMF) has on organisational performance. The resource-based view (RBV) theory, which holds that internal resources and capabilities can be exploited to gain a competitive advantage, is supported by this information. To improve organisational performance, PMF can be viewed in this way as a "resource" that can be researched. For instance, the company's increased reliance on supply chain management has increased the need to boost supply chain (SC) efficiency and effectiveness. One way to do this is to assess SC performance using a relevant framework for performance management [8].

A performance measurement framework can also enhance decision-making and accountability while ensuring accurate evaluation of the entire organisational performance. Additionally, firms commonly use their frameworks for performance measurement to inform their employees. A complete PMF will have a substantial impact on the information's fairness [5]. An efficient PMF has a favourable and proactive effect on employees' behaviour, motivation, and social interactions, claimed [11]. As a result, the relationships between teams and functions are also enhanced. They also showed how a strong PMF encourages communication and participation among staff members. Employee learning is impacted by this strategy as well. Real-time, visible measurement is also a component of PMF and promotes democratic, participatory performance management. Additionally improving internal communication and self-performance management within the organisation is a flexible and adaptive PMF. However, ineffective management skills and a shortage of knowledgeable employees inside the organisation could affect the success of implementing a PMS [11].

Organizations, according to [7], are complex adaptive social systems into which PMFs are inserted in order to effectuate organisational transformation. According to [7], the significance of the information the PMF creates, how this information is

understood, and how well this information is used are all aspects that are influenced by people's collective behaviour and are visible in the decisions and actions that they take.

4.3 Importance of PMF for Non-Profit Organisations

Various types of organisations, such as schools, universities, religious institutions, hospitals, local, state, and federal governments, charitable institutions, non-governmental organisations (NGO), humanitarian aid agencies, trade unions, cooperatives, foundations, civil rights organisations, political organisations and parties, and others, are represented by non-profit organisations (NPOs), which offer an alternative method of addressing the collective needs of particular groups in the community. There are four fundamental purposes of non-profit work, according to Frumkin (2005, referenced in [13]: (i) service delivery, (ii) social entrepreneurship, (iii) values and faith, and (iv) civic and political participation.

NPOs differ from for-profit businesses in a number of ways, including their reliance on donations, partnerships with the private sector, and public funding. They also have a workforce made up of both paid staff members and volunteers, and they are held accountable by regulators, investors, and donors through the disclosure of their financial information. Trust and legitimacy are crucial components between NPOs and their stakeholders, claimed [13]. For instance, there has been growing pressure from many parties for improved accountability, particularly when using financial resources like donations.

Non-profit organisations (NPOs) have more complicated performance measurement frameworks (PMFs) than for-profit enterprises. The reason for this is that NPOs have a focus on social mission and ideals, and they take into account both the organization's social impact and organisational efficiency and viability. As a result, evaluating NPOS performance is equally essential [13].

According to the research done by [9], unquestionably crucial to promoting ethical administration and sound governance in non-profit organisations like waqf institutions is an effective PMS. Waqf institutions now measure performance differently than other organisations, and it does not take into account all of the organization's operations as a religious and volunteer organisation. To inform stakeholders about the functioning of waqf institutions, the bulk of managers and scholars rely primarily on financial reporting and economic data.

In addition, a performance measurement framework can be very helpful for an NPO in a number of ways [10].

1. Increasing accountability: Employers can hold employees accountable for their work and ensure they meet requirements by adopting a performance measurement system. This can help to improve overall effectiveness and efficiency inside the institution while also establishing a culture of trust and transparency.

2. Enhanced decision-making: With a performance assessment system in place, the NPO's board members may get helpful data on the organization's performance, facilitating more informed choices. As a result, the board might be better able to allocate funds sensibly and select tactics that are consistent with the goals of the organisation.

3. Supporting professional development: Using a performance measuring system, employees can receive coaching and feedback on their work. This can help discover areas for improvement, foster professional development, and improve job satisfaction and staff retention.

4. Setting and tracking performance goals: An NPO can set clear goals and objectives for the organisation and its workers by putting in place a performance assessment system. The PMF can then be used to monitor progress towards these goals in order to acquire a complete picture of the NPO's performance and its areas for improvement.

4.4   Indicators of PMS for Commercial Organisations

While designing a performance measurement framework (PMF) for a commercial firm, several factors need to be considered, as argued by [8]:

  i. The PMF should be created based on organisational strategies;
 ii. The inclusivity of financial and non-financial performance measures needs to be ensured;
iii. Information derived from the PMF must aid the company's decision-making process; and
 iv. The performance measures need to be simple to understand.

A variety of financial criteria, including return on investment, return on assets, and cost-cutting, are often used in commercial organisations to assess organisational success [8]. These requirements are especially important for potential investors and other company stakeholders. The most typical factor used to assess an organization's performance, according to [8], is still its financial performance. They also have a big influence on how the business makes decisions. The ability of an organisation to innovate its strategy, tactics, products, or performance is typically reflected in organisational innovation, which is another crucial performance metric. A corporation can get a competitive edge over its rivals thanks to this innovation.

Some commercial organisations have included social responsibility measures in their performance framework. These include Shell and Novo Nordisk. Large oil and gas organisations such as Exxon Mobil and British Petroleum have incorporated sustainability development factors which cover environmental, social, and safety concerns in their business operations [8]. More companies are also coming forward to incorporate social and environmental responsibility measures while designing and implementing the performance measurement frameworks in their companies.

4.5 Indicators of PMS for Non-Profit Organisations

Economic metrics and financial reporting are frequently utilised by NPOs to evaluate their performance, as indicated by [9]. Additionally, [8] stated that a company's capacity to invest in charitable activities aimed at enhancing social conditions can be a key performance indicator for a NPO when establishing the performance assessment framework. Examples of voluntary social activities include investing in philanthropic projects to help the needy, awarding scholarships to deserving students, etc.

Four specific areas of interest are included in [14]'s definition of nonprofit performance: (a) financial performance (e.g., funds raised annually, state funding); (b) market performance (e.g., nonprofit reputation); (c) stakeholder performance (e.g., stakeholder identification; (d) mission performance (achieving the mission of the organization).

4.6 Development and Implementation of PMF for Non-Profit Organisations

Table 1 illustrates the specifications of the proposed PMF for non-profit organisations:

Additionally, the PMF proposed in this study is built on blockchain technology. The most recent technology used in the modern economy is blockchain. Trust, security, transparency, and the dependability of data processing are just a few of the industrial problems that this technology can help with. The Blockchain's architecture also enables it to spot problems and, if required, fix them. Blockchain technology is traceable as a result of this benefit, making it a helpful tool for creating a PMF [2].

Table 1 Specifications of the proposed PMF

Name	Performance measurement tool	Criteria of selection of performance indicators	Categories of key performance indicators	Measures
PMF for non-profit institutions	Key performance indicators	• Defined • Specific • Measurable	• Stakeholder's contribution • Stakeholders' satisfaction • Innovation and learning • Financial performance • Improvement of social conditions of the beneficiaries	Qualitative and quantitative (Non-measurable and Measurable)

4.7 Challenges in Implementing the Proposed Performance Measurement Framework

While implementing the proposed performance measurement framework, the management of the NPOs can face a number of challenges. For instance, there can be lack of clarity in understanding some of the indicators of the PMF. Furthermore, it might be difficult for them to effectively monitor and measure these indicators while measuring the performance of a non-profit organization. Economic crisis and governance issues can also be a major hindrance in implementing the PMF [13]. In some cases, the data collected may not provide meaningful information that non-profit organizations can use to measure performance [4].

5 Conclusion, Recommendations, and Future Implications

There is currently a dearth of research on the value of performance monitoring for non-commercial enterprises or non-profit organisations (NPOs), particularly social institutions. Similar to commercial organisations, NPOs must demonstrate effective management and desirable performance in order to fulfil their obligations to a variety of stakeholders. However, there are still just a few studies on the performance measurement of NPOs, particularly when Malaysian viewpoints are taken into account. The purpose of this study was to provide a framework for evaluating non-profit organisations' success by mostly using examples of corporate entities. The findings of this study clearly indicate that fostering ethical management and good governance makes a performance measurement framework indispensable for a non-profit organisation in Malaysia. This study also provides some useful and important insights into the prevalence of performance measurement frameworks in different commercial firms and suggests the best possible ways an NPO can follow the examples of commercial firms and develop an effective performance management framework. In future, the findings of this study will aid and empower managers of NPOs in creating effective performance measurement frameworks for their organisations, and also guide future researchers in developing new PMFs for NPOs.

As recommended in this study, non-profit institutions in Malaysia should start adopting the performance measurement frameworks like the one presented in this study in order to enhance their efficiency and effectiveness. This is also important for these institutions to satisfy the requirements of all the stakeholders, like the donors, executives, and beneficiaries of the development programmes.

References

1. Denzin, N.K., Lincoln, Y.S.: The Sage Handbook of Qualitative Research. Sage Publication, California (2011)
2. Golosova, J., Romanovs, A.: The advantages and disadvantages of the blockchain technology. In: 2018 IEEE 6th Workshop on Advances in Information, Electronic and Electrical Engineering (AIEEE), November, pp. 1–6. IEEE, (2018)
3. Jan, A., Marimuthu, M., Pisol, M., Isa, M., Albinsson, P.: Sustainability practices and banks financial performance: a conceptual review from the Islamic banking industry in Malaysia. Int. J. Bus. Managem. **13**(11), 61–88 (2018)
4. Kim, M., Charles, C., Pettijohn, S.L.: Challenges in the use of performance data in management: results of a national survey of human service nonprofit organizations. Public Perform. Managem. Rev. **42**(5), 1085–1111 (2019)
5. Lau, C.M., Amirthalingam, V.: The relative importance of comprehensive performance measurement systems and financial performance measures on employees' perceptions of informational fairness. In: Advances in Management Accounting, vol. 24, pp. 77–115. Emerald Group Publishing Limited (2014)
6. Lop, N.S., Ismail, K., Isa, H.M.: A conceptual framework of performance assessment for private finance initiative projects in Malaysia. J. Build. Perform. ISSN **9**(1), 2018 (2018)
7. Mackenzie, H., Bititci, U.S.: Understanding performance measurement and management as a social system: towards a theoretical framework. Int. J. Oper. Prod. Managem. **43**(7), 1098–1120 (2023)
8. Menhat, M., Yusuf, Y., Gunasekaran, A., Mohammad, A.M.: Performance measurement framework for the oil and gas supply chain. Benchmarking: An Int. J. 1–21 (2022). https://doi.org/10.1108/BIJ-11-2021-0704
9. Noordin, N.H., Haron, S.N., Kassim, S.: Developing a comprehensive performance measurement system for waqf institutions. Int. J. Soc. Econ. **44**(7), 921–936 (2017). https://doi.org/10.1108/IJSE-09-2015-0257
10. Rashid, H.: "Why & How" of Waqf Board Performance Management Systems. FinConnect Newsletter (2023). Retrieved from https://finconnect.news/2023/04/27/why-how-of-waqf-board-performance-management-systems/
11. Sardi, A., Sorano, E., Garengo, P., Ferraris, A.: The role of HRM in the innovation of performance measurement and management systems: a multiple case study in SMEs. Employee Relations: The Int. J. **43**(2), 589–606 (2021)
12. Sorooshian, S., Aziz, N.F., Azizan, N.A.: Ranking of performance measurement systems for smaller businesses. Int. J. Intell. Eng. Syst. **13**(2), 108–116 (2020)
13. Treinta, F.T., Moura, L.F., Almeida Prado Cestari, J.M., Pinheiro de Lima, E., Deschamps, F., Gouvea da Costa, S.E., ... Leite, L.R.: Design and implementation factors for performance measurement in non-profit organizations: a literature review. Front. Psychol. **11**, 1799 (2020)
14. Willems, J., Boenigk, S., Jegers, M.: Seven trade-offs in measuring nonprofit performance and effectiveness. Voluntas: Int. J. Voluntary and Nonprofit Organizations **25**, 1648–1670 (2014)
15. Di Zhang, D., Swanson, L.A.: Social entrepreneurship in nonprofit organizations: an empirical investigation of the synergy between social and business objectives. J. Nonprofit Public Sector Market. **25**(1), 105–125 (2013)

Investment Behaviour in Retail Green Sukuk: Case of Indonesia

Nashr Akbar, Wiku Suryomurti, and Salina Kassim

1 Introduction

Nowadays, the Sustainable Development Goals (SDGs) are the most comprehensive and inclusive model of development. Initiated by the United Nations (UN) in 2015, the SDGs call all nations to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030. Numerous efforts have been made to achieve the goals. Unfortunately, the COVID-19 pandemic and the global economic crisis have reversed the progress and reduced the available resources to finance crisis mitigation and recovery measures. Due to the pandemic, the need of financing the SDGs program has increased from USD 2.5 trillion to USD 4.2 trillion in 2020. To close this gap, innovative financial instruments such as SDG bonds and green bonds are needed [30]

For Indonesia, in 2020, the government allocated IDR 77.8 trillion to mitigate climate change, a slight decrease from IDR 97.66 trillion in 2019. Even though the amount is lower due to pandemic, this demonstrates the high commitment of the government to mitigate climate change [26]. The government is committed to preserving the sustainability of the environment as part of its contribution to protecting the planet since it is one of the important agendas of SDGs. Various efforts have been put forward to maintain a green planet as well as to maintain its sustainability at all levels globally.

Those goals of SDGs are compatible with the higher objective of sharia/maqasid sharia [2]. The Qur'an and Sunnah have placed great importance to preserve and protect the environment [35]. Therefore, Islamic finance must support environmental

N. Akbar (✉) · W. Suryomurti
Tazkia Islamic University College, Kota Bogor, Indonesia
e-mail: n.akbar@tazkia.ac.id

N. Akbar · S. Kassim
Institute of Islamic Banking and Finance, International Islamic University Malaysia, Kuala Lumpur, Malaysia

437

protection and climate action [28]. For example, Oktaviani et al. [31] argued that green sukuk is one of the best financial solutions to solve those issues.

In this regard, the Indonesian government has issued several green sukuk. So far, there are two types of green Sukuk in Indonesia: global green sukuk and retail green sukuk. The former has been issued four times since its first issuance in 2018. The latest Indonesian global green sukuk has been sold for US$ 3 billion with a maturity of 5, 10, and 30 years. Meanwhile, the retail green sukuk has been issued four times. The latest retail green sukuk (ST009) has attracted 35,397 investors with a volume of IDR 10 trillion [34]. The success of the issuance of green sukuk has encouraged the government to issue another retail green sukuk. In order to grab more investors in the future, it is necessary to understand the behaviour of potential investors in their intention to purchase.

Some research have discussed the behaviour of potential investors in sukuk in general [8, 11–14, 38]. However, we did not find any paper that discusses the behaviour of investors in retail green sukuk. As it has a special feature compared to other types of sukuk, a study on the behaviour of investors in RGS is quite important.

Against the above background, this paper aims to examine the factors that influence investors' behaviour to invest in retail green sukuk. Specifically, this research has three objectives. *First*, this study attempts to investigate the role of the Theory of Planned Behaviour (TPB) Variables (attitude, subjective norms, and perceived behavioural control) on the investor's intention to invest in retail green sukuk. *Second*, this paper investigates the relationship between intention and actual behaviour in retail green sukuk investment. *Lastly*, this study aims to examine the role of religiosity, knowledge, and environmental awareness on the attitude toward investment in retail green sukuk.

This paper has four sections. Section 2 discusses the literature review and constructs the theoretical framework, while Sect. 3 highlights the methodology. The next section is the analysis of the findings. The last section is the conclusion, recommendation, and the future research direction.

2 Literature Review

2.1 Green Sukuk

Green Sukuk is a financial instrument to encourage potential investors to finance green projects. In Malaysia, the government preferred to call it a socially responsible investment (SRI) sukuk. Apart from being a *Shariah*-compliant instrument, green sukuk may finance firms and projects that may preserve the environment. Hence, Green Sukuk can be considered a financial innovation to finance large environment-friendly infrastructure projects having a positive impact on overall society [22]. The green sukuk Tadau is one of the examples issued under this initiative. It is the first green sukuk in Malaysia, issued in 2017 to provide green energy [24]. Similarly, a

solar energy company in France, Legendre Patrimoine, issued Orasis green sukuk in August 2012 [23] Waste management is also another important environmental issue [17] that requires financing.

Indonesia has developed a framework for the issuance of the green bond and green sukuk. For instance, the eligible green project must fall into at least one of several sectors namely renewable energy, energy efficiency, Resilience to Climate Change for Highly Vulnerable Areas and Sectors/Disaster Risk Reduction, sustainable transport, waste to energy and waste management, sustainable management of Natural resources, green tourism, green buildings, and sustainable agriculture. Furthermore, several sectors are excluded such as new fossil fuel-based electric power generation capacity and expenditure related to the improvement in the efficiency of fossil fuel-based electric power generation, large scale hydropower plants (>30 MW capacity), and Nuclear and nuclear-related assets.

Indonesian retail green sukuk is a sovereign savings Sukuk which is not tradable in the secondary market. Retail investors may purchase it with a minimum purchase of IDR 1 million. It has a shorter term of 2 years. However, Savings Sukuk holders may early redeem up to 50% of their investment funds. Savings Sukuk gives a floating-with-floor rate of returns where there is a minimum return paid to investors regardless of the changes in the benchmark rate.

2.2 Conceptual Framework

This research adopted the framework of Theory of Planned Behaviour (TPB). The Theory) is a well-known social psychology theory developed by Icek Ajzen and Martin Fishbein. Currently, it has been widely applied to analyse the prediction and change of behaviour in a multitude of behavioural domains. It has been used to predict behaviour in the use of drugs, choice of travel mode, consumer behaviour, and even the use of technology [4]. The theory says that actual behaviour is influenced by intention and actual control behaviour (can be proxied by perceived behavioural control), while the intention is influenced by attitude, subjective norms and perceived behavioural control [4].

The positive influence of intention to invest upon actual investment has been significantly proven by [16]. Moreover, the attitude toward investment has significantly influenced the intention to invest in the stock market [3], in renewable energy or green sector [15, 33], in sukuk [1, 7, 12, 38], in mutual funds [20, 32], and Islamic Unit trust [7]. Hence, it can be said that the whole aforementioned previous studies (11 papers) found a positive relationship between attitude and behavioural intention to invest.

Likewise, subjective norms and perceived behavioural control also have significantly influenced the intention to invest in various sectors. However, several papers found an insignificant influence of subjective norms in mutual funds and Islamic unit trust [7, 20, 29], and also an insignificant influence of perceived behavioural control on retail bond [16], mutual funds [20], and renewable energy [15]. Most papers found
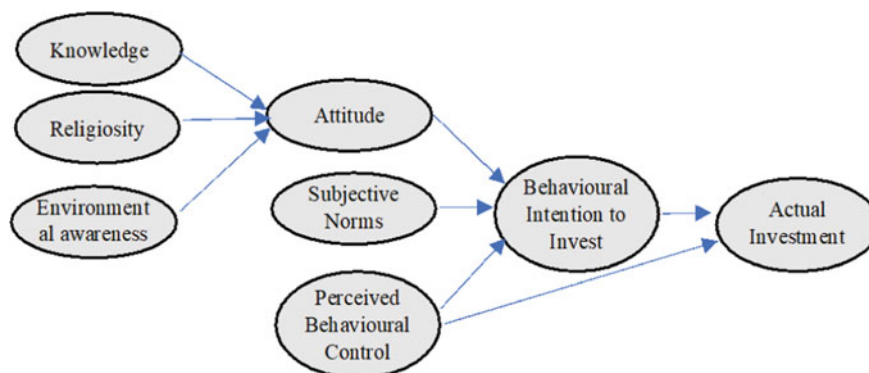
Fig. 1 Conceptual framework

a positive relationship between subjective norms and intention as well as between perceived behavioural control and investment intention.

In addition, the intention is also significantly influenced by knowledge directly [33] or indirectly through attitude [8]. It is also influenced by religiosity directly [2, 33] and indirectly [9, 29]. Khraim [25] argued that religion plays a significant role in influencing social and consumer behaviour. He found that factors of seeking religious education, Islamic current issues, and sensitive products are the best combination of dimensions to measure Islamic religiosity. Environment awareness is also an interesting variable to measure the intention toward investment in the green project [21]. The conceptual framework is illustrated in Fig. 1.

3　Methodology

3.1　Data

This research is surveying the potential investors of Indonesian retail green sukuk. The judgement sampling method was adopted to select the survey participants through an online questionnaire. Three conditions of respondents must be met for this study. *First*, respondents must be Indonesian citizens as foreigners are not allowed to purchase the RGS (Ministry of Finance, n.d). *Second*, the age of respondents is above 17. One of the requirements to be an investor is having a residence identification card whereby can be obtained when someone has reached 17 years old. *Third,* they have a basic understanding of investment.

According to the national survey on financial literacy and financial inclusion conducted by the Indonesian Financial Service Authority (OJK), only 4.92% of Indonesian people who has sufficient literacy about the capital market in 2019. It can

be said that it is only 9 million people aged more than 20 and has a basic understanding of investment in the capital market.

Nearly all questions require respondents to select one of the Six-point Likert scales ranging from "strongly disagree" to "strongly agree". It is only two questions (AI1 & AI2) related to the actual investment that provide answers: never, ever (once, twice, and three times). SmartPLS 4 application was employed to proceed with the research.

3.2 Model Development

There are three models in this study. *First*, the endogenous variable is the attitude while the exogenous variables are knowledge of sukuk, religiosity and environmental awareness. *Second*, the endogenous variable is the intention to purchase retail green sukuk, while the exogenous variables are attitude toward behavioural intention, subjective norms and perceived behavioural control. *Third*, the endogenous variable is an actual investment in retail green sukuk, while the exogenous are intention and perceived behavioural control.

Those variables are assessed by means of reflective indicators, sets of items designed to provide relatively direct measures of these constructs [4]. In this sense, dropping one indicator is not a problem as other indicators are also representative of the construct. The construct/latent variable still has the same meaning although one or several indicators are dropped [18].

3.3 Method

This study employed PLS-SEM as it requires fewer assumptions and it can work with many indicators and relatively small sample sizes [36]. As PLS-SEM does not require restrictive normality distribution assumption, it is preferred in business and social sciences research since most data in this field is characterized by non-normal data [19].

There are three steps in PLS-SEM: [20].

1. Model specification. Constructs must be considered either exogenous or endogenous. In the outer model, it is required to decide the relationship between constructs and indicators and whether the model is in a reflective or formative manner.
2. Outer Model Specification. To test the reliability, composite reliability is preferred over Cronbach's alpha. Meanwhile, the validity test can be examined by noting a construct's convergent validity (outer loading above 0.7 and AVE above 0.5) and discriminant validity (Fornell and Larcker Criterion).

3. Inner Model Specification. Several assessments for inner model specification are Coefficient of determination (R^2), cross-validated redundancy (Q^2), path coefficients, and the effect size (f^2).

4   Results and Analysis

4.1   *Profile of Respondents*

Most respondents are investors in the stock market (70%). They have sufficient knowledge and also experience in financial investment. Their ages are ranged from 20 to 39 (89%), the young generation. [9] reported that young generations, especially millennials dominated the profile of previous RGS (ST006). It was accounted that 3,950 investors out of 7,735 investors are millennials (51.1%). For the latest RGS (ST009) there were 19,075 investors (53.89%) with the volume of transaction is IDR 3.7 trillion (37.02%) [10]. Therefore, it is valuable to investigate their behaviours toward RGS. In addition, they are educated people as most of them have graduated from university (74%). Most of them reside in java Island (85%).

4.2   *Results*

4.2.1   **Evaluation of Measurement Model (Outer Model)**

In the outer model, the validity and reliability of the model are verified. The model is considered reliable when the value of the construct reliability is more than 0.7. Moreover, the model can be considered valid when the outer loadings are above 0.7, AVE is above 0.5 and the discriminant validity is established (Fornell and Larcker Criterion) [20]. Table 1 indicates that all items have outer loadings more than 0.7.

Meanwhile, discriminant validity exists when the top number in Fornell and Larcker Criterion table in any factor column is higher than the numbers (correlations) below it [19]. The result shows the establishment of discriminant validity in the model. Hence, it can be concluded that the model is reliable and also valid.

4.2.2   **Evaluation of Structural Model (Inner Model)**

Before testing the structural model, a multicollinearity test is necessary. The result finds that the value of inner VIF is less than 0.4. Hence, it can be said that the model is well-fitted. Next, the assessment of the inner model reveals that the coefficient of R^2 for those three endogenous variables namely actual investment, intention, and attitude is 0.196 (weak), 0.656 (moderate), and 0.504 (moderate), respectively. Values

Table 1 Measurement model

Latent variables	Items	Outer loadings	CR	AVE
Actual investment in RGS	AI1	0.964	0.930	0.935
	AI2	0.969		
Attitude toward RGS	AT1	0.866	0.904	0.725
	AT2	0.886		
	AT3	0.716		
	AT4	0.907		
	AT5	0.871		
Environmental awareness	EA1	0.737	0.780	0.695
	EA2	0.883		
	EA3	0.873		
Intention to invest in RGS	IN1	0.929	0.908	0.846
	IN2	0.948		
	IN3	0.881		
Knowledge	K1	0.887	0.914	0.852
	K2	0.953		
	K3	0.929		
PBC to invest in RGS	PB1	0.957	0.929	0.876
	PB2	0.954		
	PB3	0.895		
Religiosity	R1	0.843	0.810	0.725
	R2	0.890		
	R3	0.820		
Subjective norms	SN1	0.936	0.968	0.863
	SN2	0.942		
	SN3	0.938		
	SN4	0.895		
	SN5	0.915		
	SN6	0.946		

above the cut-offs 0.67, 0.33 and 0.19 are considered to be "substantial", "moderate" and "weak" respectively [20].

Moreover, the value of construct cross-validated redundancy (Q^2) was obtained through a blindfolding procedure in SmartPLS. The result reveals that the values are 0.169, 0.534, and 0.354 for respective endogenous variables, actual investment, intention, and attitude. As the values are more than zero, the models are relevant to predict the factor.

Table 2 Path analysis

Interacting path variables	Estimate	T-statistics (|O/STDEV|)	P values
Intention → Actual investment	0.363	4.894	0.000**
PBC → Actual investment	0.129	1.656	0.098*
Attitude → Intention	0.642	4.608	0.000**
Subjective norms → Intention	0.248	2.343	0.019**
PBC → Intention	−0.059	0.526	0.599
Knowledge → Attitude	0.385	4.864	0.000**
Environmental Awareness → attitude	0.318	4.439	0.000**
Religiosity → Attitude	0.214	2.122	0.034**

* Significant at 0.10 confidence level
** Significant at 0.05 confidence level

Further, the result of f^2 demonstrates that attitude strongly contributes to explaining intention (0.400). The medium effect has been contributed by knowledge towards attitude (0.203) and environmental awareness towards attitude (0.166). Other variables have a small effect on explaining the endogenous variables. Those conclusions are based on Cohen's (1988) guidelines, i.e., 0.02 (small effect); 0.15 (medium effect); and 0.35 (large effect).

Lastly, the research evaluated the significance level of the path relationship using a 5000-bootstrapping subsample in SmartPLS. The assessment (see Table 2) indicates that intention and perceived behavioural control have a significant positive influence on green sukuk investment. Moreover, the intention is significantly influenced by attitude and subjective norms, while perceived control behaviour is not proven to influence the intention to invest in green sukuk. Further, knowledge, religiosity and environmental awareness significantly influenced the attitude toward green sukuk investment.

4.3 Analysis

This paper analyses some factors that influence someone's actual behaviour to invest in green sukuk. It is found that intention and PBC have significantly influenced the actual behaviour of retail investors to invest in green sukuk. The role of intention is quite strong as the path coefficient is more than 0.36. It signifies that the higher the intention to invest, they are likely to perform it in actual investment. This finding is in line with the TPB that advocates intention as the main driver of actual behaviour.

Another finding reveals a positive relationship between PBC (proxy of perceived actual control) and actual investment. This finding is supported by [38] who found that PBC is a significant factor that leads to the actual investment of sukuk in Qatar. There are three indicators used to reflect the PBC namely "the ability to invest in Sukuk", "feeling safe to invest in sukuk", and "the easiness to invest through online system".

Hence, this finding signifies that retail investors will invest in the green sukuk as long as they perceive that the green sukuk price is affordable, safe investment, and also provide easiness to purchase it online.

Interestingly, 34.51% of respondents have invested in the previous green sukuk series. Likewise, they have a very strong intention to invest in the next green sukuk issuance (4.5 out of 6 on Likert scales) and they would like to recommend their families and colleague to invest in the retail green sukuk (4.37 out of 6). More importantly, 25.64% of green sukuk investors repeated the investment. They invested in the green sukuk more than once.

Furthermore, the intention to invest in green sukuk is positively influenced by attitude and subjective norms. This result is in line with the prior studies that attitude and subjective norms have a significant contribution to the intention to invest in sukuk [2, 9, 12, 38]. Subjective norms signify that someone's intention is influenced by the perception and also the behaviour of his family, colleagues and closest friend toward investment in RGS. Moreover, similar to the finding of this research, many studies have found that attitude is the strongest predictor of intention [9, 12, 14].

Therefore, it is worthy to further analyse several factors that may influence someone's attitude to invest in green sukuk. The result shows that knowledge, religiosity, and environmental awareness have a positive significant influence on the attitude toward behaviour. Knowledge ranks as the strongest predictor of attitude. Those respondents are very literate about the difference between sukuk and bond. They also have good knowledge about the retail green sukuk and how to invest. This signifies the importance of literacy. The higher the literacy, the higher the attitude and intention to invest in green sukuk. This finding is supported by [20] and [33] support this finding that knowledge significantly influenced investors' intention to invest. Further, Adil et al. [3] argued that financial literacy has a positive impact on attitude and has moderated the association between attitude and investment intention.

Environmental awareness is also an important variable to measure the attitude toward investment in retail green sukuk. Interestingly, environmental awareness has a higher contribution than religiosity. It can be argued that religious investors may tend to invest in another type of sukuk other than the green one. The positive relationship between religiosity and attitude can be interpreted that they still consider retail green sukuk as a good investment. However, those who have more awareness of green issues are more likely to invest in green investments [22], including green sukuk.

Unfortunately, PBC is not proven as a significant factor for the intention to invest in green sukuk. It can be interpreted that respondents intend to invest in sukuk regardless of the price of sukuk, their financial condition and easiness in doing investment. However, those three have hindered their steps to realize their intention into actual investment as elaborated above. An insignificant influence of perceived behavioural control on investment intention is also found in [15, 16, 20].

5   Conclusion and Recommendation

Green sukuk is an important instrument to finance green projects. Understanding the behaviour of potential investors is necessary to increase the demand for green sukuk investment. Several studies have examined the investment behaviour to invest in sukuk within the Theory of Planned Behaviour framework. However, they discussed the general sukuk, not a certain type of sukuk, especially retail green sukuk.

This research found that actual investment is influenced by intention and PBC. The intention factor is a stronger factor that influences the actual investment. However, PBC (price affordability as well as easiness in doing investment) must also be entertained as they have a positive influence on the actual investment. Furthermore, attitude and subjective norms have been proven as significant factors of intention to invest in retail green sukuk. The attitude is strongly influenced by knowledge, environmental awareness, and religiosity. Hence, people with sufficient knowledge about green sukuk, awareness of the environmental issues and also religious are the potential investors of retail green sukuk. Moreover, perceptions of their surroundings (subjective norms) have also contributed to their intention toward investment behaviour.

Based on the findings, increasing sukuk literacy, religiosity and environmental awareness are very important in efforts to increase investment in green sukuk among retail investors in Indonesia. Hence, the Indonesian government should intensify the campaign to promote the attitude and improve the perception of the community toward investment in retail green sukuk. The government should consider lowering the sukuk price and providing more easiness for potential investors. Additionally, the promotion of green sukuk could be targeted to the religious people/community who have sufficient knowledge about sukuk and have awareness of green issues. All these efforts would assist in expediting the investment in green sukuk among retail investors in Indonesia.

6   Future Research Direction

In addition, this research is limited to the retail green sukuk in Indonesia. Future research may examine the investors' behaviour in the global green sukuk as well as replicate this paper to study the intention to purchase green sukuk in other countries. Furthermore, the high interest in green is also an opportunity for the central bank to encourage banking to open a green deposit account.

References

1. Abdulkareem, I.A., Mahmud, M.S., Oyetunji, A.M.: Factors Influencing Nigerians to invest in sukuk for infrastructure development. J. Emerg. Econ. Islamic Res. **9**(2), 57 (2021). https://doi.org/10.24191/Jeeir.V9i2.13212
2. Abdullah, M.: Waqf, sustainable development goals (Sdgs) and Maqasid Al-Shariah. Int. J. Soc. Econ. **45**(1), 158–172 (2018). https://doi.org/10.1108/IJSE-10-2016-0295
3. Adil, M., Singh, Y., Ansari, M.S.: Does financial literacy affect investor's planned behavior as a moderator? Manage. Finance (2022). https://doi.org/10.1108/MF-03-2021-0130
4. Ajzen, I.: The theory of planned behavior: frequently asked questions. Human Behav. Emerg. Technol. **2**(4), 314–324 (2020). https://doi.org/10.1002/Hbe2.195
5. Albaity, M., Rahman, M.: The intention to use Islamic banking: an exploratory study to measure Islamic financial literacy. Int. J. Emerg. Mark. **14**(5), 988–1012 (2019). https://doi.org/10.1108/IJOEM-05-2018-0218
6. Ali, M.M., Devi, A., Furqani, H., Hamzah, H.: Islamic financial inclusion determinants in Indonesia: an ANP approach. Int. J. Islamic Middle Eastern Finance Manage. **13**(4), 727–747 (2020). https://doi.org/10.1108/IMEFM-01-2019-0007
7. Ali, S., Zani, R., Kasim, K.: Factors influencing investors' behavior in Islamic unit trust : an application of theory of planned behavior. J. Islamic Econ. Banking Finance **10**(2), 183–201 (2015). https://doi.org/10.12816/0025176
8. Ashidiqi, C., Arundina, T.: Indonesia students's intention to invest in sukuk: theory of planned behaviour approach. Int. J. Econ. Res. **14**(15), 395–407 (2017)
9. Bareksa: Milenial Masih Dominasi Hasil Penjualan Green Sukuk Ritel ST006. https://www.bareksa.com/berita/berita-ekonomi-terkini/2019-10-27/milenial-masih-dominasi-hasil-penjualan-green-sukuk-ritel-st006 (2019)
10. Bareksa: Terjual Rp10 Triliun, Ini 12 Capaian dan Rekor SBN Ritel ST009. https://www.bareksa.com/berita/sbn/2022-12-06/terjual-rp10-triliun-ini-12-capaian-dan-rekor-sbn-ritel-st009 (2022)
11. Bin-Nashwan, S.A., Muneeza, A.: Investment decisions in digital sukuk in the time of COVID-19: do tax incentives matter? J. Sustain. Finance Invest. **0**(0), 1–25 (2021a). https://doi.org/10.1080/20430795.2021.1978918
12. Bin-Nashwan, S.A., Muneeza, A.: Investment decisions in digital sukuk in the time of COVID-19: do tax incentives matter? J. Sustain. Finance Invest. **0**(0), 1–25 (2021b). https://doi.org/10.1080/20430795.2021.1978918
13. Bin-Nashwan, S.A., Muneeza, A., Kunhibava, S.: What motivates retail investors to invest in government-issued digital sukuk during COVID-19? J. Islamic Acc. Bus. Res. **13**(3) (2022a). https://doi.org/10.1108/JIABR-12-2020-0387
14. Bin-Nashwan, S.A., Muneeza, A., Kunhibava, S.: What motivates retail investors to invest in government-issued digital sukuk during COVID-19? J. Islamic Acc. Bus. Res. **13**(3) (2022b). https://doi.org/10.1108/JIABR-12-2020-0387
15. Daiyabu, Y.A., Manaf, N.A.A., Mohamad Hsbollah, H.: Extending the theory of planned behaviour with application to renewable energy investment: the moderating effect of tax incentives. Int. J. Energy Sector Manage. https://doi.org/10.1108/IJESM-11-2021-0011
16. Dewi, M.K., Tamara, D.: The intention to invest in retail bonds in Indonesia. Acad. J. Interdisc. Stud. **9**(5), 188–205 (2020). https://doi.org/10.36941/Ajis-2020-0097
17. Eswara Reddy, E., Tom, T.: A review on economic assessment on solid waste management. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_4
18. Garson, G.D.: Partial least squares: regression & structural equation models. In: Multi-Label Dimensionality Reduction. Statistical Associates Publishing (2016). https://doi.org/10.1201/B16017-6

19. Hair, J.F., Sarstedt, M., Hopkins, L., Kuppelwieser, V.G.: Partial least squares structural equation modeling (PLS-SEM): an emerging tool in business research. Eur. Bus. Rev. **26**(2), 106–121 (2014). https://doi.org/10.1108/EBR-10-2013-0128

20. Hapsari, S. A. (2021). The theory of planned behavior and financial literacy to analyze intention in mutual fund product investment. In: Proceedings of the 5th Global Conference on Business, Management And Entrepreneurship (GCBME 2020), 187(Gcbme 2020), pp. 136–141 (2021). https://doi.org/10.2991/Aebmr.K.210831.028

21. Iosifidi, M.: Environmental Awareness, Consumption , And Labor Supply : Empirical Evidence From Household Survey Data. Vol. 129, pp. 1–11. https://doi.org/10.1016/J.Ecolecon.2016.05.007

22. Kassim, S., Abdullah, A.: Pushing the frontiers of Islamic finance through socially responsible investment sukuk. Al-Shajarah, Spec. Issue: Islamic Bank. Finance 187–213 (2017a)

23. Kassim, S., Abdullah, A.: Pushing the frontiers of Islamic finance through socially responsible investment sukuk. Al-Shajarah Spec. Issue: Islamic Bank. Finance 187–213 (2017b)

24. Khouildi, M.Y., Kassim, S.H.: An innovative financing instrument to promote the development of Islamic microfinance through socially responsible investment sukuk. J. Islamic Monetary Econ. Finance **4**(2), 237–250 (2018). https://doi.org/10.21098/Jimf.V4i2.935

25. Khraim, Dr. H.: Article information : measuring religiosity in consumer research from an Islamic. J. Econ. Admin Sci. **26**(1), 52–78 (2010)

26. Ministry of Finance: Laporan Anggaran Mitigasi Dan Adaptasi Perubahan Iklim (Budget Report of Climate Change Adaptation and Mitigation), p. 96. Fiscal Policy Agency. Ministry of Finance (2020)

27. Ministry of Finance: Mengenal Sukuk Tabungan. Retrieved August 28, 2023, from https://www.kemenkeu.go.id/sukuktabungan

28. Obaidullah, M.: Managing climate change: the role of Islamic Finance. Islam. Econ. Stud. **26**(1), 31–62 (2018). https://doi.org/10.2139/Ssrn.3303687

29. Octarina, E., Hartoyo, H., Beik, I.S.: Customer purchase intention on Sharia mutual fund products: a Tpb approach. J. Consumer Sci. **4**(1), 37 (2019). https://doi.org/10.29244/Jcs.4.1.37-47

30. OECD & UNDP: Closing the SDG Financing Gap in the COVID-19 Era: Scoping Note for the G20 Development Working Group. OECD & UNDP (2021)

31. Oktaviani, Y., Rangkuti, K., Surya, A.M.P.P., Puspita, A.: Financial Solutions for Biodiversity in Contributing to the Economic Development in Indonesia. 01007 (2018a)

32. Oktaviani, Y., Rangkuti, K., Surya, A.M.P.P., Puspita, A.: Financial Solutions for Biodiversity in Contributing to the Economic Development in Indonesia. 01007 (2018b)

33. Osman, I., Ma'in, M., Muda, R., Husni, N.S.A., Hassan, S.F.S.A.F.: Determinants of behavioural intention towards green investments: the perspectives of Muslims *Ismah Osman (Corresponding Author). Int. J. Islamic Bus. **4**(1), 16–38 (2019)

34. Priyanti, M.: Terjual Rp5 Triliun, Ini 9 Capaian Green Sukuk Ritel ST008. https://www.bareksa.com/berita/sbn/2021-11-23/terjual-rp5-triliun-ini-9-capaian-green-sukuk-ritel-st008 (2019)

35. Saged, A.A.G., Abu Alhaj, T.A., Zulkifli Bi, M.Y.: The role of the Maq Ā S. Id Al-Shar Ī꜔ Ah in preserving the environment humanomics article information : Humanomics **33**(2), 125–132 (2017)

36. Sarstedt, M. Jr., Hair, J.F., Ringle, C.M.: "PLS-SEM : indeed a silver bullet"—Retrospective observations and recent advances. J. Mark. Theory Practice **00**(00), 1–15. https://doi.org/10.1080/10696679.2022.2056488

37. Takidah, E., Kassim, S.: Determinants of Islamic financial inclusion in Indonesia: a demand-side analysis. J. Islam. Finance **10**(2), 38–52 (2021)

38. Warsame, M.H., Ireri, E.M.: Does the theory of planned behaviour (TPB) matter in sukuk investment decisions? J. Behav. Exp. Finance **12**, 93–100 (2016). https://doi.org/10.1016/J.Jbef.2016.10.002

Enhancing Shariah Governance Practice: Insights from the Non-profit Organizations in Malaysia

Romzie Rosman, Nur Harena Redzuan, Nur Laili Ab Ghani, Nazrul Hazizi Noordin, and Siti Saffa Shaharuddin

1 Introduction

1.1 Background

Effective Shariah governance is essential for fostering disclosure transparency among Islamic financial institutions (IFIs) or any organisation operating in accordance with Islamic principles. It entails a comprehensive framework that ensures adherence to Islamic principles, ethical standards, and regulatory requirements. In Malaysia, the Board of Directors, and Shariah Committee members in IFIs are mandated by Bank Negara Malaysia (BNM) to enhance their transparency by disclosing the Shariah governance policies in the annual report [3]. Similarly, the cooperatives in Malaysia are also required by Cooperative Commission Malaysia (CCM) to disclose any Shariah non-compliance matters related to Islamic business activities in the cooperative's annual report [5]. However, current regulatory requirements in Malaysia are yet to focus into the needs for Shariah governance framework for other organisation such as the non-profit organisations (NPOs) especially those dealing with Islamic crowdfunding platform and Islamic social finance initiatives. This warrants further study on the importance of Shariah governance, transparency and accountability of NPOs as a charitable or social welfare organisation that adheres to Islamic principles and values.

NPOs are founded to serve the public interest, promote social welfare, and assists those in need. In addition, Islamic NPOs that promotes Islamic social welfare and humanitarian mission need to operate in accordance with Shariah principles and

---
R. Rosman (✉) · N. H. Redzuan · N. H. Noordin · S. S. Shaharuddin
IIUM Institute of Islamic Banking and Finance, International Islamic University Malaysia, Kuala Lumpur, Malaysia
e-mail: romzie@iium.edu.my

N. L. A. Ghani
UKM-Graduate School of Business, Universiti Kebangsaan Malaysia, UKM Bangi, Malaysia

ethical values especially in the fund management and distribution. These organisations are committed to promoting compassion, justice and equity while adhering to Islamic beliefs. Islamic NPOs may engage in various activities and initiatives including, but not limited to humanitarian aid, healthcare services, orphan care and support, microfinance development, community development and Islamic advocacy. Islamic NPOs have been established worldwide to achieve these missions and objectives. Several Islamic NPOs such as Islamic Relief Worldwide has achieved a record-breaking revenue to reach 17.3 million people across the globe through their humanitarian aid and development interventions [8] while the UNHCR's Refugee Zakat Fund has assisted over 1.5 million refugees in 21 countries with Zakat and Sadaqah contributions in 2022 [18]. In Malaysia, NPOs are registered under the Registrar of Society (ROS) to conduct the various activities such as human rights, education, religion, and social welfare [15].

Basically, NPOs are generally funded through donations from individuals, businesses and other organisations that share the same organisation's commitment to its charitable mission. The governance and administration of NPOs are typically overseen by the Board of Directors or Trustees who ensure that the organisations operate in accordance with mission and objectives as stated in the Code of Good Governance outlined by ROS [14].

1.2   Problem Statement and Research Objectives

As of today, ROS has yet to issue the Shariah governance requirements for Islamic NPOs in Malaysia. Several observations on Islamic NPOs in Malaysia such as Mercy Malaysia, has started their own initiative to appoint a Shariah Advisory committee in overseeing their Islamic social finance initiatives [11]. In addition, Bank Islam Malaysia Berhad has established Sadaqa House which is the platform for charity crowdfunding through its Islamic social finance initiatives, which is overseen by their Shariah Committee members [16]. Hence, this study examines the current issues and challenges of NPOs in Malaysia. This study also highlights the importance of effective governance on organisation's performance, transparency and accountability in the NPOs. This study contributes to enhance the accountability of NPOs especially those adopting Islamic crowdfunding platform and Islamic social finance initiatives in their operations. These NPOs are in need of effective governance arrangement to ensure that their operations and fund management are conducted within the Shariah principles.

2 Literature Review

Previous empirical studies on Shariah governance are focusing on the current practices and effectiveness in IFIs following the regulatory requirements mandated by BNM within the Shariah Governance Policy Documents (SGPD) [3]. Through SGPD, IFIs are expected to effectively incorporate Shariah governance arrangements within their Islamic business and risk strategies. Consequently, IFIs must establish a robust Shariah compliance risk culture to include more active responsibilities of the Board of Directors, Shariah Committee members and senior management [3]. The Shariah governance guidelines for the IFIs have been initiated back in 2010 when BNM issued the first Shariah Governance Framework (SGF 2010) which requires IFIs to establish the Shariah compliance functions which includes the Shariah review, Shariah risk management, Shariah research and Shariah audit [2]. Majority of IFIs have established an effective Shariah audit function, leading to a positive development in the effort to strengthen Shariah governance in IFIs [1].

Similarly, the Cooperative Commission Malaysia (CCM) has also established the Shariah Governance Guidelines (GP28) which requires the Islamic cooperatives operating Shariah compliance financial intermediations to establish the Shariah Committee members for cooperatives [5]. Through GP28, the Islamic cooperatives are expected to outline the accountabilities and responsibilities of the Board, Shariah Committee members, management, and internal audit division regarding the Shariah governance arrangements. The Board is responsible for the oversight role on Shariah governance and continuously discussing any Shariah non-compliance matters with the Shariah Committee members. The monitoring of Shariah governance in Islamic cooperatives operations is conducted and the practice is disclosed in the annual finance report by the Shariah Committee members. In addition, the management ensures the operations are conducted in accordance with the Shariah principles [5]. This requirement emphasized the crucial need for the Islamic cooperatives to ensure robust arrangement of Shariah governance which could provide transparent disclosure information that Islamic cooperatives activities comply with Shariah [17].

The area on Shariah governance of Islamic NPOs attracts many attentions. Recently, several empirical studies were conducted on the Shariah governance related issues for Islamic NPOs in Malaysia in terms of the Shariah governance model and reporting framework as well the governance and transparency practices. In this respect, Ramli et al. [13] acknowledged the importance of integrated reporting framework that could provide effective mechanism in communicating the mission and vision of Islamic NPOs. By adopting Maqasid Shariah as the key principles, the study has developed the integrated reporting framework to disclose the Shariah values of Islamic NPOs in terms of its organisational overview, governance, business model, risks and opportunities, strategy, performance, outlook, and basis of presentation [13]. This integrated reporting framework has emphasized and reflected the accountability of the Board and management on their commitment to incorporate Shariah values in all activities of the Islamic NPOs [13].

Besides that, another study proposed the Shariah governance model to guide the Islamic NPOs in managing their Shariah compliant operations [12]. In this paper, Nordin et al. [12] highlighted that for an Islamic NPO to establish Shariah governance and Shariah compliance within the organisation, essential principles such as Iman, Islam and Ihsan and based on the concept of Khalifah must be incorporated at all levels. It will ultimately bring higher confidence level among the stakeholders towards the integrity and transparency of Islamic NPOs.

Lokman et al. [10] have recently evaluated the level of governance, accountability and transparency level of non-profit organisations which are incorporated as the company limited by guarantee (CLBG) foundations in Malaysia. The study argued that it is not about the issue of fund management that is questioned by the stakeholders but more important is the lack of governance, legislation, guidelines, and control in NPOs [10]. Without a transparent and adequate disclosure of the detailed information concerning their governance and financial status in the annual report, effective implementation of governance structure in the NPOs cannot be verified. Consequently, stakeholders are not well-informed on the accountability of the Board and management in operating the NPOs and established an effective decision-making process for their operational activities [10].

Islamic NPOs also faced the same issue on the crucial need for the Shariah governance framework which could provide a structured approach to ensure Shariah compliance in managing the Islamic social finance and crowdfunding platform as well its Islamic activities. As a start, Kamaruddin and Ramli [9] forwarded the issue of internal control practices on financial accountability in Islamic NPOs. In this respect, the study stressed that Islamic NPOs need an effective internal control practices in order to avoid any misconduct of the Islamic charity funds which could ultimately affects the integrity and accountability of Islamic NPOs. In addition, the disclosure of financial information on fund management in the annual report is crucially important to highlight the internal control mechanism and financial accountability being practiced in the Islamic NPOs [9].

3   Research Methodology

3.1   Data Collection and Participants of the Study

By using qualitative research method, data for this study is collected by conducting face-to-face interviews with the targeted participants. Prior to that, the semi-structured questions have been prepared to be in line with the research objectives of the study. The interview sessions are conducted with the participants separately from May until July 2023. The sessions are recorded, and data are transcribed by the researchers. The transcribed data from the interviews are analyzed according to the dedicated themes.

The researchers identified four NPOs as participants in the study. Each of the NPOs is represented by one person, who had been interviewed for this study. Each participant provided insightful information on their individual organisations and their roles within them. Details of the participants are as follows:

1. Respondent 1 (R1): A charitable crowdfunding website that turned into a social finance initiative. They work with non-profit organisations to manage and distribute cash for beneficial social impact.
2. Respondent 2 (R2): A non-profit organisation that assists marginalized people in the Chow Kit area. They offer assistance and income-generating possibilities to homeless people, drug addicts, and others who are struggling.
3. Respondent 3 (R3): A non-profit organisation with activities centered on religious outreach, education, and societal well-being.
4. Respondent 4 (R4): A non-profit organisation founded on collaboration between children education and a local university. This effort aims to make books and knowledge more accessible.

3.2 Design

A semi-structured interview method was used to describe and address the study's objectives. Creswell [6] suggests that this technique allows adaptive interactions between researchers and participants, enabling unrestricted answers and more in-depth analysis. The interview was divided into three stages, which are shown in Table 1:

Table 1 Interview protocol

Phase	Purpose
First phase of the interview	• Warming up participants • Gathering information on current issues involving Non-profit Organisations (NPOs) • Asking encouraging "Why and How" questions for deeper insights
Second phase of the interview	• Gathering information on opinion on the importance of governance for NPOs, key challenges and issues faced by NPOs concerning governance • Asking encouraging "Why and How" questions for deeper insights
Wrap-up	Obtaining additional feedback from participants Allowing further expansion on provided information

3.3   Data Analysis

In accordance with the methodology presented by Braun and Clarke [4], the data from the interviews were analyzed using thematic analysis (TA). The identification of recurrent themes and patterns within the qualitative data is made easier with the use of this method. According to Howitt and Cramer [7], the analysis is carried out in accordance with a model consisting of six steps, which included data familiarization, chunking, coding, data refining, theme development, and final scrutinization. The findings section includes a presentation of the topics that emerged as a result.

4   Results and Discussions

Non-profit organisations (NPOs) play an essential part in fulfilling the requirements of society; nonetheless, these organisations frequently face a wide range of difficulties and problems connected to governance. In this analysis, the researchers evaluate the significant issues and challenges that were found in the transcribed interview responses and synthesize the viewpoints that were given by the respondents.

4.1   Issues and Challenges

1. **Model Alignment and Contextualization**: R1 draws attention to the difficulty of contextualizing governance models from other nations within the context of the local environment.

   Regarding governance, we faced challenges in developing the right model for our organisa-tion. We looked at various models from the Charities Commission in the UK and Australia, but the context in Malaysia is different, so we had to find what works best for us. (R1).

   Although there is value in using international models as references, it is essential to modify these models so that they are applicable to the specifics of the Malaysian context. Due to the nature of this difficulty, it is essential to develop a strategy that is adapted to the unique cultural and legal environment. The governance structures that NPOs design should be in line with the local environment and regulatory framework. While references from other countries might provide useful insights, it is vital to modify these models so that they are applicable to the specific circumstances of Malaysia. The formulation of effective and contextually applicable governance frameworks can be aided by collaborative efforts involving NPOs, regulators, and subject matter experts.

2. **Collaboration and Commitment**: R1 also emphasizes the importance of mutual benefit and commitment in NPO-stakeholder collaborations. It is critical for effective collaboration to ensure that partner organisations share a common

degree of dedication and expertise. This task emphasizes the importance of clear communication and expectations in the relationships.

We aim to have a mutual benefit with the NPOs we work with, ensuring that they have a certain level of commitment and capability. We have an annual review process to evaluate their performance and adherence to our guidelines. (R1).

NPOs should create clear partnership agreements outlining mutual commitments, expectations, and obligations. Open communication and shared understanding among all stakeholders are required for effective collaboration. Regular reviews and evaluations, like the mentioned annual review process, may help ensure that goals and actions are aligned to each other.

3. **Balance of Roles and Responsibilities**: R2 mentions the need to balance the roles and responsibilities of different members within an organisation. Striking a balance between full-time members and those with other responsibilities is essential for the smooth execution of programs and activities. This challenge highlights the significance of equitable distribution of tasks and contributions among team members.

From the perspective of governance in my NGO, I haven't observed any major problems so far. All the members within the organisation collaborate well. Though there might be one or two individuals who are considered full-time in the NGO, while others have their genuine responsibilities, we try to strike a balance so that programs and activities conducted can be executed effectively. (R2).

NPOs should strive for a balanced distribution of roles and responsibilities among team members. This can help prevent overburdening certain individuals while ensuring that programs and activities are executed efficiently. Regular check-ins and team assessments can aid in maintaining a fair and equitable workload. Hence, the significance of robust governance becomes evident, serving as a vital means to maintain the organisations in a state of well-being and vitality.

4. **Reporting and Transparency**: R2 also stated on reporting practices and transparency. While the NGO relies on the guidelines issued by Registrar of Societies (ROS) for reporting, the respondent acknowledges that smaller NGOs with limited funding may face difficulties disclosing detailed financial information. Achieving a balance between fulfilling reporting requirements and maintaining the transparency of financial information is a crucial challenge.

In our NGO, we work based on mutual agreement, and we believe that this is the best practice we can adopt. Regarding the reporting aspect, we rely on the ROS (Registry of Societies) to handle the reporting, as it is their responsibility. ROS requires us to report everything, and it aligns with our responsibility as well. However, for smaller NGOs, like ours, where funding is limited, it might not be necessary to disclose the financial information in detail. We prioritize the people we serve, and sometimes even the donors understand our situation. (R2).

5. **Leadership Transitions and SOPs**: R3 points out the challenge of managing transitions in leadership or internal staff. Such changes can lead to disruptions in

operations, emphasizing the importance of having well-defined Standard Operating Procedures (SOPs) and training in place. This challenge highlights the need for continuity planning and the development of robust internal processes.

One of the key challenges is managing people, especially when there are new individuals coming into the organisation. Transitions in leadership or staff can cause some hiccups but having Standard Operating Procedures (SOPs) and training in place helps to smoothen the process. (R3).

6. **Expertise in Governance**: R4 emphasizes the lack of expertise in governance and management as a significant obstacle. Without proper knowledge of regulations and procedures, NPOs may struggle to efficiently manage funds and resources. This challenge highlights the importance of capacity-building initiatives to enhance the skills and understanding of NPO leaders and staff.

One of the major obstacles you encountered is the lack of expertise in governance and management. Without proper knowledge of regulations and procedures to establish and run a non-profit organisation, it becomes challenging to ensure efficient and transparent handling of funds and resources. Mismanagement of funds can be a real concern without the necessary education and understanding of how to set up and operate an NPO effectively. From my perspective, managing governance can indeed be time-consuming. While our main mission is to help others, we also understand the significance of addressing governance-related matters, especially when dealing with a pool of funds. (R4).

Government agencies, academic institutions, and experienced NPOs can collaborate to provide education and training on governance and management practices. Workshops, webinars, and online resources can empower NPOs with the knowledge and skills needed to effectively manage funds, resources, and operations.

4.2 Effective Governance on Organisation's Performance, Transparency, and Accountability

Respondent 1 (R1) highlights the role of an oversight committee in financial management and fund distribution, showcasing the importance of governance in decision-making. Periodic Impact Reports ensure transparency and improvement. The linkage between good governance and financial operations is emphasized, and (R1) calls for a Charities Commission to enhance governance standards.

The organisation has an oversight committee called "Zakat Committee" responsible for financial management and decision-making on fund distribution. The organisation produces Impact Reports periodically (e.g., for 2020 and 2021) to ensure transparency and disclosure….the reports are shared with relevant stakeholders and help identify areas that need improvement. Effective governance enables combining social finance and commercial finance…. Good governance is essential for monitoring fund usage and ensuring costs are managed efficiently. For instance, limiting administration costs to a specific percentage of annual expenses (e.g., not more than 30%).

Respondent 1 emphasizes governance's role in oversight, transparency through reports, alignment of social and commercial finance, and efficient cost management. Respondent 1 highlights the need for regulatory support for standardized practices. It is a suggestion for a collaboration with regulators to establish a Charities Commission to provide standardized practices, training, and guidelines for effective governance.

In addition, respondent 2 acknowledges the challenges faced by small NGOs but agrees on governance's positive impact. Transparency is maintained through social media updates, detailed financial management, and donor engagement.

> We acknowledge that we don't have a formal governance framework in place due to their small size and lack of expertise in organisational management. However, I agree that effective governance can lead to improved NGO performance and greater transparency and accountability. Even for small NGOs with limited funds, good governance practices are essential". (R2).

This shows that respondent 2 points on the transparency through social media, donor engagement, and maintaining donor trust by showcasing fund utilization. Implementation a structured governance framework is essential even for small NGOs to enhance transparency and accountability, focusing on transparent fund usage reporting is crucial.

Moreover, respondent 3 highlights on the transparency through financial statements, crowdfunding reporting, and member engagement during AGMs. Social media platforms are utilized for public awareness and participation.

> Our organisation has strong governance, leading to transparency in financial management. Financial statements are sent to the relevant authority (ROS) and published on the organisation's website. Donors and members can easily access and monitor how funds are spent. (R3).

Respondent 3 emphasizes the accountability through detailed financial reporting, crowdfunding transparency, and engaging members and the public through social media. This may further enhance transparency by involving members in financial discussions beyond AGMs and explore innovative ways to engage the public through social media platforms.

Respondent 4 indicates the need for training and workshops from the Registrar of Societies (ROS) to enhance organisational skills and knowledge. Respondent 4 sees the potential in ROS-guided training covering financial management, governance, compliance, fundraising, and reporting.

> We are currently adhering to the guidelines set by the Registrar of Societies (ROS). However, we believe it would be even more beneficial if ROS could provide training and workshops on how to effectively manage an organisation. (R4).

Respondent 4 calls for ROS-guided training to bridge knowledge gaps in governance, financial management, and compliance for better organisational performance. Collaborate with ROS to develop comprehensive training modules covering various aspects of governance and organisational management.

5   Conclusion, Limitation and Future Research

It is essential for NPOs to have strong governance, which affects performance, transparency, and accountability. Impact reports, detailed financial statements, and continual updates on social media are how transparency is achieved. For NPOs adopting Islamic crowdfunding platform and Islamic social finance initiatives, Shariah governance holds particular significance due to the following reasons:

1. **Adherence to Islamic principles**

   The NPOs that operate under the principles of Shariah governance ensure that their activities align with Islamic values. This helps to maintain the integrity and reputation of the organisation within the Muslim community.

2. **Trust and credibility**

   Adhering to Shariah governance enhances the credibility and trustworthiness of the organisations. When donors, beneficiaries, and stakeholders are assured that the organisation operates ethically and in accordance with Islamic principles, they are more likely to support and contribute for the organisations' activities.

3. **Transparency and accountability**

   Shariah governance emphasizes transparency in financial transactions and decision-making. This ensures that the organisation's funds and resources are managed well and utilized in a responsible manner, thus reducing the risk of mismanagement and misuse.

4. **Avoiding unlawful activities**

   Shariah governance helps NPOs to avoid engaging in activities that are considered unlawful in Islam, such as dealing with interest (usury) or unethical business practices. By ensuring compliance with these principles, the organisation maintains its ethical stance.

5. **Social impact**

   Many NPOs focus on providing services and assistance to marginalized and vulnerable community. With the good practice of Shariah governance, it ensures that these services are provided in a manner that respects the dignity and rights of individuals, aligning with the broader goals of social justice in Islam.

6. **Alignment with donors' intent**

   Donors who are motivated by religious beliefs may specifically want to support organisations that operate in accordance with Islamic principles. Shariah governance helps in ensuring that the organisation's activities remain consistent with the donors' intentions.

7. **Legal and regulatory compliance**

   In many developed countries such as United Kingdoms, there are legal and regulatory frameworks that govern non-profit organisations (i.e., Charity Commission for English and Wales). Having Shariah governance framework would further strengthen these organisations navigate these regulations while still maintaining their commitment to Islamic principles.

Overall, Shariah governance plays a vital role in ensuring that NPOs uphold Islamic values, maintain their credibility, and effectively contribute to the betterment of society while respecting religious beliefs and principles. This study contributes to shed some lights on the importance for the Shariah governance for NPOs in ensuring Shariah compliance of the fund management, Islamic social finance, and crowdfunding activities as well as the operations of NPOs as a whole. This study may suggest on policy implications, including the need for a specific Shariah governance framework to be issued by the respective authorities for the NPOs that would like to operate in accordance with the Shariah principles. Future research may focus on the implementation of Shariah governance framework towards NPOs.

References

1. Ab Ghani, N.L., Mohd Ariffin, N., Abdul Rahman, A.R.: Effectiveness of internal shariah audit function in Malaysian Islamic financial institutions. Int. J. Econ. Manage. Acc. **30**(2), 311–347 (2022)
2. Bank Negara Malaysia: Shariah Governance Framework. Bank Negara Malaysia (2010)
3. Bank Negara Malaysia: Shariah Governance. Bank Negara Malaysia (2019)
4. Braun, V., Clarke, V., Rance, N.: How to use thematic analysis with interview data (process research) (2014)
5. Cooperative Commission Malaysia: GP28: Shariah Governance Guidelines. Cooperative Commission Malaysia, Kuala Lumpur (2015)
6. Creswell, J.W.: Steps in conducting a scholarly mixed methods study (2013)
7. Howitt, D., Cramer, D.: Thematic analysis. Qualitative Research and Educational Sciences: A Reader About Useful Strategies and Tools, pp. 179–202 (2010)
8. Islamic Relief Worldwide: Annual Report and Financial Statements 2022. Islamic Relief Worldwide, UK (2022)
9. Kamaruddin, M.I.H., Ramli, N.M.: The impacts of internal control practices on financial accountability in Islamic non-profit organizations in Malaysia. Int. J. Econ. Manage. Acc. **26**(2), 365–391 (2018)
10. Lokman, N., Othman, S., Mohd Kamal, N.A.: Governance, accountability and transparency level of non-profit organisation: a study of Malaysian foundations. Int. J. Bus. Technol. Manage. **5**(1), 304–318 (2023)
11. Mercy Malaysia: Annual Report 2022. Mercy Malaysia, Kuala Lumpur (2022)
12. Nordin, N., Embong, R., Daud, N., Abdul Aziz, S., Salleh, S.F., Ismail, S.K., Mohd Ariffin, S.R.: Model of Shariah governance for empowering Islamic non-governmental organisations in humanitarian mission. Hamdard Islamicus **43**(1), 1078–1089 (2020)
13. Ramli, N.M., Md Ali, N.S.A., Muhammed, N.A.: Integrated reporting based on Maqasid Al-Shariah: a proposed framework for islamic non-profit organizations. Adv. Econ. Bus. Manage. Res. **57**, 63–72 (2018)
14. Registrar of Society: Kod Tadbir Urus Baik Pertubuhan (COGG). Jabatan Pendaftaran Pertubuhan Malaysia. Putrajaya (2014). Accessed on 17 May 2023 from https://www.ros.gov.my//www/assets/Kod-Tadbir-Urus-Baik-Pertubuhan.pdf
15. Registrar of Society: Kategori Pertubuhan. Jabatan Pendaftaran Pertubuhan Malaysia. Putrajaya (2023). Accessed on 7 August 2023 from: https://www.ros.gov.my/www/portal-main/article?id=kategori-pertubuhan
16. Sadaqa House: Impact Report 2020. Bank Islam Malaysia Berhad, Kuala Lumpur (2023)

17. Shafii, Z., Samad, R.R., Yunanda, R.A.: Shariah governance in Shariah-based cooperatives in Malaysia and Indonesia. In: Azid, T., Alnodel, A.A. Qureshi, M.A. (eds.) Research in Corporate and Shari'ah Governance in the Muslim World: Theory and Practice, pp. 279–286. Emerald Publishing Limited, Bingley (2019)
18. UNCHR: Islamic Philanthropy Annual Report 2023. UNCHR, Suisse (2023)

Theorizing the Connection Between Economic Downturns and Employee Morale

Ch.Raja Kamal and **M. Chandrakala**

1 Introduction

In order for businesses to thrive and for workers to be satisfied, HR departments and functions need to adjust to the new normal. 2021 Authors like Collings and Nyberg [10, 11], etc. Worker stories and macro-disruption are the focus of this special edition. Economic, political, social, technological, and environmental concerns all arise in the workplace. Some examples of global crises include the Great Recession of 2008, the COVID-19 epidemic, the state of the environment, and the political and social unrest that accompanied these events.

This updated version includes the first-line, non-management, and managerial experience of current employees. Full-time, part-time, temporary, contract, freelance, and zero-hours workers are all included in this statement.

The purpose of this foreword is to provide an overview of the current macro-level turbulence affecting the world of work and to theorize how the Proactive Career, a new HR role developed from the articles, can manage the nexus between turbulence and worker experience, thus introducing turbulence in human resource management research and practice from a global perspective. Then, we focus on two areas where technology is already changing employees' experiences: when they apply for jobs and go through the hiring process, and when technology affects the design of the work they do, as well as how, when, and where they do it. We focus specifically on three areas: remote work, virtual teams, and algorithmic management, where technology is already changing how work is done. It is critical to consider the psychological needs of the workforce while developing and integrating technology in the workplace. The research process starts with the creation of a framework based on concepts and literature reviews, moves on to analysis, and concludes with the creation of

C. Kamal (✉) · M. Chandrakala
Kristu Jayanti College, Bengaluru, India
e-mail: Rajakamal@kristujayanti.com

conclusions based on the information gleaned from the study. This study aims to assess the connection between employee morale and economic downturns.

2   Macro Level Turbulence Affects on Working World

Macro-level turbulence is unexpected occurrences that change organizational structures, employee experience, and legitimacy. Crisis and uncertainty hurt management and work experience [14] they might impact sectors, economies, and nations. The COVID-19 pandemic shows how unforeseen occurrences may have far-reaching effects.

Uncertain, complex, and ambiguous (VUCA) situations may be problematic for workers. Human resources' ability to adapt to broad change is vital to an organization's long-term success [10, 11].

Organizational responses, the extent to which they are impacted, and the magnitude, timing, and frequency of external events all contribute to "macro-level turbulence." Different sectors, businesses, or countries may have different effects from the same incident due to how they handle turbulence. Problems are anticipated by many firms. It's better than nothing if this technique doesn't help employees learn as rapidly as other companies. Exogenous events affect firms differently.

Organizations react differently to macro-instability. Farmers suffer from Brexit, wildfires affect internet shopping, and pandemics boost pharmaceuticals. Rising unemployment rates may affect all employees, although company-specific working circumstances may differ.

An organization may face many crises. 574 By Christianson and Barton [6]. The 2023 worldwide pandemic and Russia's invasion of Ukraine hurt businesses [17]. External variables hinder employee impact assessment, highlighting the necessity for comprehensive frameworks.

Macroeconomic instability affects HR and employee experience. Crisis HR initiatives are misinterpreted as employer intentions. 2021 Visitors, others. Macro-level crises and uncertainty have been shown to lower productivity. First study focused on strategic or organizational objectives. The Great Recession and COVID-19 pandemic illuminated workplace attitudes, while other macro-level disasters have received less attention. Since employees are vital to any firm, it's concerning. In rough times, companies need additional aid non-institutional economies and governments, Categories of global disruptions.

The 2008 global economic and financial crisis caused layoffs, reorganizations, changes in working hours, income, benefits, and employee voice. The workplace was dangerous worldwide. Lately, hours, workload, job uncertainty, and stress have increased (Chatrakul Na Ayudhya [5]; Harney [16]; damage workers' psychological contracts. Emotional and physical wellbeing, Conway et al. [12]). According to Datta et al. [14] may alter employment statuses. Institutionally stronger economies may face another political and social shock or instability. First, ethnocentric movements like Brexit and American nationalism Immigration policy changes will hurt the

skilled, multiethnic workforce, according to Cumming et al. [13]. 2016 2017 Climate change uncertainty in society and government promotes the greener economy, according to Horak et al. Green manufacturing may eliminate new employment. ILO will affect the labor market, workforce, and individuals in 2020. Many economies slipped into recession due to socioeconomic instability like COVID-19, affecting supply chains, financial markets, industries, sectors, enterprises, and people globally. Short-term effects of staff lockout and isolation [9] will see unprecedented layoffs and unemployment. An increase in COVID-19, fights, and key personnel psychological discomfort in 2022. Mention 2021. Homeschool and childcare leaders were fatigued and anxious. 2022 Adida, etc.

Businesses are adopting digital and AI technology. Robotics and AI are changing employment organization and interaction. Based on Budhwar et al. [3]. CEOs using AI worry that its advantages may cost jobs. In 2023, Basu et al. [1]

The COVID-19 pandemic has caused a global energy crisis due to rapid economic recovery, severe weather, postponed maintenance work, and investment cuts by oil and gas companies and exporting countries. Russia invaded Ukraine in February 2022, turning this conflict around. EU retail power costs rose 50% in July 2021, forcing many households and companies to restructure.

This shows that macroeconomic volatility is hurting employees. Prevention should be HR and business priority. Large-scale occurrences are unavoidable due to our global community. In 2021, Biron et al. Successful HR efforts must consider how these instances affect employee satisfaction.

3   Human Resources in Modern Businesses: Their Emerging Role

From Fig. 1 the internal organizational landscape and HR paradigm have been swiftly influenced by the external business environment and recurring, successive, or simultaneous macro-level crises and uncertainty. In recent decades, HR has transitioned from functional to business-focused. Based on Ulrich et al. (2008). Much has been written about how HR professionals adjust to macro environmental changes. Burns et al. [4]. Boudreau (2009), Ulrich (2012), categorized HR occupations. Current HR difficulties and job kinds are internal. HR's internal emphasis makes employees and managers more aware of macro turbulence in a dynamic society. Increased HR emphasis on the outside world prepares staff for macro-level upheavals.

Due to the link between mental health difficulties and poorer productivity, attrition, and employee engagement, HR professionals advocate emphasizing employee well-being [7, 8]. Businesses got legal assistance with government shutdowns, working from home, employee absenteeism, health, and wellness during COVID-19 [7, 8]. The moral argument for firms to cherish their people is growing because it benefits both parties. More than ever, companies must balance employee well-being and shareholder rewards.
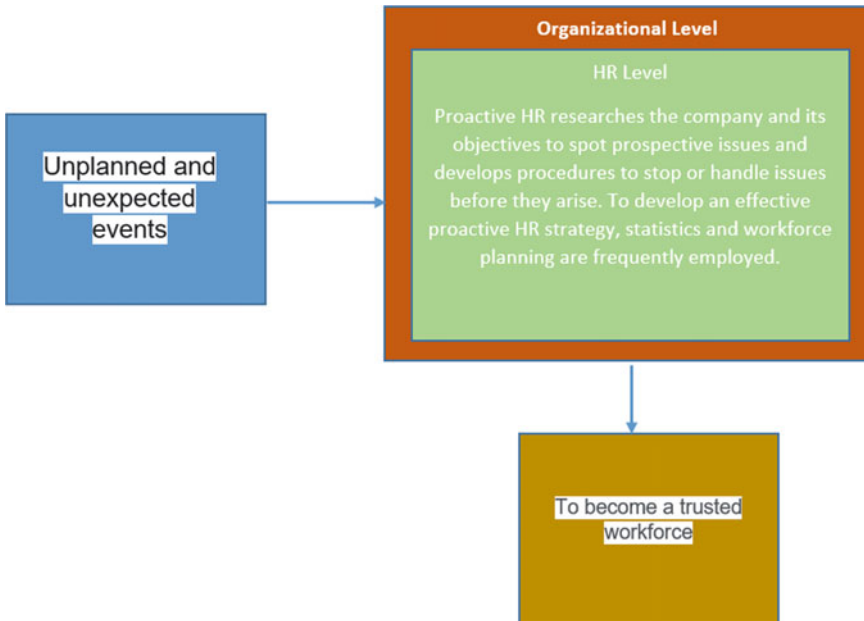
Fig. 1 Human Resources (HR) now plays a different kind of role in today's businesses. *Source* Researcher model

In this special edition, HR managers are advised to avoid disease. Frequent macro-level turbulences may devastate workers. Human resources professionals must anticipate, plan, solve, and assess employee experience. Therefore, HR professionals must focus more on employee issues and identify solutions that account for dynamic macro-environments. Human resources professionals employ antifragility. Risk-reducing, strengthening, and anti-fragile traits are shown by Bendell [2]. Human resources must adapt to economic downturns. The articles in this special issue help us describe today's firms' evolving HR role (Fig. 1).

This new HR role has six major functions. Restore HR and workplace procedures. Linking HR to artistic work. Considering employees' perspectives while establishing new processes. This, combined with computer literacy and 21st-century employment norms, Howard the Hughes-Donnelly argument. The second goal is to eliminate social tensions to promote new health methods and improve employees' tumultuous experiences. Third, assessing macro-level disturbances' effects on staff and devising solutions. Fourth, workers need job autonomy and corporate input, Fifth, connecting with and investing in contingent employees; sixth, improving HR infrastructure; sixth, managing contractual ambiguity.

Employee advocacy has increased twice since becoming a Proactive Carer. HR cares about every employee's well-being. Second, it protects workers from catastrophic workplace accidents rather than reactively communicating employees' interests to management and regulating health and safety, risk management, equality, and

diversity. HR practitioners should study how external shocks, changes, and volatility affect firms and people to plan for the future. Our suggested HR job meets this demand. The book's revised viewpoint is used in this addendum.

4 Findings

4.1 New Telework Practices and the Economic Crisis

Workers are able to make sense of telework and adapt to it even in uncertain economic times. They evaluate the external setting as they investigate how different HR practices are seen by workers as signals from the organization. The results provide light on how, in times of macro-level volatility, employees may see teleworking an ordinarily employee-centric practice as a danger, leading to its rejection. Organizations, the authors argue, should adopt HR policies in line with the macro environment [19].

4.2 Political, Economic Uncertainties

Female human resource managers in the workforce, with an emphasis on how they are adapting to the ongoing political and economic unpredictability that has been exacerbated by the explosion at the 2020 port. The results show that women HR managers use a wide variety of coping mechanisms, including emotional concentration, problem resolution, quiet, and re-doing gender roles. Human resource professionals' preparedness to deal with the complexities posed by long-term, macro-level volatility is called into doubt [20].

4.3 The Effects of the Political and Social Crises on the Workforce.

Evidence regarding how different groups of employees experience mental health and how these link to their work outcomes, including engagement and turnover intentions, shows that workers in low-skilled positions report higher levels of depressive moods than those in high-skilled jobs. In order to aid those workers most impacted by external variables, HR must first determine which groups will be hit the hardest [21].

4.4 State-Owned Enterprise Privatization on a Massive Scale and Relatively Calm Workplaces

The privatization of a formerly controlled market on a massive scale, with procedures at the national and intermediate levels to ensure employee quiet. They show how three different organizational mechanisms the disregard for democratic demands, the commoditization of everything, and the weakening of solidarity contributed to the growing hush among workers throughout the privatization process. Human resource managers may help employees cope with tumultuous times by giving them a voice and advocating for their interests [22].

5   Conclusion

To understand how team virtuosity influences how successfully team members meet each other's psychological needs, self-determination theory is used. The degree to which team members engage in need-supportive behaviors toward one another within non-virtual teams affects how well needs are met. For effective team performance, for instance, autonomy and empowerment of virtual teams are essential. The consequences of needing help and thwarting among members of a virtual team might be examined through studies that follow team activities and interaction patterns over time, including recordings of virtual communication.

Finally, despite the fact that the majority of studies have found negative impacts of algorithmic management on workers' motivation and work design elements, researchers should not see these effects as fixed and unalterable [18]. The motivating impacts of algorithmic management might be reduced by sociotechnical features of the system and organizational regulations governing their use. In summary, firms' design and use of algorithms, not the algorithms themselves, determines how motivated employees are. Organizations would benefit from hiring psychologists and human resources specialists to improve the motivational potential of these applications, which are frequently developed by computer and data scientists with input from marketing specialists.

6   Future Research Directions

We propose five lines of inquiry to better understand the impact of recent macro-level shifts in the labor market on individual employees. While this issue did highlight some noteworthy foreign cases, further study is needed before HR can effectively connect with contingent, external, and peripheral employees in their intended Proactive Career role. More study is required to test these hypotheses and learn more about the scope of this function. For instance, how do people who work in human resources

characterize their Proactive Careers? How do they make meaning of this function within the larger frameworks of their organizations and cultures? What additional characteristics, if any, does this position have? How may this function grow and change in the future? This new role of HR, which goes beyond just reacting to crises or uncertainties at the macro level and instead focuses on proactively maintaining HR ready to adapt to and respond to turbulence, may be better understood if we tackle research topics along these lines.

References

1. Basu, S., Majumdar, B., Mukherjee, K., Munjal, S., Palaksha, C.: Artificial intelligence-HRM interactions and outcomes: a systematic review and causal configurational explanation. Hum. Resour. Manage. Rev. **331** (2023)
2. Bendell, T.: Building anti-fragile organisations: risk, opportunity and governance in a turbulent world. Routledge (2016). Biron, M., De Cieri, H., Fulmer, I., Lin, C. H. V., Mayrhofer, W., Nyfoudi, M., Sanders, K., Shipton, H., Sun, J.M.J. (2021)
3. Budhwar, P., Malik, A., De Silva, M.T., Thevisuthan, P.: Artificial intelligence-challenges and opportunities for international HRM: a review and research agenda. Int. J. Hum. Resour. Manag.Resour. Manag. **336**, 1065–1097 (2022)
4. Burns, E., Smith, L., Ulrich, D.: Competency models with impact. People Strategy **353**, 16–23 (2012)
5. Chatrakul Na Ayudhya, U., Prouska, R., Beauregard, T.A.: The impact of global economic crisis and austerity on quality of working life and work-life balance: a capabilities perspective. Eur. Manage. Rev. **164**, 847–862 (2019)
6. Christianson, M.K., Barton, M.A.: Sensemaking in the time of COVID-19. J. Manage. Stud. **582** (2021)
7. CIPD: A duty to care? Evidence of the importance of organisational culture to effective governance and leadership (2016)
8. CIPD: Coronavirus COVID-19: mental health support for employees (2021)
9. Clark, D.: Cumulative number of jobs furloughed under the job retention scheme UK 2020–2021 (2022)
10. Collings, D., Nyberg, A.J.: Strategic human resource management and COVID-19: Emerging challenges and research opportunities. J. Manage. Stud. **585**, 1378–1382 (2021)
11. Collings, D.G., Nyberg, A.J., Wright, P.M., McMackin, J.: Leading through paradox in a COVID-19world: human resources comes of age. Hum. Resour. Manag. J.Resour. Manag. J. **314**, 819–833 (2021)
12. Conway, N., Kiefer, T., Hartley, J., Briner, R.B.: Doing more with less? Employee reactions to psychological contractbreach via target similarity or spillover during public sector organisational change. Br. J. Manag.Manag. **254**, 737–754 (2014)
13. Cumming, D.J., Wood, G., Zahra, S.A.: Human resource management practices in the context of rising right-wingpopulism. Hum. Resour. Manag. J.Resour. Manag. J. **304**, 525–536 (2020)
14. Datta, K., Guthrie, P., Basuil, D[1]., Pandey, A.: Causes and effects of employee downsizing: a review and synthesis. J. Manage. **361**, 281–348 (2021)
15. Gollan, P.J., Perkins, S.J.: Employee voice and value during a period of economic turbulence. Hum. Res. Manag. J. **204**, 440–443 (2010)
16. Harney, B., Fu, N., Freeney, Y.: Balancing tensions: Buffering the impact of organisational restructuring and downsizing on employee well-being. Hum. Resour. Manag. J. **282**, 235–254 (2018)
17. OECD: A fragile recovery. OECD Economic Outlook, Interim Report March 2023 (2023)

18. Singha, S., Sivarethinamohan, R.: Social inclusion, equality, leadership, and diversity to attain sustainable development goal 5 in the Indian banking industry. J. Int. Women's Stud. **23**(5), 135–141 (2022)
19. Kokila, M.S., Chandra, S.: A study on career choice as entrepreneurs among undergraduate students in Bangalore. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-26953-0_23
20. Preethi, S.J.G., Verma, K.R.: An overview of pay disparity and gender gap among selective IT employees in Urban Bangalore. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_22
21. Meenadevi, K., Mruthyunjaya Sharma, G.V., Archana, J.R., Anantha, K.S.: Work habits based on agile methodology: metrics and procedures. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023).
22. Ganapathy, D., Deepak, S.: A study on reskilling and networking on Linkedin on employee recruitment success and career advancement. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_29

Literary Muses on the Path to Conscious Self-sacrifice: A Jungian Archetypal Approach

Dania Meryan

1 What Inspires Art?

In Greek mythology, the nine muses were the daughters of Zeus and Mnemosyne, the goddess of memory and remembrance. The Muses, were believed to be the source of artistic inspiration in Ancient Greece. In Theogeny, Hesiod shares his unwavering faith in the muses' essential role in the process of artistic creation: "Happy he whomsoever the Muses shall have loved," he wrote. "Sweet is the sound that flows from his mouth." And when one "pines away troubled at heart, yet if a minstrel, servant of the Muses, shall have chaunted the glories of men of yore... quickly does he forget his melancholy, nor does he at all remember his cares." (*Theogeny* 1–25).

In time, the myth of Mnemosyne and her daughters turned into an allegory for the mystical process preceding literary creation. However, there came this compelling need to find an alternate source for artistic creativity, found in the move from the divine to the mortal, in the form of the idealized female beloved. This over idealization of the beloved, however, has turned the idea of the muse, in time, into a passive, reclined feminine beauty. Hence, the muse, as a concept, contains a paradox at its core. The idea of the muses as goddesses who inspire other people to produce art, seems to suggest, now, a recreation of the muse herself as the artists begin to mold their own work. Once they start to appropriate her, she becomes yet another component of their production, leading to our current conception of the muse as a submissive and objectified woman. Although she no longer acts as an active creator in her own right, she nonetheless serves as an inspiration to male artists, as a locus of desire and a symbol of idealized feminine beauty. (Prose *Muses* [10]; Collins "Hesiod" [1]; Tutter *The muse* [12]).

D. Meryan (✉)
Zarqa University, Zarqa, Jordan
e-mail: dmeryan@zu.edu.jo

The researcher's main argument holds that a Jungian Archetypal reading of the Individuation path for these two modern literary muses is a move beyond the object/ subject dichotomy of the muse as a concept, who, under this new perspective, is both idealised and created by the masculine yet actively inspiring the process of creation through/ within him as she consciously moves to self-realization. The research draws upon Jungian and Post-Jungian Archetypal Criticism as a theoretical approach, and uses Jungian theory of Individuation in particular as a tool for textual analysis.

2 Fated Encounters

A journalist and activist from Prague, Milena Jesenska, had heard of and read about the "elusive" nocturnal author who Kafka before seeing him in person. Milena was moved by his writing, and soon after meeting him, wrote Kafka a letter requesting his permission to translate some of his stories [4, 46]. Their relationship started as professional, then developed into a deep intense daily correspondence as the two felt bound together by their mutual suffering. (Hockaday, 48–49) Both Kafka and Milena believed that the other knew their deepest emotions for "[h]ere was someone who understood her and her sorrows even without her having to spell them out." [4] Milena was eventually given a glimpse of Kafka's inner struggles and soul's gloom. He perceived in her a person he could confide his innermost feelings to. He gave her his diaries, which he felt to be considerably more valuable than his own books, to retain for safekeeping and enabled her to read his work. But most importantly, Kafka became vulnerable with Milena. He writes to her: "No one has taken my side as knowingly and willingly as you, in spite of everything, in spite of everything" [4, 49].

Olga Ivinskaya was working for the monthly literary journal *Novy Mir* when she met Boris Pasternak, who by that time was a celebrated poet and writer. Soon after meeting Pasternak, she left the journal and became a freelance translator of poetry working in collaboration with him. Olga's life had been already marked by calamity; a widow twice and during war time. By the time Boris fell for her, he was in the midst of his second unhappy marriage. The relationship between Boris and Olga in real life is inextricably entwined with the story of Yuri and Lara in *Doctor Zhivago*, Pasternak's masterpiece and anti-Soviet novel, into which Boris poured his love for and agony over Olga, who became the manuscript's typist, advocate, agent, and martyr, being twice imprisoned in the Soviet work camps over her liaisons with Pasternak.

Pasternak writes in a letter to a friend on the theme of his epic novel, he explains:

…their inner necessity …by virtue of which the encounters between Zhivago and Lara came about in the novel. It constantly makes their path cross, forcing them to live, as it were in the same magnetic field, even though they are kept apart by distance and circumstances, and it is not clear what they need from each other…the theme is set—the theme of human destiny. (qtd. in Ivinskaya *Captive*, 417)

Pasternak's shared his postulation on the theme of destiny in *Doctor Zhivago* with his friend while still in the writing process. His thoughts are once again echoed in the novel, as the narrator ponders on the circumstances that brought Yuri and Lara together, he writes:

> They loved each other, not driven by necessity, by the "blaze of passion" often falsely ascribed to love. They loved each other because everything around them willed it, the trees and the clouds and the sky over their heads and the earth under their feet. (501)

Examining the lives of the two literary muses and their artists, one may claim that the infatuation was mutual in both stories. These fated encounters are best explained through the lens of what Jung calls "Anima" and "Animus" Which are archetypes representing the inherited expectation of experience on people of the opposite sex. The Masculine and the Feminine as archetypes in consciousness, individuation, and development, constitute integral part of Jung's work. Numerous authors do in fact appreciate Jung's groundbreaking work and his research of the Feminine in mythology and psychology.

The Feminine and the Masculine are the two sides that make up the whole, and each coexist in every human being regardless of their gender. Jung postulates a contrasexual archetype which he labeled anima in men (the inner woman and Feminine) and animus in women (the inner male and Masculine). Therefore, women live in a kind of Feminine consciousness that males do not, and they have a lower level of Unconscious Masculine. The exact opposite takes place in men who live in their Masculine consciousness while repressing the feminine aspect in their unconscious awareness.

These connections are referred to as the "odious linkage" between Eros/anima/ feminine/feeling/ unconscious/female and Logos/animus/thinking/conscious/ male. Classical Jungian psychology held that the Masculine is "other" for woman who channels her experience of the Masculine as a mystical otherness that captures her fancy. She has to be saved by a "hero" to whom she is related as his partner or wife in order to feel complete. For this reason, the young woman assumes the role of the Feminine, completing him as a partner by carrying these forms of the repressed unconscious (Eros) for him, just as he does mirror her repressed (Logos) for her. (*Consciousness* 83–100; *Psychological* 63–97).

Ivinskaya and Jesenska represent what Jungian analyst Gareth Hill refers to in his *Masculine and Feminine* [3] as the Dynamic Feminine archetype, who strongly identifies with and is activated by the Static Masculine through their mutual mirroring of "Anima" and "Animus". Static Masculine traits are in this case embodied by Pasternak and Kafka who on their part mirror the latent "Animus" in the female beloved unconsciousness.

The "magnetic field" to use Pasternak's own description of the incomprehensible coming together with Ivinskaya is described by her in a revered way, for in more than one occasion in her Memoire, *A Captive of Time* [5], Olga likens meeting Pasternak to have the same emotional effect on her as to the mystical experience of talking to God.

By the same token, Jesenska's idealized portrayal of Kafka may be clearly felt in the way she describes his unique human qualities which come across to the reader as almost impossible to realize. She writes on Kafka in a letter to her friend on:

> Obviously, we are all capable of living, because at one time or another we have all taken refuge in a lie, in blindness, enthusiasm, optimism, a conviction, pessimism, or something else. But he has never fled to any refuge, not one. He is absolutely incapable of lying…. He lacks even the smallest refuge; he has no shelter. That is why he is exposed to everything we are protected from. He is like a naked man among the dressed. (qtd in Hockaday *Kafka*, 77)

To better understand how both Jesenska and Ivinskaya reached this point of unwavering devotion to these literary towering figures, it is essential to explain the archetype Pasternak and Kafka fall into according to Jungian Archetypal Criticism. According Hill, the Static Masculine, as the archetypal principle or initiating energy, gravitates toward order, standards, systems of meaning, rules and regulations, theories of truth, and impersonal impartiality in discerning and judging under its positive manifestations. Static Masculinity's main value is Logos, and a cross, which symbolizes polar opposites held in a state of hierarchies of truths (*Masculine and Feminine* [3], 38–41). Structural order and the imposition of established guidelines for behavior are the ego's fundamental experiences for the static Masculine. Instead of being driven by self-motivation, the ego personality that is ruled by the Masculine in its static form is often influenced by expectations of how it should act and what it should accomplish. The obedient soldier, the war hero, and the patriarchal inside all serve as suitable imagery. The self-centeredness and narcissistic tendencies of the Dynamic Masculine (the traditional depiction of masculinity) are replaced here by the self-doubt and permanent need for self-reflection (Hill 83).

These traits are clearly manifested in both Pasternak and Kafka's constant pursuit of meaning to our existence, especially during dark times of utter chaos and turmoil that cast its shadow on everyday life during the war times. In *Doctor Zhivago,* Pasternak was trying to make sense of the chaos by sublimating reality, he was as he likes to describe it: "Reshaping life!" for the reason that he felt this heavy obligation towards the others, towards "People who can say that have never understood a thing about life—they have never felt its breath, its heartbeat—however much they have seen or done" (338).

Pasternak holding the torch of knowledge for humanity and embodying the logos and its cross with its mythical allusion to Jesus Christ and Prometheus, both being the bearers of light who sacrificed themselves for the sake of raising the collective consciousness. *Doctor Zhivago*'s last part contains Yuri's poems and one of which is "Garden of Gethsemane", which reads like an allegory to the sacrifice the poet makes and the state's betrayal of its own people during Stalin's era. "Garden of Gethsemane" alludes to the Last Supper, the night Christ hands the torch to his disciples, and the very same night he is betrayed by one of them.

For Kafka, Logos has so much power over the human consciousness that it almost resembles the darkest forces of nature drastically changing the landscape of our psyche. In a letter to Oskar Pollak (1904), Kafka writes, "I think we ought to read only the kind of books that wound and stab us…A book must be the axe for the frozen sea inside of us." (*Franz Kafka* 1977, 16).

It is important to mention that the Static Masculine has a shadow aspect to it if taken to an extreme. The shadow aspect of the Static Masculine shows whenever order and structure is sought after for selfish needs, by means of insincerity, rigidity, and degrading righteousness. Such was the shadow manifest by tyrannical regimes and systems of hierarchical order throughout history.

The pattern which complements the static masculine, according to Hill, is the Dynamic Feminine, which he compares to "the undirected chaos of the forest floor" in the way she pushes for change and transformation. The Dynamic Feminine stands in contrast to the Static Masculine's insistence on reasonable Logos and order. The Dynamic Feminine includes the natural progression of experience as well as unplanned movement toward the new, the irrational, and the whimsical. It is unstructured, resilient, inviting, yielding, and open to being acted upon [3, 17]

Pasternak's portrayal of Lara in *Doctor Zhivago* is almost identical with the Dynamic Feminine aspects described by Hill: "She was obsessed with the idea of breaking with everything she had ever known or experienced, and starting on something new." (76) Zhivago's Lara has an ethereal presence to her and flows into life like a river.

In her book *Mistress, Mother, Muse* [8] Maria Polaska, argues that the liminality and undefinable nature of the feminine psyche does not necessarily mean being caught in a state of in- betweenness, rather it suggests a protean nature of a constant ongoing transformation. This defiance to definitions and preconceived notions suggests a lucid "chimerical" quality to the feminine. (4) The Dynamic Feminine bewitching qualities invites the Static Masculine in by the force of "Anima" and "Animus" and awakens the inner spark of creativity within him. Kafka writes to Milena: "In a way, you are poetry material; You [sic] are full of cloudy subtleties I am willing to spend a lifetime figuring out. Words burst in your essence and you carry their dust in the pores of your ethereal individuality." (Kafka *Letters*, 133).

In submitting to the arduous initiations and the ensuing change of the Static Masculine/Dynamic Feminine polarity, the masculine is redeemed from the traditional dynamics of power relations embodied in the Static Feminine/Dynamic Masculine polarity. This change entails taming and reining the Dynamic Masculine's willful autonomy by making it suffer from within, for the purpose of conforming to a higher framework of values. (Hill 38–41) Kafka's inner suffering manifested in his willful resistance to taking his relationship with Milena from the epistolary to the corporeal level. He writes: "You [Milena] are the knife I turn inside myself; that is love. That, my dear, is love." He, somehow preferred to keep Milena on a pedestal and even when the two decided to get together once more and spent four days in Vienna. Kafka declared to her, "I don't dare offer you my hand, my dirty, twitching, claw-like, fidgety, unsteady, hot–cold hand". This is how powerful the inner transformation Milena evoked in Kafka, a man who frequented brothels and had an active love life. For him, Milena had evolved into a type of muse. He perceived her as something pure, complete, and so stunning that he was afraid to touch her in spite of the love he feels for her.

This process of transformation which takes place inside the Static Masculine ushers a movement in the direction of new configurations, often in service of a new

sense of wholeness. The perplexing and consciousness-shifting experience (such as the one with Kafka) that the Dynamic Feminine brings in fact, dismantles existing categories of consciousness by means of introducing new possibilities within the flow of outer experience. Its results are the energizing, ecstatic revelations accessed by the altered state of awareness (Hill 20).

In time, Kafka's torment and his inability to be with Milena, who at the time was unable to free herself from the confines of miserable marriage, made him request they stop corresponding al together. Kafka's decision came after a series of misunderstandings between Milena and himself in his attempt to convey to her his incapability of coping with the inner transformation her presence is causing in him. He writes to her about one of his dreams:

> I hardly remember the details, just that we kept on merging into one another, I was you, you were me. Finally [sic] you somehow caught fire; I remembered that fire can be smothered with cloth, took an old coat and beat you with it. But then the metamorphoses resumed and went so far that that you were no longer even there; instead I was the one on fire and I was also the one who was beating the fire with the coat. (*Letters to Milena* 203)

Kafka's dream is from a Jungian perspective, a phase in the individuation process towards self-realization. However, Kafka resisted the process rather than taking it all the way towards self-realization, when he decided to stop the epistolary relationship with Milena. His fear of the "watery initiation" instigated by the Dynamic Feminine, comes from the possibility of losing one's aspirations to the ideal, relying on one's ability to discern the way, and holding on to a symbolic experience of death with little more than confidence that a new sense of self will emerge. These actions cause one to dissolve into the original matrix of the Self (Hill 100).

As many other potentialities in the Self are currently unrealized, this integration could result in a one-sided evolution. In this case, it is Milena who takes this process to a completion by being open to inner transformation, whereas Kafka chooses not to cross the abyss of his consciousness and the rigid structure of his life. He felt that Milena was coming in between him and "the terrible voice from within" the voice he says would never "entrust" to anyone but her. (qtd in *Kafka* 54).

The dynamic Feminine awakens a longing for authenticity and meaning taking the form of existential crisis in the ego as it counterbalances the static Masculine. The static Masculine disintegrates, and out of a desire for renewal, new experience may compel him to abandon structure and order. According to the Jungian ideal, the ego will then enter a watery initiation as it follows the patterns of the dynamic Feminine transformative nature. After Ego death takes place for the Masculine, a consciousness that is more reflective of the Self emerges to the surface. It is known as individuation and it starts to show up as a new insight about the essence and significance of the human experience. It might result in a state of renewed unity with the self; a sense of wholeness (Hill 30).

Despite the fact that they parted ways, Kafka and Milena still respected and held each other in the highest regards until Kafka's death one year into the separation in 1924. (Hockaday [4] *Kafka* 77–78).

3 Eros and Death

The ancient myth goes that Eros/ Amor, the god of love forbids Psyche from looking at him and coerces her to live with him in his dark paradise. However, psyche's feminine desire was stronger than the rules of the Static Masculine represented her by Amor/ Eros, as she disobeys and steals a glance to his face at night. Once Psyche rebels, transformation got activated in her and she had to go through challenges before being turned into an immortal (goddess of the soul).

According to Erich Neumann (Amor 2013, 96), the six tasks Aphrodite assigns to Psyche represent the psychological processes by which a woman achieves personal individuation. These tasks include the self-development described by Hill. She is obliged to organize, make judgments, and take her own decisions, which helps her develop her repressed logos; her masculine "Animus".

The Static Masculine activates the Dynamic Feminine on her path to Individuation in a mystical way similar to the Siren effect in Greek mythology. Emma Jung explains:

> The animus, too, possesses the magic power of words, and therefore men who have the gift of oratory can exert a compulsive power on women in both a good and an evil sense. Am I going too far when I say that the magic of the word, the art of speaking, is the thing in a man through which a woman is most unfailingly caught and most frequently deluded? (qtd. in Wehr [13], 35)

Both Olga and Milena found themselves attached to men whose political circumstances necessitated devotion and sacrifice in order to keep the connection from breaking. Kafka warned Milena in more than one occasion from the "abyss" this connection will eventually throw her into. [7], 46] She had indeed ended in a concentration camp in 1940, for her active resistance as a journalist to oppressive regimes during the occupation of Czechoslovakia by the German army. Milena died in that camp in 1944.

While Kafka did not survive to witness Milena's conscious sacrifice his Static Masculinity activated in her, Pasternak saw Olga paying the price for being his muse before his death. For soon after she moved to work for him as his translator, Olga was suddenly arrested and sent to spend five years in a forced labour camp. Pasternak recalls her torment in a letter to a friend: 'She was put in jail on my account…I owe my life and the fact they did not touch me in these years to her heroism and endurance…' (*Captive* 117).

Olga resumed her life with Pasternak and they never parted ways till his death in 1960. Two months later, Olga was arrested a second time, held for interrogation along with her daughter Irina sentenced to eight years forced labour, her daughter to three. The two were transported to a camp in Siberia; Irina was released after two years and Olga after four. After her release, Olga lived in Moscow and worked as a translator. She finished writing her memoire *A Captive of Time* about her years with Pasternak eight years later in 1972 (*Captive* xxxiv-xxxv).

Reading her memoire, one cannot but recall Lara's final words as she says goodbye to Yuri in the funeral: "I'll put my grief for you in a work that will endure and be worthy

of you. I'll write your memory into an image of aching tenderness and sorrow. …
I'll stay here till this is done, then I too will go." (*Zhivago* 452).

Olga and Milena have willingly walked the path of Individuation till the end.
Self-sacrifice being the highest form of self-realization according to Jung, since it
entails having an ego that one is willingly and consciously letting go of for the sake
of something/someone precious. In other words, self-sacrifice suggests that one has
total mastery over the self. Hence the Self is already fully manifested [6] (390). In
this final phase, the Dynamic Feminine dissolves her Eros into the masculine divine
consciousness and attains the highest manifestation of sacred union. This sacred
union between the muse and the artist allows art to manifest through the artist's
conscious awareness.

Each one of these muses walked the path of self-realization consciously, deep-
ening the mysteries of Eros and creativity, emphasizing forever the liminality of the
feminine psyche, moving beyond the subject object dichotomy, as each muse blurs
and redraws the line between the ethereal and the corporal, the mortal and the divine.

References

1. Collins, D.: Hesiod and the divine voice of the muses. Arethusa **32**(3), 241–262 (1999)
2. Harding, E.: The Way of All Women: A Psychological Interpretation. Rider, London (1971)
3. Hill, G.S.: Masculine and Feminine: The Natural Flow of Opposites in the Psyche. Shambhala, Boston, London (1992)
4. Hockaday, M.: Kafka, Love and Courage: The Life of Milena Jesenská. Overlook Press (1997)
5. Ivinskaía, O.G.V.: A Captive of Time: My Years with Pasternak: The Memoirs of Olga Ivinskaya. Harvill Press, London (1978)
6. Jung, C.G.: Collected works. Vol. IX, Pt. I. The archetypes and the collective unconscious. (1959).
7. Kafka, F.: Letters to Milena. Boehm, P. (trans.) Schocken Books, New York (1990)
8. Palaska, M.: Mistress, Mother, Muse: An Exploration of the Female in Modern and Contemporary Mediterranean Literature. Cambridge Scholars Publishing (2021)
9. Pasternak, B.: Doctor Zhivago. Pantheon, New York (1958)
10. Prose, F.: The Lives of the Muses: Nine Women & the Artists They Inspired (2002)
11. Schlegel, C., Weinfield, H.: Theogony: And Works and Days. University of Michigan Press (2006)
12. Tutter, A.: The Muse: Psychoanalytic Explorations of Creative Inspiration. Taylor & Francis (2016)
13. Wehr D.S.: Religious and social dimensions of Jung's concept of the archetype: a feminist perspective. In: Feminist Archetypal Theory: Interdisciplinary Re-visions of Jungian Thought 23–45 (1985)
14. Woodman, M., Dickson, E.: Dancing in the Flames: The Dark Goddess in the Transformation of Consciousness. Shambhala, Boston (1997)

Automation of Business Processes Using Robots in the Fields of Supply Chain Management, Intelligent Transportation, and Logistics

Ch Raja Kamal ⓘ**, Glady Agnes** ⓘ**, Lydia Jemima** ⓘ**, and M. Chandrakala** ⓘ

1 Introduction

Robotic process automation RPA and its use in supply chain management automatically handles requests, estimates, and supply chain questions, cutting down on human order processing and paperwork. Businesses have gained a competitive edge through the automation of business processes using robots in the areas of supply chain management by: (1) getting nearly 100% accurate projection and forecasting of customer demand; (2) optimizing their R&D, increasing manufacturing with lower cost and higher quality. (3) Giving their clients a better experience. (4) Assisting them with the advertising. Automation of business operations with robots is now a reality in many industries, including manufacturing, finance, customer service, legal, accounting, tax, audit, architecture, and transportation. In this article, we have focused on the automation of business operations utilizing robots in supply chain management, particularly in relation to the manufacturing and retail industries. The research process begins with the construction of a framework using concepts and literature reviews, continues with the analysis, and ends with the formulation of conclusions based on the results of the study. The goal of this study is to find out how supply chain management businesses can automate certain business procedures.

2 RPA

The supply chain process helps reduce errors and duplication brought on by people when differences between suppliers are removed. The supply chain now has higher layers, and its operational expenses have lowered.

C. R. Kamal (✉) · G. Agnes · L. Jemima · M. Chandrakala
Kristu Jayanti College, Bengaluru, India
e-mail: Rajakamal@kristujayanti.com

2.1 Supply Chain Operation Streamline

There is some wiggle room when it comes to integrating supply chain tools and systems. Finding ways to streamline the supply chain by looking at typical processes. Evangelical Christian et al. [1]. Companies concerned about increased competition and pricing constraints should prioritize investing extensively in digitizing buying and supply chain management, which is often behind the other departments. RPA incorporates BPA, or business process automation, which makes use of robots. This technology includes things like software licensing, rule-based business procedures, and robots that imitate human movement and behavior to automate boring tasks. Because RPA reduces expenses and frees up workers' time, it boosts both productivity and competitiveness. To wit: In 2020, Viale and Zouari [2] A significant digital revolution is now taking place, and traditional procurement is modifying to adapt to a new reality, as the adoption of digitization in supply chain operations has evolved along with a degree of competitiveness. The use of RPA in procurement has implications for relationships, operations, and structures.

Workers in a variety of industries may be able to devote their time and energy to more meaningful pursuits as a consequence of automation replacing their routine, repetitive job. Automation of procedures by robots With RPA, supply chain management no longer requires human labor, which greatly reduces the possibility of human mistake. The software used in robotic process automation may be enabled and disabled on demand and is stored in the cloud. Instead of hiring people to execute mundane robotic tasks, businesses are instead focusing on developing their employees' problem-solving and creative thinking skills via the use of robots.

Techniques in Robotics the favorable consequences of automation in areas like credit, collections, invoicing, and more are excellent news for firms generally, but they will pay off most handsomely for those with a firm grasp on their complex supply chains. Robotic process automation (RPA) in the supply chain is fraught with dangers, yet firms are increasingly resorting to automation in hopes of increasing productivity and gaining a competitive and justifiable edge with consumers. However, this might be the beginning of a technological shift in the logistics sector.

The use of robots in the supply chain is still in its infancy, but it is becoming more popular as a tool for firms to increase their responsiveness and output. RFID Radio Frequency Identification, ERP Enterprise Resource Planning, CRM Customer Relationship Management, and other kinds of technology have long been used by businesses in many different industries, including healthcare, retail, and manufacturing. In the early days of RPA in the Supply Chain, software bots were unable to adapt to the complicated situations that sometimes arose since they are ignorant and can only automate areas of the supply chain that are basic and follow a regular pattern. RPA systems now have a more humanlike aspect that was previously only feasible with human help, thanks to the introduction of smart robots with machine learning skills and cognitive capacities. RPA in the Supply Chain may be used to help with more than just automating processes; it can also be used to predict outcomes and assist in making complicated decisions.

Robotic process automation (RPA) has the potential to improve supply chain management, transportation, and logistics by speeding up routine but time-consuming processes like data entry. Robotic process automation RPA may use software robots to cut and paste information from one computer to another. Robotic process automation RPA technology is not as advanced or rapid as other integration methods. However, in most cases, this option is more convenient to use. It also makes it easier to implement extra technologies. According to Shirley Hung, vice president at Dallas's Everest Group, a management consulting and research firm, robotic process automation RPA has been combined with other digital levers such as Internet of Things Io T, intelligent document processing, chat bots, mobile applications, and even block chain to address inefficiencies and other significant business challenges. Supply chain management processes that were previously handled manually have been automated and sped up using RPA. RPA, which is part of the continuing digital transformation, helps companies streamline their supply chain operations and improve productivity.

2.2 Automation of Email

Maintaining effective channels of communication between the many participants in a supply chain including producers, shippers, receivers, and consumers is crucial to the operation's overall performance. Despite its paramount importance, supply chain communication has room for significant development. Email contact is required by RPA in order to promote fruitful cooperation between employees in various departments. It is vital to establish methods of informing stakeholders when tasks have been completed, when they have been postponed, or when they need to be canceled. Customers often inquire as to the whereabouts of their goods. Each incoming email will be read, the shipping details noted, and the right status of the cargo will be determined using ERP software before the employee can respond to the buyer. However, Robotic Process Automation RPA may automate the whole process, from reading the email and understanding the client's demands to putting the data into the ERP system and displaying the proper status to the customer. Human intervention would be required only on rare occasions if a robot's handling abilities were poor using this approach. To have successful relationships with clients, there must be free flow of information between all sides.

2.3 Demand and Supply Planning

Technology has made formerly intractable problems in workforce supply and demand planning much more manageable. A plan has to be developed, information identified and gathered, information combined and arranged, data outliers identified and

evaluated, and the results communicated. Using machine learning and artificial intelligence, RPA in the supply chain might help companies better anticipate and respond to demand fluctuations. By automating routine supply chain procedures, companies may reduce the likelihood of human mistake and improve the speed, autonomy, and intelligence of their operations. Since supply chain management includes front-office operations like relationship development and customer support, human participation is still required. Businesses may utilize RPA to automate a variety of activities, including as buying, warehousing, inventory management, and shipping, to better manage demand and supply. Using artificial intelligence and machine learning, RPA software anticipates demand and immediately alerts procurement Nyandra et al. [3, 4].

2.4 Services to Customer

Good customer service relies on accurate and up-to-date information on the company's customers, but this information is updated in separate systems, which must be synced. For example, the supply chain procedure mandates that customers' ordering rights be temporarily revoked until the account manager is notified. These manual procedures may be automated by RPA in many forms of IT architecture. An intelligent virtual assistant, for instance, will talk to the user before forwarding their service request to the system when they utilize a mobile app to do so. Intelligent document processing systems may work with RPA robots to extract relevant data from a variety of service request papers, which can then be stored and managed. Third-party service and reverse logistics partners may benefit from a mobile app that provides location, arrival, and turnaround time information when a client sends an item back for repair or replacement. Automation of procedures by robots With the help of RPA programs, purchase confirmation emails might be sent to clients in real time. Automating mundane tasks may free up customer care teams to focus on delivering exceptional service and cultivating client connections.

2.5 Purchasing Agency Chosen

RPA aims to automate the now entirely human process of selecting providers. RPA in Supply Chain has the potential to improve the efficiency, productivity, and mechanization of all of these tasks. The first stages of a project only need human contact, including the description phase, the supplier selection phase, and any subsequent face-to-face conversations. Except for these few cases, once an organization has fully implemented RPA, no human involvement in the vendor selection process will be necessary. The steps involved in choosing a vendor include:

2.6   Supply Chain RPA Implementation Challenges

As the robot becomes increasingly sophisticated as a consequence of complex operations, standardization of the process becomes a barrier for Robotic Process Automation RPA. At any point in the lifecycle of robotic process automation RPA, process uniformity presents a significant challenge for organizations. The operational expenses and disruptions caused by RPA installation are magnified when processes are complicated. Organizations have learned the hard way that even when there is plenty of documentation, employees may still lack a thorough grasp of how things are supposed to work. There are also issues with technical support, since the assistance of an IT company is crucial throughout the process of integrating RPA in the supply chain. An IT department should be involved in the RPA deployment process. Until recently, RPA had a reputation for being a stopped automation process that offered only flexible solutions. It spreads the concept that machines have a finite capacity for learning and that they must be given very specific instructions if they are to improve in the future.

2.7   Transportation and Logistics RPA

Automation of procedures by robots RPA streamlines the development, rollout, and maintenance of software robots that perform like humans and integrate with other applications. Tailor [5] RPA handles administrative duties by 2020. Software robots have seveal human-like abilities, including the ability to read language, enter instructions, verify systems, detect objects, and gather data. Computer programs can do the task without human strain and much more quickly. With RPA, processes may be standardized to boost productivity, adaptability, and responsiveness. Eliminating routine work raises morale, commitment, and output. Robotic process automation (RPA) is user-friendly and lightweight, hastening the transition to digital. It's compatible with non-API automation systems and legacy VDIs.

Through robotic process automation, computers are taught to carry out routine tasks. It is only natural for robots to be able to do the same jobs again. Processing returns has always been a time-consuming and costly procedure. Using RPA, businesses can manage their profits without having to hire more workers, spend more money, or wait any longer than necessary. Now that the consumer is notified of the return, the RPA program may make contact, update inventory and payment records, and assess the internal billing system.

The state of RPA is improving. Learning, reflexes, and computer-mediated communication for software robots, Organizations may reap the most benefits from RPA by using scalable, global systems that are both affordable and capable of swiftly completing jobs and responding to volume fluctuations without sacrificing quality or dependability. Unlike traditional automation methods, RPA is transparent and enables quick bot creation. With the help of RPA services, organizations can build a

virtual workforce that is available around the clock and can do a variety of activities efficiently, consistently, inexpensively, and dependably.

Automation using robots has the potential to streamline, save money, and boost output in the transportation and logistics sector. Logistics companies are data driven. With the development of RPA, the logistics industry is evolving. With RPA, transportation companies may more easily manage their global freight from centralized hubs. The use of RPA reduces transportation expenses and waste.

3 RPA Benefits in Logistics and Transportation

3.1 Saves Time

There is no doubt that RPA methods can do tasks more quickly than people can. Also, RPA may be utilized to speed up the completion of labor-intensive tasks, which saves time and money for organizations by shortening the duration of the whole process cycle. As a result, people are able to focus their efforts where they are needed most, and the world's resources are better put to use (Fig. 1).

Fig. 1 Advantages of RPA in transportation and logistics
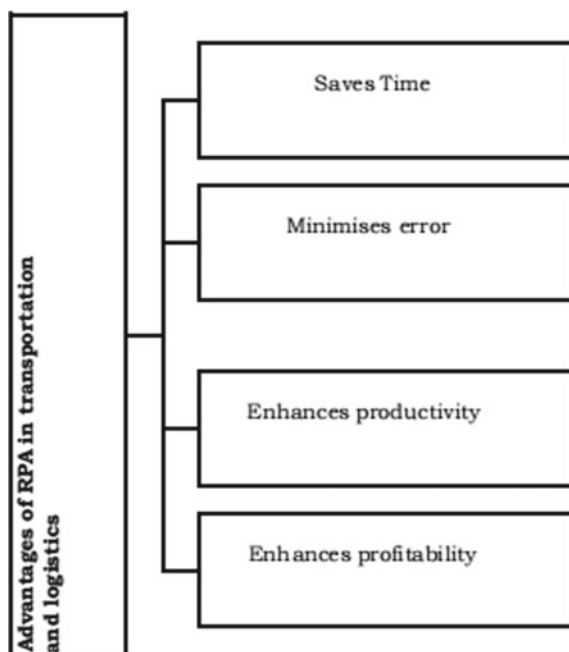
3.2 Minimizes Errors

Robotic process automation RPA reduces the number of opportunities for human error that exist when previously completed processes were handled by humans. Robotic process automation RPA drives processes to record and manage themselves, making it simple to determine the cause of issues and implement fixes.

3.3 Enhances Productivity

Robots that are part of a Robotic Process Automation RPA system may be seen of as a company's permanent workforce; using pre-programmed models, these robots consistently and accurately carry out their assigned tasks. Because of this, a company's productivity increases and it is able to function at a better level when there is complete dependability and precision and a high quality of work.

3.4 Enhances Profitability

Robots that are part of a Robotic Process Automation RPA system may be seen of as a company's permanent workforce; using pre-programmed models, these robots consistently and accurately carry out their assigned tasks. Because of this, a company's productivity increases and it is able to function at a better level when there is complete dependability and precision and a high quality of work.

4 Application of RPA in Transportation and Logistics

4.1 Inventory Processing and Order Processing

Humans must enter a lot of shipping and billing data. A serious issue, but one that emphasizes the necessity for robotic process automation in transportation and logistics. Robots may receive shipment Progressive rotating order PRO numbers from the provider's website. Data and invoice totals are straightforward to track using RPA. Producers and merchants need good inventory management to satisfy consumers. Purchasing and stockpiling need accessing multiple databases and matching the data to customer demand. Software robots excel at this and can use real-time data to adjust stock levels. Manual data input and paperwork are typical in order processing. This method is laborious and time-consuming. Manual errors also abound. This inefficient process wastes time, effort, and resources. Using RPA to automate order processing is

possible. Result: shorter and streamlined procedure. RPA speeds up order processing and supply chain movement.

4.2 Scheduling of Shipment and Tracking

Regulation, high-volume logistics tasks provide the basis for initial pick-up order processing, tracking, and reporting throughout internal operations and portals. This suggests that the logistics procedures were developed with software robots in mind. Robots' data management skills are best used when used for purposes like mining email chains for shipping details or monitoring tasks in calendars. Client satisfaction with the services may be considerably increased by providing exact pick-up times on the client or carrier websites. Evidence of shipping data may be retrieved by regularly monitoring carrier websites, which is a time-consuming process for humans but perfect for software robots. They may link the recovered information back to the order's original record, facilitating improved order management and servicing. Using RPA in shipping allows for the automated tracking of shipments, which is a huge time saver. Customers may check the status of their items by logging into their accounts with these companies. Customers may check for delays and learn when they might expect their shipments. Robotic process automation RPA might be used to handle incoming check calls, saving businesses countless resources and guaranteeing that someone will always be available to sign for deliveries that cannot be left unattended.

4.3 Invoice Management

Software robots are superior than other options because of their combined abilities to reduce complexity throughout the process. Many large 3PLs can already implement fully automated order-to-cash processes because to bots' ability to connect with commercial goods transportation. As a result, RPA helps logistics companies deal with the major problem of being paid promptly after finishing projects. You can save time and reduce human error by having bots do repetitive tasks like re-keying, copying and pasting, and manually adding data to invoices. When compared to manually processing invoices, this method takes just seconds, from data extraction shipping details to site updates clients. When a large volume of invoices must be processed and disseminated on a regular basis, the administrative load increases dramatically. In most cases, updating massive amounts of data is necessary for invoice processing. The process is lengthy for obvious reasons. Furthermore, such extended times might determine the success or failure of a transportation firm. As RPA can streamline the invoicing process, it's a viable option. RPA allows for the automation of a variety of tasks, including the monitoring of overdue payments, the analysis of invoice details to extract relevant data, and the processing of payments themselves.

4.4   Satisfaction of Customers

Robotic process automation RPA reduces the likelihood of making errors during data collection, leading to happier consumers. Using Robotic Process Automation RPA to sanitize and gather data lessens the likelihood of human mistake. Data outside of conventional systems of record may help businesses engage with customers in a more relevant and personalized way. Due to the efficiency and precision with which the process is carried out, goods are delivered to clients without delay, increasing their value and pleasure. It's crucial to ensure customer satisfaction since happy customers are more likely to return. The transportation and logistics sectors are very competitive, so businesses need to do all they can to not only win new customers, but also hold on to the ones they already have. One way to guarantee a sizable clientele is to focus on their complete satisfaction. Robotic process automation guarantees happy customers. The RPA solution allows businesses to integrate data from various transportation stages in order to answer customer concerns as quickly as feasible. The greatest possible service will be provided to customers in the form of regular updates, notifications, and a chat bot to answer any queries they may have. As a consequence, consumers will be open to working with your firm on their transportation requirements. When applied to transportation and logistics, RPA has the potential to improve accuracy, speed up production cycles, and boost revenue generation. RPA solutions are easy to implement and utilize, increasing productivity and profits with little effort. Today, customers have more expectations than ever before, and companies are struggling to meet them. This is where robotic process automation RPA comes in.

4.5   Communication

If a logistics firm wants to keep its customers happy, it must master the art of email communication. Whenever an order is received, processed, sent, or delayed, RPA may automatically notify customers. As a result of RPA's efforts to streamline business processes, interactions between companies and their customers have improved, leading to higher levels of customer satisfaction, more efficient management, and higher profits. Product information has to be readily available for everyone from upper management to employees to assistants to advisers to customers. Due to the number of people involved, the transportation chain sometimes has difficulties in communicating Singha [6]. The appropriate authority may not be able to communicate with the selected employee. RPA technologies, such as a chat bot with automated responses, may be used to address this issue. RPA technologies may periodically notify the appropriate parties by sending them email or push notifications with the latest information. In the same vein, chat bots may respond to customers' inquiries regarding their orders, shipments, and any delays they may have, as well as any other concerns they may have concerning the ordering process.

4.6 Generation of Reports

The use of RPA software streamlines the report-making process. Numerous reports, including those detailing the processing of orders, the receipt of payments, responses from customers, and revisions to transportation infrastructure, are generated on a regular basis in the transportation business. Reporting on a wide variety of frameworks for statistical purposes may be a time-consuming, error-prone process. With the use of AI, RPA systems can automatically compile reports from data. From the inputted information, the program may automatically pull the relevant facts to include in the report. When an RPA system is used to create the report, there is far less need for human intervention. Since RPA frees up so much manpower and materials, it can be put to better use elsewhere Meenadevi et al. [7].

4.7 RPA in Airline

The transportation sector stands to benefit greatly from robotic process automation RPA, which also has the potential to improve the efficiency of the aviation industry by optimizing the use of available resources. The aviation industry may benefit from RPA in a number of ways, including faster job completion, higher quality output, and cheaper overall costs because to a greater adherence to laws and regulations. To quickly assess passenger revenue and other aspects of income and expenditure in the current context, it is necessary to convert the whole process to robotic automation, which is increasingly favored over the conventional accounting approach.

4.8 Airline RPA Use Create Departmental Work Bundles

Many experts collaborate daily to carry out this process by hand. This makes it the kind of tedious, uninteresting, and time-consuming task that puts experts under a lot of stress, lowers employee happiness, and increases the likelihood of making mistakes. With RPA, a single person can oversee the whole package-creation process and deal with any issues that arise. The results include less wasted man hours, improved task management, faster cycle times, and higher quality services [11].

4.9 Revenue Outflow Recognition

The airline company may prevent revenue loss by coordinating with travel agencies. RPA makes it easier to sync up in the aviation business. The first major improvement will be a dramatic acceleration in fault detection across all synchronized domains.

With this newfound knowledge, better choices for reestablishing lost income and bolstering security may be made. Savings for the aviation industry may be substantial if automation is used to recover lost revenue and seal up leaks.

4.9.1 Fetching Data from the Old System

In the past, retrieving files required either a larger workforce due to manual processes or a request to the software developer to modify the underlying platform. Both are costly in terms of time and money. The employment of software robots may make the process much more efficient, affordable, and accurate, guaranteeing that all files on the system can be retrieved and moved to the new system without delay. Therefore, RPA may take the role of antiquated and inefficient IT systems that stifle innovation and growth. Almost no human intervention is required for any of this to occur. This suggests that RPA may assist improve the allocation of human resources toward activities with relatively high value.

4.9.2 Notification to Travelers

Careful RPA bots and chat bot systems can keep passengers updated on their flight times and reservation status. Chat bots may also respond to passengers' inquiries, providing the right response to boost customer satisfaction. This use of RPA in the airline industry is a great illustration of how the technology has the potential to boost consumer happiness.

4.9.3 Management of Data

Software robots are used in airline operations to search for missing information and locate previously delivered data. As a consequence, they'll be able to conduct the appropriate checks and maintain the required tolerances [8]. The required datasets may then be used to validate or update the various processing phases. Furthermore, robots can recognize the proper data values during the exchange of incorrect coupon codes. The documents may be compared to establish a renewal date.

5 Conclusion

Assigning tasks to team members and keeping up with workloads are both easier with the help of Robotic Process Automation RPA [9]. Automatic alert alerts ensure that all crew members are made aware of any changes. In addition, the prevalence of pandemics increases the likelihood of change; thus, the crew and the 3-airline

industry would benefit from being well-prepared to cope with the issue. Robotic process automation RPA facilitates crew scheduling Khattal and John William [6].

The adoption of RPA in different business sectors has been accelerated by technical advancements in the automation of corporate operations employing robots in the disciplines of supply chain management, intelligent transportation, and logistics Kokila and Chandra [8]. Most notably, they have been able to eliminate many layers of manual tasks including promotions, assortments, and supply chain management through the automation of business processes employing robots in the disciplines of supply chain management, intelligent transportation, and logistics Anitha Kumari et al. [9].

Some even go a step further by anticipating requests and sending things before receiving payment authorization. A reality nowadays is smart manufacturing. To fully profit from automation, however, a number of modifications are required. More significantly, the changes will force many organizations in the retail and industrial sectors to embrace new strategies, such as plant designs, reorganize their production footprints, and develop new supply chain models.

Additionally, businesses must alter the way they conduct their operations since supply chain management enabled machines and robots will eventually replace human operators with robots. It is important to highlight that supply chain management driven by robots is an increasingly growing trend in global industrial operations, suggesting that many firms globally are either now prioritizing supply chain management powered by robots or are moving toward doing so.

References

1. Christian, F., Franziska, A., Rainer, L.: Robotic process automation in purchasing and supply management: a multiple case study on potentials, barriers, and implementation. J. Purchasing. Supply Manage. (2021)
2. Viale, L., Zouari, D.: Impact of digitization on procurement: the case of robotic process automation. Supply Chain Forum: Int. J. 185–195 (2020)
3. Nyandra, M., Kartiko, B.H., Susanto, P.C., Supriyati, A., Suryasa, W.: Education and training improve quality of life and decrease depression score in elderly population. Eur. J. Anal. Chem. **132**, 371–377 (2018)
4. Nyandra, M., Suryasa, W.: Holistic approach to help sexual dysfunction. Eur. J. Anal. Chem. **133**, 207–212 (2018)
5. Tailor, R.K.: Application of robotic process automation in shopping malls in India. Int. J. Adv. Res. Commerce Manage. Soc. Sci. 234–238 (2020)
6. Khattal, M.H.D., John William, A.: Assessment on enhancing business customer acquisition for autonomous mobile robots (AMR) in industrial automation and robotics industry. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. (2023). https://doi.org/10.1007/978-981-99-3366-2_30
7. K. Meenadevi, G.V., Mruthyunjaya Sharma, J.R., Archana, K.S.A.: Work habits based on agile methodology: metrics and procedures. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023)

8. Kokila, M.S., Chandra, S.: A study on career choice as entrepreneurs among undergraduate students in Bangalore. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-26953-0_23
9. Anitha Kumari, S., Dost, A.B., Bhadani, S. (2023). Design and Automation of Hybrid Quadruped Mobile Robot for Industry 4.0 Implementation. In: Nayyar, A., Naved, M., Rameshwar, R. (eds) New Horizons for Industry 4.0 in Modern Business. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-20443-2_8

A Strategy for Conducting Sentiment Analysis Using AI in Human Resource Management

Raja Kamal Ch and **Surjit Singha**

1 Introduction

Artificial intelligence (AI) may be thought of as a collection of pre-programmed algorithms that can learn, aiming to become both more intelligent and more human-like than humans. An excellent ability for calculation, analysis, and prediction is the most essential feature of artificial intelligence. Machine learning's impact on human resources is growing daily. Experts agree that robotic process automation's most significant benefit is allowing human resources personnel to put their interpersonal abilities to work solving pressing business issues. Using RPA provides benefits, such as increasing the reliability of human resources data and decreasing operational expenses [1]. Through three distinct contributions, this work seeks to close the gap between RPA and power systems: (i) a review of the most popular RPA techniques to help the user choose the most appropriate method; (ii) a getting-started overview of those techniques to support the user in choosing the fittest approach; and (iii) a user-oriented general workflow to demonstrate the application of RPA best practices. It is worth noting that the input identification process must be approached with extreme attention owing to the direct repercussions on the RPA findings and, ultimately, on the analyst's ability to interpret the model sensitivity behaviour. This is due to the analyst's lack of knowledge regarding the potential effects of model features that are not incorporated into the set of model inputs. The research process begins with constructing a framework using concepts and literature reviews, continues with the analysis, and ends with the formulation of conclusions based on the study results. The purpose of this project is to develop an AI-based strategy for sentiment analysis.

R. K. Ch (✉) · S. Singha
Kristu Jayanti College, Bangalore, India
e-mail: rajakamal@kristujayanti.com

S. Singha
e-mail: surjitsingha@kristujayanti.com

2   Literature Review

The corporate environment has become more complicated over time, and there are now too many factors to decide. Many psychological traits and patterns of behavior It is now too risky to rely on the gut feelings of management or one's judgment. Artificial intelligence (AI) may assist in maintaining tabs on these intricate human resource factors, making evidence-based recommendations for action as needed. More and more CEOs are beginning to see the value of making decisions based on facts rather than gut instinct [2].

2.1   An Illustration from Google

Most notably, there is Google's Oxygen initiative. Google investigates the simple but important subject of whether or not having a competent leader makes a difference. They wanted to find out whether the results of data analysis helped them discover strong leaders, and they received positive results. They employed evidence-based insights from various survey responses gathered at various events and occasions. The findings of this study were quite helpful for identifying and contrasting various managers. Google was compelled to carry out this procedure since their projects' success depends on their employees' management abilities. The predictive power of the revised list of 10 Oxygen behaviours, including turnover, satisfaction, and performance, was much improved. The study revealed a significant correlation between manager performance and adopting the two newly identified behaviors [3] in that the team's performance improved from year to year, and personnel stayed with Google.

2.2   An Illustration from Hitachi

In 2016, Hitachi released a wearable device powered by artificial intelligence (AI) that employees could attach to their bodies without even realizing it was collecting data about their bio-physiology. AI then analyzed this data, yielding more valuable insights into the correlation between happy workers and thriving businesses [4].

2.3   Real-Time Human Resource Management Powered by AI

Rapid environmental change has made decisive action more critical than careful consideration. Human resource management may benefit from instant feedback and decisions. Businesses often utilize AI to provide instantaneous evaluations of employee performance. Adobe, IBM, General Electric (GE), and Microsoft are just

a few firms that do this. Promotions, responsibility shifts, and on-the-spot incentives may all be decided based on data analysis and immediate decision-making.

2.4 An Illustration from IBM

IBM employs artificial intelligence for real-time monitoring of individuals, contributing to the company's agile organizational framework concerning the skills essential for forthcoming projects. Subsequently, the AI proposes necessary adaptations to equip the company to manage these novel undertakings. In contrast to conventional group training approaches, IBM has chosen personalized training and development strategies facilitated by AI technologies [5].

2.5 Increasing Repetitive Human Resources Tasks with AI

Effectiveness in performing everyday HR duties is essential. The most often used for this purpose is RPA, or robotic process automation.

2.6 An Illustration from Nissan

Nissan adopted a Chinese RPA worker. The automaker went with UiPath because of the RPA software's capability to streamline mundane digital tasks. RPA aims to free up human resources for higher-priority tasks by reducing routine ones [6]. Invoices and expense reports are two accounting tasks that might benefit from RPA. Manual forms entered into a system might be automatically sorted, processed, and even report generated via RPA.

2.7 Automation of the Interview Process Using AI Software or a Robot

In the real world, more and more recruiters are turning to AI-led job interviews, utilizing algorithms to do initial screenings and assessments of candidates before human interviewers get involved. A link to an automated interview is sent to each candidate for each open position. Applicants may take the interview at their convenience, and many times, there are sample questions they can try before the actual ones. Applicants may be required to submit a written response or produce a concise video. Before the utilization of this evaluation by human recruiters to evaluate applicants

for a later interview, artificial intelligence (AI) documents and appends annotations to the candidate's replies, highlighting their appropriateness per essential criteria [7].

2.8 Analyzing the CVS Using AI for the First Time

Talent recruiting is an important [8], complex, and time-consuming function within HR. A staggering one million people join the workforce every month, and many more leave their jobs every month. LinkedIn claims India has the highest concentration of job-seeking professionals [9]. The organization can save time and energy by using an AI-powered application tracking system to sift through the millions of resumes in its database.

2.9 Gains from Implementing AI in HRM

Around 350,000 people work for IBM, and the company's artificial intelligence-powered technology can accurately forecast who is currently job hunting. IBM's AI technology has improved to accurately predict which workers will voluntarily leave the company over the next 12 months [10]. IBM Human Resources used Watson to develop a patented attrition prediction tool. It estimates when an employee is likely to quit and offers solutions to help managers prevent them from doing so. Artificial intelligence has saved IBM over $300 million in recruitment expenses as of this writing [10].

2.10 Software for Microsoft's Power Platform

You may build a chatbot to answer HR-related questions from workers quickly and easily with the aid of Power Virtual Agents. The agent may be programmed with a library of questions and answers to handle the most common and, perhaps, obscure inquiries HR departments get daily internal apps [11].

3 Methodology for Analyzing Opinions

The online testimonials showcased on the We360.ai website were collected from many sources on the internet. To prepare the data, it underwent multiple preprocessing procedures. The preprocessing techniques employed encompassed tokenization, transforming the text to lowercase, and filtering the data to remove frequently occurring stop words such as "the," "an," and "a." This preprocessing step aimed to

choose and preserve the most significant terms in the text. Afterwards, the collected criticisms were subjected to topic modelling using the Latent Dirichlet Allocation methodology. Through this process, distinct themes mentioned in the testimonials were identified. The investigation produced two primary outcomes: a visual representation of critical terms in a word cloud and a compilation of the extracted keywords.

4 Analysis and Interpretation of Data

Feedback on five AI programs from real users User feedback on Time-Doctor was culled to understand better the reception of this AI-based selection and recruiting tool. However, only evaluations were deemed more genuine and would soon be officially acknowledged. Reviews considered as part of the research process, this artificial intelligence (AI) based recruiting and selection solution was evaluated by a wide range of small, medium, and big businesses. From Tables 1 and 2 we deduced customer attitudes, such as how technology may be leveraged to deliver HR services like recruiting and selection, from evaluations of the firm [12].

Table 1 Average number of reviews per company size

Business size	Count
Enterprise > 1000 emp	3
Mid-market 51–1000 emp	25
Small-business 50 or fewer emp	39
Total	67

Source Complied data

Table 2 Words' relative hefts

Words	Weights
Productivity	11
Employees	11
Tool	14
We360 ai	33
AI	34
We360	34
Total	137

Source Complied data

5 Cloud of Words

By preprocessing the gathered reviews and employing topic modelling, the company uncovered pertinent keywords, depicted in Fig. 1. These keywords were significant from their perspective, aiding in identifying the areas within their product or service requiring further enhancement. This process aimed to elevate the overall customer experience. A word cloud is a visual representation of a collection of words ordered by the relative importance of those words. Table 2 assigns relative importance to terms based on their frequency of occurrence and lists the results in decreasing order. The most heavily weighted words are shown in bold and a bigger font size towards the centre of the cloud, and the opposite is true as the weight of the words falls Fig. 2, Table 4.

The sentiment analysis approach was also used for user evaluations to get insight into the value of this AI-powered HR analytics solution. Table 3 shows user sentiments, counts, and percentages. We may deduce that 55.07% of users trusted the program, 26.09% expressed delight while using the application, 15.94% were startled by the application's findings, and 1.45% displayed feelings of anger and grief after using the application based on the data in Tables 3, 4.

Fig. 1 We360.ai Wordcloud. *Source* https://sli delizard.com

Fig. 2 Analysis of feelings. *Source* https://www.mdpi.com/2079-9292/9/11/1761

Table 3 User sentiment quantified as a percentage

Count	Emotions	Percentage
0	Anticipation	0
38	Trust	55.07
11	Surprise	15.94
1	Sadness	1.45
18	Joy	26.09
0	Fear	0
0	Disgust	0
1	Anger	1.45

Source Complied data

Table 4 Identified topical terms from feedback

Words	TF-IDF
Great	0.043
Productivity	0.047
Tool	0.067
AI	0.087
We360	0.091

Source Complied data

6 Challenges and Concerns with Applying AI to HR Management

Promising Applications of AI in Human Resources Human resource planning and actual implementation are poles apart. The complex nature of the HR phenomenon: Because HR phenomena are often linked to the behavioural sciences and defy precise numerical measurement, the algorithm developed in AI or machine learning has significant challenges in comprehending them [13].

Limitations arising from inadequate data: The potential of machine learning to derive precise insights from artificial intelligence is curtailed by the incomplete coverage of all facets of human behaviour within the human resources dataset. Machine learning algorithms do not encompass concerns regarding workplace equity, ethics, and regulatory compliance. This omission can result in erroneous assessments of the intrinsic value of a company's human resources.

7 Potentially Negative Employee Reactions to Data-Driven Management Decisions

Since algorithms might not encompass the entirety of individuals' behavioral traits across diverse scenarios, this shortfall can introduce bias into AI-driven perceptions. Consequently, employees might consistently contest management decisions rooted in AI and machine learning analysis drawn from the database. AI acquires novel proficiencies through the algorithms it utilizes. The creator of the machine learning method for the AI will unconsciously impart their biases on the final product [14]. If a corporation utilizes biased technology, it might unintentionally discriminate throughout the talent acquisition process. If the recruiting process is ever questioned or attacked, the technology cannot be held culpable for the prejudice; hence, HR executives and HR personnel must bear ethical responsibility [15].

With the help of AI, the human resources department may be able to cut down on some of the time spent on recruiting and evaluating candidates. However, there are still many areas where it cannot replace human workers. Recruiting choices are based on more than simply a candidate's hard skills. Important emotional and

psychological traits include ambition and enthusiasm. There is no way for AI to monitor or evaluate human emotion, much alone account for how emotion drives a person's behaviour [16]. Since algorithms may not capture the full spectrum of human behavioral traits across various situations, this limitation can result in biases within AI-driven interpretations. As a result, employees could consistently challenge managerial judgments based on AI and machine learning analyses derived from the database. AI gains fresh competencies through the algorithms it employs. Human resources is a business that focuses on people. AI cannot replace a manager's capacity to see things from a human viewpoint or to read workers and candidates in person. When it comes to hiring members of underrepresented groups, handling reports of sexual assault, and other sensitive issues, human resources departments now must act ethically.

As opposed to human resources, who have a moral imperative to avoid prejudice, AI does not. Currently, AI relies too much on a small set of keywords. Words and phrases that help identify the best applicants are culled from the piles of applications. However, job seekers conversant with the inner workings of artificial intelligence (AI) may rapidly fool the system by including these phrases in their applications to give the impression that they are qualified for jobs for which they are not a candidate [17].

8 Conclusion

Using the system's real-time data, we may conclude that AI can assist human resource management functions more efficiently. This facilitates quick decision-making by management and helps the company maintain its flexibility to adapt to a dynamic marketplace. The automation of routine tasks can be implemented to create additional space for strategic decision-making and troubleshooting within the human resources division. The sentiment analysis of We360.ai users supports the platform's efficacy in gauging workforce productivity. By employing artificial intelligence in activities like resume screening, interviews, and gauging employee satisfaction, there's potential to augment the efficiency of human resource management, concurrently enhancing consumer confidence and curtailing costs. However, there are still obstacles to applying AI in HR since these systems cannot accurately evaluate intangibles like people's emotions and motivations. Despite the difficulties, AI has the potential to streamline HR processes and free up employees' time. It serves as a crucial tool for evaluating the responsiveness of modern power systems, which are growing in complexity. However, the extensive potential of Robotic Process Automation (RPA) in power system modeling is yet to be fully realized, primarily due to inadequate RPA practices in practical applications. Recognizing methodological pitfalls becomes paramount in reshaping educational programs to facilitate the transition to renewable energy sources. These challenges include skill gaps within the academic energy sector, such as a deficiency in statistical training, the dissemination of best practices and the creation of specialized application examples. This paper aimed to bridge the divide between RPA as a discipline and its application to power system modeling.

This endeavor addresses prevailing misconceptions and drawbacks concerning Sensitivity Analysis (SA). Acknowledging these issues serves as the initial step toward effecting change and steering clear of the risky practice of employing SA techniques for research matters not initially intended for them.

References

1. Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A., Trichina, E.: Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review. Int. J. Hum. Resour. Manag. **33**(6), 1237–1266 (2021). https://doi.org/10.1080/09585192.2020.1871398

2. Charlwood, A., Guenole, N.: Can HR adapt to the paradoxes of artificial intelligence? Hum. Resour. Manag. J. **32**(4), 729–742 (2022). https://doi.org/10.1111/1748-8583.12433

3. Garvin, D. A.: *How Google sold its engineers on management*. Harvard Business Review. https://hbr.org/2013/12/how-google-sold-its-engineers-on-management (2023)

4. Saha, P. Hitachi to launch AI-based wearable device to enhance employee happiness. *HR Katha.* https://www.hrkatha.com/hr-tools/hitachi-to-launch-ai-based-wearable-device-to-enhance-employee-happiness (2016)

5. Guenole, N., Feinzig, S.: The business case for AI in HR. *IBM*. https://www.ibm.com/downloads/cas/A5YLEPBR (2021)

6. Grodek-Szostak, Z., Siguencia, L. O., Szelag-Sikora, A., Marzano, G.: *The impact of industry 4.0 on the labor market*. IEEE Xplore. https://ieeexplore.ieee.org/abstract/document/9259295 (2020)

7. Agence France-Presse.: Interview with a robot: Speaking to Softbank's Pepper. *Gadgets 360*. https://www.gadgets360.com/science/features/interview-with-a-robot-speaking-to-softbanks-pepper-559481 (2014)

8. Press Trust of India. Over 80% of India's workforce considering changing jobs in 2022: LinkedIn. *Business Standard*. https://www.business-standard.com/article/economy-policy/over-80-of-india-s-workforce-considering-changing-jobs-in-2022-linkedin-122011800728_1.html (2022)

9. Spena, T.R., Mele, C., Marzullo, M.: Practising Value Innovation through Artificial Intelligence: The IBM Watson Case. J. Creating Value **5**(1), 11–24 (2018). https://doi.org/10.1177/2394964318805839

10. Rana, G., Khang, A., Sharma, R., Goel, A. K., Dubey, A. K. *Reinventing Manufacturing and Business Processes Through Artificial Intelligence*. CRC Press. https://doi.org/10.1201/9781003145011 (2021)

11. Dastin, J.: Amazon scraps secret AI recruiting tool that showed bias against women. *US* https://www.reuters.com/article/us-amazon-com-jobs-automation-insight-idUSKCN1MK08G (2018)

12. Tambe, P., Cappelli, P., Yakubovich, V.: Artificial intelligence in Human Resources Management: challenges and a path forward. Calif. Manage. Rev. **61**(4), 15–42 (2019). https://doi.org/10.1177/0008125619867910

13. Hmoud, B., Laszlo, V.: Will artificial intelligence take over humanresources recruitment and selection? *Fundatia Română pentru Inteligenta Afacerii* **7**(13):21–30. https://www.ceeol.com/search/article-detail?id=840067 (2019)

14. Qamar, Y., Agrawal, R., Samad, T.A., Jabbour, C.J.C.: When technology meets people: the interplay of artificial intelligence and human resource management. J. Enterp. Inf. Manag. **34**(5), 1339–1370 (2021). https://doi.org/10.1108/jeim-11-2020-0436

15. Mathew, D., Brintha, N.C., Jappes, J.T.W.: Artificial Intelligence Powered Automation for Industry 4.0. In: Nayyar, A., Naved, M., Rameshwar, R. (eds.) New Horizons for Industry 4.0 in

Modern Business. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Cham. https://doi.org/10.1007/978-3-031-20443-2_1 (2023)

16. Johansson, J., Herranen, S.: *The application of Artificial Intelligence (AI) in Human Resource Management: Current state of AI and its impact on the traditional recruitment process* (Master's thesis). https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1322478&dswid=-3243 (2019)

17. Karthick, A.V., Gopalsamy, S.: Role of IoT in Business Sustainability. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_2 (2023)

Effectiveness of Work Life Balance Towards Employee Engagement in Hospitals with Special Reference to Bangalore

K. MeenaDevi, Raja Kamal Ch , G. V. Mrutyunjaya Sharma, and Kumar SubbaAnantha

1 Introduction

In today's competitive business and academic environments, a healthy work-life balance is highly valued. Workers suffer when they have to choose between work and home responsibilities. There have been several investigations on the effects of work-family conflict and family work conflict on the well-being of private and public sector workers. Having a healthy work-life balance means finding a happy medium between the two, Include "lifestyle balance" in your definition of this term. Many individuals now feel overworked and unable to maintain a healthy work-life balance as a result of globalization, downsizing, and flexible work patterns. Urbanization and industrialization are having a profound effect on Indian homes. Healthcare is a people-oriented industry. The difference between living and dying is a key example. Employers in the healthcare industry need to figure out how to attract and retain top employees. These unique difficulties were experienced by healthcare professionals:

(1) Controlling a dwindling supply of medical equipment.
(2) Attempting to meet the ever-growing expectations of patients and employers.
(3) Being financially accountable for one's actions in terms of recompense.
(4) Inconvenient work hours.
(5) Getting along with less sleep than usual.

Because of these issues, hospital administration rethought its approach to work-life balance. That relies on how well the worker balances their professional and personal lives.

K. MeenaDevi · G. V. M. Sharma · K. SubbaAnantha
RNS Institute of Technology, Bangalore, India

R. K. Ch (✉)
Kristu Jayanti College, Bangalore, India
e-mail: Rajakamal@kristujayanti.com

A hospital provides medical treatment by employing doctors, nurses, and technicians to treat patients. Everyone needs access to good healthcare, thus hospitals are crucial. Hospitals are important to the community because they serve as a focal point. Most hospitals have emergency rooms in case of an emergency like a fire, an accident, or a sudden illness. Hospitals with a focus on treating a certain disease kind. Specialized hospitals include those for trauma patients, those with physical disabilities, those caring for the elderly, those caring for children, and those treating patients with mental illness or other conditions. These days, hospitals are often founded and funded by religious organizations, wealthy people, and political leaders. Formerly staffed by religious organizations or volunteers, hospitals are now staffed mostly by professional medical personnel. In addition to emergency care, cardiology, pharmacy, pathology, and radiology, hospitals also house a number of other specialized departments. Employers want someone who can bring unique skills to the table. Healthcare providers should take further measures to protect themselves against the spread of viruses. When sick, most people immediately go to a hospital. The ability to treat patients relies on a healthy hospital personnel. The long hours, standing duty, fast pace, and stress that hospital personnel throughout the globe experience are all real and may have serious consequences on patient care. When caring for others, people may put their own well-being on the back burner. Time with loved ones and mental peace have to take a back seat to the grind. They have to juggle work and family responsibilities since they work in the emergency room on shift. Employees' lives are never in harmony with their job schedules. The healthcare business has the lowest employee engagement of any major industry, which might have an impact on patient care. The involvement of hospital staff is crucial. The research process begins with the construction of a framework using concepts and literature reviews, continues with the analysis, and ends with the formulation of conclusions based on the results of the study. The purpose of this study is to determine how successful work-life balance is.

2 Classifications of Health Care Facilities

Functionality, Size, Location, Ownership, and Specialization all play a role in classifying hospitals. Detailed descriptions of several hospital types and their procedures are provided below.

2.1 Participation of Workers

When employees feel emotionally invested in their work, we say that they are engaged. An engaged workforce forms a permanent link between the firm and its workers. A highly engaged workforce provides confidential feedback on the firm based on employees' perceptions of the workplace. Employee engagement is not the

same thing as employee satisfaction. Even if an employee is first ecstatic with a pay boost or promotion, they may gradually become disengaged. As a result, happiness is a fleeting and ever-evolving state of mind. Satisfaction among workers is difficult to assess deeply. Employees who are happy may nevertheless be disengaged. Employees whose spirits are lifted via meaningful work are more likely to stick around. Engaged workers provide excellent results, whereas satisfied ones just go through the motions. To motivate workers and develop a long-term workforce, businesses should use novel approaches to provide a pleasant and safe workplace, expanding available tools, and decreasing uncertainty. Having invested employees is good for business in many ways, including retention, customer loyalty, and productivity, safety, and bottom line results.

2.2 Increasing Sign-Ups

Today's healthcare workers are under a brighter light than ever before, making it all the more important for hospitals to staff up with individuals who are passionate about promoting a culture of safety and transparency. Quantum has identified three key factors that aid in making employees feels more invested in their firm, which may be used to address the problem of low engagement among medical staff.

2.3 Leadership that is Constant

If the hospital's administration isn't committed to its objective, then neither will the staff. Quantum found that confidence in leadership to set the right direction was the second most important element in determining employee engagement, behind only leaders' commitment to establishing a great work environment. Leadership in the healthcare industry has seen some transition in recent years, from CEOs to nurse supervisors. And when workers' confidence in the dedication of their leaders is shaken, engagement suffers as a result. To prevent this issue, hospitals should track employee turnover rates and inquire about the reasons for and reactions to employee departures. With such information, institutions may develop focused plans to boost retention and sustain high levels of participation.

2.4 A Sense of Being Seen and Appreciated

Medical professionals now bear a disproportionate amount of accountability for their patients' health outcomes. And if their contributions aren't respected and recognized, all the new federal programs might leave them feeling overworked and exhausted.

Whether or not healthcare professionals felt highly appreciated by their organization's leadership was a major influence in employee engagement, according to a poll conducted by Quantum. Many people working in healthcare have lost interest due to rising caseloads and hostile work environments. Clinics should make every effort to halt these tendencies. One other technique to get people invested is to reward them when they succeed and help them learn from their mistakes instead of punishing them [1].

2.5 Contributing to a Worthwhile Cause While Employed by a Thriving Company

When an organization is well-positioned for future success, staff members tend to be more invested in its success. This shift toward value-based care requires strategic planning and long-term thinking on the part of hospital administration. They also need to be honest with workers at all levels about their progress. Without transparency on the performance indicators being used, clinical staff will be less invested in the organization as a whole. The most useful measures take into account physicians' normal procedures while still focusing on patient outcomes.

3 Literature Review

Quantum Workplace, a consulting organization, studied thousands of American workers and discovered that the engagement level of those working in the healthcare industry was among the lowest. Researchers advise promoting a culture of safety and openness to boost employee engagement. Quantum has found three factors that contribute to employee engagement in an effort to address the issue of poor engagement and attrition among hospital workers.

One such article is "Issues in Work Life Balance and its Impact on Employees: A Literature Review" by [2], in which the researchers use a literature review to show that workers face a variety of problems related to their work-life balance. Finally, we want to learn how a healthy work-life balance affects workers in terms of their physical, mental, emotional, social, spiritual, and environmental well-being. A better work-life balance pays off for both individuals and their employers in increased motivation and output, according to the study's authors.

This study used a closed-ended questionnaire using a four-point Likert scale for exploratory purposes. The study's results should serve as a roadmap for other government agencies interested in better comprehending the many factors that contribute to public servants feeling fulfilled in their jobs [3].

The impact of work-life balance as determined by work-family conflict and family-work conflict on the well-being of individuals employed in India's private

sector. Their study was titled "A study of work life balance: Challenges and Solution." Additionally, he concluded that happiness was determined by how one's relationships at home, at the workplace, and with one's self were all doing.

4 Objective of the Study

- To investigate the work-life balance of hospital staff members.
- To investigate the numerous elements that influence workers' satisfaction.
- To find hospital workers' involvement and satisfaction with their work-life balance are connected.

5 Research Design

This study relies on both primary and secondary sources of information. Some study questions have been added to learn how workers feel about their work-life balance [4]. Many questions regarding demographic characteristics and the many elements influencing the work-life balance were included in the questionnaire that was designed. The purpose of this research is to learn more about the work-life balance and employee involvement in Bangalore's hospitals.

Sampling:

Staff members at hospitals in Bangalore, India, were included in the survey. The main data is gathered by a structured questionnaire and a sampling strategy based on convenience.

6 Methodology

Five hundred people were surveyed systematically for this investigation. Convenience sampling, a subset of probability sampling, was employed by the researcher. Staff members who worked in the emergency services (hygiene sector) were prioritized for this study because they were the most accessible, and because convenience sampling is both practical and cost-effective [5].

The aforementioned study used a descriptive research strategy. Primary source material includes interviews and questionnaires. Secondary resources include print and online periodicals, newspapers, and magazines.

Primary and secondary sources were used to compile the data for this analysis. Visiting hospital workers in person was impractical owing to the covid situation, thus primary data was acquired using Google forms of questionnaire and telephone interview. Poor response was expected given the emergency nature of the pandemic era, when 120 questionnaires were dispersed throughout hospital departments. It has

been noted that several staff did not respond to queries. Only 442 employees out of a total sample size of 500 responded to the survey, making data analysis a bit of a challenge. The workers' job and personal lives, as well as their experiences, were used as data in this investigation. We based our conceptual framework on secondary material gathered from a wide range of credible sources, including scholarly journals (both national and international), books, newspapers, magazines, reports, and studies.

6.1 Research Gap of the Study

Until now, researchers had used either primary or secondary sources to perform studies that were both qualitative and quantitative in nature across a wide range of fields. It has been discovered that while researchers have studied the effectiveness [2] of hospital employees' work life balance and their engagement towards working place in banking, IT, pharma, police, education, transportation, and other service sectors, very few have done so for hospitals. When compared to research done in India, the vast majority take place outside. There are hardly any studies conducted in India on the topic of work-life balance for workers. There is need for investigation into what studies of work-life balance can tell us about the influence they have on the engagement of hospital staff.

6.2 Limitation of the Study

Since hospitals are under the umbrella of the emergency services sector, data collection from staff members during the corona period was particularly challenging.

(1) Due to the epidemic, the research was conducted only at a few hospitals in Bangalore.
(2) The small sample size was another constraint that might prevent drawing firm conclusions about the subject.
(3) Throughout that time frame, data collection was restricted to just a subset of hospitals.
(4) Studies might be narrowly focused on unsatisfactory amounts of data.

7 Data Analytics

Tables 1 and 2 resulting calculations demonstrate that 37% of those asked would rather have their child treated at a government hospital than anywhere else. Semi Services are available in government hospitals, and patients often prefer them to private or trust-based facilities.

Table 1 Distribution of respondents by hospital

Type of hospital	No. of respondents	Percentage
Hospitals under trust	58	13
Semi government	124	28
Private hospital	97	22
Government hospital	163	37

Source Primary data

Table 2 Relationship between work life balance and the employee engagement factors

Work life balance	Frequency (N = 442)	Percentage (%)
Work stress	270	61
Job satisfaction	172	39
Attitude	320	72
Job commitment	185	42
Competency	170	39
Target achievement	220	50
Career development	120	27
Rate of absenteeism	150	34
Health issues	260	59
Family and personal time issues	130	29
Shift duties	280	63
Grievances if any	70	16
Excess workload	150	34
Long working hours	160	36
Uncooperative supervisor	90	20
Technology adopted in hospital	310	70
Culture of working place	110	25

Source Primary data

8   Employee Engagement is Related to Work-Life Balance

The questionnaire was designed and answers were gathered to determine the connection between work-life balance and employee engagement elements. Correlational analysis was utilized to establish a causal link between WLB and enthusiastic participation in the workplace. The table above showed how the various variables of employee engagement correlated with work-life balance. When work stress is high, absenteeism is high; when it's low, absenteeism goes down; and when it's low, factors like job satisfaction, commitment, competency, and career development go up, all of which contribute to a more fulfilling life and, ultimately, a more engaged workforce.

9 Findings

The report suggests hospital personnel have poor work-life balance. All but a few responders couldn't balance work and life. The exception is unmarried hospital employees who balance work and life. Work-life balance improves culture, job happiness, employee attitude, competence, career growth, health, work stress, absenteeism, and attrition.

Except for joint family, married women in hospitals have a rigid schedule with changing shifts and home duties. Singles may handle workplace pressure, long hours, and stress better than married ones.

Hospital mistakes increase due to anxious staff who can't balance work and life. Eg. Harmful to patient treatment. Work pressure, shift work, health difficulties, reduced family time, and sickness may cause job loss or disengagement from long hours. Studies show hospital staff may skip social events due to time constraints. Hospital staff must additionally pay for kid and old parent care, child school tuition, medical leave for themselves, spouse medical facilities or insurance, drop-off and pick-up facilities, canteens, and more. Family works for everyone. Family problems, demonization, efficiency loss, and disengagement arise from ignoring this.

Unlike other industries, doctors, nurses, lab technicians, medical representatives, and siblings cannot work from home. Sanitizing medical facility supervisors or helpers. They must take the patient to the hospital for the greatest care. Leave regulations are ambiguous except in few hospitals. Each hospital staff should be rewarded and promoted for exceptional performance. This will improve morale, turnover, staff participation, and hospital goodwill. Few commercial and government entities employ cutting-edge medical technologies and are ready to provide training to the employees with the help of which the critical patient get immediate cure. The study's limits brought on by a lack of resources or a limited sample size. According to the current study, organizations will be able to establish and execute work-life balance policies with the aid of employee-driven solutions. On the job front, it will assist to cut back on overtime, stress, and workloads, while on the home front, it will help to boost flexibility and family and leisure time. Organizations must take the WLB challenge seriously since it has an impact on both their personal and professional performance. Organizations should have the welfare of their workers and their pleasure as their top priorities.

10 Recommendations

- Most employees believe there is an imbalance in their wellness, thus hospital management must create conducive culture to overcome this issue.
- Since difficulties will be everywhere, they should handle as much as possible individually.

- Long working hours are bad for staff and patients, thus hospital management should shorten them and rotate shifts.
- There must be workplace stress reduction options, so the policy will lessen tension, weariness, and reluctance and they will cheerfully serve the patient.
- Employees should also have family support to help them work effectively and cheerfully, which boosts morale and engagement.

11 Conclusions

The topics of work-life balance and employee involvement are explored in this article. According to the findings, a better work-life balance leads to more enthusiastic employees. The workforce between the ages of 30 and 40 is the happiest and most successful age group. People who work shifts are under greater pressure than those who don't. Working long hours and/or on shift disrupts employees' personal life, which in turn hinders their productivity and even poses health risks. Normal job is challenging since individuals are having trouble keeping their lives together. Working from home is not an option in the healthcare industry because of the urgent requirement to provide quality patient care. To improve hospital engagement, researchers recommend healthcare organizations prioritize their policies and take corrective steps to make staff happy on the job.

References

1. Ganapathy, D., Deepak, S.: A study on reskilling and networking on Linkedin on employee recruitment success and career advancement. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_29 (2023)
2. Kokila, M. S., Chandra, S., (2023). A study on career choice as entrepreneurs among undergraduate students in Bangalore. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R. E. (eds.) Digitalisation: opportunities and challenges for business. ICBT 2022. lecture notes in networks and systems, vol. 620. Springer, Cham. https://doi.org/10.1007/978-3-031-26953-0_23 (2023)
3. Preethi, S. J. G., Verma, K. R.: (2023). An overview of pay disparity and gender gap among selective IT employees in urban Bangalore. In: Aloysius Edward, J., Jaheer Mukthar, K. P., Asis, E. R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_22 (2023)
4. Kishore, N.: The impact of marital status on female labour force participation rate—a study on Bangalore city. In: Aloysius Edward, J., Jaheer Mukthar, K. P., Asis, E. R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_5 (2023)
5. Meenadevi, K., Mruthyunjaya Sharma, G. V., Archana, J. R., Kumar S. A.: Work habits based on agile methodology: metrics and procedures. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R. E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023)

Consumption Patterns Among Employees of IT and ITES Sectors

Devarajanayaka Kalenahalli Muniyanayaka, Naveen Pol, Syed Kazim, K. P. Jaheer Mukthar, Kotigari Reddi Swaroop, and Ravi Shankar Bhakat

1 Introduction

1.1 Information Age and Work

Human society has undergone various stages of development, each characterized by different struggles and accomplishments. Three types of society have emerged based on their nature: agricultural, industrial, and information society. Throughout history, information has been a vital component in each of these ages, though the type of information needed has varied. Today, we are in the information age where information is at the core of everything—it is the primary source, the transforming resource (through computers and communications technology), the intellectual technology, and the strategic resource through knowledge [1].

D. K. Muniyanayaka
University of Buraimi, Sultanate of Oman, Muscat, Oman

N. Pol
AISBR College, Bengaluru, India

S. Kazim
CMS Business School, JAIN (Deemed-to-Be University), Bengaluru, India

K. P. Jaheer Mukthar (✉)
Kristu Jayanti College (Autonomous), Bengaluru, India
e-mail: jaheer@kristujayanti.com

K. R. Swaroop · R. S. Bhakat
NMIMS Deemed to Be University, Hyderabad Campus, Hyderabad, India

R. S. Bhakat
MDI Murshidabad, Murshidabad, India

1.2 IT Industry in India

The IT industry in India has undergone tremendous growth over the past few decades and has become a major contributor to the country's economy. The industry began its journey in the early 1990s and has since grown rapidly, with companies offering a range of services from software development to business process outsourcing. Today, India is a leading global IT outsourcing destination, with companies from across the world seeking its services. The industry has also played a crucial role in generating employment opportunities, particularly for the country's large pool of skilled workforce.

1.3 IT Industry in Bengaluru

Bengaluru, also known as the Silicon Valley of India, is home to one of the most thriving and innovative IT industries in the world. The city is a hub for numerous global tech companies, including IBM, Microsoft, Oracle, and Google, which have set up their headquarters or development centers in the city. The availability of a skilled workforce, favorable government policies, and a strong startup ecosystem have contributed to the growth and success of the IT industry in Bangalore.

1.4 Characteristics of IT Labour Market

The IT labor market is characterized by several unique features. One of the most notable features is the constant demand for skilled and experienced professionals due to the dynamic nature of the industry. The demand for IT professionals is not limited to any particular sector, with opportunities available in areas such as software development, cybersecurity, data analytics, cloud computing, and more.

1.5 Consumerism

Consumerism is a social and economic phenomenon that emphasizes the acquisition and consumption of goods and services as a means of achieving personal satisfaction and fulfillment. It is driven by the belief that material possessions and the latest consumer products are essential to a person's social status and identity. In consumerism, people tend to place high value on material things, including brand names, luxury items, and the latest technology gadgets, and often engage in conspicuous consumption to display their wealth and status.

1.6 Consumerism in India

Consumerism in India has undergone a significant transformation over the past few decades. With the growth of the middle class and the liberalization of the economy, consumerism has become a prominent aspect of Indian culture and lifestyle. The rise of e-commerce platforms and the availability of affordable consumer goods have also contributed to the growth of consumerism in India.

1.7 Paper Structure

The research paper comprises 5 chapters. Introduction, review of literature, research methodology, analysis & interpretation and discussion & conclusion.

2 Review of Literature

The IT employees were also called cyber collies. They were called so because of their workload, which also led to an imbalance in their work life and that is when people, employees, and researchers started talking about work-life balance among IT employees. Most of the employees were ready to sacrifice their personal life and social life as they had high-paying jobs. If they would compromise on their work, they would lose their job or they would not get the desired appraisal. The IT companies were also created with such high amenities and facilities, that the employees should feel at ease while they are at the office. Reports have shown that IT employees are exhausted from their work. It is stated that a 2-day week break is not enough, but they need a three-day week break to overcome the week's work hangover [2].

The IT industry has emerged as a ray of hope for a middleman. The IT industry is the best thing that has happened to India since LPG was implemented in India. The IT industry has come as a great help for the middle class as it provided a great opportunity to work and a platform to improve their income significantly. As they have a high income, many people also feel that software engineers or IT employees are overpaid. This overpay is making them greedier and more materialistic [3].

Due to IT companies, many youths have traveled and moved to metro cities as they have great job opportunities in the field of IT. As IT employees are highly paid, they are looking to lead a much more comfortable life and a better standard of living. The IT employees want to spend their money to purchase a flat, go on regular trips in India and abroad, have a costly private education, have a lavish wedding, etc. [3].

When a foreign company comes to India, they don't only get their business, but they also get their company's culture along with it. The company and the employees are not very much concerned about the environment in which they are working and the impact it is going to create on society and the country at large. Due to the work

culture in the IT industry, the middle class has witnessed a cultural transformation as well. Due to this taste, preference, needs, wants, and overall consumption pattern has been impacted [4].

Households who received money from about tend to spend less money on food items and more money on consumer durables, this is in comparison with households who do not receive any kind of money from other countries. Thus, receiving money from family members who are working abroad, does not have any significant impact on the consumer of individuals and family members. It is the income of the family-earning members, which would generally determine how they would spend the money [1].

Advertisements play a significant role in positioning the product. If the product is positioned as a very unique and royal product, it might find more buyers. Some of the other factors which trigger the design among the people to purchase the product are the initial knowledge and awareness about the product, demand for the product, supply of the product, branding, and positioning of the product, which are some of the major elements which contribute towards sales and success of the product [5].

3 Research Methodology

3.1 Objectives

1. To study the consumption pattern of IT employees in Bengaluru.
2. To recognize the major factors of consumerism among the IT employees in Bengaluru.
3. To evaluate the consumer pattern of IT employees in Bengaluru based on the demographic details.
4. To assess the impact of advertisements on the consumerism of IT employees in Bengaluru.

3.2 Hypothesis

H0 = IT employees check the price of the product before purchasing

H0 = IT employees who have high-income purchase expensive products to enhance their social status

H0 = Use of credit or debit card is high among male IT employees for purchase

H0 = Shopping during the off-season is high among female IT employees

H0 = IT employees take a loan to purchase various products

H0 = Advertisements have a positive impact on the overspending of IT employees

3.3   Research Design

In order to conduct this study, a descriptive study was employed. The study was based on the consumption pattern of IT employees in Bengaluru. A quantitative technique was adopted to conduct the study.

A well-organized questionnaire was used to collect the primary data from respondents. A closed-ended questionnaire was used to collect information. Section one had demographic details, section two had questions about consumption patterns and section three was about consumerism and the fourth section was about the influence of advertisements on customers and consumers. A pilot study was carried out to check the validity of the study.

Data was collected from all the eight major IT parks in Bengaluru. They are ITPL, Bagmane Tech Park, Manyata Embassy Business Park, RMZ Infinity, Mind Comp Tech Park, Electronic City Tech Park, Ecospace Business Park, Kalyani Tech Park, Kirloskar Business Park, and Global Village Tech Park. The sample size was 1000, taking 100 respondents from each IT park. After the data was collected, the IBM SPSS software used employed to conduct the analysis.

Secondary data was also used for the study. The data was collected from various reports published by NASSCOM, various articles in the newspapers, research articles in journals, books, and articles in various business and IT magazines.

The study also had a number of limitations. The study was only restricted to major IT parks in Bengaluru. The study was conducted in a short span of time. The study was only limited to two major aspects, i.e., consumption and consumerism.

4   Analysis and Interpretation

4.1   Personal Profile of the Respondents

Chi-square was used to analyze the preference of the IT employees (Tables 1, 2, 3, 4, 5, 6, 7, and 8). As shown in Table 9, most IT employees spend their money on buying clothes, electronic gadgets, and food products and they purchase these not to satisfy their basic needs but to fulfill their desire.

Chi-square was used for the analysis. As shown in Table 10, the Chi-square value was at 126.56, P < 0.01. Most IT employees go shopping on a weekly basis or

Table 1   Gender

Gender	Frequency	Percentage
Male	500	50
Female	500	50
Total	1000	100

Source Primary data

Table 2 Native place

Native place	Frequency	Percentage
Karnataka	200	20
North India and North East	400	40
Other South Indian States	400	40
Total	1000	100

Source Primary data

Table 3 IT park

IT park	Frequency	Percentage
ITPL	100	10
Bagmane tech park	100	10
Manyata embassy business park	100	10
RMZ infinity	100	10
Mind comp tech park	100	10
Electronic city tech park	100	10
Ecospace business park	100	10
Kalyani tech park	100	10
Kirloskar business park	100	10
Global village tech park	100	10
Total	1000	100

Source Primary data

Table 4 Religion

Religion	Frequency	Percentage
Hindu	590	59
Muslim	200	20
Christians	150	15
Others	60	6
Total	1000	100

Source Primary data

Table 5 Marital status

Marital status	Frequency	Percentage
Married	620	62
Unmarried	365	36.5
Widow	10	1
Divorced	5	0.5
Total	1000	100

Source Primary data

Table 6 Monthly income

Monthly income	Frequency	Percentage
Less than Rs. 25,000	20	2
Between Rs. 25,001 and Rs. 50,000	520	52
Between Rs. 50,001 and Rs. 75,000	320	32
Between Rs. 75,001 and Rs. 100,000	100	10
Above Rs. 100,000	40	4
Total	1000	100

Source Primary data

Table 7 Experience

Experience	Frequency	Percentage
Less than 5 years	327	32.7
5.1–10 years	324	32.4
10–20 years	224	22.4
20 years and above	125	12.5
Total	1000	100

Table 8 Family members

Family members	Frequency	Percentage
1–3 members	750	75
4–6 members	325	32.5
7 members and above	25	2.5
Total	1000	100

Source Primary data

Table 9 Buying preferences

Buying preferences	Yes	No	Chi-square	P
Clothes	702	298	65.61	0.000**
Cosmetics	260	740	92.16	0.000**
Electronics	578	422	9.61	0.002**
Food	628	372	26.01	0.000**
Jewellery	335	665	43.56	0.000**
Automobiles	192	808	151.29	0.000**

**Level of significance $= P < 0.01$
Source Primary data

Table 10 Frequency of shopping

Frequency of shopping	Frequency	Percentage
Once a week	500	50
Once a month	200	20
Once in three months	175	17.5
Once in six months	125	12.5
Total	1000	100

Chi-square $= 126.56$ **Level of significance $= P < 0.01$ $P = 0.000$**
Source Primary data

on a monthly basis. The IT employees want to shop as they see it as an act of entertainment, time pass, and also acts as a stress buster. Most of the IT employees prefer to do shopping in malls. They only shop from nearby stores when they are in urgent need of anything.

4.2 Hypothesis

4.2.1 Seeing the Price of the Product Before Purchase

$H0 = IT$ employees check the price of the product before purchasing.

As shown in Table 11, 68% of the respondents checked the price of the product and 32% did not check the price of the product before purchasing. A Chi-square test was applied and the test was significant at (0.05) 5% level. The chi-square value is 5.157a and degree of freedom is 1, level of significance is 0.025. Here $P < 0.05$ and these two variables are associated with each other and it is clear that IT employees are interested and then check the price of the product before they could purchase it. Thus, the null hypothesis is accepted and the alternative hypothesis is rejected.

Table 11 Seeing the price of the product before purchase

Options	Response	Percentage
Yes	680	68
No	320	32
Total	1000	100
Pearson Chi-square $= 5.157a$	Degree of freedom $= 1$	Level of significance $= 0.025$

Source Primary data

4.2.2 Purchase Expensive Products to Enhance Social Status

H0 = IT employees who have high-income purchase expensive products to enhance their social status.

As shown in Table 12, 67% of the respondents with an income of less than Rs. 25,000 per month do not purchase expensive items to enhance their status. 60% of the respondents with an income between Rs. 25,001 and Rs. 50,000 do not purchase expensive items to enhance their status. 56% of the respondents with an income between Rs. 50,001 and Rs. 75,000 purchase expensive items to enhance their status. 61% of the respondents with an income between Rs. 75,001 and Rs. 100,000 purchase expensive items to enhance their status. 79% of the respondents with an income of above Rs. 100,000 purchase expensive items to enhance their status.

Chi-square test was applied and the test was significant at a 5% level (0.05). The calculated chi-square test value is 27.844a and the degree of freedom is 4 and the level of significance is 0.000. Here the $P < 0.05$. This means these two variables are associated with each other. Thus, the null hypothesis is accepted and the alternative hypothesis is rejected. Thus, IT employees who have high-income purchase expensive products to enhance their social status. People with high incomes respond to more luxurious products and extravagant spending. The theory of Bourdieu also speaks about the same aspect where they are concerned about establishing, their social identity through the use of various goods.

Table 12 Purchase expensive products to enhance social status

Options	Yes	No	Total
Less than Rs. 25,000	35	70	105
	33%	67%	100%
Between Rs. 25,001 and Rs. 50,000	95	140	235
	40%	60%	100%
Between Rs. 50,001 and Rs. 75,000	175	140	315
	56%	44%	100%
Between Rs. 75,001 and Rs. 100,000	140	87	227
	61%	39%	100%
Above Rs. 100,000	93	25	118
	79%	21%	100%
Total	538	462	1000
	55%		100%
Pearson Chi-Square = 27.844a	Degree of freedom = 4	Level of significance = 0.000	

Source Primary data

Table 13 Using of credit or debit cards to purchase by male employees

Gender	Mode of payment			
	UPI	Cash	Debit/credit card	Total
Male	28	150	322	565
	5.5%	30%	64.5%	100%
Female	25	291	232	548
	5%	48.5%	46.5%	100%
Total	53	392	555	1000
	5.3%	39.3%	55.5%	100%
Pearson chi square = 13.716a	Degree of freedom = 2		Level of significance = 0.001	

Source Primary data

4.2.3 Using of Credit or Debit Cards to Purchase by Male Employees

H0 = Use of credit or debit card is high among male IT employees for purchase.

As shown in Table 13, 64.5% of the male employees use a Debit/Credit Card to purchase their goods and services. 46.5% of the female employees use a Debit/Credit Card to purchase their goods and services. The chi-square test was applied and the test was significant at a 05 (5%) level. The Pearson Chi-square value is 13.716a and the degree of freedom is 2, the level of Significance is 0.001. Since $P < 0.05$, there is a significant difference was noticed between gender and normal mode of purchase. Thus, the null hypothesis is accepted and the alternative hypothesis is rejected. Thus, the use of credit or debit card is high among male IT employees when they want to purchase certain goods or services.

4.2.4 Off-Season Purchase by Females

H0 = Shopping during the off-season is high among female IT employees.

As shown in Table 14, 67% of the male IT employees do shopping during the off-season. 80% of the female IT employees do not do shopping during the off-season. The chi-square test was applied and the test was significant at a 5% (0.05) level. The chi-square value is 7.404a and the degree of freedom was 1, the level of significance is 0.007. The $P < 0.05$ and means that these variables are associated with each other. Thus, the null hypothesis is accepted and the alternative hypothesis is rejected. Thus, shopping during the off-season is high among female IT employees.

4.2.5 Take a Loan to Purchase Products

H0 = IT employees take a loan to purchase various products.

Table 14 Off-season purchase by females

Gender	Off season purchase		
	Yes	No	Total
Male	338	162	500
	67%	33%	100%
Female	398	102	500
	80%	20%	100%
Total	736	264	1000
	74%	26%	100%
Pearson chi square = 7.404 a	Degree of freedom = 2	Level of Significance = 0.007	

Source Primary data

As shown in Table 15, 81% of IT employees with an income of less than Rs. 25,000 do not take loans to purchase products. 71.3% of IT employees with an income between the income of Rs. 25,001 to Rs. 50,000 do not take loans to purchase products. 59.5% of the IT employees between the income of Rs. 50,001 to Rs. 75,000 do take a loan to purchase products. 53.8% of IT employees between the income of Rs. 75,001 to Rs. 100,000 take loans to purchase products. 55.3% of IT employees with an income above Rs. 100,000, do not take loans to purchase products.

The Chi-square test was applied and the test was significant at a 5% level (0.05). The calculated chi-square value is 18.692a and the degree of freedom is 4 and the

Table 15 Take a loan to purchase products

Options	Yes	No	Total
Less than Rs. 25,000	20	85	105
	19%	81%	100%
Between Rs. 25,001 and Rs. 50,000	68	167	235
	28.7%	71.3%	100%
Between Rs. 50,001 and Rs. 75,000	128	187	315
	40.5%	59.5%	100%
Between Rs. 75,001 and Rs. 100,000	105	122	227
	46.2%	53.8%	100%
Above Rs. 100,000	65	53	118
	55.3%	44.7%	100%
Total	386	614	1000
	38.5%	61.5%	100%
Pearson Chi-square = 18.692a	Degree of freedom = 4	Level of significance = 0.001	

Source Primary data

Table 16 Advertisements impacting overspending

Advertisements	Habit of overspending		
	Yes	No	Total
Influence of ads	410	205	615
	66.7%	33.3%	100%
Non-influence of ads	185	200	385
	48.1%	51.9%	100%
Total	595	405	1000
	59.5%	40.5%	100%
Pearson chi square = 12.520a	Degree of freedom = 1	Level of significance = 0.000	

Source Primary data

level of significance is 0.001. Thus, the null hypothesis is accepted and the alternative hypothesis is rejected. Thus, IT employees take a loan to purchase various products. Employees with high incomes are more interested to purchase products that are more expensive and luxurious in nature. Thus, they require more money, which they don't have due to which they end up taking loans.

4.2.6 Advertisements Impacting Overspending

H0 = Advertisements have a positive impact on the overspending of IT employees.

As shown in Table 16, 66.7% of IT employees state that advertisements influence them to overspend. 51.9% of IT employees state that advertisements do not influence them to overspend. The Chi-square test was applied and the test was significant at a 5% level (0.05). The calculated chi-square value is 12.520a and the degree of freedom is 1 and the level of significance is 0.000. Here the $P < 0.05$ and these two variables were associated with each other. Thus, the null hypothesis is accepted and the alternative hypothesis is rejected. Thus, advertisements have a positive impact on the overspending of IT employees.

5 Discussion and Conclusion

IT companies are mainly trying to attract youth into the fold of style, glamour, and popular culture. They want to focus on youth as they are soft targets and they have a pretty good purchasing power, especially in urban cities. The majority of the youth are looking forward to becoming IT/software engineers as they feel that they will be able to earn good money just with a bachelor's degree. They also feel that software engineering is a high-paying job when compared to other professions.

The IT employees indulge in consumption as it gives them a sense of satisfaction. They feel nothing wrong with buying more and more products as they have the rationality to prove behind what they do. The impact of advertisements is also a significant factor as to why they buy so many products, which also impacts their choice. The advertisements also impacted the IT employees to only buy and use branded products, as it would add value to their self-esteem and they would be able to create a better image and reputation with their colleagues.

As the IT employees did shopping on a regular basis they preferred debit cards, credit cards, or UPI payments. They avoid keeping a huge amount of hard cash with them. They mainly purchased various food products, snacks, clothes, and electronic gadgets like smartphones and laptops. They also used these electronic devices for official work, so they would purchase the latest product in the market.

Shopping has emerged as a technique to overcome the stress that they face on a regular basis during work. For IT employees, their prestige and status with their colleagues would play a significant role, thus they want to purchase costly clothes, electronic gadgets, footwear, and all other things which they need and which they do not need. They also believe that expensive products add to their status. They mainly buy products that are in trend, which catch the eye of people, and which would be in fashion.

Other than income, the gender of IT employees has a significant impact on consumption patterns. Both males and females indulge in spending. Male employees spend more money on electronic gadgets and women spend more money on cosmetics. IT employees with higher incomes were more interested in purchasing a house or a flat by taking a loan from the bank. The availability of the products and shopping facilities like malls in certain locations would also have a significant impact on their purchase. The consumption pattern also varies based on the culture and religion of the IT employees.

The government should also take strong action against misleading advertisements and advertisements with false or vague claims. Companies with unethical advertisements should be fined and penalized and the government should also go to the extent of banning them if they are found to be guilty. The government should especially focus on the youth about their outlook and perception of life, with the help of awareness campaigns, which could ultimately help in controlling consumerism and reducing carbon footprints.

Consumerism might give pleasure to individuals, profit to companies, and tax to the government, but in the long run, it is not a sustainable development model. It has a negative impact on the environment. The aspect of is environment is not taken into consideration in the study, but various students have shown the grave impact consumerism is having on society. Thus, the government should plan and take the necessary steps on how it can be controlled.

6 Further Scope for Research

With respect to the study, further research avenues could include delving into the psychological factors shaping the link between consumerism and identity, exploring regional variations in consumption patterns, assessing the environmental impact of excessive consumption, and examining ethical and social responsibility dimensions.

References

1. Firat, A.: Consumption, consumer culture and consumer society. J. Commun. Soc. Pract. **13**(1), 183–203 (2013)
2. Moor, J.E.: One road to turnover: an examination of work exhaustion in technology professionals. Manag. Inf. Syst. Q. **24**(1), 141–168 (2000)
3. Fuller, C.J., Narasimhan, H.: Information technology professionals and the new-rich middle Class in Chennai (Madras). Mod. Asian Stud. **41**, 121–151 (2007)
4. Lange, H., Meier, L.: The new middle classes: globalizing lifestyles, consumerism, and environmental concern. Springer publishers, Dorchecht (2009)
5. Bhuian, S. N.: Consumerism in the Middle East: the case of Saudi Arabia. In: A. K. Manrai (eds.) Global Perspective in Marketing for the 21st century: Proceedings of 1999 World Marketing Conference 93–95 (1999)

Logistics Technology and Quality Management

User Behavior and Emotional Responses in Social Media Avatar: Exploring Empathy, Attitudes, and Social Norms

A. Pushpa ⬤**, C. Nagadeepa** ⬤**, K. P. Jaheer Mukthar** ⬤**,**
Oklander Mykhailo ⬤**, Oklander Ihor** ⬤**, and Rakytska Svitlana** ⬤

1 Introduction

In the modern digital era, social media platforms have revolutionized the way individuals communicate, interact, and express themselves. One of the intriguing aspects of this paradigm shift is the introduction and proliferation of avatars—digital representations or personas that individuals adopt in their virtual interactions. An avatar is a digital representation of a user in a virtual environment or digital platform. It serves as a visual and often interactive embodiment of the user, allowing them to engage with various online spaces, such as virtual worlds, social media platforms, video games, and other online communities [1]. Avatars can take many forms, from realistic human likenesses to imaginative creatures, and they play a significant role in shaping online interactions and experiences.

As social media continues to shape our social landscapes, understanding how users behave and emotionally respond within these avatars' contexts has become a critical area of research. This study delves into the multifaceted dynamics of user behavior and emotional responses within social media avatars, with a specific focus on empathy, attitudes, and the influence of social norms. The allure of avatars lies in their capacity to grant users newfound freedoms of self-presentation and identity expression. Online platforms allow individuals to craft avatars that can embody ideals, alter egos, or even entirely fictional identities, diverging from their real-world selves. This discrepancy between the virtual and physical self opens avenues for exploring how users perceive and engage with empathy—the ability to understand

A. Pushpa · C. Nagadeepa (✉) · K. P. Jaheer Mukthar
Kristu Jayanti College (Autonomous), Bengaluru, Karnataka, India
e-mail: cnagadeepa@gmail.com

O. Mykhailo
Odessa Polytechnic National University, Odesa, Ukraine

O. Ihor · R. Svitlana
Odessa State Academy of Civil Engineering and Architecture, Odesa, Ukraine

and share the feelings of others—within the context of avatars. Understanding how empathetic responses manifest in avatar-mediated interactions contributes to a deeper comprehension of how technology reshapes human emotional connections.

Attitudes, both towards others and oneself, play a pivotal role in shaping online interactions. Avatars serve as canvases upon which users project their attitudes, reflecting not only how they view themselves but also how they perceive their peers and the digital environment. Exploring the linkage between avatar-mediated attitudes and user behavior can shed light on the mechanisms driving online engagements, leading to insights into the formation of online communities, social hierarchies, and the propagation of digital narratives.

Likewise, the influence of social norms in avatar-mediated interactions is a compelling facet of online behavior. While avatars can grant anonymity, users still operate within the framework of broader societal norms and expectations, albeit with potential alterations due to the digital realm's unique characteristics. Investigating how users conform to, deviate from, or transform social norms within avatar contexts unveils the intricate interplay between virtual and real-world norms and how they shape digital social dynamics.

This study embarks on a comprehensive exploration of the intricate interrelationships between user behavior, emotional responses, empathy, attitudes, and social norms in the realm of social media avatars. By researching into these dimensions, we seek to unravel the mechanisms that underlie online interactions, the factors that drive engagement and disengagement, and the implications for individuals' emotional well-being. Through a combination of qualitative and quantitative methodologies, this research aims to provide a nuanced understanding of how users navigate the complex landscape of avatars, offering insights that are valuable for both academia and the design of future online platforms.

The research paper follows a structured flow, beginning with an introduction that highlights the significance of the Metaverse and its interplay with avatar-driven environments. A comprehensive literature review enquires into theories surrounding avatars, virtual interactions, and user behavior, while the theoretical background section establishes the foundation for the study's conceptual framework. Research questions and hypotheses are presented, guiding the investigation into the patterns and trends arising from demographic variables, user behavior, and emotional responses within the combined context of the avatar-driven social platforms. The research methodology outlines the chosen approach, population, sampling, and data collection. Subsequently, the data analysis and interpretation section analyzes collected data and draws conclusions, leading into discussions on limitations and avenues for future research. Finally, the conclusion reiterates key findings and their implications, solidifying the contribution of the study to the understanding of user dynamics in this evolving digital landscape.

2 Related Work Social Media Avatar: The Current Landscape

The investigation of user behavior and emotional responses within social media avatars necessitates a comprehensive review of existing literature in related fields. This section examines key themes, concepts, and findings from prior research that contribute to the understanding of empathy, attitudes, social norms, and digital interactions. Previous research has predominantly unfolded within virtual realms, wherein avatars stand as digital representations guiding users through three-dimensional landscapes. The concept of avatars dates back to early computer games and virtual communities, where users would select or create characters to navigate and interact within digital spaces [2]. Over time, avatars have evolved to become more sophisticated, dynamic, and customizable, reflecting advancements in technology and user expectations. Today, avatars are central to the immersive nature of virtual reality (VR), augmented reality (AR) [3].

Avatars are widely in usage as they have multifaceted roles- enabling creative self-expression through customizable appearances and personalities; facilitating virtual social interactions akin to real-life engagements; enhancing immersion in VR and AR by embodying users in the digital environment; playing a central role in gaming, empowering players in narrative shaping; representing users on social media platforms, fostering connections and discussions; acting as a canvas for identity experimentation; and eliciting emotions and empathy, forging meaningful virtual connections. While interactions may eventually lead to the development of friendships, initial communication often transpires among individuals who were previously unfamiliar to each other. In a more contemporary context, avatars have found integration within social media platforms. Individuals utilizing prevalent social networking platforms such as Facebook, Snapchat, Instagram, and WhatsApp engage with these sites to either revive connections with past acquaintances or cultivate ongoing friendships [4]. Scholars have dissected the societal consequences of avatars by exploring how individuals handle self-representation within this emerging medium, as well as the degree to which an avatar's visual attributes can influence digital interactions [5]. The visualization of avatars holds the potential to influence individuals' actions and perspectives within digital settings [6]. Utilizing an avatar to engage in actions has the capacity to impact real-world behavior and induce behavioral transformations [7]. Consumers with less expertise or familiarity are more prone to form unfavorable assessments of human-like avatars [8]. A positive link was identified between technology familiarity and the overall attitude toward avatars.

Empathy in online interactions involves the capacity of individuals to understand, share, and respond to the emotions and experiences of others within digital platforms. It encompasses the ability to convey compassion, emotional support, and connection despite the limitations of mediated communication channels. Empathy can be fostered in online interactions [9, 10]. Avatars, as digital representations, have been found to influence users' empathy levels, with some research suggesting that anonymity provided by avatars may lead to reduced emotional inhibition [11].

Avatars facilitate experimentation with self-presentation and identity projection [12]. Avatars have been identified as vehicles for attitude expression, enabling users to portray attitudes and values that might differ from their offline persona [13].

Attitude refers to how an individual's opinions, beliefs, and evaluations influence their actions, choices, and engagement with a particular technology or platform. It involves the alignment between one's attitudes and their actual usage patterns, reflecting the impact of personal preferences and perceptions on their behavior. Avatars have been identified as vehicles for attitude expression, enabling users to portray attitudes and values that might differ from their offline persona [13].

Social norms within online communities refer to the unwritten rules, behaviors, and expectations that guide interactions and influence the conduct of members within digital platforms. These norms develop through shared experiences and serve as the framework for acceptable behavior, communication styles, and community engagement. The dynamics of social norms in online communities have been a subject of comprehensive investigation [14]. Avatars can influence users' conformity to group norms, leading to the emergence of unique online social norms within digital spaces [15].

As the digital landscape evolves, researchers increasingly acknowledge the multidimensional impact of avatars on user interactions, empathy, attitudes, social norms, and emotional experiences. The synthesis of existing literature provides a foundation for understanding the complexities of user behavior in avatar-mediated contexts, thereby informing the current study's research objectives and questions. Studies demonstrate that Limited scholarly exploration has been undertaken to investigate the factors impacting user's behavior and emotional responses.

3   Research Questions and Objectives

As the digital landscape continues to evolve, this research provides timely insights into the evolving nature of human interaction in the digital age, making valuable contributions to various academic disciplines and addressing the challenges and opportunities presented by these emerging communication paradigms. This study is relevant because it investigates the complex interplay between empathy, attitudes, social norms on user behavior, and emotional responses while interacting with social media platforms. The present study aimed to comprehend the subsequent inquiries. Does empathy, attitude and social norm govern interactions within avatar-based contexts as they engage virtually? And To what extent does empathy, attitude and social norm manifest in avatar-mediated interactions, and how does it stimulus behavior and emotions of users?

Based on the above research questions the following two objectives are framed.

1. To examine the influence of empathy, attitudes, and social norms on interactions within avatar-based contexts during virtual engagements.

2. To investigate the manifestation of empathy, attitudes, and social norms in avatar-mediated interactions and their potential impact on users' behaviors and emotional responses.

4 Research Methodology

This study employs a quantitative research approach to explore the interaction between empathy, attitudes, social norms, behavior, and emotional experiences within avatar-mediated interactions. The research involved surveying a sample of 300 participants from diverse demographic backgrounds through probability convenience sampling method to recruit participants. A structured online survey consisting of validated scales and items was used through a survey method to gather data on participants' demographic profile and levels of empathy, attitudes, adherence to social norms, avatar-based behaviors, and emotional experiences during virtual interactions through various digital platforms. Quantitative data was analyzed using descriptive statistics to provide an overview of participants' responses and inferential statistics—SEM analysis to show the relationship between empathy, attitudes, and adherence to social norms, avatar-based behaviors, and emotional experiences.

5 Data Analysis and Interpretation

The demographic analysis provides crucial insights into the characteristics of the study participants. By examining factors such as age, gender, and engagement patterns, this analysis contextualizes the research findings within specific user groups. Understanding the demographic profile enhances the comprehension of user behavior and emotional responses within the context of the study's focus.

Table 1 presents the comprehensive profile of avatar users based on their demographic characteristics and engagement patterns. The distribution of participants across different age groups demonstrates a notable presence of young adults, with the 18–24 age group being the most prominent (35%). Gender distribution reveals a majority of male participants (57%), indicating a gender imbalance in avatar engagement. Regarding frequency of avatar use, participants exhibit varying levels of engagement, with 66% reporting using avatars either very often or sometimes. An examination of social media platform preferences highlights a diversified landscape, where Facebook, Instagram, and Twitter are more widely embraced, while platforms like TikTok, Snapchat, and WhatsApp contribute to a substantial portion of users' engagement (46% combined). Additionally, avatar customization habits reflect a diverse range of approaches, with 46% dedicating some degree of time to personalize their avatars, while 54% allocate minimal or no time. These insights provide a comprehensive understanding of avatar users' profiles and engagement dynamics,

Table 1 Avatar users profile: demographic information

Demographic info	Group	Percentile
Age	Under 18	14
	18–24	35
	25–34	27
	35–44	12
	45–54	9
	55 and above	3
Gender	Male	57
	Female	43
Frequency of avatar use	Very often	27
	Sometimes	39
	Rarely	22
	Never	12
Social media platforms	Facebook	11
	Instagram	23
	Twitter	22
	TikTok	11
	Snapchat	15
	WhatsApp	18
Avatar customization	A lot of time	14
	Some time	32
	Very little time	35
	None at all	19

paving the way for further exploration into the relationships between demographics, behaviors, and emotional responses in the realm of avatars on social media platforms.

5.1 Avatar-Influenced User Behavior and Emotional Responses Model Analysis:

Structural Equation Modeling (SEM) is a powerful statistical methodology used to analyze complex relationships among variables and their underlying constructs. It's a versatile approach that allows researchers to examine not only direct relationships between variables but also the underlying theoretical framework governing those relationships. SEM is widely applied in various fields, including social sciences, psychology, economics, and more, to gain deeper insights into intricate phenomena.

This study employs Structural Equation Modeling (SEM) to uncover the complex relationships between user behavior and emotional responses in the context of social

media avatars. By examining the influence of avatar users' empathy, avatar users' attitude, and social norms on user behavior, as well as the impact of empathy and attitude on emotional responses, this research aims to illuminate the intricate dynamics at play. SEM offers a powerful lens through which to understand the connections between these variables, contributing to a deeper comprehension of how avatars and emotional interactions shape user behavior in virtual environments.

According to the results shown in the Table 2, the model fit analysis for the Avatar-Related User Behavior and Emotional Responses reveals a chi-square value of 53.06 with a significance of 0.051, suggesting a relatively acceptable fit. Goodness-of-fit indices, including GFI (0.911) and AGFI (0.901), indicate a reasonable alignment of the proposed model with the data. The comparative fit index (CFI) at 0.927 and the normed fit index (NFI) at 0.903 further affirm the model's coherence with the observed data. The root mean square error of approximation (RMSEA) stands at 0.039, reflecting a close fit of the model to the underlying covariance structure. Collectively, these indices suggest a favorable overall fit of the model, indicating its appropriateness in representing the complex relationships among avatar-related user behavior and emotional responses.

Table 3 exibits the factor loadings obtained from the analysis indicate the strength of the relationships between the variables in the study. The results suggest that users who frequently leave encouraging comments and show understanding through interactions with others' posts (Avatar Users Empathy) have a strong inclination toward empathetic behavior (Factor loading: 0.94). Similarly, users more likely to engage with content in line with their positive attitudes and beliefs (Avatar Users Attitude) are also influenced by their personal attitudes when interacting on the platform (Factor loading: 0.85). While the active engagement with posts reflecting personal values is positively related to this factor, its factor loading is comparatively lower (Factor loading: 0.6). The consideration of social norms and cultural expectations when selecting avatars (Social Norms) is moderately related to conforming avatars to prevailing social group norms (Factor loading: 0.68). Additionally, users who frequently create new posts or share content with their avatars (User Behaviour) also tend to frequently like or share content from others (Factor loading: 0.83). The Emotional Response factor is associated with users feeling a sense of happiness after positive interactions (Factor loading: 0.6) and experiencing frustration or anger when encountering opposing beliefs (Factor loading: 0.59) while using their avatars. These findings provide insights into the interplay between avatars, empathy, attitudes, social

Table 2 Avatar-related user behavior and emotional responses model fit analysis

Chi-square and significance	53.06 and 0.051
Goodness-of-fit index (GFI)	0.911
Adjusted goodness-of-fit index (AGFI)	0.901
Comparative fit index (CFI) 1	0.927
Normed fit index (NFI)	0.903
Root mean square error of approximation(RMSEA)	0.039

norms, user behavior, and emotional responses within the context of social media platforms, illustrating the complex relationships among these factors.

The results of the path analysis, presented in Table 4, reveal significant relationships between the dependent variables (User Behavior and Emotional Response) and the independent variables (Avatar User's Empathy, Avatar User's Attitude, and Social Norms). These same results are visually represented in pictorial form in Fig. 1.

Table 3 Factor loadings of avatar-related user behavior and emotional responses model

Particulars (Constructs and itesm)	Factor loading
Avatar users empathy	
Encouraging comments with empathy	0.94
Kindness in interactions	0.88
Avatar users attitude	
Engagement with aligned content	0.78
Influence of personal attitudes	0.85
Engagement with resonating posts	0.6
Social norms	
Avatar appearance and norms	0.68
Avatar conformity	0.67
User behaviour	
Post and content creation	0.88
Engagement with others' content	0.83
Emotional response	
Positive interactions (happiness/anxiety)	0.6
Engaging with conflicting content (feelings of frustration or anger)	0.59

Table 4 Regression weight of avatar-related user behavior and emotional responses model

Dependent variable	Independent variable	Path co-efficient	SE	CR	Sig
User behaviour	Empathy	0.095	0.03	3.116	0.002
	Attitude	0.215	0.047	4.562	0.001
	Social norms	1.136	0.077	14.688	0.000
Emotional response	Empathy	0.293	0.036	8.036	0.000
	Attitude	0.611	0.07	8.701	0.001
	Social norms	0.392	0.055	7.16	0.000
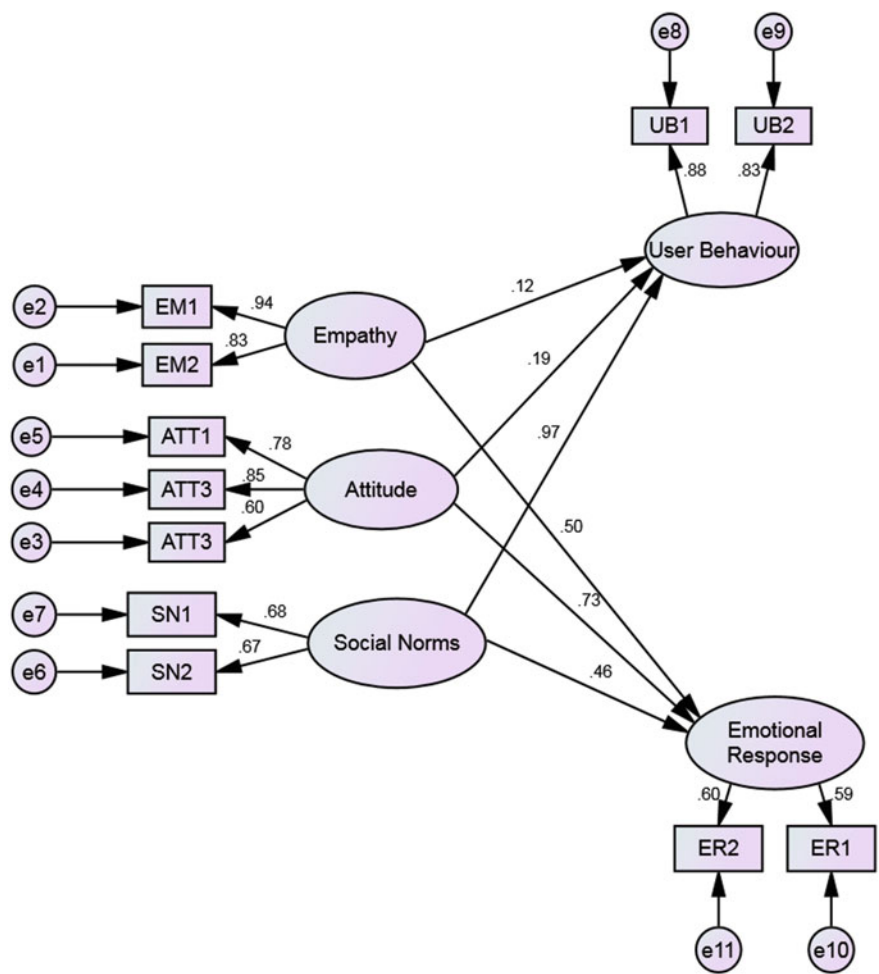
Fig. 1 SEM of avatar-related user behavior and emotional responses

5.2 Interplay Between Avatar Users Empathy, Attitude, Social Norms and Behaviour

Avatar Users Empathy

The path coefficient between Avatar Users Empathy and User Behavior is 0.095 (SE: 0.03), indicating a positive relationship. This suggests that users who frequently engage in empathetic behaviors, such as leaving encouraging comments and showing understanding in their interactions, tend to exhibit increased user behavior on the platform (CR: 3.116, p = 0.002). Higher empathy appears to foster more active participation and engagement.

Avatar Users Attitude

The relationship between Avatar Users Attitude and User Behavior is notably stronger, with a path coefficient of 0.215 (SE: 0.047). This positive relationship implies that users who have positive attitudes towards content alignment are more likely to engage in higher levels of user behavior (CR: 4.562, p = 0.001). A favorable attitude seems to drive increased interaction and engagement with content.

Social Norms

The path coefficient for the relationship between Social Norms and User Behavior is substantial, at 1.136 (SE: 0.077). This suggests a significantly positive association between conforming to social norms and higher user behavior (CR: 14.688, p < 0.001). Adhering to the prevailing norms within the platform's community strongly influences increased user participation and engagement.

5.3 Interplay Between Avatar Users Empathy, Attitude, Social Norms and Emotional Responses

Empathy

Regarding Emotional Response, the path coefficient between Empathy and Emotional Response is 0.293 (SE: 0.036). This positive relationship indicates that users who exhibit higher levels of empathy tend to experience more intense emotional responses to content (CR: 8.036, p < 0.001). Greater empathy contributes to heightened emotional reactions.

Attitude

The path coefficient between Attitude and Emotional Response is 0.611 (SE: 0.07), reflecting a strong positive relationship. Users with positive attitudes towards content alignment experience stronger emotional responses (CR: 8.701, p = 0.001). A positive attitude appears to enhance the emotional impact of content interactions.

Social Norms

Similarly, the relationship between Social Norms and Emotional Response is also significant, with a path coefficient of 0.392 (SE: 0.055). This positive relationship suggests that users who conform more to social norms experience heightened emotional responses (CR: 7.16, p < 0.001). Conforming to social norms contributes to more intense emotional reactions to content.

The analysis demonstrates that the independent variables—Avatar Users Empathy, Avatar Users Attitude, and Social Norms—significantly impact both User Behavior and Emotional Response. Each variable uniquely contributes to shaping users' engagement and emotional reactions on the social media platform, highlighting the complex interplay of factors that influence online interactions and experiences.

6   Conclusion

In the digital era, avatars have become integral elements of the social media landscape, transforming the way individuals express themselves and engage with online platforms. Avatars, personalized digital representations of users, bridge the gap between real-life identities and virtual interactions, offering a customizable medium through which users navigate the online world. These virtual embodiments go beyond mere aesthetics; they encapsulate users' preferences, personalities, and aspirations, serving as vehicles for self-expression and identity construction. Avatars enable individuals to project facets of their character that align with their online persona, fostering a sense of agency and creative expression. This study delved into the intricate dynamics of user behavior and emotional responses within the context of social media avatars. The path analysis results unveil a web of significant relationships between key variables. The findings underscore the critical role of empathy, attitudes, and social norms in shaping user behavior and emotional experiences on the platform. Empathetic behaviors, aligned attitudes, and adherence to social norms emerge as strong drivers of increased user engagement, highlighting the importance of positive interactions and community adherence. Moreover, the study reveals the profound impact of empathy, attitudes, and social norms on emotional responses. Users who exhibit higher empathy, hold positive attitudes, and conform to social norms tend to experience more intense emotional reactions to content, underlining the empathetic and attitudinal elements that resonate within the virtual environment. Overall, this research offers valuable insights into the complex interactions that drive online behaviors and emotional experiences, shedding light on the multifaceted dynamics that define interactions within the realm of social media avatars.

6.1   *Limitations*

While this study contributes significant insights, several limitations should be considered. Firstly, the research relies on self-reported data, which might be subject to response bias and may not fully capture participants' true behaviors and emotions. Additionally, the study's cross-sectional nature prevents establishing causal relationships, warranting caution in drawing definitive conclusions. The scope of the study is limited to a specific set of independent variables, potentially overlooking other influential factors in user behavior and emotional responses. The demographic composition of the sample could affect the generalizability of findings, thus requiring replication across diverse populations. Lastly, the study focuses on avatars within social media, omitting potential differences across various online platforms and their distinct user behaviors.

6.2 Further Study

To address these limitations and extend the research, future studies could employ longitudinal designs to better explore causal relationships over time. Incorporating objective behavioral data, such as tracking actual interactions, could enhance the accuracy of findings. Broader and more diverse samples would enable a comprehensive examination of user behavior across demographics and platforms. Exploring the interplay between avatars and content characteristics could provide a deeper understanding of how emotional responses are triggered. Moreover, investigating the influence of technological advancements, such as virtual reality, on avatar-mediated interactions remains a promising avenue for research. Lastly, qualitative methods could uncover nuanced user experiences and motivations that quantitative measures might overlook. Collectively, future studies can build upon these findings to unravel deeper layers of user behavior and emotional responses within the evolving landscape of social media avatars.

References

1. Tamborini, R., Eastin, M., Lachlan, K., Fediuk, T., Brady, R., Skalski, P.: The effects of violent virtual video games on aggressive thoughts and behaviors. In: 86th Annual Convention of the National Communication Association. Seattle Washington (2000)
2. Chung, D., de Buys, B.D., Nam, C.S.: Influence of avatar creation on attitude, empathy, presence, and para-social ınteraction. In: Jacko, J.A. (eds.) Human-Computer Interaction. Interaction Design and Usability. HCI 2007. Lecture Notes in Computer Science, vol. 4550. Springer, Berlin, Heidelberg (2007). https://doi.org/10.1007/978-3-540-73105-4_78
3. Chung, D.: Something for nothing: understanding purchasing behaviors in social virtual environments. Cyber Psychol. Behav. **6**, 538–554 (2005)
4. Joinson, A.N.: Proceeding of the Twenty-Sixth Annual CHI Conference on Human Factors in Computing Systems—CHI '08—Looking at, Looking Up or Keeping up with People? (0), 1027 (2008). ACM Press, Florence, Italy. https://doi.org/10.1145/1357054.1357213
5. Vasalou, A., Joinson, A., Bänziger, T., Goldie, P., Pitt, J.: Avatars in social media: balancing accuracy, playfulness and embodied messages. Int. J. Hum.-Comput. Stud. **66**(11), 801–811. ISSN: 1071-5819. https://doi.org/10.1016/j.ijhcs.2008.08.002
6. Zimmermann, D., Wehler, A., Kaspar, K.: Self-representation through avatars in digital environments. Curr. Psychol. (2022). https://doi.org/10.1007/s12144-022-03232-6
7. Yoon, G., Vargas, P.T.: Know thy avatar: the unintended effect of virtual-self representation on behavior. Psychol. Sci. **25**(4), 1043–1045 (2014)
8. Gammoh, B.S., Jiménez, F.R., Wergin, R.: Consumer attitudes toward human-like avatars in advertisements: the effect of category knowledge and imagery. Int. J. Electron. Commer. **22**(3), 325–348 (2018). https://doi.org/10.1080/10864415.2018.1462939
9. Derks, D., Fischer, A.H., Bos, A.E.: The role of emotion in computer-mediated communication: a review. Comput. Hum. Behav. **60**, 35–40 (2016)
10. Xu, Y., Zhang, L., Wang, Y.: How online social interactions affect customer satisfaction with mobile applications: an empirical study in China. Inf. Manage. **55**(4), 420–438 (2018)
11. Huang, L., Bargh, J.A.: The effects of repeated self-disclosure on impression formation in computer-mediated communication. Commun. Res. **41**(3), 387–407 (2014)
12. Smith, J.D., Egan, K.A., Reilly, R.R.: The Experimental Analysis of Behavior: A Biological Perspective. Routledge (2019)

13. Lin, H., Lu, H.P.: Why people use social networking sites: an empirical study integrating network externalities and motivation theory. Comput. Hum. Behav. **103**, 31–41 (2020)
14. Postmes, T., Spears, R., Lea, M.: The formation of group norms in computer-mediated communication. Hum. Commun. Res. **26**(3), 341–371 (2000)
15. Jiang, Z., Benbasat, I., Liu, D.: Tracing the S-D logic-based service innovation journey: an exploration of antecedents, processes, and outcomes. MIS Q. **41**(2), 597–620 (2017)

Selection of Logistics Center Location DEMATAL Method

D. Ravindran ⓘ**, K. Janaki Priya, Oleksandr M. Kovbasa** ⓘ**,**
Vitaly V. Polyvoda, Maksym A. Zaidenko, and Nadiia P. Reznik ⓘ

1 Introduction

The selection of a logistics center location is a critical decision that can have a significant impact on the overall efficiency and effectiveness of supply chain operations. There are several factors to consider when choosing a logistics center location. Here are some key considerations.

A logistics center should be strategically located in close proximity of the target market or customer base it serves. This helps to reduce transportation costs, minimize lead times, and improve customer service by ensuring faster and more responsive deliveries. Transportation infrastructure which emphasizes the availability of well-developed transportation infrastructure is crucial. Looking for locations with easy access to major highways, ports, airports, and rail networks. This enables efficient inbound and outbound transportation, reduces transit times, and improves connectivity to regional and global markets. Considering the availability of a skilled workforce in the chosen location. Looking for areas with a strong labor market that can meet specific staffing needs. Evaluating labor costs, including wages, benefits, and any potential labor disputes or shortages that could affect the operations. Land and real estate availability analysis deal with the cost of suitable land or existing facilities for establishing a logistics center. Considering factors such as the size of the site, zoning regulations, expansion potential, and proximity to transportation hubs.

D. Ravindran (✉)
Kristu Jayanti College (Autonomous), Bengaluru, Karnataka, India
e-mail: rtkob@yahoo.co.in

K. Janaki Priya
Alagappa Government Arts College, Alagappa University, Karaikudi, Tamil Nadu, India

O. M. Kovbasa · V. V. Polyvoda · M. A. Zaidenko
Sumy National Agrarian University, Sumy, Ukraine

N. P. Reznik
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

Adequate space is essential for storage, warehousing, and distribution activities. Evaluating the overall business environment of the location, including factors such as tax incentives, government regulations, permits, and licensing requirements. Ensure that the legal and regulatory framework supports the logistics operations and allows for smooth business operations. Risk and resilience assess the vulnerability of the location to natural disasters, geopolitical risks, and other potential disruptions. Considering the region's history of earthquakes, hurricanes, floods, political stability, and security. It's important to choose a location that minimizes risks and ensures business continuity. Evaluating the overall cost of operating in the chosen location [1–4]. This includes not only land or facility costs but also factors such as taxes, utilities, labor, and other operating expenses. Conducting a thorough cost analysis to ensure that the chosen location aligns with budget and financial objectives. Future growth and expansion opportunities also to be considered the potential for future growth and expansion in the chosen location. Analyzing the local market trends, economic growth prospects, and the availability of additional facilities or land to support long-term business plans. Environmental considerations are also taken into account regarding environmental regulations and sustainability initiatives in the region. Evaluating the location's impact on carbon emissions, waste management, and the availability of renewable energy sources [5]. Choosing an environmentally friendly location can enhance brand reputation and align with sustainable business practices. Research on the competitive landscape in the chosen location which appraise the presence of other logistics providers, potential partnerships, and opportunities for collaboration. Assess how the location can give a competitive advantage in terms of cost, service quality, and market reach.

By carefully considering these factors and conducting thorough analysis and research, can make an informed decision regarding the selection of a logistics center location that best aligns with business goals and objectives. It may also be helpful to engage with logistics and supply chain experts, as well as local economic development agencies, to gain further insights and support in the decision-making process.

2   Materials and Concepts

The importance of logistics centre placement in research resides in its ability to influence the general effectiveness and competitiveness of the supply chain operations. To optimise costs, improve service levels, improve supply chain resilience, promote sustainability, optimise network design, leverage technological advancements, consider policy and regulations, and address global supply chain dynamics, research in logistics centre location is critical. In today's changing business world, these research initiatives help to improve the general effectiveness and competitiveness of supply chains [6]. This study is broken into five parts. The next 104 part gives a summary of existing research 105 of the logistics center choice problem, method 106, and criterion used. The second portion describes the proposed strategy, as well

as an application in selecting a logistics facility in Sivas, Turkey, an examination of MCDM methodologies [7], and an analysis of sensitivity. The final section contains a brief conclusion and discussion.

2.1 *Weather Condition*

Weather conditions refer to the state of the atmosphere at a specific time and place, including factors such as temperature, precipitation, humidity, wind speed, and atmospheric pressure. Understanding weather conditions is vital for individuals, businesses, and society as a whole. It enables us to prepare for and adapt to changing conditions, make informed decisions, and mitigate risks associated with weather-related events [8].

2.2 *Landform Condition*

Landform condition refers to the physical characteristics and features of the Earth's surface, including its shape, elevation, slope, and composition. Assessing and understanding landform condition is important for various purposes, including urban planning, environmental management, resource utilization, and hazard assessment. It provides insights into the physical characteristics and features of the Earth's surface, guiding land use decisions and supporting sustainable development practices [6].

2.3 *Water Supply*

Water supply refers to the provision of safe and reliable water resources for various purposes, including drinking, sanitation, agriculture, industry, and environmental needs. Securing a reliable and sustainable water supply is crucial for meeting basic human needs, supporting economic activities, and maintaining ecological balance. Effective management, infrastructure development, and conservation efforts are essential for ensuring access to clean and safe water for present and future generations [9].

2.4 *Power Supply*

Power supply refers to the provision of electrical energy for various purposes, including residential, commercial, industrial, and institutional use. Access to a reliable and affordable power supply is essential for modern societies. Power supply

system's play a crucial role in meeting energy demands, supporting economic activities, and improving quality of life. Continued investments in infrastructure, renewable energy integration, and grid resilience are vital for ensuring a sustainable and resilient power supply for the future [10].

2.5 Solid Castoff Disposal

Solid castoff disposal refers to the management and proper disposal of solid waste or refuse that is generated from various sources, such as households, businesses, industries, and construction activities. Efficient and sustainable solid castoff disposal is essential for maintaining a clean and healthy environment. It involves the responsible management of waste, incorporating recycling and resource recovery techniques, and ensuring compliance with waste regulations. By adopting proper solid castoff disposal practices, we can minimize environmental impacts and promote a more sustainable future [11].

2.6 Sum

"Sum" refers to the mathematical operation of adding two or more numbers together to obtain a total or the result of addition. In short, the sum is the answer or the total value obtained when adding numbers. It is a fundamental mathematical concept used in various calculations, including arithmetic, algebra, and statistics. The sum is denoted by the "+" symbol and is obtained by adding the individual values or terms together [12].

3 Methodology

The DEMATEL methodology is often used to identify the selection of logistics center location. The Decision-Making Trial and Evaluation Laboratory (DEMATEL) method is a systematic approach used to analyze complex relationships and dependencies among variables in decision-making processes. It provides a structured framework for understanding the cause-and-effect relationships among factors and identifying the most influential elements [13]. The DEMATEL approach was created to deal with situations in which variables or components are interconnected and have reciprocal interactions [14]. It seeks to reveal hidden linkages and feedback loops inside a complicated system. Decision-makers may obtain significant insights into the structure of the system and arrive at better informed judgements by knowing these linkages [15]. The DEMATEL approach consists of multiple phases. The first step is to identify a group of elements or variables connected to the decision problem. These

variables might be qualitative or quantitative. Then, experts or users are brought in to offer their perspectives or judgements on the linkages between the variables [16]. In the next step, a DEMATEL matrix is constructed based on the collected judgments [17]. This matrix represents the cause-and-effect relationships between the factors and captures the strengths and directions of these relationships. Using mathematical techniques, the matrix is further analyzed to derive important information, such as the direct and indirect influences among the factors and the overall influence of each factor in the decision context [18]. The DEMATEL method enables decision-makers to visualize and understand the complex relationships and interactions among the factors [19]. It helps identify key factors that have a significant impact on the decision problem and uncovers potential feedback loops or interdependencies that may exist. This information can guide decision-makers in prioritizing actions, allocating resources, and developing strategies that address the underlying dynamics of the system [20].

Overall, the DEMATEL method provides a valuable tool for analyzing complex decision problems by uncovering the cause-and-effect relationships and revealing the most influential factors [21]. It aids in structuring decision-making processes, enhancing understanding, and facilitating more effective decision-making.

Alternative Parameter: weather condition, Landform condition, Water supply, Power supply, Solid castoff disposal.

Evaluation Parameters: weather condition, Landform condition, Water supply, Power supply, Solid castoff disposal.

4   Result and Discussion

Table 1 shows DEMATAL Method with respect to weather conditions, Landform condition, Water supply, Power supply, Solid castoff disposal. The total of all the parameters with high values. The highest value is seen in Table 1, where value is 11.

Table 1 Conditions parameters

	Weather condition	Landform condition	Water supply	Power supply	Solid castoff disposal	SUM
Weather condition	0	2	4	2	3	11
Landform condition	4	0	2	1	2	9
Water supply	2	1	0	3	1	7
Power supply	1	3	2	0	2	8
Solid castoff disposal	2	4	1	3	0	10

Figure 1 shows DEMATAL Method with respect to weather conditions, Landform condition, Water supply, Power supply, Solid castoff disposal. It is an assessment and comparison of any two facilities.

Table 2 shows DEMATAL Method Normalization of direct relation matrix with respect to weather condition, Landform condition, Water supply, Power supply, Solid castoff disposal; Fig. 2 shows that all of the data's diagonal values are zero. Consider the Y Value in Table 2.

Table 3 given that the Identity matrix the matrix diagonal line got values one other values is zero.

Table 4 calculated the (I-Y)-1 value. All values are negative but diagonal line values are positive values.

Table 5 shows the total correlation matrix, the direct correlation matrix, multiplied by the inverse of the direct correlation matrix value subtracted from the identity matrix (Table 6).
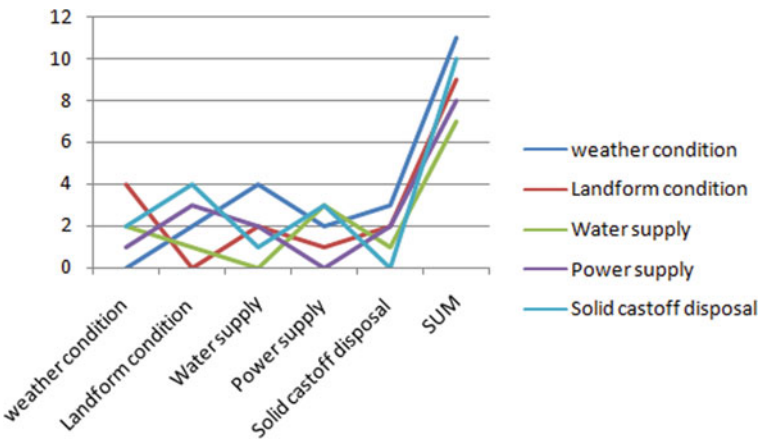
Fig. 1 Demal Methods-Parameters

Table 2 Normalization of direct relation matrix

	Weather condition	Landform condition	Water supply	Power supply	Solid castoff disposal
Weather condition	0	0.181818182	0.363636364	0.181818182	0.272727273
Landform condition	0.363636364	0	0.181818182	0.090909091	0.181818182
Water supply	0.181818182	0.090909091	0	0.272727273	0.090909091
Power supply	0.090909091	0.272727273	0.181818182	0	0.181818182
Solid castoff disposal	0.18181812	0.363636364	0.090909091	0.272727273	0
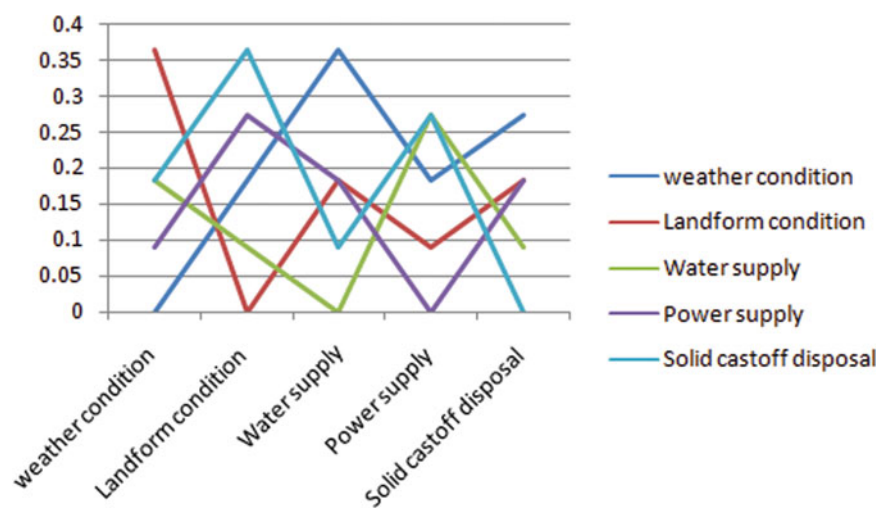
Fig. 2 Normalization of direct relation matrix

Table 3 I = Identity matrix

1	0	0	0	0
0	1	0	0	0
0	0	1	0	0
0	0	0	1	0
0	0	0	0	1

Table 4 The (I-Y)-1 value

	Weather condition	Landform condition	Water supply	Power supply	Solid castoff disposal
Weather condition	1.890832008	1.1006889	1.1683448	1.0381558	1.0107755
Landform condition	1.081081081	1.8378378	0.9639464	0.8647649	0.8738739
Water supply	0.749867515	0.7355591	1.6122593	0.8155803	0.6331037
Power supply	0.788553259	0.9523052	0.8325384	1.6661367	0.7668256
Solid castoff disposal	1.020137785	1.19505815	0.93658356	1.0317965	1.7682388

Table 7 presents the values for Ri + Ci and Ri-Ci for various factors relevant to the selection of a logistics center location. The factors included in the table are weather condition, landform condition, water supply, power supply, and solid castoff disposal.

Table 5 Total correlation matrix

	Weather condition	Landform condition	Water supply	Power supply	Solid castoff disposal
Weather condition	0.890832008	1.1006889	1.1683448	1.0381558	1.0107755
Landform condition	1.081081081	0.8378378	0.9639464	0.8647649	0.8738739
Water supply	0.749867515	0.7355591	1.6122593	0.8155803	0.6331037
Power supply	0.788553259	0.9523052	0.8325384	1.6661367	0.7668256
Solid castoff disposal	1.020137785	1.19505815	0.93658356	1.0317965	1.7682388

Table 6 Ri and Ci

	Ri	Ci
Weather condition	5.2087970	4.5304726
Landform condition	4.6216216	4.8214096
Water supply	3.5463699	4.5136902
Power supply	4.0063593	4.4165342
Solid castoff disposal	4.9517753	4.0528175

Table 7 Ri + Ci and Ri-Ci

	Ri + Ci	**Ri-Ci**
Weather condition	9.7392687	0.6783254
Landform condition	9.4430313	−0.199788
Water supply	8.0600601	−0.9673203
Power supply	8.4228935	−0.4101749
Solid castoff disposal	9.0045928	0.8989578

The Ri + Ci value represents the sum of the Ri (Rating for a particular factor) and Ci (Weight or importance assigned to that factor). It provides an indication of the overall desirability or attractiveness of a location based on the specific factor (Fig. 3).

On the other hand, the Ri-Ci value represents the difference between the Ri and Ci. Figure 4 indicates the degree of discrepancy or imbalance between the perceived rating and assigned weight for a particular factor.

Looking at the values in the Table 7, we can observe the following:

For Weather condition, the Ri + Ci value is 9.7392687, suggesting that the location's weather condition is considered highly favorable or desirable. The Ri-Ci value is 0.6783254, indicating a positive balance between the perceived rating and assigned weight for this factor.

For Landform condition, the Ri + Ci value is 9.4430313, indicating that the landform condition is considered quite favorable for establishing a logistics center.
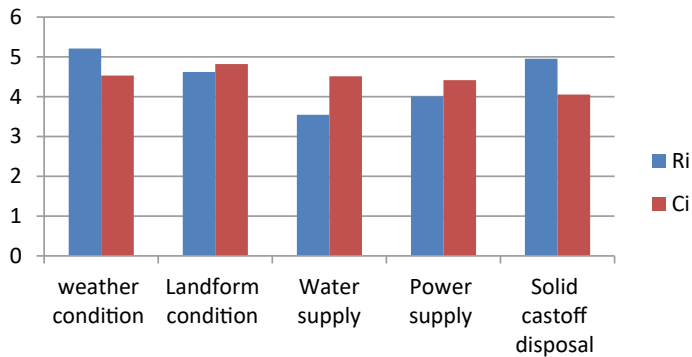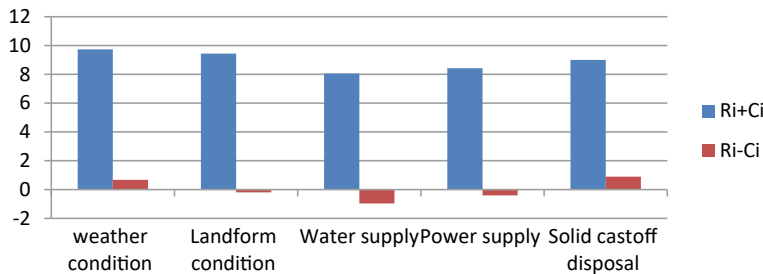
Fig. 3 Ri and Ci

Fig. 4 Ri + Ci and Ri-Ci

However, the Ri-Ci value is −0.199788, suggesting a slight discrepancy or lower importance assigned to this factor compared to its perceived rating.

For Water supply, the Ri + Ci value is 8.0600601, indicating that the availability of water supply is moderately desirable for a logistics center location. The Ri-Ci value is −0.9673203, suggesting a slightly negative balance between the perceived rating and assigned weight for this factor.

For Power supply, the Ri + Ci value is 8.4228935, indicating a relatively favorable power supply situation for the logistics center. The Ri-Ci value is −0.4101749, suggesting a slight discrepancy between the perceived rating and assigned weight for this factor.

For Solid castoff disposal, the Ri + Ci value is 9.0045928, indicating that the disposal of solid waste is considered highly desirable for a logistics center location. The Ri-Ci value is 0.8989578, indicating a positive balance between the perceived rating and assigned weight for this factor.

Table 8 given ranking Source weather condition for a first rank, Landform condition for a second rank, Solid castoff disposal for a third rank, Power supply for a fourth rank and Water supply for a fifth rank, seen in Fig. 5.

Table 8 Ranking

	Rank
Weather condition	1
Landform condition	2
Water supply	5
Power supply	4
Solid castoff disposal	3
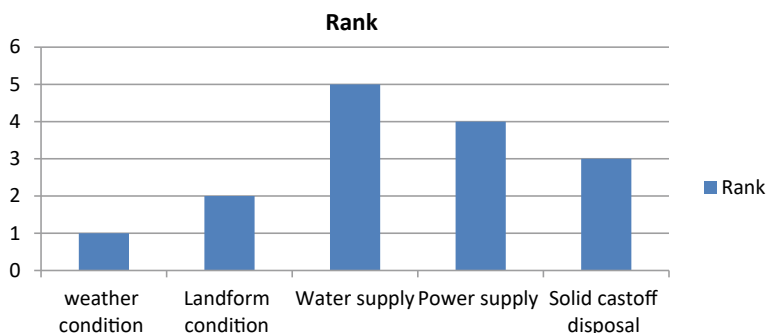
Fig. 5 Ranking

5 Conclusion

The decision to locate a logistics center is a vital choice with substantial ramifications for both supply chain operations as well as overall business performance. The site chosen can have an influence on a variety of factors, including transportation costs, delivery times, customer service, inventory management, and the general effectiveness of operations. Companies may make educated judgements regarding the best site for their logistics centre by carefully considering aspects such as accessibility to consumers and vendors, transportation infrastructure, labour availability, land and facility prices, and regulatory issues. The logistics centre placement research is crucial because it gives useful insights and approaches for firms for creating strategic decisions. Companies may reduce costs, increase service levels, improve supply chain responsiveness, as well as gain an advantage in the market by doing detailed study and evaluation of alternative site possibilities. Additionally, the research contributes to the broader field of logistics and supply chain management by advancing knowledge and understanding of the factors that influence location decisions. It helps businesses navigate the complexities of selecting a logistics center location in a globalized and dynamic business environment. Overall, the research on the selection of logistics center locations is of great significance to companies seeking to optimize their supply chain operations and achieve operational excellence.

It provides a foundation for informed decision-making, enabling businesses to strategically position their logistics centers and create a robust and efficient supply chain network.

References

1. Kazançoğlu, Y., Özbiltekin, M., Özkan-Özen, Y.D.: Sustainability benchmarking for logistics center location decision: an example from an emerging country. Manage. Environ. Qual. Int. J. **31**(5), 1239–1260 (2020)
2. Tuzkaya, U.R., Yilmazer, K.B., Tuzkaya, G.: An integrated methodology for the emergency logistics centers location selection problem and its application for the Turkey case. J. Homeland Secur. Emerg. Manage. **12**(1), 121–144 (2015)
3. Li-li, Q., Yan, C.: An interactive integrated MCDM based on FANN and application in the selection of logistic center location. In: 2007 International Conference on Management Science and Engineering, pp. 162–167. IEEE (2007)
4. Rikalović, A., Soares, G.A., Ignjatić, J.: Spatial analysis of logistics center location: a comprehensive approach. Dec. Making: Appl. Manage. Eng. **1**(1), 38–50 (2018)
5. Shieh, J.-I., Wu, H.-H., Huang, K.-K.: A DEMATEL method in identifying key success factors of hospital service quality. Knowl.-Based Syst. 23(3), 277–282 (2010)
6. Yazdani, M., Chatterjee, P., Pamucar, D., Chakraborty, S.: Development of an integrated decision making model for location selection of logistics centers in the Spanish autonomous communities. Expert Syst. Appl. **148**, 113208 (2020)
7. Żak, J., Węgliński, S.: The selection of the logistics center location based on MCDM/A methodology. Transp. Res.
8. Li, Y., Liu, X., Chen, Y.: Selection of logistics center location using axiomatic fuzzy set and TOPSIS methodology in logistics management. Expert Syst. Appl. **38**(6), 7901–7908 (2011)
9. Uyanik, C., Tuzkaya, G., Oğuztimur, S.: A literature survey on logistics centers' location selection problem. Sigma J. Eng. Nat. Sci. **36**(1), 141–160 (2018)
10. Erkayman, B., Gundogar, E., Akkaya, G., Ipek, M.: A fuzzy TOPSIS approach for logistics center location selection. J. Bus. Case Stud. (JBCS) **7**(3), 49–54 (2011)
11. Stević, Ž., Vesković, S., Vasiljević, M., Tepić, G.: The selection of the logistics center location using AHP method. In: 2nd logistics international conference, pp. 86–91 (2015)
12. Tomić, V., Marinković, D., Marković, D.: The selection of logistic centers location using multi-criteria comparison: case study of the Balkan Peninsula. Acta Polytechnica Hungarica **11**(10), 97–113 (2014)
13. Turskis, Z., Zavadskas, E.K.: A new fuzzy additive ratio assessment method (ARAS-F). Case study: the analysis of fuzzy multiple criteria in order to select the logistic centers location. Transport **25**(4), 423–432 (2010)
14. Du, Y.-W., Li, X.-X.: Hierarchical DEMATEL method for complex systems. Expert Syst. Appl. **167**, 113871 (2021)
15. Rao, C., Goh, M., Zhao, Y., Zheng, J.: Location selection of city logistics centers under sustainability. Transp. Res. Part D: Transp. Environ. **36**, 29–44 (2015)
16. Pramanik, S., Dalapati, S., Roy, T.P.: Logistics center location selection approach based on neutrosophic multi-criteria decision making. In: New Trends in Neutrosophic Theories and Applications, pp. 161–174. Pons-Editions, Brussels (2016)
17. Chang, B., Chang, C.-W., Wu, C.-H.: Fuzzy DEMATEL method for developing supplier selection criteria. Expert Syst. Appl. **38**(3), 1850–1858 (2011)
18. Ulutaş, A., Karakuş, C.B., Topal, A.: Location selection for logistics center with fuzzy SWARA and CoCoSo methods. J. Intell. Fuzzy Syst. **38**(4), 4693–4709 (2020)
19. Zhang, W., Deng, Y.: Combining conflicting evidence using the DEMATEL method. Soft. Comput. **23**, 8207–8216 (2019)

20. Yang, Q., Meng, L.: Analytic hierarchy process (AHP) in the application of logistics center location selection process. In: 2016 4th International Conference on Mechanical Materials and Manufacturing Engineering, pp. 120–122. Atlantis Press (2016)
21. Shieh, J.-I., Wu, H.-H.: Measures of consistency for DEMATEL method. Commun. Stat. Simul. Comput. **45**(3), 781–790 (2016)
22. Wu, W.-W., Lee, Y.-T.: Developing global managers' competencies using the fuzzy DEMATEL method. Expert Syst. Appl. **32**(2), 499–507 (2007)
23. Lin, Y.-T., Yang, Y.-H., Kang, J.-S., Yu, H.-C.: Using DEMATEL method to explore the core competences and causal effect of the IC design service company: an empirical case study. Expert Syst. Appl. **38**(5), 6262–6268 (2011)
24. Reznik, N., Hrechaniuk, L.: Justification of measures to improve the efficiency of logistics system management. AIP Conf. Proc. **2413**, 040002 (2022). https://doi.org/10.1063/5.0090406
25. Reznik, N., Hrechaniuk, L., Zahorodnia, A.: Analysis of the logistics component of the economic security system of enterprises. Int. J. Innov. Technol. Econ. **4**(36), (2021). https://doi.org/10.31435/rsglobal_ijite/30122021/7739

Total Quality Management's Impact on Telecom Customers Satisfaction, Analyzed Taking TQM-SERVQUAL Approach

Ch. Raja Kamal [ID]**, M. Chandrakala** [ID]**, Halak Iryna** [ID]**, Kostyuchenko Oleksandra** [ID]**, Penkivska Katerina** [ID]**, and P. Reznik Nadiia** [ID]

1 Introduction

The growth of certain companies has come at the price of their services' quality and the value they provide to clients. Some firms are allegedly failing because of less expensive competitors, and brand loyalty is dwindling as a result. The prosperity of every company depends on the high quality of its services. However, when a company places a premium on providing outstanding service and follows through on its promises, it earns customer loyalty and experiences growth. Everyone who invests money expects to obtain something worthwhile in return. The components utilized in the manufacturing and delivery of a product or service are the primary determinants of its quality. A product or service's quality is determined by how well it serves its intended audience while simultaneously addressing any pressing social concerns. The quality of goods and services is also important to the success and efficiency of the supply chain [1]. Keep in mind that there is a wide range of quality expectations among clients. Because of their singularity and constant flux, services are challenging to create and evaluate. Businesses should give consumers more priority. Defining quality, implementing initiatives to improve the service delivery process and the company's reputation, educating customers on the full scope of services offered, encouraging a positive and supportive work environment, consistently exceeding

Ch. Raja Kamal (✉) · M. Chandrakala
Kristu Jayanti College Autonomous, Bengaluru, India
e-mail: Rajakamal@kristujayanti.com

H. Iryna · K. Oleksandra · P. Katerina
National Transport University, Kyiv, Ukraine

P. Reznik Nadiia
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

customer expectations, and measuring and assessing service quality are all essential to achieving this goal [1].

TQM's impact on service quality and patron satisfaction is analyzed [2]. The influence of the telecom industry's emphasis on service quality may be seen in societal and political trends. The development of telecommunications businesses across the world may have an effect on consumer preference for these services. These modifications signal an emerging consumer behavior trend in the telecommunications industry [3] and set a higher standard for the whole market. The attitudes of customers about telecommunications services are influenced by the choices made here. Now a days, a company's survival depends on its ability to provide excellent customer service. Providing cutting-edge service technologies and excellent customer assistance is not exclusive to the telecommunications industry [4]. Companies in today's economy need a customer satisfaction strategy like SERVQUAL to thrive. Difficulties in gauging quality and acquiring services have dampened enthusiasm [5]. It's hard to pin down what constitutes "excellent service" and then really provide it. The challenges of measuring service quality have been well explained in the service management literature; but, empirical research into how service firms are addressing these challenges is lacking [6]. When it comes to measuring customer satisfaction, SERVQUAL has been the industry standard for the last decade. When SERVQUAL was initially developed, its validity, utility, and reliability were all called into doubt by many [7].

2 Literature Review

In today's competitive global market, the quality of a company's management, leadership, employees, processes, products, and services may make all the difference between success and failure [8]. Overall quality manage refers to the strategy and execution of quality-related matters at the level of the organization.

2.1 Total Quality Management

TQM helps organizations plan and implement continuous and breakthrough improvement [9]. Dynamic management systems grew TQM. 20th-century TQM advanced. Despite globalization, quality management employs the TQM wheel and Ten Element Model. Lean and Six Sigma are top "new" management methods. TQM embeds quality throughout a company.

Product and process designers improved quality. HRM departments must emphasize quality improvement throughout the enterprise. If a corporate connection fails, other departments may employ TQM. Low war production. Quality inspectors minimized production line issues [10]. TQM on a global scale. "Total" implies that every worker is committed to doing their best. The quality of a corporation may be defined

as the excellence of its people, systems, and processes in the areas of production, customer happiness, service delivery, and cost-effectiveness [11].

TQM puts an end to quality control. We looked at IQC, SPC, TQC, and CWQC in the '90s. TQM subgroups began forming in the 1980s. Quality was evaluated using the Six Sigma method, reengineering, ISO 9001, and ISO 9002. Regulations improve manufacturing quality, the most rigorous analysis possible in business and industry. Some enterprises are saved by regulations. TQM emphasizes integrated management, customer-focused practices like reducing rework, long-term thinking, employee involvement, teamwork, process redesign, team-based problem-solving, constant results assessment, self-inspection, cost-of-quality monitoring, and closer supplier quality relationships. TQM improves organization [2].

Companies grow with quality [12]. Quality increases global competitiveness. Improve quality before changing management. ISO 9000 stresses customer satisfaction, high-quality goods, and exceptional service, enhancing service quality. ISO 9001 boosts customer service and satisfaction [13]. TQM improves service. Customers rate telecom service. ISO 10001. SERVICEQUAL boosts customer satisfaction. Product/service loyalty. TQM increased telecom customer satisfaction. TQM and telecom customer satisfaction. SERVQUAL measures customer satisfaction based on these factors: concreteness, reliability, responsiveness, certainty, and empathy [14], looking at the concepts of materiality, dependability, and adaptability.

Quality management is essential in every field. Companies always keep quality in mind. Service excellence benefits your organization and customers. ISO 9001 and Six Sigma rule. Or alone. Compare and contrast. ISO 9001 controls quality, Six Sigma optimizes processes. Six Sigma describes quality maintenance, whereas ISO 9001 does not reduces [15]. Inefficiency in corporate operations. In 1986, Bill Smith of Motorola stumbled across it. Six Sigma with an emphasis on finding solutions. A strong and flexible system that can make on-the-fly adjustments is one of the goals of Six Sigma, along with a focus on the customer and providing them with the best possible benefits, mapping procedures to identify the true source of waste or errors, and process improvement to address the problem. DMAIC/DMADV's Six Sigma rival. When combined, they improve a business' services [16].

Define, Measure, Analyze, Improve, Control—DMAIC. Product quality may improve. DMADV—Define, Measure, Analyze, Design, Validate. This method may establish industrial or service processes. When optimized operations disappointed consumers, this was used. QMS ISO9001. ISO 9001 requires QMS. It assists global enterprises. ISO 9001 helped numerous firms save costs, boost customer satisfaction, and streamline procedures. ISO 9001 meets customer and production goals [17].

2.2 ISO 9001 Versus Six Sigma A Comparison

ISO 9001 and Six Sigma have many similarities. Included are all relevant Six Sigma and ISO 9001 criteria:

- **Processing Method**

Both standards emphasize process-oriented implementation. ISO 9001 involves several simple steps. Thus, procedures and results are prioritized. Six Sigma improves processes [18]. SIPOC diagrams help Six Sigma understand each process.

- **Improvement**

Organizations utilize these criteria to improve. ISO 9001 advances goods and services via the Plan-Do-Check-Act cycle. This technology helps your firm make quality and error-reducing changes [19]. Like Six Sigma uses DMAIC technology to improve processes. This plan also suggests changes to existing methods to improve product and service quality.

2.3   ISO 9001 Versus Six Sigma

Organizations utilize these criteria to improve. ISO 9001 advances goods and services via the Plan-Do-Check-Act cycle. This technology helps your firm make quality and error-reducing changes [19]. Like Six Sigma uses DMAIC technology to improve processes. This plan also suggests changes to existing methods to improve product and service quality.

2.4   Integrating ISO 9001 with the Six Sigma Method

It has been questioned whether it would be possible to replace or combine the afore-mentioned two standards. Despite this, the two approaches are not complementary and have different goals. You may combine them to create better products or services. Businesses may benefit greatly from adopting both Six Sigma and ISO 9001. ISO 9001 will assist you in establishing a quality management system, and Six Sigma will aid you in fixing any issues that crop up inside it by merging the standards, your company may save both time and money.

3   Hypothesis of the Study

H1: Consumer satisfaction evaluates a company's goods, services, and expertise. Surveys and reviews may help a business grow.
H2: Pre and post-service quality both contribute positively to satisfied customers.
H3: Customers are more likely to be happy with a company if they get high-quality support after a purchase.

Table 1 Labels of variables used

Category	Items
Dependent: CSA	Customer satisfaction
Independent variables: ETM, BDS&ASS	Equipment and materials Before and during services After-sales services

Source Compiled by researcher

4   Research Methodology

The study employed a descriptive research approach to determine the connection between the variables. Its goal was to demonstrate how one variable influences other variables and to explain the reasons or consequences of one or more variables.

4.1   Research Framework

Table 1 contains a list of the variables used in this analysis. Table 1 displays the correlation between the three independent variables—equipment and materials, before and during service, and after-sales services—and the dependent variable, customer satisfaction.

5   Findings and Discussions

According to the data in Table 2, not one of the respondents was illiterate. When it came to marital status, those who were unmarried at the time of the study scored higher than the others.

Table 3 illustrates the correlation matrix, which links variables. ETM and CSA are strongly correlated. "Equipment and Materials" (ETM) shown to positively affect customer satisfaction (CSA). According to, "Equipment and Materials" (ETM) has a high CSA. BDS and ASS linked favorably with CSA. ASS positively affects ETM, according to research. Good equipment and resources enable after-sales services and give personnel confidence to operate productively. Table 3 shows that many independent variable cross correlation values are small. This justifies ignoring multicollinearity among independent variables.

The model estimate for Table 3 data shows that thorough quality management improves customer satisfaction. With a 95.0% confidence interval, the authors investigated a complete quality management model for customer satisfaction. Experiment p-value was 0.001.

Table 2 Respondents' demographic characteristics

Variable	Category	Respondents	Percentage
Gender	Female	327	69.12
	Male	673	60.88
Age	Below 21	28	3.60
	21–30	101	12.63
	31–40	266	33.00
	41–50	217	27.13
	51–60	96	11.88
	61–70	76	9.26
	71 +	21	2.63
Education level	X certificate	276	36.60
	Senior Certificate	388	68.60
	Undergraduate degree	102	12.76
	Master's degree	26	3.13
	Others	9	1.13
Duration of membership or contract in years	0–4	183	22.88
	5–9	328	61.00
	10–14	163	17.88
	15–19	106	13.13
	20 +	61	6.13

Source Compiled by researcher

Table 3 Correlation matrix

Variable	ASS	BDS	EMT	CSA
ASS	0.108	0.148	−0.025	1
BDS	0.223	0.131	1	
EMT	0.902	1		
CSA	1			

[**] At the 0.01 level (two-tailed), the correlation is significant. [*] At the 0.05 level (two-tailed) the correlation is significant
Source Compiled by researcher

6 Hypothesis Testing

Establishing service standards relies heavily on input from customers. Support for TQM is shown by customers who utilize the network's services. This research found that improved quality management led to happier business customers. It is clear from Table 4 and the data in that both "Equipment and Materials" and "Service Quality" contribute positively to an improvement in customer satisfaction. Total quality

Table 4 The summary of hypotheses

Hypothesis		Conclusion
H1	Consumer satisfaction evaluates a company's goods, services, and expertise. Surveys and reviews may help a business grow	Supported
H2	Pre and post-service quality both contribute positively to satisfied customers	Supported
H3	Customers are more likely to be happy with a company if they get high-quality support after a purchase	Supported

Source Compiled by researcher

management was shown to have a significant impact on service quality and customer happiness in their research. Because of its flawed adoption and interpretation of the disconfirmation model, SERVQUAL is flawed at its core, as argued by Cronin and Taylor (1992). According to Cronin and Taylor (1994), SERVQUAL confuses the two concepts of service quality and customer satisfaction. They came up with the performance measurement tool SERVPERF and postulated that service quality might be evaluated based on "alike to an attitude" qualities. Customer satisfaction mediates the influence of earlier judgments of service quality and results in new perspectives on service quality, according to studies by critics of Cronin and Taylor. Reputations may be changed by providing exceptional service [22].

7 Conclusions and Recommendations

Data was analyzed and interpreted. 800 workers and customers' TQM attitudes were analyzed. They respond similarly. Clients were unprepared to respond. The study was easy. Using numerous statistical methods, the main conclusions were found and published [21].

This research found that telecommunication businesses must focus on service quality to survive and satisfy customers. The findings showed that telecommunication firms lose customers when service quality is degraded, affecting consumer happiness and value. This research proposes that TQM rules in the telecommunications sector should focus on service quality, including "Equipment and Materials," "Before and During Services," and "After-Sales Services". The research demonstrates that telecommunication businesses must focus on service quality to thrive since consumer's judge them by their capacity to please customers.

Researchers concluded that telecoms should focus on the following areas:

- Equipment and materials are palpable.
- Service providers should be dependable.
- They should address concerns swiftly.

- They should guarantee service quality and handle issues quickly.
- Total quality management improved service quality and customer happiness because telecom businesses must exhibit empathy.

8   Limitation of the Study

The results have significant ramifications for TQM's potential to boost customer satisfaction at telecom companies. However, there were a number of limitations to the study. First, the data used in the evaluation prevents the researcher from drawing broad conclusions about the whole sector of telecom companies [20]. This research uses data from only a fraction of the whole telecom industry. Staff members may be reluctant to provide easy access to information on telecom operations due to bureaucratic, ideological, and other influences in telecom administration. The researcher was therefore limited in her ability to survey a representative sample of the community at large. However, because of the nature of the research design, only a very small subset of the population was included in the data set. Additionally, the model employed to measure TQM's impact on customer happiness did not have access to other factors of customer satisfaction that would not have affected the validity of the results. Some employees fear that by discussing the telecom company online, they may be giving competitors valuable, proprietary information. Despite these limitations, the study's findings are nonetheless reliable, valid, and predictable.

9   Policy Implications

The results of the research provide credence to a variety of policy suggestions. Studies on TQM in the telecom sector suggest that sticking closely to established rules and standards might improve service quality. The implication is that if TQM methods were used, customer satisfaction would increase. To guarantee that clients get the most out of their services, the author of the report suggests that the telecom sector use innovation-driving technical devices and fraud-detection and tracking systems. However, they may improve customer happiness by investing in infrastructure and building enhancements that are in line with what their target demographic expects. The quality of the service supplied to customers may be enhanced, however, by regular upkeep of gear and technology. According to the results of the survey, telecom companies prioritize initiatives that increase customer satisfaction and, by extension, their market share and revenue. Managers, CEOs, board members, and faculty members may all learn from these findings.

10 Recommendations for Future Research

The results of this study added to our understanding of how overall quality management affects customer satisfaction in the telecommunications sector. The author of the study suggests, however, that further research be conducted in order to broaden the scope of existing knowledge [22]. Telecom firms may boost customer satisfaction by either adding more skilled workers or providing the current workforce with more TQM training. Employees are responsible for collecting customer feedback, servicing clients at all hours, and making consumers happy via excellent service. The proposed line of inquiry will provide an all-encompassing assessment of client confidence and contentment.

References

1. Gajewska, T., Zimon, D., Kaczor, G., Madzík, P.: The impact of the level of customer satisfaction on the quality of e-commerce services. Int. J. Prod. Perform. Manag. **13**, 9 (2019)
2. Pambreni, Y., Khatibi, A., Azam, S., Tham, J.: The influence of total quality management toward organization performance. Manag. Sci. Lett. **9**, 1397–1406 (2019)
3. Arndt, C., Davies, R., Gabriel, S., Harris, L., Makrelov, K., Modise, B., Anderson, L.: Impact of COVID-19 on the South African economy. In: Southern Africa-Towards Inclusive Economic Development Working Papers, p. 98 (2020)
4. Akpan, I.J., Soopramanien, D., Kwak, D.-H.: Cutting-edge technologies for small business and innovation in the era of COVID-19 global health pandemic. J. Small Bus. Entrep.Entrep. **33**, 607–617 (2021)
5. Martins, S.M., Ferreira, F.A., Ferreira, J.J., Marques, C.S.: An artificial-intelligence-based method for assessing service quality: insights from the prosthodontics sector. J. Serv. Manag.Manag. **31**, 291–312 (2020)
6. Matzner, M., Büttgen, M., Demirkan, H., Spohrer, J., Alter, S., Fritzsche, A., Möslein, K.M.: Digital transformation in service management. SMR-J. Serv. Manage. Res. **2**, 3–21 (2018)
7. Peitzika, E., Chatzi, S., Kissa, D.: Service quality expectations in the fitness center context: a validation of the expectations component of the SERVQUAL scale in Greece. Serv. Mark. Q. **41**, 89–104 (2020)
8. Mehreza, A., Bakria, A.: The Impact of Human Resource Practices on Job Satisfaction and Intention to Stay in Emerging Economies: Model Development and Empirical Investigation among High Caliber Governmental Employees in Qatar. Available online: http://hdl.handle.net/10576/15264 (2019). Accessed on 14 Aug 2022
9. Hussein, F.B.F.: The Impact of Total Quality Management for Achieving Sustainable Project Management. The British University in Dubai (BUiD), Dubai, United Arab Emirates (2021)
10. Abbas, J.: Impact of total quality management on corporate green performance through the mediating role of corporate social responsibility. J. Clean. Prod. **242**, 118458 (2020)
11. Ghobakhloo, M., Fathi, M.: Corporate survival in Industry 4.0 era: the enabling role of lean-digitized manufacturing. J. Manuf. Technol. Manag. **31**, 1–30 (2019)
12. Mizuno, S., Bodek, N.: Management for Quality Improvement: The Seven New QC Tools. Productivity Press, New York, NY, USA (2020)
13. Bounabri, N., El Oumri, A.A., Saad, E., Zerrouk, L., Ibnlfassi, A.: Barriers to ISO 9001 implementation in Moroccan organizations: empirical study. J. Ind. Eng. Manage. (JIEM) **11**, 34–56 (2018)

14. Rachmawati, M., Farenda, R.R., Tanudjaja, E., Sinaga, O.: Efforts to improve Wom' to Achieve Consumer Satisfaction by Improving Serqual and Price Policy in the Hotel "Janevalla" Bandung. Central Asia Cauc. **23**, 3468–3474 (2022)
15. Arcidiacono, G., Pieroni, A.: The revolution lean six sigma 4.0. Int. J. Adv. Sci. Eng. Inf. Technol. **8**, 141–149 (2018)
16. Gupta, V., Jain, R., Meena, M., Dangayach, G.: Six-sigma application in tire-manufacturing company: a case study. J. Ind. Eng. Int. **14**, 511–520 (2018)
17. Xuan, V., Trung, N.: Factors affecting quality management in business: evidence in Vietnam manufacturing and technology enterprises. Manag. Sci. Lett. **10**, 2099–2106 (2020)
18. Evans, J.R., Lindsay, W.M.: An Introduction to Six Sigma and Process Improvement. Cengage Learning, Boston, MA, USA (2014)
19. Lodgaard, E., Aasland, K.E.: An examination of the application of plan-do-check-act cycle in product development. In: DS 68–10: Proceedings of the 18th International Conference on Engineering Design (ICED 11), Impacting Society through Engineering Design, Vol. 10: Design Methods and Tools Pt. 2, Lyngby/Copenhagen, Denmark, 15–19 August 2011; Technical University of Denmark, Lyngby, Denmark (2011)
20. Kokila, M.S., Chandra, S.: A study on career choice as entrepreneurs among undergraduate students in Bangalore. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-26953-0_23
21. Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.): Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-33662_34.
22. Meenadevi, K., Mruthyunjaya Sharma, G.V., Archana, J.R., Subba Anantha, K.: Work habits based on agile methodology: metrics and procedures. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023).

Ernest Hemingway's *The Sun Also Rises*: A Critical Approach Based on E. D. Hirsch's Hermeneutic Theory

Kifah Moh'd Khair Ali Al Omari

1 Introduction

In analyzing a modern novel like Ernest Hemingway's *The Sun Also Rises* (1926), there is a need of an approach which goes beyond the traditional divisions of such works into plot, character, setting, theme, and other similar elements. In addition to the huge critical scholarship that this novel receives, the present paper proposes another approach that has never been emphasized in the earlier studies; it is an approach that depends mainly on E. D. Hirsch's Hermeneutic Theory. The researcher argues that Hemingway's novel can illustrate all Hirsch's critical views about the meaning of the literary work and attempts, accordingly, to provide a textual analysis that supports the validity of such views.

2 E. D. Hirsch

Eric Donald Hirsch (1928-) is an American literary critic and scholar. He is best known for his book *Cultural Literacy: What Every American Needs to Know* (1987). He graduated with a BA degree from Cornell University, Ithaca, New York in 1950. He got his PhD degree from Yale University, New Haven, Connecticut, in 1957. Some of his well-known books are *Validity in Interpretation* [8], *The Aims of Interpretation* [9], and *The Philosophy of Composition* [10]. Based on his teaching experience, he thinks that American students don't have the basic knowledge of cultural terms and concepts that they need for academic advancement. In order to fill in this gap, he wrote books like *Fairness and Core Knowledge* (1991), *The Schools We Need and Why We Don't Have Them* (1996), *The Knowledge Deficit* (2006),

K. M. K. Ali Al Omari (✉)

Department of English Language and Literature, The Hashemite University, Zarqa, Jordan
e-mail: k.m.alumari@hu.edu.jo

and *The Making of Americans: Democracy and Our Schools* (2009). He is the founder and chairman of the non-profit Core Knowledge Foundation, an institution which provides curriculum guidelines for Pre-K through 8th grade. He is now a professor emeritus of education and humanities at the University of Virginia.

3 Phenomenology and Hermeneutics

Phenomenology and hermeneutics are two trends in literary theory that flourished during the twentieth century. Both trends are concerned with the 'suitable' way of interpreting literary texts, especially in a world full of anarchy and chaos. The attainment of truth and 'valid interpretation' is the ultimate goal for both of them. The relationship between the literary text, its author and the reader is one of the important aspects that both trends examine thoroughly.

As for phenomenology, it refers to the science that emphasizes pure phenomena. It is the name given by the German philosopher Edmund Husserl for this philosophical method which rejects earlier methods that take knowledge for granted. It emphasizes only what we can be sure about in our consciousness and the concrete things themselves. In literature, phenomenology can be applied to the act of reading and interpreting literary texts. The text itself is reduced to what the author had in mind during the act of writing. To know the author's mind, we need to refer to nothing outside the work itself, and to penetrate to the elements of the author's consciousness that are manifested in the work itself.

Hermeneutics, on the other hand, means the science or art of interpretation. It broadens its scope to encompass the problem of textual interpretation as a whole. One of the well-known proponents of this doctrine is the American thinker E. D. Hirsch (1928-). In his famous book *Validity in Interpretation*, he examines many issues related to textual interpretation, the most important of which is the issue concerning 'meaning.'

4 The Meaning of the Literary Work

The meaning of a literary work has always been a controversial issue throughout ages. Literary debate over this issue has increased in the twentieth century with the appearance of new literary theories. Some of these theories, Russian Formalism and New Criticism for example, claim that the meaning of a literary work is to be found in the text itself. In order to define the 'correct' meaning of the work, there is no need to refer to anything outside the text under investigation. Other theories like reception theory and reader-response criticism assign greater importance to the role of the reader in finding out this meaning. For the adherents of this theory, the reader is the one who actualizes the literary work. The third and final kind of theories considers the author as the sole owner of the meaning of his/her work. This view is

adopted by some hermeneuticists, especially those who adhere to the earlier form of the theory. The debate, then, is whether to look for the meaning in the text, in the reader's response, or in the mind of the author. It is still going on till nowadays, and no final resolution is achieved.

Another debate concerning the meaning of the literary work is whether this meaning is changeable or not. Again, some theories take one extreme, others take the other, and a third kind of theories try to make a sort of compromise between the two extremes. The present paper is an attempt to shed light on one of those who try to achieve this compromise; this is E. D. Hirsch., and to apply his theory on *The Sun Also Rises* (1926) by Ernest Hemingway [7]. The researcher claims that this novel is one of the best novels that may represent Hirsch's views, especially his insistence on the importance of the author's role in conveying the meaning of the text.

5 Meaning for E. D. Hirsch

For E. D. Hirsch, the meaning of a literary work is absolute; it is not changeable. It is identical with whatever the author has in mind during the time of writing. He doesn't deny, however, that the meaning of a literary work may change, but this is a matter of the work's significance, rather than its meaning. Meaning and significance, for Hirsch, are the two horizons of textual meaning.

Meaning for Hirsch, says Terry Eagleton, is an affair of consciousness; it is not an affair of signs or things. It is something which the author wills. It is a "ghostly, wordless mental act which is then 'fixed' for all time in a particular set of material signs" (Eagleton [4], 58). In his book entitled *Validity in Interpretation*, Hirsch [8] emphasizes that a word sequence means nothing in particular until somebody either means something by it or understands something from it (1967). In the same book, he defines 'meaning' as "that which is represented by a text; it is what the author meant by his use of a particular sign sequence; it is what the signs represent" [8, p. 8]. Hirsch sometimes uses the term 'verbal meaning' by which he means nearly the same thing, 'Verbal meaning' for him is "whatever someone has willed to convey by a particular sequence of linguistic signs and which can be conveyed (shared) by means of those linguistic sings" [8, p. 31]. In order to determine this meaning and its correct interpretation, we need two principles: the social principle of linguistic genres and the individual principle of authorial will. It is true that many things are likely to be going on in the author's mind at the time of writing, these things; however, are not to be confused with 'verbal meaning.'

It is important to point out here to some important issues that should be taken into consideration when we identify the meaning of a text. In identifying the meaning of a text with what the author meant by it, Hirsch does not presume that we always have access to the author's intentions. We cannot reproduce the author's intended meaning. For one thing, we are all different from him/her. For another, we cannot get inside his/her mind to compare the meaning he/she intends with the meaning we understand. However, one can argue that we cannot be certain about the author's

intended meaning, but the impossibility of certainty in understanding should not be confused with the impossibility of understanding. "Since genuine certainty in interpretation is impossible, the aim of the discipline must be to reach a consensus … that correct understanding has *probably* been achieved" [8, p. 17]. It is better, in such cases, to employ our energies in making the text relevant to our present concerns.

Even the author himself/herself doesn't often know what he/she means. The authorial ignorance is of two types; one has to do with the subject matter, and the other with the author's meaning itself. There are usually "components of an author's intended meaning that he is not conscious of" [8, p. 21]. It is not possible to mean what one does not mean, but it is very possible to mean what one is not conscious of meaning. There is, then, a big difference between meaning and consciousness of meaning. Since meaning is an affair of consciousness as we have seen earlier, "one can say more precisely that there is a difference between consciousness and self-consciousness" [8, p. 22]. The author, then, might not have any intention in conveying some of his/ her meanings.

The fact that the author may not sometimes know what he/she means does not allow us to do without taking him/her into consideration when interpreting literary works. Ignoring the author will lead to many theoretical confusions because it obscures "the only compelling normative principle that could lend validity to an interpretation' [8, p. 5]. In order to define the concept of validity, Hirsch emphasizes the importance of this general normative principle despite the fact that there is nothing in the text which compels the reader to consider the author's meaning as his normative ideal. The reader can easily construe meanings that are different from the author's. Once again, however, only the author's intention provides us with a "criterion which would allow us … to determine which of the linguistically possible interpretations of any given work is correct" [11, p. 17]. According to Eagleton, Hirsch's basic proposition is that the meaning of the literary text is the author's property, it should not be stolen by the reader (1983). So, the literary meaning for all these critics is immutable and wholly resistant to historical change.

The way the author uses language is another important factor in defining the meaning of a literary work. Wellek and Warren [13] argue in *Theory of Literature* that even the phonetic level of a language cannot be isolated from its meaning (1949). They add that the structure of meaning is itself amenable to linguistic analysis. One can write the grammar of a literary work beginning with phonology, going on to vocabulary, and rising to syntax. Similarly, Hirsch argues that the use of language is sometimes constitutive of meaning. It is true, Hirsch argues, that there are some limitations on the possibilities of language, but these are not of great significance. According to Juhl [11], the meaning of a literary work has no constraints on the interpretation of the work other than those imposed by the rules of the language itself.

As far as interpretation is concerned, Hirsch emphasizes in all his writings what he calls the 'validity of interpretation'. Validity implies the correspondence of an interpretation to a meaning which is represented by the text (1967). Validity of interpretation, thus, is not the same as inventiveness of interpretation. It is important

to achieve a normative principle of valid interpretation. That is why Hirsch opposes principles like 'historicism,' 'psychologism', and 'autonomism'. These principles, he argues, deny the possibility of what he calls 'normative validity'. In their quick survey of the major literary theories in the twentieth century, Fokkema and Kunne-lbsch [5] emphasize Hirsch's authority with regard to the issue of interpretation.

In addition to *Validity in Interpretation*, Hirsch emphasizes the same views in his other two books entitled *The Philosophy on Composition* [10] and *The Aims of Interpretation* [9]. In both books, he convincingly argues that valid interpretation can indeed be achieved. He distinguished between two aims of a genuine discipline, a theoretical and a practical one. The theoretical aim is the attainment of truth. The practical aim, on the other hand, is agreement that truth has probably been achieved. Consensus, then, is precisely the aim of valid interpretation; it can be reached by mastering the relevant evidence. Certainty for him is not the same thing as validity. In general, Hirsch's aim is to establish a set of authoritative and consistent principles capable of generating correct interpretation and of resolving conflicts, especially those concerning the meaning of a literary work. He remains throughout committed to protecting the stable determinacy of meaning. Meaning is stable, what may change is the significance of a work to the reader, or even to the author himself.

In order to move from the theoretical part of this paper to the practical one, the researcher attempts to apply all Hirsch's critical views on a selected work of literature to test their 'validity.' The work chosen for this purpose in Ernest Hemingway's famous novel *The Sun Also Rises* (1926). This novel is chosen in particular because of the nature of the novel itself, the story presented in it, its peculiar style, and the critical acclaim that it has received since its publication**.**

6   Ernest Hemingway: Style and Themes

Before going to the actual application, it is helpful to give a brief idea about Hemingway himself and about the novel, its main characters, events, and themes. Ernest Hemingway (1899–1961) is one of the most well-known American writers during the first half of the twentieth century. He is known as a novelist, a short story writer and a journalist. He was awarded the Nobel Prize in Literature in 1954. His novels include *The Sun Also Rises* (1926), *A Farewell to Arms* (1929), *To Have and Have Not* (1937), *For Whom the Bell Tolls* (1940), and *The Old Man and the Sea* (1952).

During his lifetime, he travelled to Paris, Spain, Cuba, Africa, and other places. In addition, he witnessed the two World Wars, which gives him a wide knowledge and experience that strongly affects his style of writing and gives him a wide variety of many topics to write about. He is mainly interested in writing about love, war, travel, wilderness, and loss.

Style is the most important element that distinguishes Hemingway from all other writers during the first half of the twentieth century. He is known for economy, understatement and the iceberg theory. In his essay entitled "Observations on the Style

of Ernest Hemingway," Levin [12] cites many examples to prove that Hemingway's diction is thin, that his syntax is weak, that his adjectives are not powerful, and that his verbs are not energetic (73–79). Despite all these drawbacks, no one can deny that Hemingway has an unexampled style. In all his works, says Levin, "each clipped sentence, each prepositional phrase, is like a new frame in a strip of film" (79–80). Unlike many other writers, he tries always to keep his writing on a linear plane. According to Levin, Hemingway "holds the purity of his line by moving in one direction, ignoring sidetracks and avoiding structural complexity" (80). Hemingway achieves his special vividness and fluidity by "presenting a succession of images, each of which has its brief moment when it commands the reader's undivided attention" (81).

7 *The Sun Also Rises*

The novel is about a group of young American and British expatriates travelling to Europe during the 1920s and representing the lost generation at that time. The two main characters are Jake Barnes and Lady Brett Ashley. Jake is the novel's main narrator, he is a journalist who participate in World War I and suffered from an injury that rendered him impotent. After the war, he travelled to Paris and lived near to his friend Robert Cohn. Brett, who also lives in Paris, helped in treating Jake's injury and falls in love with her, only to know later on that Cohn also has the same relation with her, and both leave Paris together to Spain. Jake decides to travel to Spain with Cohn and his friend Bill Gorton in order to attend the Fiesta in Pamplona. While being there, they met Brett and her fiancé Mike Campbell. Montoya, the owner of the hotel where they stayed, introduces them to bullfighting. Brett runs off to Madrid with a nineteen-year old bullfighter known as Pedro Romero. Jake decides to go back to Spain, but he receives a telegram from Brett asking for his help. She asks Romero to leave for fear of corrupting him. The novel ends with both Jake and Brett talking together in a taxi in Madrid. Brett tells Jake that they could have a wonderful time together, and Jake responds by saying, "Yes, isn't it pretty to think so?" (258).

8 E. D. Hirsch's Hermeneutic Theory and *The Sun Also Rises*

It is time now to apply some of E. D Hirsch's views mentioned earlier in this paper on Hemingway's *The Sun Also Rises*. However, it is helpful before doing so to refer briefly to some other critics who might have the same view about the novel. In his book entitled *Ernest Hemingway: The Artist as Man of Action* (1972), J. Bakker [1] states that the structure of Hemingway's *The Sun Also Rises* offers no surprises on the representational level (75). The novel is divided into three books, the first and part of

the second describe the actions of the main characters in Paris, after which the scene shifts to Spain where we see the fishing trip to Burguet and the fiesta in Pamplona. The narration in the novel is "swift, straight forward, obeying a strict chronology without flashbacks or any other experimental technique" (Bakker 75). Everything in the novel is imparted to the reader through the consciousness of the main first person omniscient narrator of the novel and its protagonist Jake Barnes. So, the reader can trust Barnes and rely heavily on his narration. Despite this seeming simplicity of the novel, Bakker adds that the most important thing in it is its symbolic structure, and in particular the symbolic significance of the bullfights (75).

In his book entitled *Writing Degree Zero* (1953), Roland Barthes [3] argues that Hemingway's writing is far from being neutral; on the contrary, it is "loaded with the most spectacular signs of fabrication' (74). For Barthes, a style-less or 'colourless' way of writing is impossible to achieve. This way of writing for him quickly becomes a noticeable style in itself. There is no such thing as pure context, all contexts come to men already coded, shaped, and organized by language. Most of Barthes's work can be seen as an attack on the presumption of innocence. He keeps emphasizing that none of us is innocent, we invent the world we inhabit and we modify and reconstruct what is given.

In his book *S/Z* (1975), Roland Barthes [2] suggests a full-length study of a single short story by Balzac called "Sarrasine" based on various 'codes'. One of these codes is very much related to E. D. Hirsch's theory; this is the 'hermeneutic' code. Barthes defines this code by saying that it consists of "all the units whose function it is to articulate in various ways a question, its response, and the variety of chance events which can either formulate the question or delay its answer" (quoted in Hawkes [6], p. 94). This code, says Terence Hawkes, emphasizes the problems raised in the literary work and their various solutions.

The hermeneutic code can be seen in the very title of Hemingway's novel. *The Sun Also Rises* was first published as *Fiesta* in Britain. In both titles, there is a kind of suspense and a puzzle that calls for a solution. As for the first title, the sun is always considered to be a symbol for hope, but when we say that 'it also rises,' many questions will come up to one's mind: what causes it to fall down? What happens as a result? How can it rise once more? The same set of questions are raised by the second title; Fiesta: what is fiesta? Why is it held? Who takes part in it? What happens in it? According to E. D. Hirsch's Hermeneutic Theory, knowing what is going on in Hemingway's mind at the time of writing the novel may help a lot in finding answers to all these questions. To add more to the suspense created by the fiesta, Hemingway starts his actual account of it in chapter fifteen: "At noon on Sunday, the 6th of July, the fiesta exploded. There is no other way to describe it" (157). In addition, the meaning of 'fiesta' should be identical with what Hemingway has in mind at the time of selecting this title for the novel. However, its significance can vary according to the way each reader might understand it.

If we go directly from the title to the ending of the novel, one can notice that Hemingway, once again, emphasizes the same suspense and provides the reader with an open ending. The novel ends with Jake responding to Brett's question by saying, "Yes, isn't it pretty to think so?" (258). On the one hand, the novel ends by a

question. On the other, it is an enigmatic question that might have different answers. It is true that one possible interpretation is that there is hope for American people to have a better life. They are wounded physically by the war. This wound, however, is not a spiritual one. Jake and Brett are finally able to find a way out of all their miseries:

> The driver started up the street. I settled back. Brett moved close to me. We sat close against each other. I put my arm around her and She rested against me comfortably. It was very hot and bright, and the houses looked Sharply white. We turned out onto the Gran Via.
>
>   'Oh, Jake,' Brett said, 'we could have had such a damned good time together" (258).

By now, Jake and Brett have had a good experience in life; they will be able to live happier. However, Jake's answer to Brett's question by another question may pose a lot of doubt about such interpretation.

Another example about the significance of E. D. Hirsch's theory in reading and understanding this novel can be traced back to the very first lines of the novel when the narrator talks about Robert Cohn. Cohn is a boxing champion, but he "cared nothing for boxing, in fact he disliked it" (3). The narrator adds more to the confusion of the reader by saying. "I always had a suspicion that perhaps Robert Cohn had never been middleweight boxing champion" (3).

The same confusion can be seen in the narrator's early account of his relation with Brett:

> She was looking into my eyes with that way she had of looking that made you wonder whether she really saw out of her own eyes. They would look on and on after every one else's eyes in the world would have stopped looking. She looked as though there were nothing on earth she would not look at like that, and really she was afraid of so many things. Her eyes had different depths; sometimes they seemed perfectly flat. Now you could see all the way into them. (26)

For Jake Barnes, it is an enjoyable feeling to be in love, for Brett, however, it is not. The *mystery* about their relationship will not be revealed until the end of the novel when Brett realizes that she could have a good time with Jake.

The last example to be discussed from the novel is related to the fight between Romero and Cohn. It is one of the most important events in the novel that can be interpreted in various ways. One way to understand it is to say that this fight had not touched Romero's spirit, but it hurt his body, especially his face. Cohn's strength, on the other hand, is not an internal one, that's why his spirit is completely smashed towards the end of the novel. Romero's triumph affects the way he killed the following bull, he kills the bull as he wanted to. As the novel ends, Romero proves to be the only 'real' man among all the other men. Some consider him the real hero of the novel. His killing of the bull is a sign of a communal triumph, which marks the end of the fiesta. He meets the challenge of death by a behavior that all other men should adopt.

So, the examples discussed above are only a sample of many other important events that can be understood in different ways. According to Hirsch's theory, they are 'significant' events that can have various changeable meanings, despite the fact

that Hemingway might have only one meaning in his mind at the time of writing the novel.

9 Conclusion

To conclude, one can say that Ernest Hemingway's *The Sun Also Rises* in one of the works that can be best read and understood according to E. D. Hirsch's Hermeneutic Theory. Knowing what is going on in Hemingway's mind at the time of writing the novel may help the reader a lot to better understand all the enigmatic and ambiguous characters and events. Hirsch doesn't deny, however, that the readers cannot always have access to the author's intended meaning, but they can at least try to do so. He differentiates between meaning and consciousness of meaning; it is not possible to mean what one does not mean, but it is very possible to mean what one is not conscious of meaning. By the end, Hirsch's main purpose is to give more importance to the role of the author. He claims that no one can usurp the author's position because doing such a thing may eliminate the only compelling principle to achieve validity of interpretation.

References

1. Bakker, J., Hemingway, E.: The Artist as Man of Action. Van Gorcum, New York (1972)
2. Barthes, R.: S/Z (trans. R. Miller). Cape, London (1975)
3. Barthes, R.: Writing Degree Zero. Cape, Trans. Annette Lavers and Colin Smith. London (1967)
4. Eagleton, T.: Literary Theory: An Introduction. Blackwell Publishers, UK (1983)
5. Fokkema, D.W., Kunne-Ibsch, E.: Theories of Literature in the Twentieth Century: Structuralism, Marxism, Aesthetics of Reception, Semiotics. London: C. Hurst and Co. Ltd., 1978.
6. Hawkes, T.: Structuralism and Semiotics. Routledge, London (1977)
7. Hemingway, E.: The Sun Also Rises. Introduction by Henry Seidel Canby. FB &c Ltd, New York (2016)
8. Hirsch, E.D.: Validity in Interpretation. Yale UP, London (1967)
9. Hirsch, E.D.: The Aims of Interpretation. The University of Chicago Press, Chicago (1976)
10. Hirsch, E.D.: The Philosophy of Composition. The University of Chicago Press, Chicago (1977)
11. Juhl, P.D.: Interpretation: An Essay in the Philosophy of Literary Criticism. Princeton, Princeton UP (1980)
12. Levin, H.: Observations on the style of Ernest Hemingway. In: Weeks, R.P. (Ed.) 20th Century Views—A Collection of Critical Essays: Hemingway. Princeton, London (1962)
13. Wellek, R., Warren, A.: Theory of Literature. Harcourt, Brace and World, New York (1949)

Impact of Supply Chain Quality Management Practices on the Purchasing Efficiency of Service Organizations

Ch. Raja Kamal , **Arti Singh** , **Khodakyvskyy Volodymyr** ,
Olena Rusak , **Rybak Mariia** , and **Nadiia P. Reznik**

1 Introduction

According to Smeltzer and Ogden [1], services businesses have more problems procuring raw materials and finished goods than manufacturers. Dispersed procurement, unclear connections between inputs, processes, and final products, insufficient emphasis on procurement skills among employees, a focus on end users rather than processes, excessive outsourcing, inadequate contracts, loss of control over suppliers and consumers, etc. increase complexity [2]. Complex service organizations have ambiguous buy performance dynamics [2]. QMPPs and hotel purchases were analyzed. Inns fight. Advances compete. Business demands hotel overnight stays. Effectiveness raises standards and decreases costs.

Service businesses improve purchasing performance using QM buying systems [3, 4]. Covered here. Research has several goals. Purchasing information system services integrate QMPPs and buying performance to enhance QM, purchasing, technology management, and SCM. Purchasing information systems are used to analyze how QMPPs affect buying performance. Services-focused supply chain management

Ch. Raja Kamal (✉) · A. Singh
Kristu Jayanti College Autonomous, Bengaluru, India
e-mail: Rajakamal@kristujayanti.com

K. Volodymyr · O. Rusak
Polissia National University, Zhytomyr, Ukraine

R. Mariia
National University, Zhytomyr, Ukraine

N. P. Reznik
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

and procurement research fills a need. Producers are inspected [5]. Third, efficient procurement during environmental crises helps companies. Finally, ASEAN studies show that Western ideals may be applied to non-Western contexts.

2   Contextual Theory

2.1   *Current Trends in the Hospitality Sector*

In today's crowded and quick-moving world, people use aircraft, trains, buses, and vehicles to go where they need to go. Food, lodging, and services must be readily available and reasonably priced for tourists. More and more rooms, restaurants, bars, banquet halls, conference, convention, and entertainment spaces are being added to hotels all over the world. The United States attracts a huge number of international tourists each year. Hotels may benefit from the use of computers and data processors in the areas of managing unit costs, budgeting, payroll control, market research, and statistics. Hotels might utilize this information for planning, forecasting, and analysis purposes. Every business owner seeks 100% occupancy and maximum earnings. Reduce waste and Kokila [6] increase productivity so that you can provide affordable homes and excellent services [7]. The Company's fast expansion since the 1960s has necessitated the hiring of highly skilled staff. Young people who are well-versed in science and technology are in high demand in today's business and management worlds.

2.1.1   Shopping for Hotels and Resorts

Timing is essential in the hospitality industry. Although this seems like a straightforward statement, it presents a significant difficulty for the hotel's purchasing manager when applied to the thousand to two thousand items the hotel has to stock. Chemicals for use in the hotel's restaurants, bars, laundry rooms, and guest rooms are purchased by the hotel's procurement department. Travel agents and hotel management are buyers. Fast and low-priced supply acquisition is essential for the hospitality industry. Customers in the hotel industry may use sourcing to find suppliers. Estimates of future operations are the basis for purchasing decisions. After deciding on a target volume, the buyer will next get vendor price quotes. Certain merchants will get purchase orders. When the hospitality business buys goods, purchase orders let accounts payable pay the bills [8].

3   Review of Literature

3.1   Purchasing QMPPs—Quality Management Practices

Total quality management TQM is a "philosophy" or "approach to management" that relies on a set of complementary ideas, methods, and techniques. According to Hoyle [9], TQM boosts productivity through improving process controls, cutting down on waste, cutting costs, expanding into new markets, energizing employees, and establishing a shared vision for the company's future. According to Peng et al., TQM abilities may boost business results. TQM adoption and execution have an effect on SC models, as discovered by Ameer et al. [10] propose quality certification throughout the supply chain for monetary and social gains. TQM improves SC performance via collaborative partner efforts, as shown by Fernandes et al. [11]. For this reason, several researchers advocate integrating quality management QM techniques and processes into all value chain activities, including buying Fletcher [12] and Sancha [13].

The authors researched supply chain quality assurance. Look at the results of the implementation and the work done with the suppliers. Hemsworth and Sanchez-Rodriguez [14] cite a slew of research that highlights the need of purchasing benchmarking, the importance of quality management of buying professionals, and the importance of greater purchasing engagement with other company activities.

Start of the QMPPs. Humphries and Gibbs [15], several studies have shown that SQM aids consumers in obtaining quality. Reduced supplier portfolio size, better improvement objectives, recognition of supplier progress, encouragement of participation and expansion, etc. are only some of the benefits of SQM [16].

QMPPs broaden the scope of vendor management. Quality and newness are two areas that buyers and producers collaborate on Burt [17] Purchasing departments in TQM companies need careful management that allows for independence, authority, and teamwork Abouzeid [2], Giunipero and Vogt [18] QM has to include recruiting people as part of its strategy for maintaining harmony. Benchmarking and manager dedication to quality improvement are essential components of quality management systems. Purchasing benchmarking, manager dedication, employee management, cross-functional buying coordination, and supplier quality management are all examples of Quality Management Practices QMPPs identified in this study.

3.2   Acquiring Services for Information Systems PISS

Kefel [19] claim that the information-based economy is the most important development of the previous two decades. Information-based economy may force organizations to become digital. Information drives digital competitiveness. Digitization changes corporate strategies, models, and processes, creating new competitors, according to Ilcus [20]. Thus, organizations must collect, evaluate, and use data

in all aspects of operation, including purchasing and supply chain management SCM. Digital technology improves business structures worldwide. Cousins [21] recommends permitting resources to maintain performance. Real-time digital technology allow suggests IT-enabled digital communication and information sharing benefits multi-level supply chains. IT enables agile supply chain management and procurement [22–24]. Procurement methods enhanced quality management.

Internet and EDI are included. QMPPs need live data. EDI, Internet-enabled technology, and supplier information exchange may improve data quality [24].

3.3   The Purchasing Efficiency Ratio PP

Buying is becoming regarded as a vital value-chain support activity Cousins et al. [21], even if production and SCM have historically gotten more emphasis. When making purchases, safety and dependability are more important than low prices and mass production. Purchasing performance may be negatively impacted by a number of factors, including supplier selection, contract writing, social embeddedness due to a lack of trust and commitment, and moral hazards [25, 26]. There is some evidence that effective supplier and procurement management may aid a company's performance in volatile markets [26].

Delivery times, estimated expenses, and material quality were all assessed. Quality management in procurement procedures has both a direct and an indirect bearing on output. We expand further on the potential causal linkages between the various concepts relevant to our issue.

4   Research Methodology

The purpose of this research is to evaluate the efficiency of Thai hotel purchasing departments. The model was verified by structural equation modeling and further factor analysis. So it looked for ways to associate QMPPs with PP. A questionnaire survey method was employed for this research. Experienced purchasing managers filled out the survey Table 2. Twenty-two questions examined QMPPs, five assessed IS practices, and four assessed acquisition efficiency. Three to five star hotels in Ethiopia that are members of the Ethiopia Hotel Standard Association were surveyed. The hypothesis was examined using AMOS SEM. When comparing relationships across constructs that stand for first and/or higher-order measurement levels, SEM may be used to calibrate a large number of regression models. Quality of measurements, reliability of links, and model fitness are evaluated.

Table 1 Basic information

Level	Respondents
Five stars	26
Four stars	43
Three stars	**54**

Table 2 Results of confirmatory factor analysis

Code	Standardized	CR	T values
BM	0.024	0.346	< 1.96
IS	0.001	–	–
CFC	0.097	0.906	< 1.96
MC	−0.100	−0.918	< 1.96
PM	0.077	–	–
SQM	−1.280	−0.829	< 1.96

5 Results and Findings

Table 1 contains some basic information about the survey's respondents. To examine the constructs' validity, reliability, and uni-dimensionality see Table 2, we ran a series of factor analyses FA and alpha coefficient tests.

Table 2 reveals that SM scale 1–6 C.R < 1.96 is not significant. All 1–6 standardized loadings are -1.280, showing low correlations. 7–12's PM construct C.R < 1.96 is unremarkable. All 7–12 standardized loadings = 0.077 suggest inadequate variable connections. 13–16 CFC scale C.R. < 1.96 is unremarkable. All 13–16 standardized loadings exhibit low dependent variable relationships. Management commitment scale 17–19 showed a C.R < 1.96 and was not significant. 17–19 loadings are weak. BM scale 20–22 has C.R < 1.96 and is unremarkable. All 20–22 standardized loadings show low correlations. IS scale 23–27 C.R > 1.96 matters? All 23–27 standardized loadings show strong correlations. PP purchasing performance scale 28–31 has C.R > 1.96. All 28–31 standardized loadings have strong key factor linkages.

6 CFA Fit Indices

CFA In 1998, Anderson and Gerbing [27] looked at the stability, validity, and one-dimensionality of measurement quality. Tight limits meant that promises couldn't be kept and comparisons couldn't be made. The score was determined by checking the five QMMP indicators. Excellent QMLP. All the idea indicators converge towards the true meaning of the concept. There was convergent validity since all factor loadings were rather large. Convergent validity was shown by significant coefficients of p0.01 for markers of SQM, PM, CFC, MC, and BM. Indicator variables constructed using

QMPPs, IS, and PP have large, statistically significant p0.01 coefficients. Because every CFA model is correct, every building has just one dimension.

7   Hypothesis Testing

A model chi-square value of CMIN = 89.619, df = 73, and p = 0.091 p 0.05 was obtained from the structural model estimate. This research design worked perfectly. The RMSEA was less than 0.10, while the CMIN/df value was less than 3.00. Under the threshold of 0.10, the index RMR was 0.049. The NFI = 0.93, CFI = 0.95, GFI = 0.90, and IFI = 0.96 fit indices all met or above the 0.90 threshold established by Chau [28]. As a result, the data samples confirm the hypothesized paradigm. Consequently, the proposed model may investigate the direct and indirect effects of QMPPs and associated IS activities on purchasing efficiency.

8   Findings of the Study

- Data is gathered by QMPPs. H1: IS = −1.650, CR = 0.692, 0.05. Sadly, H1 does not work. QMPPs decrease PIS while raising H2. The route importance, IS, PP, and CR for both paths are all 99%. Shopping is improved with more information.
- Purchasing behavior is affected by QMPPs. PP = 0.048; CR = 3.626.
- Managing for quality improves H3 acquisition. QMPPs facilitated by IS increase spending.
- There was a 0.512, 0.048, and 0.463 increase in sales due to QMPPs. Buying QMPP IS may increase PP in a roundabout way.
- Thirty-one model indicators looked at three different factors.
- Human resource management, supplier quality, and benchmarking all scored well.
- These findings provide credence to the practice of quality control benchmarking.
- Purchasing information systems benefit from suppliers' usage of the Internet and reliable information sources.
- Scheduling of manufacturing between a company's buyers and its suppliers.
- Supplier quality was degraded due to internal information.
- These results imply that buyers may have difficulty gaining access to suppliers' private information.
- Vickery et al. and Stump both agree.
- Systems for buying stock.
- The price of the raw materials had an effect on the final decision.
- Hendrick and Ruch [9], Anil and Satish [29], and Baraniecka [3] all found that the price of material performance affected consumer behavior.

9   Outcomes from Model Analysis

QMPPs, PISS, and PP were all examined for their potential to be linked in the structural model. All of the hypotheses, with the exception of H1, are strongly supported by the data. There was empirical support for both the immediate and oblique effects of QMPPs. Insight into the most important aspects of QMPPs and PISS and their potential to improve buying performance are provided by the suggested mediated model, which is consistent with data acquired from the system under study. This study builds on prior findings that examined the effects of specific IS applications for procurement, such as those of Banerjee[8]. This study has zeroed in on a set of intertwined IS practices in procurement and uncovered substantial gains from adopting all of them simultaneously.

10   Implications for Management

Purchasing and supply chain managers may benefit from this study by learning how quality management and IS can improve purchasing performance. Companies in today's fast-paced industry need to mix quality and technology to keep up with the ever-evolving marketplace. In order to optimize value, purchasing and supply chain management SCM systems should benefit from the adaptability, speed, and resiliency made possible by Industry 4.0 technologies like as block chain, the Internet of Things, and big data analytics. Therefore, a prompt, early approach is preferred. Last but not least, modern quality management systems and digital technologies are expensive, which is a problem for SMEs. Therefore, starting early is essential. The emotional and material returns on such investments, however, are substantial.

11   Discussion of Results, Caveats, and Future Directions

In order to enhance the purchasing processes of service organizations, we take a look at QMPPs, purchasing information system services, and purchasing performance. These details might be useful to managers in selecting appropriate QM and IS solutions to improve spending efficiency. In order to boost QMPP buying efficiency, the report recommends benchmarking and supplier performance. If businesses could better understand the impact of various skills on accuracy, they might better prioritize capacity-enhancement initiatives.

In our research, QMPPs and IS played Meenadevi [30] important roles as both antecedents and mediators of the relationship between QMPPs and company success. The IS-purchasing performance connection modeled here may be improved by including mediators in further research. Electronic Data Interchange EDI and the Internet. Block chain, big data analytics, and the Internet of Things are essential for

e-commerce to reach its full potential. Future research may show that Kaizen and Lean Six Sigma may boost purchase and SC performance alone and in combination. Improvements in pandemic management are achieved by the use of quality management and information systems strategies including as Kaizen's, Six Sigma, block chain technology, big data analytics, the internet of things, and others. QMPPs and IS might be useful in future research.

References

1. Smeltzer, L., Ogden, J.: Purchasing professionals' perceived differences between purchasing materials and purchasing services. J. Supply Chain Manag.Manag. **38**, 54–70 (2006)
2. Abouzeid, E.: Procurement in service vs in manufacturing organisations. Ractical Insights. https://www.linkedin.com/pulse/procurement-service-vsmanufacturing-organisations-eman (2019). Accessed 12th January 2022
3. Baraniecka, A.: How to measure the social capital in a supply chain? Actalogistica **34**, 23–30 (2016). Bergman, B., Klefsjö, B.: Quality from Customer Needs to Customer Satisfaction, 3rd edn. Elanders Hungary Ktf, Hungary (2010)
4. Gutierrez-Gutierrez, L.J., Barrales-Molina, V., Kaynak, H.: The role of human resource-related quality management practices in new product development. Int. J. Oper. Prod. Manag.Oper. Prod. Manag. **381**, 43–66 (2018)
5. Ahire, S., Golhar, D., Waller, M.: Development and validation of TQM implementation constructs. Decis. Sci. **271**, 23–56 (1996). Åhlström, P., Nordin, F.: Problems of establishing service supply relationships: evidence from a high-tech manufacturing company. J. Purch. Supply Manag. **12**, 75–89 (2006)
6. Kokila, M.S., Chandra, S.: A study on career choice as entrepreneurs among undergraduate students in Bangalore. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-26953-0_23
7. Andresen, M.A.: Regionalizing global trade patterns, 1981–2001: application of a new method. Can Geographer **531**, 24–44 (2009)
8. Andrew, H., John, M.: Purchasing selecting and procurement for the hospitality, 6th edn. Wiley (2001)
9. Hendrick, T.E., Ruch, W.A.: Determining performance appraisal criteria for buyers. J. Purch. Mater. Manage. **242**, 20–35 (1988). Hoyle, D.: Quality Management Essentials. Elsevier, Oxford (2007)
10. Ameer, M.S.: Total quality management practices and supply chain management: understanding linkages from the logistics sector of Pakistan. SEISENSE J. Manage. **14**, 22–28 (2018)
11. Fernandes, A., Sampaio, P., Sameiro, M., Truong, H.: Supply chain management and quality management integration a conceptual model proposal. Int. J. Qual. Reliab. Manage. **341**, 53–67 (2017)
12. Fletcher, G., Greenhill, A., Griffiths, M., McLean, R.: The social supply chain and the future high street. Supply Chain Manage. **211**, 78–91 (2016)
13. Sancha, C., Longoni, A., Giménez, C.: Sustainable supplier development practices: drivers and enablers in a global context. J. Purch. Supply Manag. **212**, 95–102 (2015)
14. Hemsworth, D., Sanchez-Rodriguez, C.: The effect of quality management purchasing on purchasing performance and internal customer satisfaction; a structural model. ASAC Conference, Halifax (2003). https://doi.org/10.1504/IJISM.2007.011975
15. Humphries, A.S., Gibbs, R.: Collaborative Change. Create Space, Charleston (2010)

16. Trent, R., Monczka, R.: Achieving world-class supplier quality. Total Qual. Manag. 106, 927–938 (1999). Trent, R.J., Monczka, R.M.: Pursuing competitive advantage through integrated global sourcing. Acad. Manag. Exec. **162**, 66–80 (2002)
17. Burt, D.: Managing product quality through strategic purchasing. Sloan Manag. Rev. **303**, 39–48 (1989)
18. Giunipero, L., Vogt, J.: Empowering the purchasing function: moving to team decision. Int. J. Purch. Mater. Manage. **291**, 35–45 (1997)
19. Kefel, G.: Knowledge-based economy and society has become a vital commodity to countries. Int. NGO J. **5**, 160–166 (2010)
20. Ilcus, A.M.: Impact of digitalization in business world. Rev. Manage. Comparat. Int. **19**, 350–358 (2018)
21. Cousins, P.D., Lamming, R., Lawson, B., Squire, B.: Strategic Supply Management: Principles, Theories, and Practice. Prentice Hall, Edinburgh (2008)
22. Chang, J.: The effects of buyer-supplier's collaboration on knowledge and product innovation. Ind. Mark. Manag. 65, 129–143 (2017). Chao, C., Scheuing, E., Ruch, W.: Purchasing performance evaluation: an investigation of different perspectives. Int. J. Purch. Mater. Manag. 293, 33–39 (1993)
23. Dumond, E., Newman, W.: Closing the gap between buyer and vendor. Prod. Invent. Manag. J. **314**, 13–17 (1990)
24. Gregory, G.D., et al.: Developing e-commerce marketing capabilities and efficiencies for enhanced performance in business-to-business export ventures. Ind. Mark. Manag. (2017). https://doi.org/10.1016/j.indmarman.2017.03.002
25. Eckstein, D., Blome, C., Henke, M.: The performance impact of supply chain agility and supply chain adaptability: the moderating effect of product complexity. Int. J. Prod. Res. **5310**, 3028–3046 (2015)
26. Yaqub, M.Z.: Antecedents, consequences, and control of opportunistic behavior in strategic networks. J. Bus. Econ. Res. **72**, 15–31 (2009)
27. Anderson, J., Gerbing, D.: Structural equation modelling in practice: a review and recommended two-step approach. Psychol. Bull. **1032**, 411–423 (1998)
28. Chau, P.: Re-examining a model for evaluating information centre success using a structural equation modelling approach. Decis. Sci. **282**, 309–334 (1997)
29. Anil, A.P., Satish, K.: Enhancing customer satisfaction through total quality management practices–an empirical examination. Total Qual. Manag. Bus. Excell. **3013–14**, 1528–1548 (2019)
30. Meenadevi, K., Mruthyunjaya Sharma, G.V., Archana J.R., Subba Anantha, K.: Work habits based on agile methodology: metrics and procedures. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023)

Evolving Horizons of Work: Unravelling the Conceptual and Future Research Dimensions of Digital Workspaces

A. Pushpa (ID)**, Nidhi Shukla, Liliana Horal** (ID)**, Oleksandr Kivshyk** (ID)**, Olha Stepaniuk** (ID)**, and Nadiia P. Reznik** (ID)

1 Introduction

In the contemporary era of rapid technological advancement, the traditional boundaries of work have undergone a seismic shift. Companies are committed to establishing innovative, flexible, and environmentally conscious work settings that aim to enhance productivity, foster collaboration, and prioritize employee well-being. The digital revolution has propelled remote collaboration and digital workspaces into the spotlight of organizational dynamics, fundamentally reshaping how individuals and teams engage in professional activities. A digital workspace encompasses an integrated technological framework designed to facilitate the delivery and management of applications, data, and desktop accessibility. This enables employees to promptly access their applications and data, regardless of their location or the storage method—be it cloud services or a data center. Successful workspace solutions ensure a unified, context-aware, and secure experience for both IT personnel and end users. The amalgamation of cutting-edge digital technologies, ubiquitous connectivity, and evolving work culture has catalyzed a fundamental transformation in the traditional notion of office spaces. Kelliher et al. [1], digital workspaces, often accessible across

A. Pushpa (✉)
Kirstu Jayanti College (Autonomous), Bengaluru, Karnataka, India
e-mail: pushpa@kristujayanti.com

N. Shukla
Reva University, Bengaluru, India

L. Horal · O. Stepaniuk
Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine

O. Kivshyk
National University «Yuri Kondratyuk Poltava Polytechnic», Poltava, Ukraine

N. P. Reznik
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

an array of devices, transcend geographical confines, empowering individuals to interact, exchange ideas, and contribute collectively from disparate corners of the globe. Concurrently, remote collaboration has emerged as a linchpin of contemporary work practices, encompassing virtual meetings, collaborative document editing, and real-time communication tools that seamlessly connect geographically dispersed teams [2].

Remote work refers to a specific form of flexible work arrangement where individuals operate without strict limitations in terms of location or working hours [3]. From one perspective, organizations and their workforce commonly embrace remote work because of the sense of independence and adaptability it provides. These qualities have been suggested to contribute positively to employee effectiveness [1]. Furthermore, the pandemic managed to overcome cultural and technological limitations that previously hindered the adoption of remote work. As a result, there has been a significant change in the traditional locations of work for certain individuals. The global pandemic took the world off guard, presenting a grave danger to human lives [4–6]. Despite the expanding body of research on digital workspaces and remote collaboration, there remains a distinct gap in understanding certain specific facets that this study intends to address. This current research is geared towards comprehending the conceptual underpinnings and potential trajectories for future investigations, which will contribute to the ongoing body of knowledge within this domain.

1.1 Are "Digital Workplace " and "Digital Workspace" Synonymous?

The digital workplace is a cloud-based working platform that facilitates the virtualization of the entire work environment. It encompasses an online space where individuals engage and cooperate while operating remotely, utilizing collaborative technologies to facilitate teamwork and collaboration from their homes.

In contrast, a digital framework or workspace serves as a simulated emulation of a conventional physical workstation. This dynamic construct encompasses an ever-evolving array of technologies that empower individuals to engage in work activities across diverse devices, irrespective of the timeframe. Among the key technologies incorporated within this digital framework are application and desktop virtualization, collaborative content sharing, secure connections to Software as a Service (SaaS) applications, unified management of endpoints, Single Sign-On (SSO) functionality, and the implementation of streamlined automated workflows.

The article explores the emergence and evolution of digital workspaces, shedding light on the technologies that empower them and investigating. It delves into the influential forces shaping the digital workspace landscape, ranging from technological advancements to evolving work patterns that demand flexibility. The metamorphosis of digital workspaces is examined, tracing their evolution from basic document-sharing platforms to intricate ecosystems integrated. The article highlights

the role of digital workspaces in pioneering remote collaborations. A comprehensive review of existing literature provides insights into the ongoing discourse on digital workspaces and their impact on remote collaboration, presenting a mosaic of best practices, challenges, and avenues for future research.

1.2 Emergence of Digital Workspaces—Technologies Enabling

The emergence of digital workspaces has been driven by a confluence of technologies collectively shape the landscape of digital workspaces, providing the infrastructure and tools necessary to facilitate remote collaboration, streamline access to resources, and create a more flexible and adaptive work environment. Several key technological components contribute to the creation and functioning of digital workspaces are depicted in Table 1.

1.3 Metamorphosis of Digital Workspaces

The historical progression of digital workspaces is presented chronologically encompassing all the nuances and specific developments that have occurred in the field of digital workspaces. The concept of a digital workplace is not new. As companies continue to go through a digital transformation, the idea of a workplace perimeter continues to disappear. While modern desktop transformation has IT departments decoupling user data and applications from the OS and its device, users want these workspace components wherever and whenever they need them.

The evolution of digital workspaces showcases the transformative journey from basic computing environments to sophisticated, interconnected ecosystems that empower with enhanced accessibility, collaboration, and productivity. This evolution has been marked by key milestones and shifts in technology, leading to the dynamic and user-centred digital workspaces we see today. Figure 1 exhibits the key milestones that have shaped today's workspace.

The evolution of digital workspaces has been a remarkable journey, closely intertwined with the advancements in technology over the decades. It all began in the 1960–1980s during the emergence of personal computing. This period saw the birth of digital workspaces alongside the rise of personal computers. However, these early workspaces were confined to individual machines, limiting their collaborative capabilities and hindering efficient teamwork.

The landscape transformed in the 1990–2000s with the advent of networked computing and the internet. As networking technologies became prevalent, digital workspaces expanded their horizons. Local Area Networks (LANs) and the internet

**Table 1** Technologies enabling digital workspace emerge

Technologies	Description
Cloud computing	Forms the Backbone of digital workspaces. It allows for centralized storage, access, and sharing of applications, data, and resources across various devices and locations
Cloud technology forms the virtualization	Technologies such as virtual desktop infrastructure (VDI), enable the deployment of virtual desktop environments that can be accessed remotely
Mobile and remote access	Mobile devices, smartphones, and tablets, along with secure remote access solutions, facilitate on-the-go access to digital workspaces from anywhere, ensuring continuity even outside the traditional office environment
Collaboration tools	Real-time communication and collaboration tools, like video conferencing, instant messaging, and shared document editing platforms, enable team members to interact and work together seamlessly, regardless of geographical distances
Cybersecurity solutions	Robust cybersecurity measures are crucial. Encryption, multi-factor authentication, and secure virtual private networks (VPNs) safeguard sensitive information
Artificial intelligence (AI) and Machine learning	AI-driven insights enhance user experiences within digital workspaces by offering context-aware recommendations, automating routine tasks, and optimizing resource allocation
IoT (Internet of Things)	These devices can be integrated into digital workspaces to monitor and control physical work environments remotely. Smart sensors, lighting, and climate control systems contribute to a more personalized and efficient workspace
APIs and integration	These facilitate integration between different software tools, allowing for seamless data flow and collaboration among diverse applications
User experience (UX) design	Intuitive UX design ensures that digital workspaces are user-friendly, making it easier for employees to navigate and access resources efficiently
Data analytics	The analytical tools can provide insights into workspace usage patterns, helping organizations optimize resource allocation, identify bottlenecks, and enhance overall productivity

(continued)

Table 1 (continued)

Technologies	Description
Blockchain	Ensures enhanced security, data integrity, and identity management within digital workspaces, ensuring trust and transparency in transactions
Augmented reality (AR) and Virtual reality (VR)	They have the potential to create immersive workspaces, enabling remote collaboration and training experiences that simulate physical environments
Edge computing	Edge computing can enhance the speed and efficiency of data processing within digital workspaces, reducing latency and improving real-time interactions

Fig. 1 Phases in evolution of digital workspace. *Source* Author compilation
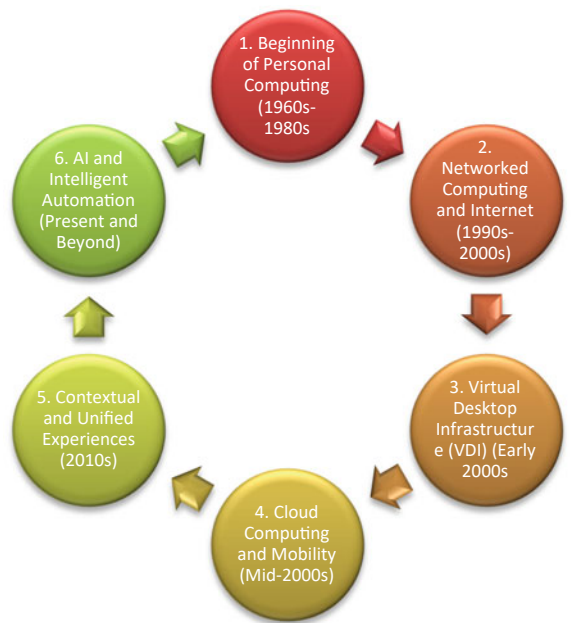
played a pivotal role by facilitating basic data sharing and remote access. This era marked the initial steps towards more interconnected and accessible workspaces.

The early 2000s ushered in the era of Virtual Desktop Infrastructure (VDI), a significant milestone in the evolution. VDI brought centralized management and remote desktop access to the forefront. Enhanced security and streamlined administration were standout advantages, improving both user experience and IT management efficiency.

The mid-2000s witnessed the revolutionary impact of cloud computing and mobility on digital workspaces. Cloud technology revolutionized how data was stored

and accessed, breaking down the barriers of physical limitations. Simultaneously, the rise of mobile devices, including smartphones and tablets, introduced an element of mobility that transformed the way workspaces were utilized.

The 2010s emphasized seamless experiences across devices and contexts. The focus shifted towards providing users with unified experiences regardless of their chosen device. This was achieved through the integration of context-aware technologies, which facilitated personalized and efficient interactions within the digital workspace environment.

In the present and beyond, the integration of Artificial Intelligence (AI) and intelligent automation takes the evolution of digital workspaces to new heights. AI brings predictive analytics and automation into play, optimizing user interactions and streamlining tasks. These AI-driven insights not only enhance the quality of workspace interactions but also empower users to work more efficiently and make informed decisions.

In essence, the journey of digital workspaces has been a continuous quest for improved connectivity, accessibility, collaboration, and efficiency. From the early days of individual machines to the current era of AI-driven insights, each phase has contributed to shaping the digital workspaces we rely on today, with the promise of even more exciting developments on the horizon.

1.4   Forces Shaping the Digital Workspace

The contemporary workspaces have undergone profound changes driven by a convergence of multifaceted forces that are exerting their sway on the modern workspace. Understanding these forces, businesses can strategically position themselves to harness opportunities while effectively addressing the challenges presented by this dynamic evolution. Some of the forces behind digital workspaces are:

Flexibility: Virtual desktops and other digital workspace technology allow employees to work wherever and whenever they want, on whichever device they prefer. This provides workers with a greater sense of control over their lives since their work life and personal life aren't constantly conflicting. It also reduces recruitment time since candidates are more attracted to companies with remote or flexible work options.

Productivity: The benefit of flexibility also encourages increased employee productivity. Furthermore, workers are less likely to take sick days since they aren't required to come into an office and can instead work from home.

Improved Collaboration: A digital workspace encourages easy, streamlined interactions between co-workers and supervisors. Links, data, documents and images can be easily shared, and employees can work on projects together regardless of their physical location.

Higher Retention Rates: A digital workspace has the potential to strengthen a company's employee experience. The empowerment that comes from increased flexibility also helps workers trust and respect their superiors and feel like they are trusted and respected in return. This increases employee satisfaction and makes it more likely that workers will commit to and remain with the company for extended periods of time.

Better Customer Service: The digital workspace often incorporates technologies that offer self-service education and analytics. These two offerings—in addition to a strong employee experience—can elevate the level of customer service provided by employees.

Reduced Costs: Since a digital workspace eliminates the need for a physical work environment, companies can benefit by saving on previous expenses like utilities and commercial square footage.

1.5 Pioneering Remote Collaborations Through Digital Workspaces

The emergence and future evolution of digital workspaces are profoundly influencing our work methodologies, collaborative practices, and technological interactions. Digital workspaces are at the forefront of transforming how individuals and teams operate. The concept of remote workspaces is gaining traction as technology advances and workplace dynamics evolve. This paradigm shift is marked by the convergence of various trends that are reshaping the way we work, collaborate, and engage with technology.

Some of the key trends in digital workspaces are:

Hybrid Work Models: The pandemic has highlighted the feasibility of remote work, leading to the rise of hybrid work models. In the future, digital workspaces will need to seamlessly integrate in-office and remote work environments, providing consistent experiences regardless of location.

Immersive Technologies: Augmented reality (AR) and virtual reality (VR) are finding their way into digital workspaces, offering immersive collaboration experiences. Virtual meetings, training sessions, and collaborative projects could benefit from these technologies, enhancing engagement and interaction.

Artificial Intelligence and Automation: AI-driven insights and automation will play a pivotal role in optimizing digital workspaces. Predictive analytics, task automation, and AI-powered personal assistants will enhance efficiency and decision-making.

Data Security and Privacy: With remote work becoming more prevalent, data security and privacy concerns are growing. Future digital workspaces will focus on robust encryption, secure access controls, and compliance with data protection regulations.

Decentralized Technologies: Block chain and decentralized platforms have the potential to redefine data ownership, privacy, and security within digital workspaces. Decentralization can provide enhanced control and transparency over data sharing and management.

Contextual and Personalized Experiences: Digital workspaces will become more context-aware, tailoring experiences based on user preferences, roles, and tasks. This will lead to more personalized and efficient interactions.

Collaborative Tools and Integration: The future will see enhanced integration of collaboration tools within digital workspaces. Unified communication platforms, real-time document editing, and project management tools will seamlessly coexist, fostering teamwork.

Wellness and Mental Health Support: As remote work continues, digital workspaces will prioritize employee well-being by integrating features that promote mental health, work-life balance, and social interactions.

Quantified Self and Productivity Tracking: Wearable devices and analytics will enable employees to track their productivity and well-being, helping them make data-driven decisions to optimize their work routines.

Edge Computing: With the growth of IoT devices and real-time data processing, edge computing will play a significant role in ensuring efficient and low-latency interactions within digital workspaces.

Customizable Work Environments: Users will have the ability to customize their digital workspaces, choosing layouts, applications, and tools that best suit their work preferences and tasks.

Environmental Sustainability: Digital workspaces of the future may also emphasize environmental sustainability, reducing carbon footprints through remote work and eco-friendly technologies.

2 Review of Literature

The fusion of technological advancements and evolving work dynamics has given rise to digital workspaces and remote collaboration as integral components of contemporary organizational structures. The following review of literature delves into key studies and insights that shed light on the conceptual foundations, benefits, challenges, and transformative potential of these phenomena. Scholars have endeavored to establish clear conceptual frameworks for digital workspaces and remote collaboration.

The phrase 'digital workplace' has gained increasing popularity within the business sphere from the 2010s onward [7], although scholarly research concerning it remains limited [8]. It encompasses 'a means of characterizing the comprehensive

array of interconnected technologies that employees employ in their daily tasks,' and it serves as an all-encompassing notion that spans various enterprise tools [7, p. 16].

Charles Grantham and Larry Nichols introduced the concept of the "Digital Workplace" in 1993 referring digital workplace to the compilation of digital resources that enable employees to perform their duties. These resources encompass various tools like intranet, communication platforms, email, customer relationship management (CRM), and enterprise resource planning (ERP), human resources (HR) systems, calendars, and other software applications that contribute to the overall operational activities of a company [3].

The digital workspace offers employees the flexibility to work at their preferred hours and access information and individuals regardless of their location or device. This implies that an employee has the option to work from various places such as a home office, a remote site, a shared workspace, or a café. They can easily exchange ideas, insights, and content, and have the distinctive chance to assume leadership roles by sharing their expertise and passions. Within their organizations, employees possess a platform to express their opinions, receive acknowledgment for their input, and actively influence their career trajectories.

Jones et al. [9] present a comprehensive conceptual framework that elucidates the core elements and dimensions of digital workspaces, emphasizing the integration of technology, social interactions, and information sharing. Similarly, Martínez et al. [2] provide a comprehensive definition of the digital workplace, encompassing virtual spaces that enable collaboration, knowledge sharing, and task management. Digital workspaces have been highlighted for their capacity to transcend geographical barriers and enhance collaboration. Doherty et al. [10] underscore how digital workspaces foster a sense of interconnectedness among remote teams, enabling seamless communication, document sharing, and knowledge dissemination. Additionally, they emphasize the role of these spaces in promoting a flexible work culture that enhances employee satisfaction and work-life balance. Remote collaboration, while transformative, is not devoid of challenges. Hertel et al. [11] address issues related to trust and coordination in virtual teams, noting that asynchronous communication can lead to misunderstandings and delays. They suggest strategies such as clear communication norms, task interdependence, and the use of appropriate technology tools to mitigate these challenges and foster effective remote collaboration. Technology plays a pivotal role in enabling digital workspaces and remote collaboration. Soga et al. [3], delve into the impact of technology-mediated communication on team dynamics, exploring the nuances of textual and nonverbal cues in virtual interactions. They highlight the importance of design choices in communication tools to enhance shared understanding and foster a sense of presence among remote collaborators. The advent of digital workspaces and remote collaboration has led to a transformation in traditional work paradigms.

Bracci et al. [12] examine the shift towards hybrid work models, where employees alternate between physical and digital workspaces. They explore how organizations are adapting to this transition, considering factors such as organizational culture, leadership, and technological infrastructure. Digital workspaces and remote collaboration have also been linked to fostering creativity and innovation. Gallupe et al. [13]

investigate the role of digital platforms in facilitating idea generation and collaborative problem-solving. They emphasize the significance of inclusive communication practices and the integration of diverse perspectives in virtual creative processes. The literature on digital workspaces and remote collaboration underscores their transformational impact on organizational dynamics, team interactions, and work culture. Scholars have delineated conceptual frameworks, explored benefits and challenges, and provided insights into strategies for effective remote collaboration. As the digital age continues to reshape the world of work, understanding the intricacies of these phenomena remains essential for organizations seeking to harness their potential for enhanced productivity, creativity, and connectivity.

3   Research Methodology

This study employs a theoretical exploration to comprehensively explore the conceptual foundations and future research dimensions of digital workspaces within the evolving landscape of work. The primary research objective is to elucidate the distinct characteristics of digital workspaces and their role in shaping contemporary work scenarios. To achieve this, the following research questions guide the study: (1) How are digital workspaces conceptually defined and differentiated from traditional work environments? (2) What are the key features and components of digital workspaces influencing their evolving role in modern work settings? (3) What are the current trends and challenges associated with the adoption and utilization of digital workspaces? (4) What potential research dimensions and areas of exploration can inform the future development of digital workspaces? These questions will be addressed through a qualitative analysis of expert interviews, delving into conceptual aspects, and a quantitative survey to gauge trends and perceptions. The study aims to provide insights that contribute to a deeper understanding of digital workspaces' significance and to guide future research in this dynamic field.

4   Discussion

4.1   Technological Advancements and Integration

The integration of emerging technologies like augmented reality (AR) and virtual reality (VR) within digital workspaces has gained substantial attention in the literature due to its potential to revolutionize remote collaboration and redefine work environments [14]. Juan et al. [15] emphasized AR and VR's immersive capabilities, transcending geographical barriers and fostering presence in digital workspaces. Similarly, Chen et al. [16] found that AR and VR-driven collaboration improved problem-solving and knowledge sharing among remote teams. Yet,

Aquino et al. [17] raised concerns about challenges like motion sickness and technical complexities. While the transformative promise of AR and VR in reshaping digital workspaces is evident, meticulous handling of technical barriers, user experience, and organizational readiness is crucial for successful implementation.

4.2 Remote Team Dynamics and Communication

Remote team dynamics within digital workspaces, essential in the context of evolving work horizons marked by remote collaboration growth. Enquiring into the dynamics of remote teams within digital workspaces. Exploring how communication patterns, trust-building, and leadership strategies evolve in virtual environments [18]. Communication patterns in virtual teams gain prominence, driven by diverse tools like video conferencing and instant messaging, bridging gaps [19]. Trust-building is pivotal, with digital workspaces allowing transparency and regular updates, countering challenges [20–22]. Leadership strategies are crucial too, with digital workspace leaders needing adaptive approaches to monitor progress, provide direction, and leverage technology effectively [23, 24]. This synthesis highlights the importance of tailored strategies to lead remote teams successfully in the digital era.

4.3 Well-Being and Work-Life Balance

Examining the impact of digital workspaces on employee well-being and work-life balance. Investigating factors such as constant connectivity, boundary management, and strategies for preventing burnout. Brown et al. [25] highlighted the drawbacks of constant connectivity through digital workspaces, noting their potential to blur work-life boundaries and increase stress. This is consistent with Derks et al. [26], who found heightened pressure due to round-the-clock accessibility. Golden and Veiga [27] emphasized boundary management's significance to preserve work-life balance, crucial as digital workspaces can encroach on personal time, impacting leisure and family interactions. This aligns with the concept of "technostress" by Tarafdar et al. [28], reflecting the stress induced by technology's negative influence on well-being. Strategies for mitigating burnout have been explored, such as Sonnentag and Fritz's [29] emphasis on recovery experiences like relaxation and detachment, offering effective means to counter the adverse effects of perpetual connectivity.

4.4 Competencies and Development

Investigations have explored individuals' aptitude for acquiring new skills and their willingness to engage in training. Digital competencies encompass a core set of essential knowledge, skills, and abilities that empower workers to effectively perform and conclude their job duties within digital work environments [30]. The significance of soft skills like communication, problem-solving, and creativity in environments enriched with technology is increasingly being highlighted [31, 32]. Work standardization is linked to better interpersonal skills but not cognitive and psychomotor skills. Meanwhile, greater task variety demands cognitive and interpersonal skills over psychomotor skills [33].

5 Conclusion

The article underscores how the emergence of digital workspaces has fundamentally transformed traditional work paradigms, offering a synergistic blend of cutting-edge technologies, shifting work dynamics, and the imperative for seamless virtual collaboration. To varying extents, remote work or, more probably, a combination of remote and office work is becoming a permanent fixture. Understanding these implications is crucial in developing an ideal digital work model that benefits both companies and their employees. Future research endeavors can aim to fill this void by conducting a thorough exploration of the intricacies within this domain. For continued research in this domain studies can emphasize on how organizations endeavor to optimize digital workspaces for enhanced remote collaboration. While embracing digital work offers substantial advantages, it's important to recognize that it also brings along unintended adverse effects on both cognitive and psychological wellbeing like stress and anxiety stemming from technology use. Researchers can attempt future research to fold, evaluate, and analyze longitudinal data to establish the causal relationships depicted in the conceptual framework. Furthermore, we urge researchers to include cross-national data from various cultural contexts. We recommend that researchers undertake comparative studies, taking into consideration demographic variables within the context of longitudinal research. By probing deeper into uncharted territories, researchers can gain a more comprehensive understanding on digital workspaces as it is still in a nascent stage, thereby enriching the knowledge base and providing actionable insights for practitioners and decision-makers in this evolving landscape.

References

1. Kelliher, C., Anderson, D.: Doing more with less? Flexible working practices and the intensification of work. Human Relations **63**(1), 83–106 (2010). https://doi.org/10.1177/001872670 9349199
2. Martínez-Moreno, J., Luna-Reyes, L.F., Cresswell, A.M.: Digital workplace: conceptualization and validation of a scale. J. Bus. Res. **94**, 384–394 (2019)
3. Soga, M., Gaston, K.J.: Towards a unified understanding of human-nature interactions. Nat. Sustain. **5**, 374–383 (2022)
4. Donthu, N., Gustafsson, A.: Effects of COVID-19 on business and research. J. Bus. Res. **117**, 284–289 (2020)
5. Ghobadian, A., Han, T., Zhang, X., O'Regan, N., Troise, C., Bresciani, S., et al.: COVID-19 pandemic: the interplay between firm disruption and managerial attention focus. Brit. J. Manage. **33**, 390–409 (2022)
6. Khanra, S., Dhir, A., Kaur, P., Joseph, R.P.: Factors influencing the adoption postponement of mobile payment services in the hospitality sector during a pandemic. J. Hosp. Tour. Manage. 46, 26–39 (2021)
7. Marsh, E.: Understanding the effect of digital literacy on employees' digital workplace continuance intentions and individual performance. Int. J. Digital Literacy Digital Competence **9**(2), 15–33 (2018)
8. Attaran, M., Attaran, S., Kirkland, D.: The need for digital workplace: increasing workforce productivity in the information age. Int. J. Enterpr. Inf. Syst. **15**(1), 1–23 (2019)
9. Jones, C., Poncin, I., Hicks, B.: Digital workspaces: a conceptual framework and review. Comput. Hum. Behav. **105**, 106222 (2020)
10. Doherty, N.F., Connolly, P., Carson, D.: Digital workplaces, remote work and the pandemic. J. Manag. Inf. Syst. **38**(4), 1023–1032 (2021)
11. Hertel, G., Geister, S., Konradt, U.: Managing virtual teams: a review of current empirical research. Hum. Resour. Manag. Rev. **29**(2), 166–190 (2019)
12. Bracci, E., Noci, G., Marzi, G.: In the hybrid work era, digital workplaces are not just a matter of technology. Harvard Bus. Rev. Digit. Articles 2–4 (2021)
13. Gallupe, B., Dennis, A.R., Valacich, J.S., Nunamaker, J.F., Vogel, D.R., George, J.F.: Virtual teams research: 10 years, 10 themes, and 10 opportunities. J. Manag. Inf. Syst. **36**(4), 1083–1130 (2019)
14. Fereydooni, N., Walker, B.N.: Virtual Reality as a Remote Workspace Platform: Opportunities and Challenges (2020)
15. Delgado, J.M.D., Oyedele, L., Demian, P., Beach, T.: A research agenda for augmented and virtual reality in architecture, engineering and construction. Adv. Eng. Inf. **45**, 101122 (2020). ISSN 1474-0346. https://doi.org/10.1016/j.aei.2020.101122
16. Chen, J., Fragomeni, G.: Virtual, augmented and mixed reality. multimodal interaction. In: Proceedings of the 11th International Conference, VAMR 2019. Springer International Publishing (2019)
17. Aquino, S., Rapaccini, M., Adrodegari, F., Pezzotta, G.: Augmented reality for industrial services provision: the factors influencing a successful adoption in manufacturing companies. J. Manuf. Technol. Manag. **34**(4), 601–620 (2023). https://doi.org/10.1108/JMTM-02-2022-0077
18. Erdem, F., Ozen, J., Atsan, N.: The relationship between trust and team performance. Work Study **52**(7), 337–340 (2003). https://doi.org/10.1108/00438020310502633
19. Glikson, E., Erez, M.: The emergence of a communication climate in global virtual teams. J. World Bus. **55**(6), 101001 (2020). ISSN: 1090-9516. https://doi.org/10.1016/j.jwb.2019.101001
20. Hambley, L.A., O'Neill, T.A., Kline, T.J.B.: Virtual team leadership: the effects of leadership style and communication medium on team interaction styles and outcomes. Organ. Behav. Human Decis. Process. 103, 1-20

21. Guinalíu, M., Jordán, P.: Building trust in the leader of virtual work teams. Spanish J. Mark. ESIC **20**(1), 58–70 (2016). ISSN 2444-9695. https://doi.org/10.1016/j.reimke.2016.01.003
22. Breuer, C., Hüffmeier, J., Hibben, F., Hertel, G.: Trust in teams: a taxonomy of perceived trustworthiness factors and risk-taking behaviors in face-to-face and virtual teams. Human Relations **73**(1), 3–34 (2020). https://doi.org/10.1177/0018726718818721
23. Cascio, W.F., Montealegre, R.: How technology is changing work and organizations. Annu. Rev. Organ. Psychol. Organ. Behav. **3**, 349–375 (2016). https://doi.org/10.1146/annurev-org psych-041015-062352
24. Kozlowski, S.W.J., Ilgen, D.R.: Enhancing the effectiveness of work groups and teams. Psychol. Sci. Public Interest **7**(3), 77–124 (2006). https://doi.org/10.1111/j.1529-1006.2006.00030.x
25. Brown, A.D.: Identities in organization studies. Organ. Stud. **40**(1), 7–22 (2019). https://doi.org/10.1177/0170840618765014
26. Derks, D., Bakker, A.B.: Smartphone use, work-home interference, and burnout: a diary study on the role of recovery. Appl. Psychol. **63**(3), 411–440 (2012). https://doi.org/10.1111/j.1464-0597.2012.00530.x
27. Golden, T.D., Veiga, J.F., Dino, R.N.: The impact of professional isolation on teleworker job performance and turnover intentions: does time spent teleworking, interacting face-to-face, or having access to communication-enhancing technology matter? J. Appl. Psychol. **93**(6), 1412–1421 (2008). https://doi.org/10.1037/a0012722
28. Tarafdar, M., Bolman, E., Pullins, Ragu-Nathan, T.S.: Technostress: negative effect on performance and possible mitigations. Inf. Syst. J. **25**(2), 103–132 (2015). https://doi.org/10.1111/isj.12042
29. Sonnentag, S., Fritz, C.: Recovery from job stress: the stressor-detachment model as an integrative framework. J. Organ. Behav. **36**, S72–S103 (2015). https://doi.org/10.1002/job.1924
30. Oberlander, M., Beinicke, A., Bipp, T.: Digital competencies: a review of the literature and applications in the workplace. Comput. Educ. **146**, 103752 (2020). https://doi.org/10.1016/j.compedu.2019.103752
31. Ederer, P., Nedelkoska, L., Patt, A., Castellazzi, S.: What do employers pay for employees' complex problem solving skills? Int. J. Lifelong Educ. **34**, 430–447 (2015). https://doi.org/10.1080/02601370.2015.1060026
32. Borner, K., Scrivner, O., Gallant, M., Ma, S., Liu, X., Chewning, K., et al.: Skill discrepancies between research, education, and jobs reveal the critical need to supply soft skills for the data economy. Proc. Natl. Acad. Sci. U.S.A. **115**, 12630–12637 (2018). https://doi.org/10.1073/pnas.1804247115
33. Beer, P., Mulder, R.H.: The effects of technological developments on work and their implications for continuous vocational education and training: a systematic review. Front. Psychol. **11**, 918 (2020). https://doi.org/10.3389/fpsyg.2020.00918

Human Resource Management in the 5.0 Economy: An Analytical Analysis

Ch.Raja Kamal ⓘ **, Svitlana V. Vovchok** ⓘ **, Yuriy V. Ladyka,**
Nataliia M. Ladyka, and Nadiia P. Reznik ⓘ

1 Introduction

The rapid advancement of technology and its integration into various aspects of our lives has given rise to what is commonly referred to as the "5.0 economy." This new economic paradigm is characterized by the convergence of physical, digital, and biological realms, resulting in unprecedented levels of innovation, connectivity, and disruption. In this dynamic landscape, human resource management (HRM) plays a pivotal role in shaping the success of organizations. This article aims to provide an analytical analysis of the key challenges and opportunities that HRM faces in the 5.0 economy. The research process begins with the creation of a framework utilizing concepts and literature reviews, then moves on to the analysis and, lastly, to the drawing of conclusions using the discovered research findings. This study's objective is to investigate how human resources management (HRM) affects economic sustainability.

2 Literature Review

Books, magazines, and websites are all examples of literature. The authors of Industry 5.0 and Human–Robot Co-working discuss the benefits and drawbacks of collaboration between humans and robots in the workplace. Industry 5.0 places a premium on

C. Kamal (✉)
Kristu Jayanti College Autonomous, Bengaluru, India
e-mail: rajakamal@kristujayanti.com

S. V. Vovchok · Y. V. Ladyka · N. M. Ladyka
Sumy National Agrarian University, Sumy, Ukraine

N. P. Reznik
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

social needs, values, and responsibilities while still relying on technology advances made possible by industry 4.0 (as described in "Industry 4.0 and Industry 5.0: Inception, Conception, and Perception"). Business cultures have been rethought with the use of knowledge management in preparation for Industry 5.0. This lends credence Credence [1] to the idea that giving both humans and machines more autonomy in the workplace increases productivity and, by extension, profitability. E-HRM, or electronic HR management, is a modern solution to this problem. The article "Gamifying employer branding: an integrating framework and research propositions for a new HRM approach in the digitized economy" addresses the ways in which gamified processes improve employee branding and expertise. Tataru [2] proposes new approaches to human resources, putting the customer first, and embracing a diverse workforce that includes smart computers and robots in his book Digital HR: A Manager's Realities and Perspectives Xu et al. [3]. The philosophical problems and human resource management strategies for integrating AI at the team level with human workers. Considering that people and machines will be working together in the future, it is important to assess HR managers. "Influence of Emotional Intelligence on Industry 5.0 Workforce" Nahavandi [4] the success of a company is directly tied to the emotional intelligence of its workforce.

3   Research Objectives

- To identify HRM variables impacting industry 5.0
- To investigate important elements to understand industry 5.0
- To create a comprehensive HRM model for industry 5.0.

3.1   Hypotheses

H01—Industry 5.0 has improved industrial performance via human-technology collaboration. H02—The fifth generation of industry improves people's emotional intelligence.

H03—The HR procedures have become more automated as a result of Industry 5.0.

H04—Industry 5.0 needs multidisciplinary workers.

4   Research Methodology

4.1   Research Design

Literature reviews examine relevant papers, articles, and blogs. Based on the study objective's components, hypotheses are presented to test Cillo et al. [5]. To test such theories, working professionals from various industries are surveyed. The research relies on these replies. Each hypothesis has its own Likert-scale questions.

4.2   Primary Data

The responses that were given by employees who were employed by a range of companies to the questions that were addressed to them in the format of Google Forms.

4.3   Sample Convenience

A technique of sampling is used here. 144 working human resources (HR) experts from a wide variety of firms in India and other countries made up the sample for this study.

4.4   Statistical Tool Used

Anova

5   Data Analysis and Hypotheses Testing

One-way analysis of variance (ANOVA) is a kind of analysis of variance (ANOVA) used in statistical testing and data analysis. One-way analysis of variance (ANOVA) was performed to evaluate the statement that "Industry 5.0 has improved industrial performance by creating coordination between man and technology." Martynov et al. [6]. Both technology application and human resource/technology coordination were treated as constants for the duration of this evaluation. Here is a quick rundown of what we learned from our investigation:

Mean, standard deviation, and standard error for two variables are shown in the descriptive table. When people and machines work together, the average is over 3.

Since the median score is 3, and the mean value is 3.54, most respondents would say that employees and technology are well integrated. (Table 1).

In Table 2 shows that the ANOVA F-value at the specified degree of freedom is 10.871 and the p-value is 0.00, which is less than the alpha value of 0.05 (F = 10.871, p 0.05), indicates that Industry 5.0 has a substantial influence on coordinating man and technology in order to increase industrial performance Berber et al. [7]. Therefore, the coordination of man and technology within Industry 5.0 has resulted in enhanced overall industrial performance. The one-way ANOVA test was used to test the hypothesis that "Industry 5.0 will improve people's emotional intelligence. Küppera et al. [8]". For this test, the use of technology was treated as a fixed factor, and improvements in emotional intelligence as well as the advantages these improvements bring to companies were treated as the dependent factor Arslan et al. [9].

The mean, standard deviation, and standard error for the two variables are all provided in the Table 3. A mean score over 3 indicates productive collaboration between humans and machines. When compared to a neutral score (3), the median value of emotional intelligence growth and business benefits are higher, suggesting that Industry 5.0 enhances emotional intelligence Meijerinka et al. [10].

The Table 4 shows that Industry 5.0 significantly affects employees' emotional intelligence, according to an examination of variance's F-value and p-value. Industry 5.0 improves workplace efficiency since the ANOVA p-value is less than 0.05. Industry 5.0 enhances emotional intelligence.

Table 1 H01 Industry 5.0 has improved industrial performance via human-technology collaboration

	N	Mean	Std. deviation	Std. error
Strongly agree	42	2.111	0.0	1.10
Agree	76	4.111	0.0	1.10
Neutral	20	3.361	0.9	1.09
Disagree	4	3.142	0.9	1.11
Strongly disagree	2	4.214	0.7	1.11
Total	144	3.541	0.9	1.09

Table 2 H01-Industry 5.0 has improved industrial performance via human-technology collaboration

	Sum of squares	d_f	Mean square	F	Sig
Between groups	38.759	6	6.278	10.871	0.000
Within groups	92.883	138	0.646		
Total	125.642	144			

Table 3 H02: The fifth generation of industry improves people's emotional intelligence

		N	Mean	Std. deviation	Std. error
Technology has increased employees' emotional intelligence	Strongly agree	42	4.001	0.0	0.00
	Agree	76	5.001	0.0	0.00
	Neutral	20	4.591	0.9	0.17
	Disagree	4	4.570	0.9	0.10
	Strongly disagree	2	4.091	0.9	0.10
	Total	144	4.950	0.8	0.09
Boosting employees' EQ may have positive effects on the business	Strongly agree	42	4.001	0.0	0.0
	agree	76	5.001	0.0	0.0
	Neutral	20	4.591	0.9	0.17
	Disagree	4	4.570	0.9	0.09
	Strongly disagree	2	4.091	0.9	0.11
	Total	144	4.844	0.8	0.07

Table 4 Analysis of H02: The fifth generation of industry improves people's emotional intelligence

		Sum of squares	d_f	Mean square	F	Sig
Technology has raised employees' EQ	Between groups	22.582	4	3.248	4.446	0.112
	Within groups	88.418	238	0.618		
	Total	111	243			
Boosting employees' EQ may have positive effects on the business	between groups	22.582	4	3.248	4.446	0.112
	Within groups	88.418	238	0.618		
	Total	111	243			

Validating the hypothesis One-way implications of Industry 5.0 include HR automation. The ANOVA test shows that collaborative robots negatively impact evaluations and that this is a consistent factor. The latest results support the employment of a diverse team.

As can be seen in the descriptive Table 5, which also contains the standard deviation and standard error of the two aforementioned criteria, a mean score larger than 3 indicates more automation in HR process Meenadevi et al. [12]. If the average of the two scores is higher than 3, then the organization has effectively adopted a higher level of automation with the help of Industry 5.0.

The Table 6 shows that F-value for the dependent variable (whether collaborative robots will affect the assessment) is 1.995, and the p-value is 0.099, which is larger than the significance threshold (alpha) of 0.05, showing that Industry 5.0 has no meaningful impact on the evaluation. The F-value, p-value, and ANOVA all fall below 0.05, Selvaraj [11] indicating that having a diverse workforce is statistically

Table 5 H03: The HR procedures have become more automated as a result of Industry 5.0

		N	Mean	Std. deviation	Std. Error
Collaborative robots may negatively affect your future performance evaluation	Strongly agree	42	4.001	0.0	0.00
	Agree	76	5.001	0.0	0.00
	Neutral	20	4.591	0.9	0.17
	Disagree	4	4.570	0.9	0.10
	Strongly disagree	2	4.091	0.9	0.10
	Total	144	4.950	0.8	0.09
Cross-disciplinary workers have the latest work and technical expertise, which may benefit organizations	Strongly agree	42	4.001	0.0	0.0
	Agree	76	5.001	0.0	0.0
	Neutral	20	4.591	0.9	0.17
	Disagree	4	4.570	0.9	0.09
	Strongly disagree	2	4.091	0.9	0.11
	Total	144	4.844	0.8	0.07

significant. Thus, Industry 5.0 automated human resources. "Industry 5.0 requires a multidisciplinary workforce" was tested using one-way analysis of variance.

The Table 7 shows the variables' means, variances, and margins of error. If the mean score is above 3, a diverse workforce is needed to boost production. 5.0 If the average score for both criterion is higher than 3. Saxena et al. [13]. Most respondents think a diverse team is necessary for industry success.

Table 8 shows that Cross-disciplinary teams for improved job processing has an F-value of 0.000, which is smaller than the alpha value of 0.05, indicating a considerable demand for such a workforce.

Table 6 Analysis of H03: The HR procedures have become more automated as a result of Industry 5.0

		Sum of squares	d_f	Mean square	F	Sig
Collaborative robots may negatively affect your future performance evaluation	Between groups	22.582	4	3.248	4.446	0.112
	Within groups	88.418	238	0.618		
	Total	111	243			
Cross-disciplinary workers may provide the latest work and technological insights to a business	Between groups	22.582	4	3.248	4.446	0.112
	Within groups	88.418	238	0.618		
	Total	111	243			

Table 7 H04—Industry 5.0 needs multidisciplinary workers

	N	Mean	Std. deviation	Std. error
Strongly agree	42	4.77	0.50	0.17
Agree	76	4.47	0.74	0.10
Neutral	20	4.75	0.79	0.07
Disagree	4	3.75	0.87	0.15
Total	144	4.58	0.74	0.07

Table 8 Analysis of H04—Industry 5.0 needs multidisciplinary workers

	Sum of squares	d_f	Mean square	F	Sig
Between groups	10.308	4	3.769	8.124	0.000
Within groups	66.692	140	0.469		
Total	77.00	144			

6 Results and Discussion

When modern technology, intelligent machines, or robots collaborate, organizational performance increases significantly. The current workforce, then, must learn to work together and adapt to new information and technologies.

Numerous studies confirm that an increase in an employee's emotional quotient correlates with a corresponding rise in the company's bottom line. In order to succeed in the industry 5.0, workers will need to constantly update and refresh their skills and expertise. Kleinings [14]. Thus, HR professionals may anticipate guiding their staff in a direction that will increase their knowledge and ambition, thus boosting their emotional intelligence. In addition, they may do individualized sessions with staff members to boost productivity and efficiency.

The industry 5.0 hypothesis postulates that this shift to automation will occur. Human resources experts, however, should proceed with caution Chin [15]. With performance assessment being a core HR responsibility, managers must take into account the possibility of a mixed human and robotic workforce and tailor their evaluations accordingly. As an added bonus, research shows that gamifying staff training and development initiatives increases their effectiveness Kokila and Chandra [16].

Collaboration between humans and intelligent devices, such as collaborative robots, is inevitable. According to the available evidence, coordination between people and these technologies is decreasing Karthick et al. [17]. As a result, preparing the current workforce to collaborate with these groups is an urgent need. Previous research articles show that employing a multidisciplinary staff is beneficial to productivity and expansion. Employees in this situation really need the right kind of training.

7   Conclusion

The primary objective of this study is to determine what aspects of HR management are impacted by the shift to industry 5.0. Finding and investigating these contributing elements is presented. Finally, in the discussion and outcomes section, we highlight the model that was developed to demonstrate the comprehensive strategy for upgrading to version 5.0. Ultimately, "the emotional intelligence of employees does need to be cared for while cross disciplinary workforce is conducting the processes in the organization, which provides automation while showing improved performances Mary Josephine et l. [18]." In the 5.0 economy, human resource management is at the forefront of shaping organizational success by navigating the intricate interplay between technology, people, and processes. The challenges and opportunities presented by this new paradigm require HRM to embrace innovation, agility, and a deep understanding of the evolving needs of the workforce. By harnessing the potential of advanced technologies, fostering a culture of continuous learning, and prioritizing employee well-being, HRM can lead organizations toward sustainable growth and prosperity in the 5.0 economy. It offers useful recommendations for future scholars and decision-makers. Investigating the effects of the independent variables, such as managing the environment in which human resources are managed, acquiring and preparing human resources, evaluating and developing human resources, and compensating human resources, on the sustainability of the economy, society, and environment, is how this is accomplished.

References

1. Credence.: Industry 5.0 and human-robot co-working. Procedia. Comput. Sci. **158**, 688–695 (2019)
2. Tataru, C.: Human resources in the digital age a manager's realities and perspectives. Rev. Int. Comp. Manag. **20**(4) (2019)
3. Xu, X., Lu, Y., Vogel-Heuser, B., Wang, L.: Industry 4.0 and Industry 5.0—Inception, conception and perception. J. Manuf. Syst. 530–535 (2021)
4. Nahavandi, S.: Industry 5.0—a human-centric solution. Sustainability **11**, 4371 (2019). https://doi.org/10.3390/su11164371
5. Cillo, V., Gregori, G.L., Daniele, L.M., Caputo, F., Bitbol-Saba, N.: Rethinking companies' culture through knowledge management lens during Industry 5.0 transition. J. Knowl. Manag. ahead-of-print(ahead-of-print) (2021). https://doi.org/10.1108/JKM-09-2021-0718
6. Martynov, V.V., Shavaleeva, D.N., Zaytseva, A.A.: Information technology as the basis for transformation into a digital society and Industry 5.0. In: International Conference "Quality Management, Transport and Information Security, Information Technologies" (IT&QM&IS) (2019). https://doi.org/10.1109/ITQMIS.2019.8928305
7. Berber, N., Đorđević, B., Milanović, S.: Electronic human resource management (e-HRM): a new concept for digital age. Strategic Manag. **23**(2) (2018)
8. Küppera, D.M., Kleinb, K., Völckner, F.: Gamifying employer branding: an integrating framework and research propositions for a new HRM approach in the digitized economy. Hum. Resour. Manag. Rev. **31**(1), 100686 (2019). https://doi.org/10.1016/j.hrmr.2019.04.002

9. Arslan, A., Cooper, C., Khan, Z., Golgeci, I., Ali, I.: Artificial intelligence and human workers interaction at team level: a conceptual assessment of the challenges and potential HRM strategies. Int. J. Manpower ahead-of-print(ahead-of-print) (2021). https://doi.org/10.1108/IJM-01-2021-0052

10. Meijerinka, J., Boonsb, M., Keeganc, A., Marlerd, J.: Algorithmic human resource management: synthesizing developments and cross-disciplinary insights on digital HRM. Int. J. Hum. Resour. Manag. **32**(3), 1–18 (2021). https://doi.org/10.1080/09585192.2021.1925326

11. Selvaraj, A.: Role of humans in Industry 5.0 (2019). https://www.columbusglobal.com/en/blog/role-of-humans-in-industry-5.0

12. Meenadevi, K., Mruthyunjaya Sharma, G.V., Archana, J.R., Subba Anantha, K.: Work habits based on agile methodology: metrics and procedures. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023)

13. Saxena, A., Saxena, A., Sharma, R., Parashar, M.: Emergence of futuristic HRM in perspective of human—Cobot's collaborative functionality. Int. J. Eng. Adv. Technol. **10**(5), 292–296 (2021)

14. Kleinings, H.: Industry 5.0: Leadership in the era of AI (2021). https://levity.ai/blog/leadership-ai

15. Chin, S.T.S.: Influence of emotional intelligence on the workforce for Industry 5.0. J. Hum. Resour. Manag. Res. **2021** (2021), Article ID 882278. https://doi.org/10.5171/2021.882278

16. Kokila, M.S., Chandra, S.: A study on career choice as entrepreneurs among undergraduate students in Bangalore. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-26953-0_23

17. Karthick, A.V., Gopalsamy, S.: In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023)

18. Mary Josephine, M., Muninarayanappa, M.: Industry 4.0—It's impact and scope towards sustainable business operations. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore. https://doi.org/10.1007/978-981-99-3366-2_15

Use Social Media and Employer Branding to Reach Online Shoppers of Generation Z

Raja Kamal , **Ibha Rani** , **Kseniia V. Bliumska-Danko** ,
Bohdan M. Plishyvyy, Egor M. Plishyvyy, and Nadiia P. Reznik

1 Introduction

Generation Z is gradually replacing the Baby Boomer generation in the workforce throughout the world. Generally speaking, there are noticeable differences across generations. To keep up with the times, businesses must invest in and carefully manage their human resources. Generation Z consists of those born between 1997 and 2012; the Karnataka Central Statistics Agency estimates that there are 74.93 million members of this generation BPS [1]. People of this generation grew up with computers, smartphones, and other digital technologies since they were born into the information age. The members of Generation Z are more skeptical, logical, visual, and reliant on technology, particularly the internet and the digital world, than previous generations. They are more likely to do internet research prior to making a choice than preceding generations Alvara Research Center Temasek, and Bain & Company [2].

All aspects of human life have been altered by the advent of digital technology Suwarni et al. [3]. The eConomy estimates that Karnataka's digital economy generated $40 billion in GMV in 2018, up 49% annually from 2015. The expansion of Indonesia's digital economy can be traced back primarily to the e-commerce industry. E-commerce "unicorn" startups in Indonesia with a value of $1 billion or more are impacted by the country's growing digital economy.

Competition for job applicants is intensified by the rising number of new businesses, necessitating innovative approaches. A talent war may break out as businesses compete to recruit the best and brightest new staff Fishman [4]. Insight and Job2Go

R. Kamal (✉) · I. Rani
Kristu Jayanti College Autonomous, Bengaluru, India
e-mail: Rajakamal@kristujayanti.com

K. V. Bliumska-Danko · B. M. Plishyvyy · E. M. Plishyvyy
Sumy National Agrarian University, Sumy, Ukraine

N. P. Reznik
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

conducted a poll among job seekers in 2020, and found that e-commerce enterprises like Tokopedia and Shopee were highly regarded Alika [5]. E-commerce positions were found to be the third most sought after in a poll performed in many locations, including Bangalore.

Companies need to differentiate themselves throughout the hiring process in order to attract qualified candidates in today's competitive employment market. Essential in both the conFrequencyer goods and labor markets, new employer branding and social media techniques may help. Therefore, e-commerce startups should prioritize employer branding initiatives to increase their pool of qualified candidates. Companies that have embraced internet and digital business methods might stand out as more appealing to the tech-savvy younger workforce.

The value of an employer's brand is affected by seven critical aspects: employee interest, societal and economic reasons, technological advancement, practical application, strategic leadership, and work-life balance. Applicants' level of interest in an organization is calculated by comparing each value to their own. When a candidate's requirements, personality, and values are a good fit for the firm, they become more interested in working for that organization Sivertzen [6] Company branding and job postings on social media are useful tools for finding and keeping good personnel. To do this, they must identify the core beliefs that offer them a leg over in the marketplace Berthon et al. [7]. The use of social media is also crucial in the process of hiring new staff Vilkaite-Vaiotone and Lukaite [8]. This research set out to answer the question, "How do employer branding values and social media affect Generation Z's intentions to apply for jobs at e-commerce firms in Monaco?" research proceed initially with the development of framework using literature review and concepts, proceed with the analysis finally drawn conclusions with identified research findings.

2   Literature Review

2.1   *Marketing to Potential Employers*

Marketing to Potential Employers incorporates developmental opportunities, financial incentives, and a feeling of community as a whole Ambler et al. [9]. In addition, it includes organizational measures to attract and retain talented workers in order to achieve organizational objectives Mosley and Schmidt [10]. It improves the company's reputation, which in turn attracts a higher quality pool of candidates from which to make a final decision Aslam [11].

Potential workers, whether they be students, fresh graduates, or seasoned professionals, might benefit from the four-point scale Berthon et al. [7] used by human resource managers throughout the recruiting process. Seven Marketing to Potential Employers values were defined by, with the first scale focusing on (1) interest value (product/service innovation), the second on (2) social value (showing the work environment and connections among colleagues), and so on. (3) There's the monetary

gain to workers; (4) there's the potential for professional growth for those workers. (5) The practical worth of knowledge is in the career prospects it opens up, (6) leadership principles, or management ideals; (7) workers' ability to strike a healthy balance between their professional and personal lives.

2.2 Social Media

Companies who don't change with the times have a hard time competing for top talent Micik and Micudova [12]. On the other hand, people who have a large number of connections in social networks may readily find qualified applicants for open jobs Ollington et al. [13]. To build a public or semi-public profile on a system, present a list of other users with similar connections, see and edit one's own list of connections, and so on are all features of social media Boyd and Ellison [14]. It is crucial for marketing since it allows conFrequencyers to create profiles and expand their social networks Sivertzen et al. [6].

2.3 Motivation to Fill Job Application

The motivations behind people doing certain acts, like seeking for a job, are as varied as the people taking those actions. Examining a person's desires or interests is what drives their actions, as stated by reasoned action theory Fishbein and Ajzen [15]. Job-seekers who use the information provided in job ads to research and evaluate potential employers is one example of how belief impacts interest Gomes and Neves [16]. According to this notion, prospective employees' enthusiasm for a job will lead them to submit an application.

2.4 Prior Studies

- Sivertzen et al. [6] wrote a paper titled "Marketing to Potential Employers: employer attractiveness and the use of social media" that discusses the impact of Marketing to Potential Employers and social media on the interest of job applicants.
- Aslam [11] "Marketing to Potential Employers and Intention to Apply by Usage of Social Media in Banking Sector, Pakistan."
- Dediek Tri Kurniawan [17] titled, "Generation Y Trends in Choosing an Employer: Impact of Marketing to Potential Employers Toward Intention to Apply in E-Commerce Companies in Indonesia."

- Minh Ha and Vinh Luan [18] wrote about "The effect of employers' attraction and social media on job application attention of senior students at pharmaceutical universities in Vietnam."
- As stated by Vilkaite-Vaitonedan and Lukaite [8] "Company Image in Social Network as Predictor of Intention to Apply for a Job Position."
- Millennials' perceptions on the connection between a company's brand appeal and their desire to hire, as presented by Santiago [19].

2.5 Hypothesis

From the Fig. 1 we can draw the following list of the research hypotheses:

H_1: There is a correlation between strong Marketing to Potential Employers and increased interest in applying for employment.
H_2: The interest of people in looking for employment is influenced favorably by social media.
H_3: The value of the interest has a considerable impact on Marketing to Potential Employers.
H_4: The social sphere has a big impact on company branding.
H_5: The economic worth of a company has a substantial impact on its brand.
H_6: The value of employee development has a substantial impact on corporate branding.
H_7: The worth of an application has a substantial impact on an employer's brand.
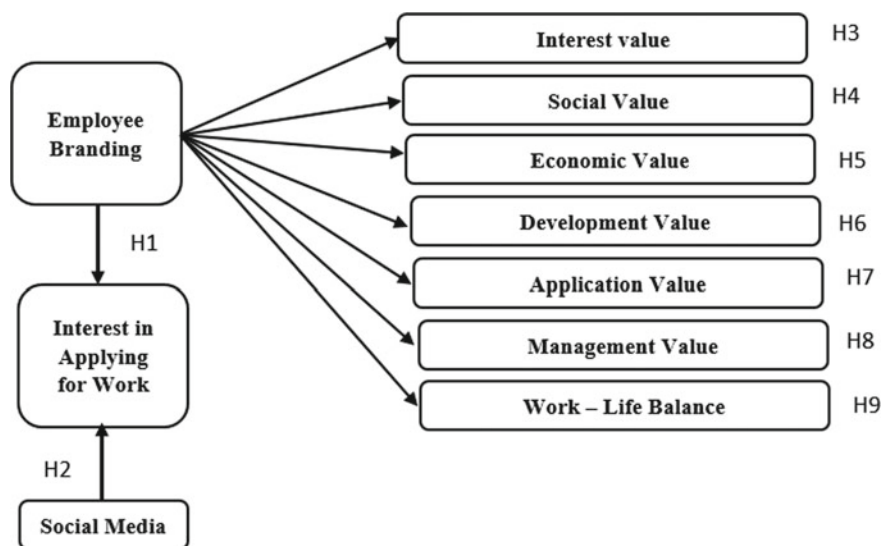
Fig. 1 Conceptual frame work

H$_8$: The value of management has a huge impact on the way an organization is branded.

H$_9$: Maintaining a healthy work-life balance has a tremendous impact on corporate branding.

3 Methods of Study

We used an online survey using a Likert scale from 1 to 5 for our primary data collection. Purposive sampling was utilized to collect data from 164 members of the working-age Z generation in Monaco. E-commerce job-seeking enthusiasm was a prerequisite for participation. Structured equation modeling (SEM) in SPSS Amos 22 was used to examine the data.

3.1 Branding for Employers

Values such as curiosity, altruism, economics, progress, practicality, leadership, management, and work-life harmony Dabirian et al. [20] were used to evaluate employer brands. Several indicators used a Likert scale from 1 (strongly disagree) to 5 (strongly agree) to quantify each value.

3.2 The Social Media (SM)

The impact of social media was evaluated using a number of measures that Collins and Stevens [21] created and that Sivertzen et al. [6] later accepted. A Likert scale with points ranging from 1 (strongly disagree) to 5 (strongly agree) was used to assess the four different indicators.

3.3 Motivation to Fill Job Application

The researchers Highhouse et al. [22] devised a number of metrics to quantify applicants' levels of interest in job applications. A Likert scale with response options ranging from 1 (strongly disagree) to 5 (strongly agree) was used to assess five different factors.

3.4 Structural Equation Modeling

To get a full picture of a model, researchers often use structural equation modeling, a kind of multivariate analysis that looks at the connection between several complex variables 24. With a sample size between one hundred and two hundred, the maximum likelihood method was used for this investigation. Several indicators of model agreement were used Lupiyoadi et al. [23]: X2 (small anticipated Chi-Square), 0.05 (probability), 0.08 (RMSEA), 0.90 (GIF), 0.90 (AGFI), 2.00 (CMIN/DF), 0.95 (TLI), and 0.95 (CFI). Modification indices may be created in case the model is not up to par. Values in the table of change indices indicate areas where the unsuitable model might benefit from revision. The highest negative number in the table of modification indices is the Par Change value, suggesting that it may be used to nullify indicators. The following step is to check whether the fitness model has a cutoff value of 0.05; if it does not, the modification indices step is performed. When doing SEM hypothesis testing, the number of regression weights was analyzed, and a statistically significant impact was found at a P-value of less than 0.05.

4 The Findings and Discussions

4.1 Respondent Profile

The following respondent profiles were derived from their expressed desire to work for an e-commerce firm:

According to Table 1, the majority of the survey's 173 respondents (168 out of 173) are keen in working for an online retailer. The 168 questionnaire answers utilized in this study all came from people with an interest in working for an e-commerce firm. Only 164 surveys met our criteria for further analysis. Based on the data collected from the questionnaire, the following characteristics of the sample population may be determined:

According to Table 2, 148 of the respondents are members of the Z generation and fall between the ages of 20 and 24. Of these 148 respondents, 102 62.2% of the total are female.

Table 1 Job-seeking attitudes among E-commerce respondents

Category	Frequency	Percentage (%)
Yes	142	91
No	22	9
Total	164	100

Source Primary data

Table 2 Participants by age and gender

Category		Frequency	Percentage (%)
Age	15–19 year	24	9.8
	20–24 year	140	90.2
	Total	164	100
Gender	Male	69	37.8
	Female	95	62.2
	Total	164	100

Source Primary data

4.2 Validity Test

If the sum of the r counts for each question in the test exceeds the r table value, then the test may be declared legitimate. At the value of n = 164, the table for determining the magnitude of the value of r becomes visible, as follows:

To get the value of r table at df = 162, subtract 2 from 164 to get 162.

Table 3 displays the results of the validity tests, which demonstrate that the computed r-values for each question item in each variable are higher than the table r values. This study questionnaire has just appropriate questions, it follows.

4.3 Reliability Test

Questionnaire has a Cronbach's alpha score of 0.60 or above, it may be considered valid and trustworthy.

Cronbach's alpha values for all variables are more than 0.60, as shown in Table 4. This study's variables are, thus, very reliable.

4.4 Structural Equation Modeling

This study's preliminary model has the following form Fig. 2 using Standardized Estimates initial model.

After the initial model is processed, the following test results are obtained:

Table 5 shows that the original findings from testing the whole model did not satisfy the fit requirements, thus adjustments were made.

Table 6 shows that a Par Change of − 0.691 indicates that e2 should be removed from the equation. This means that EB2 rather than e2 should be used as the measurement variable. Figure 3 shows the first-stage updated version of the model, the following experimental findings are acquired after the model's first stage has been modified.

Table 3 Validity test result

r-count	r-table	Category
0.712	0.1633	Accepted
0.73	0.1633	Accepted
0.637	0.1633	Accepted
0.642	0.1633	Accepted
0.672	0.1633	Accepted
0.64	0.1633	Accepted
0.641	0.1633	Accepted
0.644	0.1633	Accepted
0.64	0.1633	Accepted
0.696	0.1633	Accepted
0.716	0.1633	Accepted
0.626	0.1633	Accepted
0.644	0.1633	Accepted
0.622	0.1633	Accepted
0.676	0.1633	Accepted
0.693	0.1633	Accepted
0.662	0.1633	Accepted
0.617	0.1633	Accepted
0.636	0.1633	Accepted
0.672	0.1633	Accepted
0.676	0.1633	Accepted
0.473	0.1633	Accepted
0.644	0.1633	Accepted
0.67	0.1633	Accepted
r-count	*r-table*	*Category*
0.771	0.1633	Accepted
0.796	0.1633	Accepted
0.729	0.1633	Accepted
0.767	0.1633	Accepted
r-count	*r-table*	*Category*
0.722	0.1633	Accepted
0.792	0.1633	Accepted
0.739	0.1633	Accepted
0.767	0.1633	Accepted
0.713	0.1633	Accepted

Table 4 Reliability test results

Variable	Cronbach's alpha
Marketing to potential employers	Marketing to potential employers
Motivation to fill job application	0.887
Social media	0.878

Source Complied data

Fig. 2 Standardized estimates initial model. *Source* Compiled data
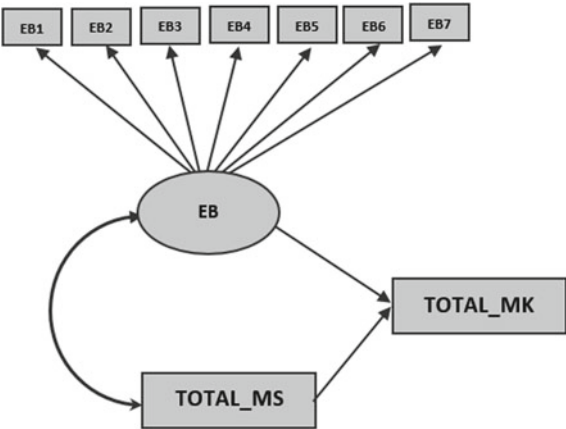
Table 5 Full model test

Criteria	Result
CFI	0.923
TLI	0.917
CMIN/DF	2.934
AGFI	0.828
GFI	0.916
RMSEA	0.118
Sign probability	0.000
Chi-square	75.468

Source Complied data

Table 7 shows that the first-stage model fit requirements are not met by the updated model's complete test results.

Table 8 shows that the Par Change for e4 should be − 0.524, hence mistake 4 (e4) is the target of the second round of elimination, with the EB4 factor serving as the metric. Figure 4 shows the updated model from the second phase.
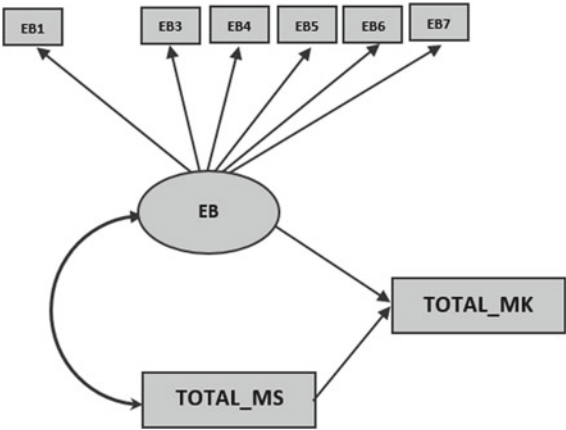
The following test results were obtained when Stage 2 model modifications were implemented:

Table 6 M.I. Par change

	M.I. Par change
E2 ↔ E1	10.370 − 0.850
E4 ↔ E2	3.623 − 0.531
E8 ↔ E2	3.283 − 0.691
E4 ↔ E3	3.783 0.369
E6 ↔ E4	13.176 − 0.525
E8 ↔ E4	13.923 1.080
TOTAL_M ↔ E5	3.995 0.398

Source Complied data

Fig. 3 Consistent evaluations the very first complete model revision. *Source* Complied data

Table 7 Exhaustive first-phase model testing results

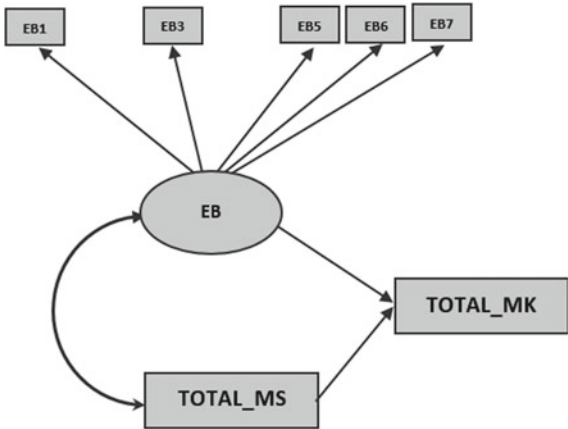| Criteria	Result
CFI	0.846
TLI	0.822
GFI	0.828
CMIN/DF	2.826
AGFI	0.863
RMSEA	0.216
Sign probability	0.000
Chi-square	53.515

Source Compiled data

From Table 9, the EB2 Social Value and EB4 Development Value variables were removed using modification indices, and the redesigned model passed the second-stage appropriateness test with flying colors. This is shown by the significance of the model-appropriate computations.

Table 8 Shows that the Par change

	M.I. Par change
E6 ↔ E4	13.377 − 0.513
E7 ↔ E4	4.551 − 0.331
E7 ↔ E6	4.788 0.232
E8 ↔ E4	8.677 0.824
E8 ↔ E3	4.767 − 0.494
TOTAL_MS ↔ E5	4.181 0.437

Source Complied data

Fig. 4 Consistent evaluations completely revised version 2 of the model. *Source* Complied data

Table 9 The final model test outcomes of the second phase of change

Criteria	Result	Category
CFI	0.894	Accepted
TLI	0.867	Accepted
CMIN/DF	1.532	Accepted
AGFI	0.821	Accepted
GFI	0.877	Accepted
RMSEA	0.049	Accepted
Sign probability	0.083	Accepted
Chi-square	21.124	Accepted

4.5 Hypothesis Testing

P value of less than 0.05 is used to test a hypothesis by gauging the magnitude of the regression weights. You can see the results of the regression in the table below.

Table 10 Regression weights

	Regression weights
EB → MK	0.326
EB → MK	0.480
EB3 → EB3	0.598
EB3 → EB3	573
EB3 → EB3	0.739
EB3 → EB3	0.755
EB1 → EB1	0.792

The P-values for all of the variables in Table 10 are significantly lower than 0.05. The study methodology is generally accepted, and the findings show that all hypotheses are accepted since Employer variable branding does not contain EB2 or EB4 development values.

5 Findings

- Marketing to Potential Employers influences job application interest MK by 48%. Branding boosts employment Aslam [11].
- E-commerce marketing to Potential Employers boosted Generation Z job applications.
- 32.6% of job applicants are influenced by social media found social media effects job applications. Social media recruits better Minh Ha and Vinh Luan [18].
- Tech-savvy Generation Z job hopefuls utilize social networking.
- Interest value EB1 mainly affects Marketing to Potential Employers.
- Regression with 0.05 P-value claim interest is the most important Marketing to Potential Employers element.
- Since social value EB2 is not a major Marketing to Potential Employers component, the study model must ignore it. Gen Z likes great ecommerce brands.
- Economic value EB3 is a significant Marketing to Potential Employers factor with a P-value and regression value.
- Marketing to Potential Employers loses EB4 to test research methods.
- Progress may attract job seekers notwithstanding.
- E-commerce expansion doesn't affect Generation Z job applications.
- EB5, good Marketing to Potential Employers, with a P-value and a regression value.
- Application value affects Marketing to Potential Employers. Generations Y and Z brand workplaces differently.
- Management value EB6 is a significant Marketing to Potential Employers factor with a P-value and regression value.
- Managerial value did not impact Marketing to Potential Employers.

- Gen Z favors e-commerce companies appreciate labor.
- Work-life balance EB7 is important Marketing to Potential Employers at Gen Z seeks remote e-commerce jobs.

6　Conclusion

Focusing on the importance of Marketing to Potential Employers value, this research set out to answer the question, Does Marketing to Potential Employers and social media influence Generation Z job applications to e-commerce companies Kokila and Chandra [24] in Both Marketing to Potential Employers and social media were shown to promote interest in applying for employment at e-commerce enterprises among members of Generation Z. Values in interest, economics, applications, management, and work-life balance round out the top five benefits of corporate branding. However, social and growth ideals have little to no role in shaping an organization's brand.

In conclusion, social media may be used to find new workers and Marketing to Potential Meenadevi et al. [25]. Employers can clarify what they can anticipate before applying. To attract more members of Generation Z to apply for employment in e-commerce, businesses may manage their employer brand and social media presence.

7　Implication of Managerial

E-commerce businesses may use the insights from this research to better tailor their employer brand and social media strategies to the preferences of Generation Z in order to pique their interest in filling open positions. More members of Generation Z will be interested in applying for positions at your company if you do a good job of establishing yourself as an employer. This may be done through creating a pleasant workplace, rewarding and making use of employees' creative abilities, and releasing high-quality, original goods and services.

Using social media effectively may encourage members of Generation Z to seek for employment. Because members of Generation Z utilize technology differently than earlier generations, they need to pay attention to and manage their social media presence. To reach millennials and Generation Z, businesses might utilize social media with a strong visual component, such as Instagram and YouTube, to advertise job openings and other relevant information.

References

1. BPS, "PotretSensusPenduduk 2020," (2020)
2. Alvara Research Center, "The Battle Of Our Generation: Indonesia Gen Z and Millennial Report 2020," (2020)

3. Temasek, and Bain & Company, e-Conomy SEA 2019 Report
4. Fishman, C.: "The war for talent," Fast Company, p. 104 (1998)
5. Alika, R.: PertaminadanTokopediaTermasuk 10 TempatKerja Paling Diminati, katadata.co.id (2020)
6. Sivertzen, M., Nilsen, E.R., Olafsen, A.H.: Marketing to potential employers: employer attractiveness and the use of social media. J. Prod. Brand. Manag. **22**, 473–483 (2013)
7. Berthon, P., Ewing, M., Hah, L.L.: Captivating company: dimensions of attractiveness in marketing to potential employers. Int. J. Advert. **24**(2), 151–172 (2005)
8. Vilkaite-Vaiotone, N., Lukaite, U.: Employer attractiveness on social networks and organizational image as predictors of intentions to apply for a job position. Mark. Manag. Innov. **3**, 209–222 (2019)
9. Ambler, T., Barrow, S.: The employer brand. J. Brand Manag. **4**(3), 185–206 (1996)
10. Mosley, R., Schmidt, L.: Marketing to Potential Employers. Wiley (2017)
11. Aslam, S.: Marketing to potential employers and intention to apply by usage of social media in banking sector Pakistan. Int. J. Sci. Eng. Res. **6**(5), 400–405 (2015)
12. Micik, M., Micudova, K.: Employer brand building: using social media and career websites to attract generation y. Econ. Sociol. **11**(3), 171–189 (2018)
13. Ollington, N., Gibb, J., Harcourt, M.: Online social networks: an emergent recruiter tool for attracting and screening. Pers. Rev. **42**(3), 248–265 (2013)
14. Boyd, D.M., Ellison, N.B.: Social network sites: definition, history, and scholarship. J. Comput. Commun. **13**(1), 210–230 (2008)
15. Fishbein, M., Ajzen, I.: Belief, Attitude, intention, and behavior: an introduction to theory and research (1975)
16. Gomes, D., Neves, J.: Organizational attractiveness and prospective applicants' intentions to apply. Pers. Rev. **40**(6), 684–699 (2011)
17. Kurniawan, D.T.: Generation Y trends in choosing an employer: impact of marketing to potential employers toward intention to apply in E-commerce companies in Indonesia. Int. J. Bus. Manag. Res. **8**(2), 43–52 (2018)
18. Minh Ha, N., Vinh Luan, N.: The effect of employers' attraction and social media on job application attention of senior students at pharmaceutical Universities in Vietnam. Int. J. Bus. Soc. 19(2), 473–491 (2018)
19. Santiago, J.: The relationship between brand attractiveness and the intent to apply for a job: a millennials' perspective. Eur. J. Manag. Bus. Econ. **28**(2), 142–157 (2019)
20. Dabirian, A., Kietzmann, J., Diba, H.: A great place to work!? Understanding crowdsourced marketing to potential employers. Bus. Horiz. **60**(2), 197–205 (2017)
21. Collins, J., Stevens, C.K.: The relationship between early recruitment-related activities and the application decisions of new labor-market entrants: a brand equity approach to recruitment. J. Appl. Psychol. **87**(6), 1121–1133 (2002)
22. Highhouse, S., Lievens, F., Sinar, E.F.: Measuring attraction to organizations. Educ. Psychol. Meas. **63**(6), 986–1001 (2003)
23. Lupiyoadi, R., Ikhsan, R.B.: PraktikumMetodeRisetBisnis. SalembaEmpat Jakarta (2015)
24. Kokila, M.S., Chandra, S.: A Study on career choice as entrepreneurs among undergraduate students in Bangalore. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-26953-0_23
25. Meenadevi, K., Mruthyunjaya Sharma, G.V., Archana, J.R., Subba Anantha, K.: Work Habits Based on Agile Methodology: Metrics and Procedures. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds.) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol. 620. Springer, Cham (2023)

Study on Delinquency Levels and Portfolio Quality of the Microenterprise Bank—Peru

Rosario Huerta-Soto [ID], **Edwin Hernan Ramirez** [ID], **K. P. Jaheer Mukthar** [ID], **Rolando Saenz-Rodriguez** [ID], **and Juan Villanueva-Calderón** [ID]

1 Introduction

Credit risk is a challenge facing the banking sector. The problem of asymmetric information causes credit markets to function inefficiently. In the short term, delinquency problems cause liquidity problems, and in the long term, in the absence of contingent credit lines, this problem could turn into a solvency problem, which may ultimately lead to the liquidation of the institution. Since liquidity constraints can cause difficulties in the agents' ability to pay, they are considered one of the macroeconomic problems [1]. The degree of financial obligation is also significant. The increasing burden of debt service or the lower availability of additional financing could make it difficult for agents with higher levels of indebtedness to fulfill their promises. There are three broad categories of macroeconomic factors that contribute to default: those that have to do with the economic cycle, those that influence the degree of liquidity of agents and those that quantify their debt volume [2].

According to the microeconomic indicator, the degree of default of each given financial institution is a direct result of the actions of its individual management. Some of the most studied factors are lending practices, business approach and risk management techniques [3]. The caliber of a bank's loan portfolio is influenced by its lending policy. A lowering of standards for applicants could be accompanied by a more liberal lending policy, which could lead to more defaults [4]. However, the nature of the business is also a factor influencing portfolio quality. Thus, mortgage loans are safer than consumer loans. In order to meet the unique banking needs of

R. Huerta-Soto · E. H. Ramirez (✉) · R. Saenz-Rodriguez
Universidad Cesar Vallejo, Huaraz, Peru
e-mail: eramirezas@ucvvirtual.edu.pe

K. P. Jaheer Mukthar
Kristu Jayanti College Autonomous, Bengaluru, India

J. Villanueva-Calderón
Universidad Cesar Vallejo, Trujillo, Peru

microentrepreneurs and open up capital markets for them, Mibanco was founded in March 1998. As of December 2022, Banco de la Microempresa (Mibanco) had a market share in terms of loans of 3.32% of the entire Peruvian national financial system, with 27.80% of all loans to small and microenterprises. With the experience of its promoter-owners, Grupo ACP (Grupo Acción Comunitario del Peru, with operations in 12 countries) and Accion International, Mibanco has become an important Peruvian microenterprise lending institution.

Mibanco has more clients than any other Peruvian microfinance organization. In response, its parent company has diversified into related but distinct fields by establishing subsidiaries in Peru and other Latin American countries (Brazil, Bolivia, Mexico, El Salvador, Guatemala, and Ecuador), such as insurance, education, communications, and services. With a total of S/. 4,024 million in outstanding loans (including contingent loans) at the end of 2011, Mibanco represented 3.32% of total loans granted by the banking system and 27.8% of total loans granted to small and microenterprises [5].

This leading market position is the result of the company's extensive familiarity with the microenterprise sector, which stems from its close working relationships with Grupo ACP and Accion International, and the efficiency of its customer service channels (a network of branches in Peru's 22 regions, ATMs, and branches open at unusual hours). The expansion of the loan portfolio is being carried out with reasonable credit evaluation requirements, which, combined with the potential for financial income creation, is sufficient to write off 100 percent of the past-due loans provided and accurately represent the prevailing delinquency levels.

As shown in Table 1 Mibanco.s delinquency rate was 3.66% as of December 2021, taking into account portfolio at risk and portfolio quality, 6.58% from portfolio at high risk and in judicial collection, and 3.82% as of January 2022, which indicates a slight increase from previous periods, but which must improve significantly to limit the trend in the delinquency rate observed due to the impact of the global crisis on credit demand [6].

With the proliferation of microfinance organizations and the participation of various banking institutions that now also serve this market, the availability of loans for MSEs has expanded dramatically in the last decade. In 2005, Mibanco opened an office in the city of Huaraz; by 2016, the bank had 117 branches throughout Peru. Most of Mibanco's branches are located in the capital city of Lima and the city of Callao (53 in total), but in recent years, 64 more branches have opened in other parts of the country [7]. Agencia Huaraz2 debuted in June of this year, becoming the second agency in the city. This organization will not be included in the investigation. This strategic change was intended to improve the agency's ability to assess the creditworthiness of potential clients. As a result, the level of loan placements decreased. However, by 2010, the delinquency rate had risen further, reaching 5.97%. Subsequently, in 2022, the delinquency rate peaked at 7.28%. As of April 2022, the agency had a portfolio valued at 51 million soles, with a client base that included 4996 individuals. The data also revealed a delinquency rate of 8.36%.

Mibanco classified the agencies according to their delinquency levels into A, B, C and D ratings, assigning the Huaraz agency a C rating because its delinquency rates

Table 1 Delinquencies by type and type of loan by Banking Company

Concept	B. Continental	B. de Crédito del Perú	B. Financiero	B. Interamericano de Finanzas	Scotiabank Perú	Interbank	Mibanco	Total multiple banking
Corporate loans	–	0.00	0.00	0.00	0.00	0.00	–	0.00
Loans to large companies	0.14	0.06	0.10	0.15	0.03	0.24	–	0.18
Loans to medium-sized companies	1.75	2.27	3.66	2.37	2.72	1.86	3.32	2.23
Loans to small companies	3.90	6.11	3.83	3.30	4.39	4.55	4.51	4.95
Loans to microenterprises	0.77	2.16	3.31	2.42	2.37	4.70	2.80	2.49
Consumer loans	2.67	2.75	2.17	2.21	1.51	3.02	2.35	2.75
Mortgage loans for housing	0.53	1.28	1.16	0.24	0.78	0.79	1.75	0.87
Total direct loans	1.03	1.46	2.18	1.07	1.47	1.65	3.82	1.54

Note Information obtained from BANTOTAL

exceed 8%. The ratings impose limitations on approval amounts within the agencies. In the specific situation of Huaraz, agency approval is limited to a maximum of S/. 85,000 nuevos soles. Amounts exceeding this limit are subject to approval by the risk unit. As a consequence of the above circumstances, this study raises the following question: What is the correlation between delinquency rates and portfolio quality within the Mibanco—Huaraz Peru Agency?

2 Literature Review

According to [8], delinquency is defined as the borrower's inability to repay loan principal and interest. In this research, we define delinquency as the percentage of loans more than 30 days past due. Commercial credits are defined by Agboola et al. [9] as "credits granted by institutions of the financial system for the financing of production, commercialization of goods and services in their various stages, including contingent operations and those with similar purposes." Granting credit to someone implies placing trust in them to supply products and means of payment in exchange for future payment or reimbursement. It is an agreement whereby one financial institution lends money to another for a specific period of time in exchange for interest, with the expectation of recovering its money at the end of that period of time.

According to [10], microeconomic and macroeconomic factors as determinants of microcredit delinquency explain the portfolio quality problem of Peruvian microfinance organizations, using an empirical and international approach to the subject. Their findings raise questions, and their technique of analysis provides a useful reference point for the one to be carried out here [11]. The research of [12] empirical evidence on the combined relevance of aggregate factors such as the evolution of the economy, aggregate demand, the unemployment rate, income and wages is provided by a study on delinquency in Spanish savings banks. Several factors specific to each institution's lending strategy play a crucial role in determining its effectiveness. These factors include market share, loan growth rate, corporate incentive schemes, efficiency and solvency, among others [13].

After conducting a thorough analysis of the existing academic literature on banks and other financial intermediaries, we have created a comprehensive inventory of the characteristics that influence the overall performance of a bank's loan portfolio quality, categorizing them into macroeconomic and microeconomic factors [14]. There are two main factors that influence an institution's environment: external factors, which affect the financial capacity of its customers, and internal factors, which are directly related to the firm's management practices [15].

In models that attempt to shed light on the causes of corporate insolvencies, the link between the non-payment of bank loans and the circumstances of macroeconomic activity has been investigated indirectly. The financial failure of a firm cannot be reduced to a delay in the payment of credits; however, a defaulting firm can be expected to experience many of the same difficulties as a failing firm. Kosztowniak

[16] offer a model for understanding the causes of corporate bankruptcy, which includes, among others, liquidity, debt, capital and aggregate demand.

According to [17], the management policies and market participation strategies of individual financial institutions are examples of microeconomic factors that influence the delinquency behavior of their loan portfolios. Some of the most studied factors are placement strategy, corporate approach and risk mitigation techniques. However, according to [18], a financial institution's credit policy is an important factor in establishing the quality of its loan portfolio. When lending standards are relaxed in conjunction with an expansionary policy, as is sometimes the case, adverse selection problems and, in turn, higher default rates can occur. However, [19] points out that this need not be the case if credit growth is managed carefully.

According to [20] on the contrary, industries that inherently offer high risk, such as agriculture, are often associated with higher credit risk. A financial institution's default rates will be higher if it places a disproportionate amount of its capital in high-risk loans and industries. Consider also [21]. Since the delinquency rate of a financial institution's loan portfolio decreases as it improves its loan selection and its monitoring and recovery procedures, these two factors are crucial in determining the recovery rate. Unlike microfinance institutions, banking institutions do not rely on the individual efforts of credit analysts to perform this due diligence. Since the efficiency with which a financial intermediary monitor and recovers loans decreases as more loans are placed per employee or analyst, the average placements per employee indicator, defined as the ratio of total placements to the number of employees, is not the most appropriate indicator for examining the bank's ability to evaluate, track and recover defaulted loans.

According to [11] find that there is a positive sign in the correlation between operating costs and delinquency, suggesting that as costs increase, so does the probability of default. Poor portfolio quality management by bank managers and directors. Nguyen et al. [22] argue that default rates of financial institutions can also be explained by the presence or absence of collateral. However, there is no agreement on how default and collateral are related. There is an argument that borrowers who are more willing to comply with regulations are also willing to provide greater collateral. Customer moral hazard may be reduced if greater collateral is provided. However, there are theories that suggest that the presence of collateral may be positively related to loan default, as it reduces the institution's incentives to effectively monitor credit and may generate undue trust among borrowers.

Specifically, [23] argues the market power of banks is related to the level of competition in the loan market. Banks that dominate the market may be willing to take on riskier loans, as they can compensate for the inevitable increase in delinquency by charging more interest to their customers. However, if there were more competition in the credit market, borrowers would have a wider range of financing options to choose from, which would reduce the influence of lenders and the likelihood that they would accept higher current delinquencies in anticipation of charging higher interest rates in the future. Therefore, it can be concluded that dominant banks have a higher proportion of non-performing loans in their portfolio [24].

According to [3] to mitigate credit risk, banks should take into account a number of criteria when deciding whether or not to grant credit. To name a few: The profitability of the credit business, The bank's assurance that the credit operation is successful depends on the following factors: the final location of the funds, The credit and the economic climate in which it is granted are backed by these guarantees. In addition, liquidity evaluates a company's resource generation potential, taking into account whether this potential will be used to finance working capital, consumer spending, etc. Check the applicant's credit, payment history, industry experience and collateral to make sure it is a good bet. In a similar vein, research by Xiliang et al. [13] on delinquency in Spanish savings banks provides empirical evidence of the importance of both macroeconomic factors such as the state of the economy and aggregate demand and microeconomic factors such as a bank's market share, loan growth rate, the firm's incentive policies, the level of efficiency and solvency.

The quality of a portfolio, as [25] argue, no portfolio is healthy by accident; it requires work to establish concrete sales policies, credit policies that encourage sales while limiting risks, and flexible collection policies that vary according to portfolio segment, product, length of delinquency and market condition. Before, during and after the distribution of goods, the above standards should also include delinquency prevention initiatives. The product/service description and sales meeting are two examples of pre-approval tools. Company marketing, slogans, good merchandising, brand building and brand penetration are crucial factors here [26].

Portfolio preparation and credit analysis, including effective verification procedures, are used as tools during product underwriting to ensure a more secure underwriting process. Especially for new clients. Most of the credit analyst's work will consist of verifying the accuracy of the information that has been photocopied, some examples of supporting documents that can be used in financial transactions are pay stubs, specific monetary figures, employment details, correlation of receipts, source used and final verification calls made to the respective organization [19].

For post-grant instruments, a loan quality survey conducted shortly after a risk assessment and prior to loan distribution has proven to be particularly effective for consumer products [27]. It is critical to make sure that people understand why it is so important to pay on time, what they will get if they do, and what they will lose if they do not. Having a salesperson, credit analyst, supervisor, or manager visit a regular borrower can help in many ways, such as strengthening the relationship between the lender and borrower, learning more about the client's business and operations, and gaining insight into how inventory is managed so that the client feels valued.

Accounts are regularized more quickly, and a culture of payment can be fostered, when arrears are handled nimbly, quickly, efficiently and professionally from day one [26]. Never losing sight of the qualities that led to our selection as a supplier is essential, nor is neglecting to promote those qualities to ourselves. Customers will be less likely to consider replacing us as a supplier if we offer the best prices, the best products, the widest range of services, or anything else that differentiates us from the competition. Payment reminders sent to customers who have refinanced or are chronically late will improve our overall collection rates. Determine the payment

schedule together with the client to match the regularity of their income. Alcívar-Moreira and Bravo-Santana [28] consider the Peruvian financial system to be one of the most solid in the region. This perspective is corroborated by both the steady expansion of loans and deposits and the gradual reduction of dependence on the U.S. dollar within the economy, along with banks' capital/lending ratios. According to the Association of Southeast Asian Banks (Asbanc), the quality of loan portfolios has also increased substantially in recent years.

Looking at the proportion of loans in each risk category, the influence claims to see evidence of superior debt management by commercial banks. In May of this year, 93.65% of the portfolio was made up of loans classified as "normal," while the remaining 0.95%, 1.03% and 0.95% were classified as "substandard," "doubtful" and "loss-making," respectively. In December, the delinquency rate, which is the ratio of past-due loans to total loans, rose to 1.98% from 1.59% in November, according to data compiled by Soria-Manitio [20]. According to leverage statistics, this is the highest delinquency rate since March 2009, when it was 1.51%. The better availability of liquidity of companies and households, in an environment of economic dynamism, and the improved payment culture are factors that have contributed to the decrease in the delinquency rate, Asbanc said in a statement.

According to [17] states that a bank's loan portfolio includes several varieties of credit, each with its own set of potential losses. Therefore, defining credit portfolios with shared characteristics is useful for creating risk rating systems. Similarly, a credit portfolio is the general term for the securities, commercial paper and customer records that make up the current assets of a firm, bank or corporation [20].

There will be eight (8) different categories of loans established by Kosztowniak [16]. Corporate loans are granted to companies that, according to their most recent annual audited financial records, have had revenues in excess of S/. 200 million in each of the last two (2) years. Loans will not be evaluated in this category if the debtor does not have audited financial accounts. In the event that the debtor's annual sales are less than S/. 200 million for two (2) consecutive years, the loans must be classified as loans to large companies. Corporate credits are defined by the Law as sovereign credits, credits originated by multilateral development banks, credits granted by public sector entities, credits granted by securities intermediary companies, credits offered by financial system companies and credits granted by guarantee and credit insurance funds established in accordance with the provisions of the Law [23].

Companies that meet one or more of the following criteria are eligible for a loan from a financial institution: Recent financial records show that the debtor has generated annual revenues of more than S/. 20 million but less than S/. 200 million. The debtor has kept all capital market debt instruments current for the past year. The term "loans to medium-size companies" refers to credit granted to organizations that do not meet the criteria for "corporate loans" or "loans to large companies", but whose total debt in the financial system is greater than S/. 300,000 in the previous six (6) months. Subsequently, the Debtor's loans must be classified as loans to large companies or corporate loans, as applicable, if the Debtor's annual sales were greater than S/. 20 million for two (2) consecutive years or if the Debtor had made any

issuance in the capital market. Also, if the debtor's accumulated debt within the financial system remains below S/. 300,000 for a continuous period of six (6) months, it is necessary to categorize the loans as small business loans or microenterprise loans, depending on the specific amount of the debt.

Loans granted to consumers whose aggregate debt in the financial system (excluding mortgages) has exceeded S/. 300,000 in the last six (6) months are also considered medium enterprise loans, provided that some proportion of such aggregate debt corresponds to small or microenterprise loans. Loans must be reclassified as consumer loans (revolving and/or non-revolving) and as small or microenterprise loans depending on the level of indebtedness and the purpose of the loan, as applicable, if the debtor subsequently reduces its total indebtedness in the financial system (excluding home mortgage loans) to a level no greater than S/. 300,000.

Small business loans are defined as loans granted to individuals or legal entities whose overall indebtedness in the financial system, excluding mortgage loans, is between S/. 20,000 and S/. 300,000 during the previous semester, for the purpose of financing production, commercialization or service rendering activities. Subsequently, the loans must be classified as loans to medium-size companies if the total indebtedness of the debtor in the financial system (excluding housing mortgage loans) exceeds S/. 300,000 during six (6) consecutive months. Likewise, if the debtor's total indebtedness in the financial system (excluding mortgage loans) is less than S/. 20,000 for six (6) consecutive months, the loans must be classified as microenterprise loans.

If a natural or legal person has not contracted a mortgage loan in the last six (6) months, then it is eligible for a microenterprise loan, a loan is a financial instrument used to finance activities related to the production, commercialization or offering of services.

Revolving personal lines of credit are loans granted to consumers for the acquisition of products, services or the settlement of expenses not directly related to the operation of a business. Loans must be classified as medium enterprise loans if the debtor also has micro or small enterprise loans and the overall indebtedness of the banking system, excluding home mortgage loans, exceeds S/. 300,000. Finally, home mortgage loans are defined as loans granted to individuals for the purpose of acquiring, constructing, remodeling, enlarging, improving or subdividing a single-family residence, provided such loans are made through duly registered mortgages. Also included in this category are loans for the acquisition and construction of dwellings on which a mortgage cannot be constituted at the time of the transaction because the properties being acquired or constructed are future assets, assets in the process of becoming independent, or assets in the process of property registration.

Table 2 shows the Agency rating that has been in place at Mibanco since 2019 in relation to the quality of its portfolio.

According to [16] that the increase in both the client base and credit placements over one-month time periods constitutes the growth of a loan portfolio. The process of selecting clients to whom credit should be granted is called "credit targeting", and [29] describes it as the use of several strategies. The creditworthiness of the customer is assessed and compared with the credit requirements of the company. Independence in credit approval at Mibanco is established at the levels shown in Table 3.

Table 2 Risk assessment by agency

Agency type	Rating	Level of delinquency
A	Profitable agency	Up to 3.49% of
B	Doubtful agency	From 3.50 to 5.59%
C	Deficient agency	From 6.00 to 8.99%
D	Losing agency	More than 9.00%

Source Information obtained from BANTOTAL

Table 3 Levels of autonomy for credit approval

Position	Autonomy
Credit Manager	Up to S/ 25,000
Agency Manager	From S/25,001 Up to S/50,000
Regional Manager	From S/25,001 Up to S/85,000
Territorial Manager	From S/85,001 Up to S/150,000
Business Manager	From S/150,001 Up To S/350,000
General Manager	From S/350,001 Up to S/1′0000,000
Board of Directors	More than S/1′0000,000

Source Information obtained from BANTOTAL

3 Methodology

The study was descriptive and correlational in nature. Hernandez and Mendoza [30] state that the objective is to identify and detail the most outstanding features and attributes of the communities, groups or phenomena under study. This research aimed to characterize delinquency trends and their connection with portfolio quality in the microempresa bank of Peru.

There was no cost involved in conducting this study, as the researcher chose a topic that aroused his academic curiosity. Loan portfolio: The BANTOTAL portfolio report (24 months) was the research framework for this study. Due to the limited sample size, we investigated expanding our research to include the entire population. Secondary analysis of BANTOTAL data was used to quantify the variables and their connections. The study was based on statistical and documentary data provided by risk management and other financial instructions, as well as books from specialized libraries and online research. Descriptive statistics were calculated for each independent variable and the results were presented graphically in the form of a frequency distribution. SPSS software was used to analyze the data and Pearson's correlation coefficient was used to determine the strength of the relationship between the variables.

4 Results

Table 4 is based on information provided by BANTOTAL reports, which provide in-depth assessments and interpretations of the quality of the microenterprise bank's portfolio and the true state of delinquency, and shows the outstanding portfolio and types of loans as of December 2022.

According to Fig. 1, Mibanco's outstanding portfolio for 2022 is broken down by type of credit. The current assets account for 43.2%, fixed assets for 24.8% and time lines of credit for 16.8%.

Figure 2 shows the distribution of clients by credit limit, showing that 39.33% of clients have limits below 30,000 soles.

Figure 3 shows that in the microenterprise bank, both delinquencies and portfolio quality are increasing.

Pearson correlation analysis was used to examine the relationship between the quantitative variables and the hypothesis. Table 5 shows that the microenterprise bank's portfolio quality improves when delinquency rates decrease. The results show

**Table 4** Performing portfolio by type of loan 2022

| Type of credit	Amount	Percentage (%)
Working capital	16,938,483	43.2
Fixed assets	9,726,323	24.8
Fixed installment line of credit	6,565,352	16.8
Personal	1,782,738	4.6
Housing without mortgage	1,928,372	4.9
Home mortgages	1,672,736	4.3
Letter of guarantee	562,533	1.4
Total	39,176,537	100.0

Source BANTOTAL Report

Fig. 1 Performing portfolio by type of loan 2022. *Source* Own elaboration
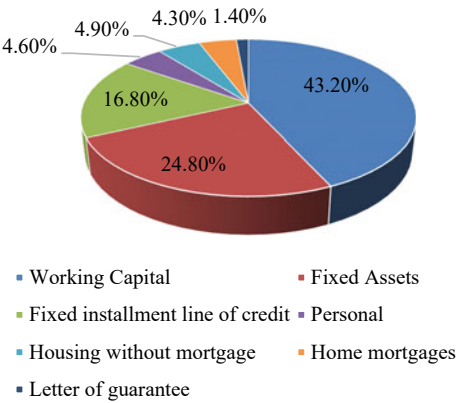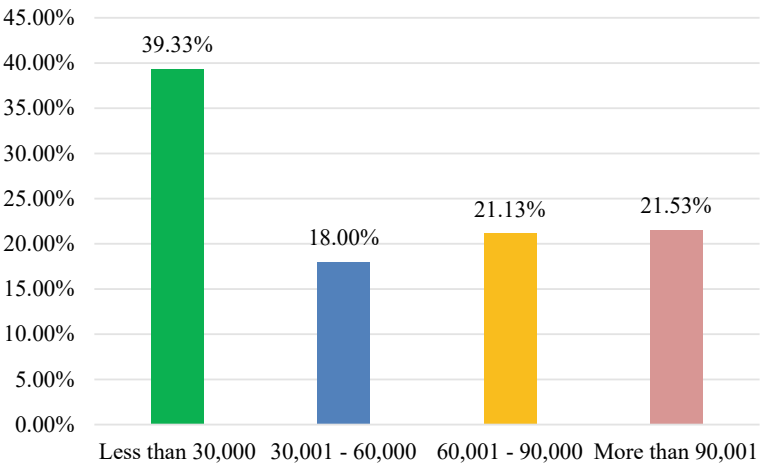
Fig. 2 Number of clients by amount 2022. *Source* Own elaboration
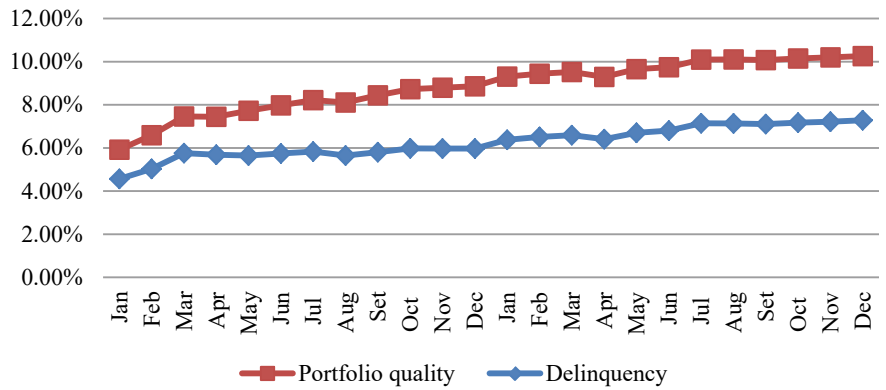
Fig. 3 Delinquency behavior—portfolio quality 2021–2022. *Source* Own elaboration

a positive relationship between delinquency and portfolio quality of Mibanco. The Pearson correlation value is 0.928.

Table 5 Summary of Pearson's correlation analysis

Model	R	R-squared	Adjusted R-squared	Standard error of the estimate
1[b]	0.928[a]	0.947	0.945	0.28,453

[a]Predictors: (Constant), MOROSITY
[b]Dependent Variable: PORTFOLIO QUALITY

5 Discussion

The delinquency rate refers to the proportion of loans in a portfolio that are at risk and more than 30 days past due. It is determined by dividing the number of such loans by the total number of loans in the portfolio and has traditionally been used as a proxy for the quality of loan portfolios in Peru. According to [21] banks do not include in their actual write-offs when calculating the delinquency rate, which is based on days past due. Moreover, due to the time lag involved in the identification of the hazard. Consequently, according to [31] it would not be a good indicator to study credit risk, as it would be delayed and trigger alerts when the problem has already developed. Therefore, it would be advantageous to assess the quality of a portfolio by considering the entire past-due portfolio, encompassing the portfolio at risk, the high-risk portfolio and the heavy portfolio. Although other research has examined the use of this indicator to assess credit risk specifically in the context of Mibanco.

In analyzing the quality of a bank's loan portfolio, [32] argue that provisioning expense is a better indicator than bank NPLs. But, the most reliable measure of portfolio quality is the aggregate of portfolios at risk, which encompasses high-risk portfolios and heavily weighted portfolios. This is due to the fact that delinquency, as defined by accounting standards, only takes into account the number of days a payment is late and does not take into account write-offs [33].

This study shows that, for Banco de la Microempresa, there is a positive correlation between delinquency and portfolio quality at a 95% confidence level. These data show that, in 2021, the Huaraz agency had a delinquency rate of 5.97%, giving it a B (Doubtful) quality rating, but that its portfolio quality would drop to 8.86%, giving it a C (Poor) quality rating.

In 2021, the agency had a delinquency rate of 7.28%, making it a C (Poor) grade agency, while calculating the rate based on the total number of delinquent portfolios yielded a rate of 10.26%, making the portfolios D (Losing) quality. This finding is complementary to that proposed by Mayta-Mamani et al. [15] that knowledge of the influence of the customer profile is important to implement measures aimed at mitigating the escalation of the delinquency rate within the portfolio. This shows that, regardless of the metric used, there was concern about the causes of the increase in delinquent activity. In contrast to what [10] found in the analysis of delinquency in Spanish savings banks, it was observed that provisioning expenses were mostly concentrated in the heavy portfolio, specifically in loans more than 180 days past due. However, the results indicated that provisioning expenses were predominantly concentrated in the risky portfolio, specifically in loans more than 30 days past due.

These results are in line with those mentioned by Agboola et al. [9]. In its study on delinquency within Spanish savings banks, the organization conducted research and analysis, to the effect that mortgage loans are less delinquent than consumer loans, as evidenced by the fact that 40% of provisioning expenses are concentrated in working capital loans. It also supports the findings of Bueno-Mariaca and Arias-Vascones [1], who found that delinquency rates were higher in banks that focused on high-risk loans and industries. There is a strong linear regression pattern in the

quality of Mibanco's loan portfolio. This finding is consistent with the delinquency rate or portfolios; at risk, high risk and heavy portfolios, both of which are already available in the Peruvian financial system. When analyzing the factors that contribute to the delinquency rate in Peruvian MFIs, this finding is consistent with that of [14].

6   Conclusions

During the year 2021–2022, the delinquency rate had a beneficial impact on the quality of the portfolio managed by the Mibanco—Huaraz Agency. In that sense, the agency presented a delinquency rate of 7.28%, which translated into a C (poor) rating for the agency. However, when the index was calculated based on the total number of delinquent portfolios, the result was an index of 10.26%, resulting in a D (deficient) quality rating for the portfolios.

The delinquency behavior presented in the Mibanco Agency between the years 2021 and 2022. It is increasing. According to these figures, the Huaraz agency had a delinquency rate of 5.97% in 2021, which earned it a quality grade of B (Doubtful). However, the statistics also suggest that its portfolio quality would deteriorate to 8.86%, which would earn it a quality grade of C (Poor).

During the 2021–2022 fiscal year, Mibanco's Huaraz agency was rated as a loss-making agency. In 2022, the Huaraz agency had a delinquency rate of 6.97%, giving it a quality rating of B (Doubtful), but its portfolio quality dropped to 8.97%, giving it a quality rating of C (Poor).

References

1. Bueno-Mariaca, W.A., Arias-Vascones, G.R.: La morosidad de las Cajas Municipales del Perú en la era pre y post covid. Análisis del sector microempresarial. Economía & Negocios **4**(1), 77–89 (2022). https://doi.org/10.33326/27086062.2022.1.1352
2. Valeri, M.: Structural analysis of credit portfolio of microfinance organizations acting in Georgia. Eur. J. Econ. Manag. Sci. (3), 61–63 (2022). https://doi.org/10.29013/EJEMS-22-3-61-63
3. Chong, F.: Loan delinquency: some determining factors. J Risk Financ. Manag. **14**(7), 320 (2021). https://doi.org/10.3390/jrfm14070320
4. Uquillas, A., Tonato, R.: Inter-portfolio credit risk contagion including macroeconomic and financial factors: a case study for Ecuador. Econ. Anal. Policy **73**, 299–320 (2022). https://doi.org/10.1016/j.eap.2021.11.006
5. Ramirez-Asis, E.H., Norabuena-Figueroa, R.P., Toledo-Quiñones, R.E., Mázmela, P.R.H.M.: Validación de una escala de conciencia sobre ciberdelito en estudiantes universitarios de Perú. Revista Científica General José María Córdova **20**(37), 209–224 (2022). https://doi.org/10.21830/19006586.791
6. Ramírez-Asís, H., Vílchez-Vásquez, R., Huamán-Osorio, A., Gonzales-Yanac, T., Castillo-Picón, J.: Digitalization and success of peruvian micro-enterprises in the retail 4.0 sector. In: The Implementation of Smart Technologies for Business Success and Sustainability, pp. 225–236. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-10212-7_20

7. Maguiña, M.E., Ramirez, E.H., Huerta, R.M., Concepción, R.J.: Microcrédito y desarrollo de las microempresas en las zonas rurales de Ancash, Perú. CIENCIA ergo-sum **28**(1), e109 1–9 (2021). https://doi.org/10.30878/ces.v28n1a3

8. Calderon-Contreras, V., Ostos, J., Florez-Garcia, W., Angulo-Bustinza, H.: Determinants of credit risk: a multiple linear regression analysis of Peruvian municipal savings banks. Decis. Sci. Lett. **11**(3), 203–210 (2022). https://doi.org/10.5267/j.dsl.2022.4.003

9. Agboola, O., Adelugba, I.A., Eze, B.U.: Effect of financial technology on the survival of micro-enterprises. Int. J. Entrepreneurial Knowl. **11**(1), 1–13 (2023). https://doi.org/10.37335/ijek.v11i1.188

10. Cedeño-Palacios, C.A., Palma-Macías, G.R.: Gestión de riesgo de crédito, para mejorar la calidad de la cartera de microcrédito, en la cooperativa comercio Ltda. Polo del Conocimiento: Revista científico-profesional **5**(3), 225–254 (2020). https://doi.org/10.23857/pc.v5i3.1334

11. Cueto-Sanchez, S.C., Ticlavilca-Forlong, R.D.: Factores de la calidad de cartera de créditos en la rentabilidad de una caja municipal de ahorro y crédito. REVISTA Veritas et Scientia—UPT **10**(2), 230–246 (2021). https://doi.org/10.47796/ves.v10i2.564

12. Karthick, A.V., Gopalsamy, S.: Role of IoT in business sustainability. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current trends in economics, business and sustainability. ICEBS 2023. contributions to environmental sciences & innovative business technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_2

13. Xiliang, Q., Kuo, Y.K., Abourehab, M.A., Mabrouk, F., Ramirez-Asis, E., Abdul-Samad, Z., Makes, N.: The impact of ICT, green finance, and CSR on sustainable financial performance: moderating role of perceived organizational support. Economic Research-Ekonomska Istraživanja, 1–21 (2022). https://doi.org/10.1080/1331677X.2022.2151489

14. Iqbal, Z., Rao, Z.U.: Social capital and loan credit terms: does it matter in microfinance contract? J. Asian Bus. Econ. Stud. (2022). https://doi.org/10.1108/JABES-10-2021-0185

15. Mayta-Mamani, E.A., Ticlavilca-Forlong, R.D.: La calidad de cartera crediticia y su influencia en la morosidad. Revista Veritas Et Scientia-UPT **12**(01), 21–31 (2023). https://doi.org/10.47796/ves.v12i01.775

16. Kosztowniak, A.: Changes in the quality of the loan portfolio in the polish banking system. Econ. Bus. Organ. Res. 33–49 (2020). https://dergipark.org.tr/en/pub/ebor/issue/58610/847677

17. Silva, E., Pereira, A., Vaz, Â.: Credit risk-The importance of credit portfolio management. Int. J. Bus. Manag. Technol. **3**(5) (2019). https://www.theijbmt.com/arc929.php

18. Thirumagal, P.G., Tirkey, A., Suresh, S.: Moderating effect of board size and board independence between women on board and ESG. In: Aloysius Edward, J., Jaheer Mukthar, K.P., Asis, E.R., Sivasubramanian, K. (eds.) Current Trends in Economics, Business and Sustainability. ICEBS 2023. Contributions to Environmental Sciences & Innovative Business Technology. Springer, Singapore (2023). https://doi.org/10.1007/978-981-99-3366-2_3

19. Mirza, N., Afzal, A., Umar, M., Skare, M.: The impact of green lending on banking performance: evidence from SME credit portfolios in the BRIC. Econ. Anal. Policy **77**, 843–850 (2023). https://doi.org/10.1016/j.eap.2022.12.024

20. Soria-Manitio, N.K.: Determinantes de la morosidad en las microempresas en Ecuador: Análisis y estudio Banco Central. Revista Científica FIPCAEC (Fomento de la investigación y publicación científico-técnica multidisciplinaria). ISSN: 2588-090X. Polo de Capacitación, Investigación y Publicación (POCAIP) **6**(3), 222–236 (2021). https://doi.org/10.23857/fipcaec.v6i3.397

21. Mohamed, T.S., Elgammal, M.M.: Credit risk in Islamic microfinance institutions: the role of women, groups, and rural borrowers. Emerg. Mark. Rev. **54**, 100994 (2023). https://doi.org/10.1016/j.ememar.2022.100994

22. Nguyen, T.P.T., Trinh, N.T., Nghiem, S.: Can Chinese banks expand their loan portfolio while maintaining loan quality and profitability post-global financial crisis? J. Chin. Econ. Foreign Trade Stud. (2023). https://doi.org/10.1108/JCEFTS-08-2022-0047

23. Nieto-Cuadrado, F.X.: Operaciones crediticias de las microempresas en Ecuador, previo a Emergencia Sanitaria. Podium (39), 37–52 (2021). https://doi.org/10.31095/podium.2021.39.3

24. Yating, Y., Mughal, N., Wen, J., Ngan, T.T., Ramirez-Asis, E., Maneengam, A.: Economic performance and natural resources commodity prices volatility: evidence from global data. Resour. Policy **78**, 102879 (2022). https://doi.org/10.1016/j.resourpol.2022.102879

25. Orichom, G., Omeke, M.: Capital structure, credit risk management and financial performance of microfinance institutions in Uganda. J. Econ. Int. Finance **13**(1), 24–31 (2021). https://doi.org/10.5897/JEIF2020.1096

26. Zafar, S.Z., Zhilin, Q., Mabrouk, F., Ramirez-Asis, E., Alzoubi, H.M., Hishan, S.S., Michel, M.: Empirical linkages between ICT, tourism, and trade towards sustainable environment: evidence from BRICS countries. Economic Research-Ekonomska Istraživanja 1–22 (2022). https://doi.org/10.1080/1331677X.2022.2127417

27. Torres-Inga, C.S., Velasco-Heras, C., Juana, A.J.A.D., Guevara-Viera, G.E., Guevara-Viera, R.V.: Technical efficiency's nonparametric analysis of Ecuadorian saving and credit cooperatives before and during the pandemic. Economies **10**(4), 82 (2022). https://doi.org/10.3390/economies10040082

28. Alcívar-Moreira, X.K., Bravo-Santana, V.P.: Índice del riesgo de morosidad en los microcréditos simples; caso Cooperativa de Ahorro y Crédito Chone LTDA.: Artículo de revisión bibliográfica. Revista Científica Multidisciplinaria Arbitrada Yachasun **4**(7 Ed. esp.), 182–198 (2020). https://doi.org/10.46296/yc.v4i7edesp.0080

29. Paulino-Valencia, E.E.: Indicadores de calidad de cartera y endeudamiento, en las empresas financieras, Perú, años 2015 al 2019. Revista Hechos Contables **1**(1), 64–85 (2021). https://doi.org/10.52936/rhc.v1i1.60

30. Hernandez, Mendoza: Metodología de la investigación: las rutas cuantitativa, cualitativa y mixta. Mcgraw-Hill interamericana editores, S.A. (2018)

31. Vogel, R.C.: Other people's money: regulatory issues facing microenterprise finance programs. In: Strategic Issues in Microfinance, pp. 197–216. Routledge (2019)

32. Abdullaev, A., Jo'rayev, S.: Improving scientific and methodological approaches to assessing the quality of the loan portfolio of commercial banks. Scientific Collection «InterConf» (153), 55–63 (2023). https://archive.interconf.center/index.php/conference-proceeding/article/view/3234

33. Ramírez, E.H., Maguiña, M.E., Huerta, R.M.: Attitude, satisfaction and loyalty of customers in Municipal Savings Banks of Peru. Retos **10**(20), 313–325 (2020). https://doi.org/10.17163/ret.n20.2020.08

A Study on the Impact of Green Branding on Consumer Buying Behaviour with Respect to the Purchase of Apparel

Wilber Acosta-Ponce ⓘ **, Syed Kazim, K. P. Jaheer Mukthar** ⓘ **,**
Juan Villanueva-Calderón ⓘ **, Edwin Hernan Ramirez, and J. K. Singh**

1 Introduction

Green marketing refers to the use of effective marketing principles to develop environmentally desirable products for a specific target audience. It encompasses all marketing initiatives that encourage consumers to adopt pro-environmental attitudes and behaviors. Green marketing enables organizations to achieve their profit objectives while remaining sensitive to the environment and societal needs, with the aim of preserving it for future generations. Additionally, green marketing provides a competitive advantage to brands that seek to incorporate environmentally conscious practices into their management decisions. It involves a range of activities that prioritize meeting consumer needs while minimizing environmental damage.

Green brands refer to companies that offer environmentally friendly products that have a reduced negative impact on the environment. These brands educate consumers on the advantages of eco-friendly products and are associated with a positive reputation and consumer preference due to their environmental benefits. Additionally, green brands are those that possess a significant environmental advantage compared to their competitors and are capable of attracting consumers due to their environmentally-friendly attributes.

Consumer attitudes towards global warming have become increasingly serious, resulting in the adoption of environmentally conscious lifestyles. Consumers are

W. Acosta-Ponce · J. Villanueva-Calderón · E. H. Ramirez
Universidad Cesar Vallejo, Trujillo, Peru

S. Kazim
JAIN (Deemed to Be University), Bengaluru, India

K. P. Jaheer Mukthar (✉)
Kristu Jayanti College Autonomous, Bengaluru, India
e-mail: jaheer@kristujayanti.com

J. K. Singh
Aryabhatta College, University of Delhi, Delhi, India

increasingly opposed to irresponsible manufacturing and consumption practices, and there has been a noticeable shift towards green products in Western markets. Brands have also experienced changes in consumer purchasing behavior due to increased media attention, support from social activists, and stricter government regulations. Additionally, social consensus, group identity, and individual values have been identified as crucial factors in promoting eco-friendly behavior.

Organic clothing is an integral part of the green apparel categorization. Several consumers show a strong sense of commitment towards purchasing organic clothing due to concerns for the environment, green lifestyle, trust in the green brand, and social pressures. Multiple researchers around the globe have posited increasing awareness of green brands. Several consumer characteristics like degree of fashion orientation, shopping sensibilities, and environmental concerns have been identified to predict consumer preference for such apparel.

Consumer perception refers to the thoughts and impressions that consumers have about a particular brand or product. Perception is a crucial process by which individuals gain insights about their environment and interpret this information based on their needs, behavior, and perspective. Several other studies have presented perception as a complex process. Consumers' sensory receptors collect messages from external signals, which are then processed, interpreted, and stored by the consumer to be used in their decision-making process. Perception as a stage of information processing.

The relationship between a brand and a consumer can create cognitive benefits that form positive emotional bonds. Relationships are interactions that occur over time and are characterized by mutual dependence between the entities involved. Relationship marketing, as defined by, focuses on retaining profitable customers through engagement and partnerships. According to previous research by (insert author names), the consumer-brand relationship is considered a function of brand satisfaction, brand trust, and brand attachment.

The environment-conscious movement has gained significant momentum due to changes in government regulations, increasing media coverage, and evolving consumer preferences. As a result, both international and domestic apparel brands have begun transitioning towards green production. This has also led to the emergence of numerous new brands in this space, given the potential and profitability of the opportunity. However, despite these developments, some studies suggest that consumers' environmental awareness does not always translate into the purchase of green apparel products.

The paper is structured into five chapters. The introduction sets the context and objectives of the study. The literature review examines existing research to establish a foundation and identify gaps. The research methodology outlines the approach, data collection, and analysis methods. The analysis and interpretation section presents findings and insights drawn from the data. Lastly, the discussion and conclusion synthesize the study's implications, aligning them with the literature and wrapping up the research journey.

2 Literature Review

As environmental awareness grows among consumers, there is a rising interest in investing in eco-friendly products. Companies worldwide have acknowledged this trend and are striving to make their manufacturing processes more environmentally sustainable. This has prompted organizations to incorporate environmentalism into their business models. Green marketing encompasses all marketing efforts aimed at promoting a pro-environmental mindset and behavior among consumers [1].

The increasing demand for environmentally friendly products has created a distinctive opportunity for established brands to expand their product offerings and for new brands to emerge in this market. This has also given rise to a new category known as "green brands" and "green consumers." Green brands prioritize eco-friendliness and educate consumers about the benefits of using environmentally sustainable products. As a result, they enjoy a positive reputation among consumers and are often preferred for their eco-friendly attributes [2].

In the present-day crisis of limited resources on earth, the significance of green marketing has become evident. While individuals and brands have the right to fulfill their wants, the question arises of how to achieve consumer satisfaction with the limitation of resources. Green marketing provides the answer by balancing these activities and utilizing limited resources to serve both consumer and organizational needs, while achieving objectives with an eye on environmental preservation [3].

The issue of global warming has prompted consumers worldwide to adopt eco-friendly lifestyles. There is a growing awareness among consumers about the negative impact of irresponsible manufacturing and consumption. Consequently, there has been a notable shift in the market for green products in the western world. Brands have been quick to take notice of this trend, with media coverage, social activism, and government regulations contributing to the change in consumer behaviour [4].

Organic clothing is a crucial component of sustainable apparel, and it has garnered significant interest from consumers who prioritize environmental consciousness, sustainable living, brand integrity, and societal norms. Studies from various regions around the world have highlighted a growing awareness of green brands among consumers. Researchers have identified several consumer traits, such as fashion orientation, shopping habits, and environmental concerns, that determine their inclination towards organic clothing. Mothers, in particular, are more inclined to prefer organic clothing for their children and are willing to pay a premium for it. The key factors that influence their buying behavior are environmental concerns, product recyclability, and green purchasing habits [5].

India, recognized as a favored market by international brands among emerging economies, is currently grappling with various pollution challenges. Consequently, the country has embraced eco-friendly manufacturing strategies to address these issues. As mentioned in reference, the industry is actively working towards reducing water consumption and implementing practices like utilizing organic dyes in the production of apparel. Growing environmental awareness among consumers has

sparked concerns about the situation, leading to rising demand for organic and eco-friendly clothing. To cater to this market segment, green brands, and private labels have already ventured into apparel categories such as baby clothing, kids' wear, and premium adult wear. Furthermore, renowned international brands like Zara, Levi's, Nike, Wal-Mart, and C&A have introduced clothing lines featuring organic garments specifically for the US and European markets [6].

According to a study conducted by Mintel in 2009 in the United Kingdom, it was found that consumers tend to prefer green products over non-green options when they have similar prices and functionalities. This preference is influenced by the frame of reference theory, which encompasses reactions, habits, and intentions as part of the behavioral component. Consumer perception towards green brands is strongly influenced by the element of social acceptability. When consumers publicly consume green brands, it enhances their self-image and brings personal satisfaction. Reference groups also play a significant role in stimulating green purchasing behavior. Individuals are motivated to display their affiliation with environmentally conscious groups by making environmentally friendly choices. Consequently, it is important to consider social acceptability as a significant factor instead of focusing solely on intentions [7].

Consumers rely on their past experiences when it comes to purchasing green products. Their attitude and behavior towards these products can be influenced if the product's performance doesn't meet their expectations during their interaction with it. Moreover, the continued usage of green products depends on two factors: (a) the consumer's level of environmental consciousness, and (b) their overall purchase experience. The quality of the green experience is influenced by consumer satisfaction through engaging experiences. This satisfaction is linked to the consumer's likelihood of substituting the brand with another. Customers who hold pro-environmental beliefs have stronger confidence in the performance of green products. These beliefs can be shaped by various factors, including consumer attitudes, feelings, experiences, and social influences. Furthermore, having knowledge about environmental and social issues positively impacts the consumer's decision-making process when it comes to purchasing green products and influences their overall attitude [8].

The use of ethical green advertising has a positive impact on consumer responses toward green products. Green consumers reacted favorably to the extension of green product lines by well-established brands. Additionally, these consumers responded positively to recycled products offered by established brands compared to new brands. This can be attributed to the trust and confidence instilled by the established brand name, alleviating concerns about the quality of the recycled components. Organizations can allocate resources to enhance the perceived value of green products while reducing perceived risks, which significantly influences consumers' intentions to purchase green products. Marketing strategies that emphasize product safety, ecological balance, and fair pricing contribute to strengthening consumers' intentions to buy organic personal care products [9].

In many instances, consumers associate environmentally-friendly manufacturing processes with the green attributes of a product. Their sense of responsibility towards the environment fosters a positive perception and a willingness to purchase products

from environmentally conscious brands. This concern for environmental preservation drives consumers to choose environmentally friendly products. Notably, environmental concern has been identified as a motivating factor in the purchase of organic foods [10].

3 Research Methodology

3.1 Objectives

  i. To assess the factors influencing green apparel brand
 ii. To evaluate the perception of consumers towards green apparel brands
iii. To study the relationship between green apparel brands and consumer brand relationship

3.2 Research Methodology

The study will adopted a quantitative research design to collect and analyze data. A purposive sampling technique is employed to select a sample of participants who have experience purchasing apparel and are familiar with green branding. The target population consist of consumers from different demographic backgrounds, such as age, gender, and socioeconomic status. Data is analyzed by using appropriate statistical tools.

3.3 Limitations

Some potential limitations of this study include sample representativeness, self-reporting bias, and generalizability of findings. Efforts will be made to address these limitations by employing a diverse sample and emphasizing the confidentiality of responses.

3.4 Significance and Implications

The study aims to contribute to the existing body of knowledge on green branding and consumer behavior in the context of apparel purchases. The findings can provide insights for apparel brands and marketers to understand the impact of green branding
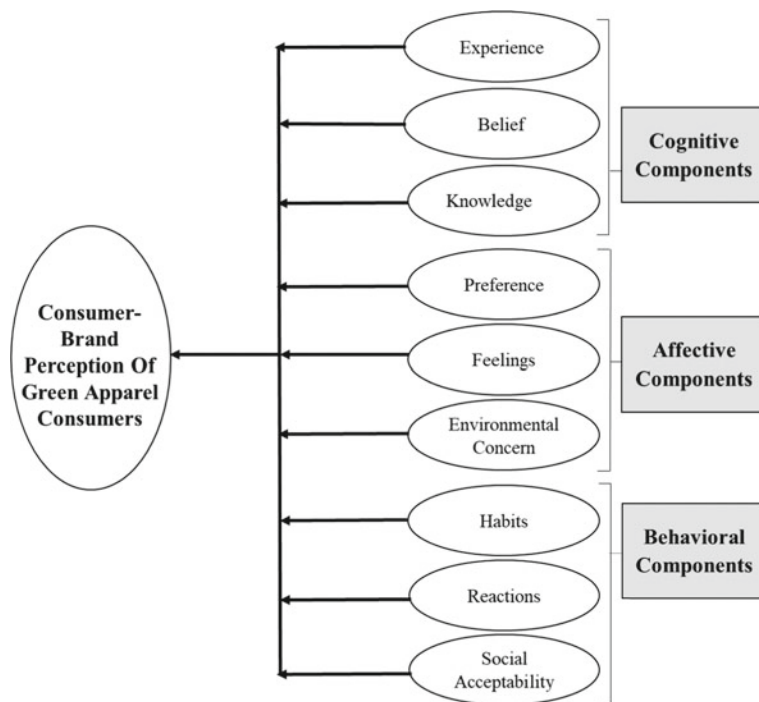
Fig. 1 Conceptual model

on consumer perceptions and behaviors. The study can also offer practical implications for developing effective green branding strategies to attract environmentally conscious consumers.

3.5 Conceptual Model

Figure 1 shows conceptual model of Consumer brand perception of Green Apparel.

4 Analysis and Interpretation

4.1 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) serves the purpose of validating the factor structure that was initially identified in the exploratory factor analysis. This analytical approach plays a critical role in assessing the validity of the measurement model.

In the specific context of consumer-brand perception for green apparel brands, CFA is employed to examine the validity of factors and their relationships, providing valuable insights into how consumers perceive and evaluate such brands shown by Fig. 2

Construct loading refers to the degree of association between a construct and its corresponding items. Figure 2 shows that it is a standardized loading value that ideally falls within the range of 0.7–0.9 that In the case of consumer-brand perception for green apparel brands, all the constructs exhibit construct loading values between 0.7 and 0.9, indicating a strong and reliable relationship between the constructs and their respective items.

4.2 Establishing the Construct Validity

The study proceeded to validate the factor structure obtained from the exploratory factor analysis by conducting a confirmatory factor analysis using AMOS 23. This analysis aimed to confirm the predefined factor structure of the extracted constructs. Construct validity was assessed through the utilization of convergent and discriminant validity, which were obtained through the process of confirmatory factor analysis. The study employed a first-order confirmatory factor analysis to analyze the data and arrive at the final results.

4.3 Convergent Validity

To establish convergent validity, specific criteria need to be met. These criteria include the composite reliability (CR) exceeding 0.7, the average shared variance (AVE) being greater than 0.5, and the CR being higher than the AVE for all the constructs. In the present study, the calculated values for the nine constructs fulfilled all these conditions, thereby confirming the presence of convergent validity.

4.4 Discriminant Validity

Discriminant validity is considered established when the average shared variance (AVE) exceeds the maximum shared variance (MSV), and the square root of the AVE is greater than the correlation with other constructs. In this study, both of these conditions were satisfied by the computed values of the seven constructs, confirming the presence of discriminant validity in the proposed model of consumer-brand perception for green apparel brands (Tables 1 and 2).
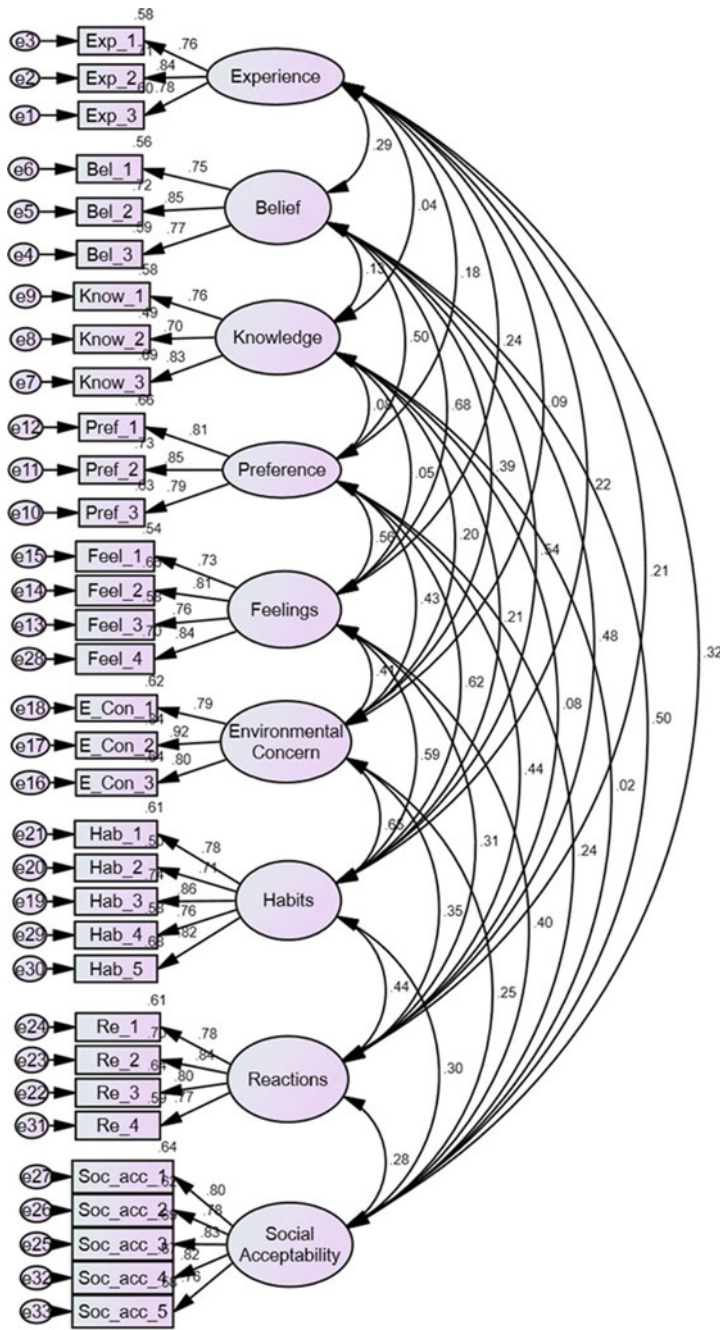
Fig. 2 CFA of consumer brand perception for green apparel brands

Table 1 Convergent validity

Aspects	CR	AVE
Reactions	0.877	0.637
Experience	0.837	0.629
Belief	0.831	0.620
Knowledge	0.809	0.584
Preference	0.860	0.669
Feelings	0.868	0.620
Concern for the Environment	0.876	0.700
Habits	0.892	0.621
Social acceptability	0.899	0.638

Source Primary Data

4.5 Measurement Model Fit

Several fit indices are commonly used to evaluate the model fitness in research. Various researchers have put forward different indices to assess the adequacy of a model. Table 3, presents a compilation of the most widely accepted fit indices:

Given that all the indices fall within the desired range, it can be concluded that the suggested model is suitable for adoption.

The construct loading represents the extent to which the construct influences each individual item. It is expected that this standardized loading value falls within the range of 0.7 to 0.9. In the case of consumer-brand relationship constructs pertaining to green apparel brands, all the construct loading values range from 0.7 to 0.9.

4.6 Establishing Construct Validity

To validate the a priori factor structure of the extracted constructs, the seven factors derived from exploratory factor analysis underwent confirmatory factor analysis (CFA) using AMOS 23. The CFA was conducted to assess construct validity through the evaluation of convergent and discriminant validity. In this study, first-order confirmatory factor analysis was employed to derive the results.

4.7 Convergent Validity

The fulfillment of certain conditions confirms the reliability and validity of the seven constructs. Specifically, for each construct, it was found that the composite reliability (CR) exceeded 0.7, the average shared variance (AVE) exceeded 0.5, and the CR

Table 2 Convergent validity

	CR	AVE	MSV	Reactions	Experience	Belief	Knowledge	Preference	Feelings	Environmental_Concern	Habit s	Social_Acceptability
Reactions	0.877	0.639	0.230	0.800								
Experience	0.837	0.64	0.104	0.215	0.795							
Belief	0.84	0.622	0.457	0.480	0.296	0.789						
Knowledge	0.809	0.586	0.043	0.078	0.043	0.132	0.766					
Preference	0.860	0.68	0.383	0.442	0.186	0.6	0.086	0.820				
Feelings	0.868	0.622	0.457	0.315	0.245	0.676	0.06	0.558	0.789			
Environmental_Concern	0.876	0.702	0.420	0.356	0.094	0.40	0.196	0.427	0.408	0.838		
Habits	0.892	0.623	0.420	0.443	0.216	0.536	0.207	0.619	0.50	0.648	0.790	
Social_Acceptability	0.899	0.640	0.240	0.280	0.322	0.500	0.023	0.240	0.404	0.253	0.305	0.800

Source Primary Data

Table 3 Model fit indices

Name of the index	Estimated value	Required value
CMIN/DF	1.623	Less than 3
CFI	0.953	> 0.9
TLI	0.946	> 0.9
NFI	0.888	> 0.08
RMSEA	0.043	< 0.08
GFI	0.878	> 0.8
AGFI	0.850	> 0.8

Source Primary Data

Table 4 Convergent validity

Aspects	CR	AVE
Brand self	0.866	0.619
Customer expectation	0.873	0.634
Customer experience	0.874	0.581
Ability	0.861	0.673
Benevolence	0.853	0.660
Reliability	0.863	0.559
Prominence	0.910	0.628

Source Primary Data

was greater than the AVE. These calculated values satisfied all these conditions, establishing the robustness of the constructs (Table 4).

4.8 Discriminant Validity

The confirmation of discriminant validity in the consumer-brand relationship model for green apparel brands is based on two conditions. Firstly, the average shared variance (AVE) should exceed the maximum shared variance (MSV) among the constructs. Secondly, the square root of AVE should be greater than the correlation with other constructs. The computed values of the seven constructs satisfied both these conditions, thereby establishing the discriminant validity of the model shown by Table 5.

Table 5 Discriminant validity

	CR	AVE	MSV	Brand self	Customer_ Expectation	Customer experience	Ability	Benevolence	Reliability	Prominence
Brand self	0.867	0.620	0.446	0.788						
Customer expectation	0.874	0.635	0.302	0.493	0.797					
Customer experience	0.875	0.582	0.316	0.38	0.512	0.763				
Ability	0.862	0.674	0.374	0.612	0.550	0.562	0.822			
Benevolence	0.854	0.67	0.359	0.552	0.502	0.436	0.599	0.813		
Reliability	0.864	0.560	0.387	0.622	0.53	0.524	0.588	0.523	0.749	
Prominence	0.92	0.629	0.446	0.668	0.457	0.388	0.480	0.485	0.60	0.793

Source Primary Data

Table 6 Model fit indices

Name of the index	Estimated value	Required value
CMIN/DF	1.935	Less than 3
CFI	0.940	> 0.9
TLI	0.931	> 0.9
NFI	0.883	> 0.08
RMSEA	0.053	< 0.08
GFI	0.869	> 0.8
AGFI	0.841	> 0.8

Source Primary Data

4.9 Measurement Model Fit

To evaluate the model fitness, several fit indices are employed. Numerous researchers have suggested various indices for this purpose. Table 6 is a tabulation of the most widely acknowledged fit indices:

Given that all the indices fall within the desired range, it can be concluded that the suggested model is suitable for adoption.

4.10 Focus Group

To ensure meaningful participation and effective control, it is deemed appropriate to limit the size of a focus group to a maximum of 10 members. Larger groups tend to hinder participants from freely expressing their insights on the topic, and managing such larger groups becomes challenging. Therefore, in this study, a focus group consisting of 10 experts in the green apparel category was assembled. Their expertise was utilized to assign numerical weights to the three dimensions of consumer-brand perception for green apparel brands (cognitive, affective, and behavioral components) and consumer-brand relationship with green apparel brands (satisfaction, trust, and attachment) using the technique of weighted averages calculation (Table 7).

5 Discussion and Conclusion

The apparel industry heavily relies on non-renewable energy sources, resulting in a significant contribution to the escalating levels of greenhouse gases. The concept of green brands serves as a guiding principle for retailers, designers, governments, and consumers alike, enabling informed decisions regarding apparel design, sourcing, and purchasing, while also monitoring the brand's environmental impact. This concept promotes a comprehensive comprehension of production processes

Table 7 Expert weighted average calculation

Components	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6
Cognitive components	5	3	3	4	5	4
Affective components	3	4	5	5	3	5
Behavioural components	4	5	4	3	4	3
	Expert 7	Expert 8	Expert 9	Expert 10	Total	Weight
Cognitive components	5	4	4	5	42.00	0.35
Affective components	4	5	3	4	41.00	0.34
Behavioural components	3	3	5	3	37.00	0.31

Source Primary Data

that aid in environmental preservation through practices such as reusing materials, promoting local production, utilizing alternative or sustainable raw materials, and adopting energy- and water-efficient methods. Additionally, it offers valuable insights into understanding production processes on the opposite end of the spectrum that contributes to environmental degradation.

The purpose of this study is to provide valuable insights to policymakers, green apparel brand managers, researchers, practitioners, and brands considering transitioning to sustainable practices. It aims to enhance their understanding of green consumers by examining the consumer-brand perception of green apparel brands.

Apparel stands out as a unique product category from a consumption standpoint due to its close association with fashion and individual style expression. Moreover, environmental concerns among consumers add complexity to their consumption patterns. The model of consumer-brand perception for green apparel brands proves valuable in comprehending consumer behavior towards such brands. Its various components play a significant role in shaping consumer perceptions. Consequently, green brands must strategically target each of these components to establish a positive consumer-brand perception.

Based on their perception scores, each respondent was assigned to a distinct homogeneous cluster, which showed heterogeneity between clusters. Through cluster analysis, four such clusters were identified, each representing consumers with unique characteristics but comparable within their respective cluster. A comprehensive marketing strategy was developed for each cluster. Therefore, it is evident that organizations should establish a well-defined methodology to target these consumer segments. This can be achieved by crafting and delivering targeted marketing messages to elicit positive consumer responses.

Green apparel represents a relatively new business sector, both for brands and consumers. For green brands to succeed, it is crucial to establish a strong connection with consumers by demonstrating a commitment to environmental preservation and fostering an emotional bond with them. The Consumer-brand relationship model for green apparel brands offers valuable insights into understanding green consumer behavior through its various components. Consequently, green brands should focus

on targeting each of these components to cultivate a robust consumer-brand relationship. In this study, respondents were segmented into distinct clusters based on their relationship scores.

By employing cluster analysis, we successfully generated four distinct consumer clusters. Each cluster exhibited unique characteristics and represented a specific group of similar consumers, highlighting the need for tailored marketing strategies. Based on our findings, we recommend that brands devise a comprehensive methodology to effectively target specific consumer segments and elicit positive consumer responses through targeted promotional messages. To ensure consumer retention, brands should prioritize the development of strategies that enhance consumer engagement and elevate the perceived value of green products.

Establishing a consumer-brand relationship is crucial for cultivating brand trust, satisfaction, and attachment among green consumers. Each of these components contributes to strengthening the bond between the consumer and the green apparel brand. Organizations should possess a mechanism to identify their core consumer base and foster a partnership with them. Co-creation can play a pivotal role in building long-term relationships by gaining a deeper understanding of consumer needs and aligning green products accordingly. This approach empowers consumers to actively contribute to the brand's success, resulting in a stronger relationship between the green brand and its environmentally conscious consumers. Furthermore, this model facilitates the identification of potential partners who may not yet be significant, but have the potential to become valuable collaborators. By implementing targeted marketing efforts, this group can be converted into significant partners, thereby bolstering brand development.

It is crucial for brands to prioritize the improvement of consumer knowledge regarding environmental degradation and conservation activities. In the current context, consumers must comprehend these concepts to make informed decisions about their consumption patterns. By actively enhancing consumer brand knowledge, organizations can foster a preference for their respective green brand and generate positive consumer sentiments towards it. Brands can achieve this by designing and implementing targeted environmental campaigns. Such initiatives have the potential to cultivate a positive consumer attitude towards green brands, resulting in increased adoption rates and widespread social acceptability across diverse consumer segments.

Scope for Further Research

The scope for further research is extensive within the realm of green apparel brands and consumer behavior. Research could delve into broader influencing factors, such as cultural and demographic variables, marketing strategies, and communication channels, to enhance the understanding of green brand adoption. Examining the dynamic evolution of consumer perceptions over time, investigating post-purchase behaviors and brand loyalty, and exploring cross-cultural comparisons could deepen insights into the sustainability-consumer perception relationship. Investigating the impact of digital and social media, comparing perceptions with conventional brands, and assessing the effectiveness of specific sustainability initiatives

can contribute to a more comprehensive understanding of the consumer-brand relationship dynamics and guide brands' strategies for meaningful engagement with environmentally-conscious consumers.

References

1. Jain, S., Kaur, G.: Green marketing: an Indian perspective. Decision **31**(2), 168–209 (2004)
2. Hartmann, P., Ibanez, V.: Green value added. Mark. Intell. Plan. **24**(7), 673–680 (2006)
3. Polonsky, M.J.: An introduction to green marketing. Electronic Green J. **1**(2), 111–125 (1994)
4. Kianpour, K., Anvari, R., Jusoh, A., Othman, M.F.: Important motivators for buying green products. Intangible Capital **10**(5), 873–896 (2014)
5. Gam, H.J., Cao, H., Farr, C., Kang, M.: Quest for the eco-apparel market: A study of mothers' willingness to purchase organic cotton clothing for their children. Int. J. Consum. Stud. **34**(6), 648–656 (2010)
6. Gugnani, A., Jain, G., Nigar, S.: The Indian fashion apparel market 2017 and beyond **2**(6), 22–35 (2017)
7. Gupta, S., Ogden, D.T.: To buy or not to buy? A social dilemma perspective on green buying. J. Consum. Mark. **26**(6), 376–391 (2009)
8. Smith, S., Paladino, A.: Eating clean and green? Investigating consumer motivations towards the purchase of organic food. Australas. Mark. J. **18**(2), 93–104 (2010)
9. Kim, H.Y., Chung, J.: Consumer purchase intention for organic personal care products. J. Consum. Mark. **28**(1), 142–155 (2011)
10. Padel, S., Foster, C.: Exploring the gap between attitude and behaviour: understanding why consumers buy or do not buy organic food. British Food J. **107**(8), 606–625 (2005)

Robust and Fragile Determinants of Foreign Direct Investment in Jordan

Taimour Alrubaiat

1 Introduction

Foreign direct investment (FDI) has emerged as a critical topic in economics, particularly for rising economies looking to attract it. Foreign direct investment (FDI) is the direct investment of foreign capital into another country, which drives economic growth and employment creation [1]. It also increases familiarity with management techniques, laws, and marketing strategies, so increasing national competence. Governments actively work to create a favorable climate for FDI by providing incentives to overseas investors.

The relationship between FDI and economic growth has provoked heated debate in Jordan. Several studies have been conducted to investigate the factors that influence FDI, such as location, trade openness, and macroeconomic variables. Jordan's persistent FDI attraction is linked to factors such as political stability, investment incentives, and participation in trade treaties. However, legislative inconsistency and foreign ownership restrictions have caused difficulties. Removing these restrictions could increase FDI and boost economic gains, however it is recognized that further steps are required for long-term prosperity, greater employment, greater productivity, exports, and technological transfer all demonstrate the favorable impact of FDI [2]. Jordan's industrial sector has seen increased FDI inflows, cementing Jordan's position as a preferred destination for foreign capital in the Gulf Region.

The purpose of this study is to address the complicated relationship of FDI influences in Jordan by assessing the impact of modifications to policy on various sectors and taking into account the varied character of sustainable economic growth. Based on the above arguments this study aims to answer the following research questions.

1. Does the Market size effect on foreign direct investment in Jordanian industrial companies?

T. Alrubaiat (✉)
Al Al-Bayt University, P.O. Box 130040, Mafraq 25113, Jordan
e-mail: Taimouralrubaiat@gmail.com

2. Does the Openness effect on foreign direct investment in Jordanian industrial companies?
3. Does the Labor Costs and Productivity effect on foreign direct investment in Jordanian industrial companies?
4. Does the Political Risk effect on foreign direct investment in Jordanian industrial companies?
5. Does the Gross Domestic Product effect on foreign direct investment in Jordanian industrial companies?
6. Do the Tax effect on foreign direct investment in Jordanian industrial companies?

1.1 Practical Significance

Foreign investment is a critical engine of industrial development, particularly in emerging economies, and research shows that it has a wide-ranging influence, including job creation, increased productivity, competitiveness, and technological dissemination [3]. Managers are advised of the critical role that safety dedication plays in developing successful management of safety, culture, and general environment, an issue that merits more managerial investigation.

This novel study investigates the factors that influence Foreign Direct Investment (FDI) in Jordanian industrial shareholding enterprises as a whole. The study's findings have the ability to provide critical conclusions and suggestions that would significantly help Jordanian industrial firms. This research intends to contribute to the accomplishments and financial stability of these enterprises by promoting FDI development. Notably, the study's examination of FDI determinants adds to its overall worth.

2 Literature Review and Hypotheses Developments

2.1 Foreign Direct Investment

Foreign Direct Investment (FDI) inflows increased dramatically following World War II, rising from $225 billion in 1990 to $1.43 trillion in 2017 [4]. These inflows are only one component of international capital flows, which also include loans, investments in portfolios, savings in banks, and long-term foreign direct investments. Approximately fifty percent of these monies were allocated to developing countries. Surprisingly, since the 1990s, global revenues of abroad affiliates have regularly exceeded goods and services exports. These inflows have had an impact not only on the growth and profitability of investment firms, but also on the economic systems of the nations that are investing (home) and recipient (host) countries.

Foreign Direct Investment (FDI) is a procedure by which individuals or groups from one nation acquire ownership of a corporation in another country in order to

exert influence over various operational aspects of the host country's corporation [5]. The International Monetary Fund, or IMF, defines FDI as a financial investment aimed at acquiring long-term ownership in a business functioning outside the shareholder's economy in order to exert management influence. Foreign direct investment (FDI) is a significant part of cross-border funding that is recorded in the accounting records of transactions. As a result, the following hypothesis emerges.

2.2 Market Size

As evidenced by Aladelusi and Olayiwola [1] market size has continuously proven to be the primary factor affecting the amount of foreign direct investment (FDI) flows. This theory is based on FDI research, which shows that a large market is critical for the effective utilization of resources and economies of scale. The idea is that once market size hits a crucial level, FDI grows, enabling effective manufacturing technology deployment.

Schaufelbuehl [6] found that a developing home market has a significant impact on FDI destination selections in the United States of America and the European Economic Community between 1958 and 1968. According to the market size hypothesis, FDI is conditional on achieving market size standards for efficient manufacturing technology adoption. Capital inflows have increased in tandem with demand growth, highlighting the link between overall demand and required capital. As a result, the following hypothesis is developed.

H1: Market size has no significant influence on Foreign direct investment in the Jordanian industrial listed companies.

2.3 Openness

Foreign direct investment (FDI) and openness are key causes. For explaining the finance-growth nexus, our understanding of the relationship between finance and growth has enhanced of increased economic openness and foreign direct investment. When considering the relationship among both external debt and economic growth, there are two opportunities to think at trade openness and foreign direct investment. First, Trade liberalization and FDI inflows have typically been cited as fundamental drivers of economic growth [7]. Because of the buildup of physical capital and technology transfer, trade openness can have a favorable and considerable impact on economic growth.

Foreign direct investment (FDI) and trade openness are considered as critical components of economic growth in emerging and low-income countries. Economic growth is the gradual increase in the value of the products and services generated in an economy, often measured as the amount of GDP or real GDP per capita to account for inflation and its misleading effect on real output. Foreign direct investment (FDI) is an

increasingly prevalent method for wealthy nations to transfer expertise to developing economies. FDI also encourages domestic investment and allows host companies to capitalize on current talented employees and infrastructure. As a result, the following hypothesis is proposed.

H2: Openness has no significant influence on Foreign direct investment in the Jordanian industrial listed companies.

2.4   Labor Costs and Productivity

Labor productivity is defined as the number of goods and services generated by a worker over a particular period. The four key sources of productivity development were "resource", "capital", "technology", and "labor". Importantly, as discussed in the "learning by doing" [8], the bounds of "labor" capital were boundless. There may be no visible degrees of progress, but employee efficiency can be increased in the short or long term by applying any lessons learned from mistakes and valuable experience, or by their ability to educate themselves. As a result of this, the theory listed below is offered.

H3: Labor Costs and Productivity has no significant influence on Foreign direct investment in the Jordanian industrial listed companies.

2.5   Political Risk

Political risk has been defined as the likelihood of an authority utilizing its dominant position over legal pressure to forbid it from complying with current contracts with an MNE in order to influence the allocation of provides among the public and private sectors as a result of either technological demise or the presence of high sunken costs [9]. Leveraging the political institution's viewpoint, this way of thinking has been linked to the principle of political discretion, and it has grown into one of the most researched aspects of political risk, particularly in connection with infrastructure developments. As a result, the following hypothesis is developed.

H4: Political Risk has no significant influence on Foreign direct investment in the Jordanian industrial listed companies.

2.6   Gross Domestic Product

Jordan's economy is among the open economies worldwide. According to the World Bank (2019), Jordan's economy has two major constraints: sluggish economic expansion and high rates of unemployment. Economic growth has slowed from 5.47% in 2008 to 1.94% in 2018. Meanwhile, the unemployment rate climbed from 12.9%

in 2011 to 18.6% in 2018 [10]. Jordan's GDP is confined due to the country's low natural resources. The financial backing for investments is also weak, as seen by the government's dropping expenditure, which fell from 29.2% of GDP in 1980 to 15.4% of GDP in 2018.

H5: Gross Domestic Product has no significant influence on Foreign direct investment in the Jordanian industrial listed companies.

2.7 Tax

Effective fiscal and monetary policies underlie the management of the macroeconomic and FDI attraction. Fiscal policy comprises government spending and taxation, whereas monetary policy controls the money supply to influence market pricing. These policies work together to attract FDI.

Tax income is an important fiscal instrument, and the money supply is critical in monetary policy. Taxation is important all throughout the world, with tax collections accounting for a sizable portion of overall revenue in countries such as the United States (92%), the Republic of South Africa (90%), and India (78%). In 2012, Jordan's tax receipts comprised 61% of overall public income [11].

Tax policies have an impact on FDI, with reduced taxes improving FDI prospects. The extent of FDI is also influenced by a competitive workforce and readily available resources. Nonetheless, despite the potential benefits of FDI, its distribution among nations remains uneven. As a result, the following hypothesis emerges.

H6: Tax has no significant influence on Foreign direct investment in the Jordanian industrial listed companies.

3 Research Methodology

3.1 The Study Population and Its Sample

The study population consisted of all 56 industrial firms in Jordan, according to the website of the Jordanian Ministry of Commerce and Industry, and the sampling unit was formed from all the industrial firms during period (2005–2020).

3.2 Study Tool

The study instrument and the initial fundamental stage for collecting data related to the study variables, which precede the statistical analysis procedure, are panel data,

which consist of a set of characteristics that clarify the study variables. The panel data were created using industrial enterprises from 2005 to 2020.

3.3 Statistical Processing

The researcher used the following statistical methods:

The E-views has been used in the following different statistical analyses:

1. Unit root test.
2. Co-integration test.
3. Multicollinearity test.
4. Dynamic ordinary least squire (DOLS).

4 Econometric Analysis

4.1 Dynamic Ordinary Least Squire (DOLS)

It is a parametric method that is one of the latest and most powerful methods because of its performance in small samples. This method is used to estimate the long-term equilibrium relationship of a system that contains integrated variables of different degrees, but it is still co-integrated. The model equation, the dynamic model, was proposed by the researcher [12] and was developed by Stock and Watson [13], This method relies on the values of displacements. And lags (leads and lags)—so the dynamic regression equation is written as follows:

$$Y_t = \theta Z_t + \iint_{1=-k}^{k} \pi j \Delta X_{t-j} + \varepsilon_t$$

$$\Delta x_t = \mu_t$$

As:

$$Z_t = (1, X_{t)}$$

$$\vartheta = (\beta_0, \beta_1)$$

Since Vt is not associated with j − ut, we can get:

$$\varepsilon_t = V_t + \int_{J>K} \pi j \mu_{t-j}$$

4.2   Model of the Study

Based on past research and economic theory, the overall structure of the study model is projected to be as follows:

$$FDI = f(GDP, OPEN, Labor, MKT, Tax, POL)$$

The linear equation of the model is expected to be as follows:

$$\text{FDI} = \beta 1\,\text{OPEN} + \beta 2\,\text{Labor} + \beta 3\,\text{MKT} + \beta 4\,\text{Tax} + \beta 5\,\text{POL} + \beta 6\,\text{GDP} + u$$

Correlation Matrix

Table 1 shows the correlation between the study variables. We note from the table that there was no problem of correlation between the dependent variable and the independent variables, but the correlation was weak between direct foreign investment and Labor, as its ratio is − 0.03 and it is a very low percentage. The relationships between GDP on the one hand and Labor, Market Size and Openness were high where all of them are recorded 0.75, 0.83 and 0.9 respectively.

Figure 1 shows the time series of the study model variables. We note the fluctuation of the study data over the time period. We also note that there was a significant decline in all study variables during the period from 2012 to 2014 due to the occurrence of the Arab Spring crises, which greatly affected the Jordanian economy.

Table 1 Correlation matrix between variables

	FDI	GDP	LABOR	MKT	OPEN	POL	TAX
FDI	1.00	0.50	− 0.03	− 0.29	0.47	− 0.27	− 0.26
GDP	0.50	1.00	0.75	0.83	0.90	− 0.22	0.65
LABOR	− 0.03	0.75	1.00	0.79	0.70	− 0.17	0.44
MKT	− 0.29	0.83	0.79	1.00	0.80	0.08	0.68
OPEN	0.47	0.90	0.70	0.80	1.00	− 0.22	0.65
POL	− 0.27	-0.22	− 0.17	0.08	-0.22	1.00	− 0.21
TAX	− 0.26	0.65	0.44	0.68	0.65	− 0.21	1.00

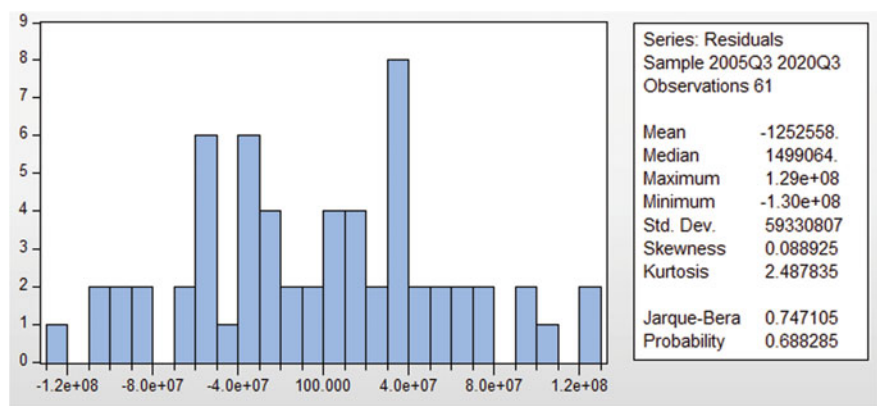*Source* Prepared by the researcher based on the E-Views program
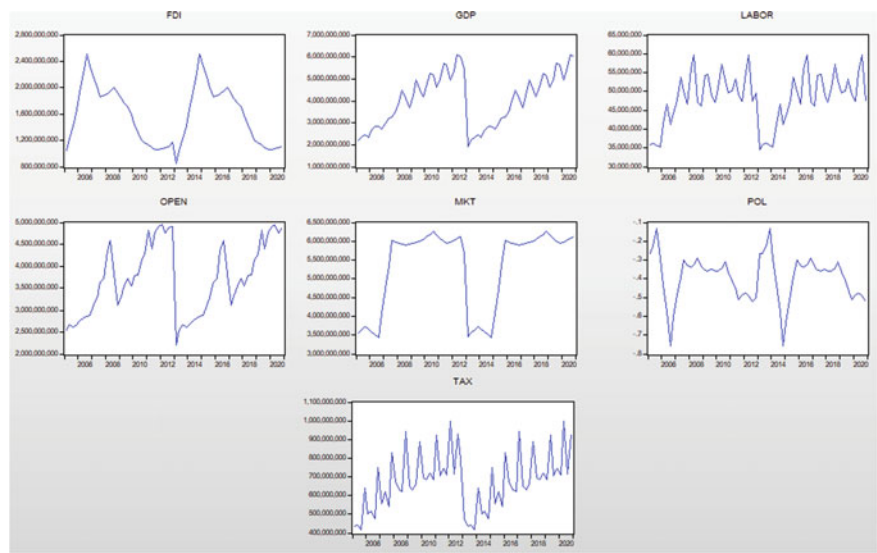
Fig. 1 Shows the time series of the study model variables. *Source* Prepared by the researcher based on the E-Views program
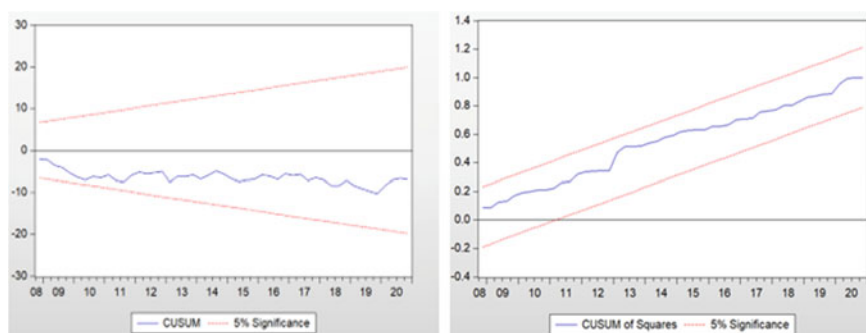
Diagnostic Test for Model

Normality Test (Jarque–Bera)

Figure 2 shows the Jarque–Bera test, which is concerned with the normal distribution of errors, as the null hypothesis states that the residuals follow a normal distribution at the 5% level.

Fig. 2 Normality test Jarque–Bera. *Source* Prepared by the researcher based on the E-Views program

Fig. 3 Stability test cusem and cusem squares. *Source* Prepared by the researcher based on the E-Views program

Through Fig. 2 it becomes clear to us that the probability value (Jarque–Bera) is 68.8%, which is a value greater than 5%, so we must not reject the null hypothesis, that the residuals follow a normal distribution at the level of significance of 5%.

Stability Test (Cusem and Cusem Square)

The Cusum Test and Cusum Square Test were conducted in order to ensure that the study period is appropriate and does not need to be divided, and you can see the Fig. 3.

Cusem and Cusem squares test were conducted to test the stability of the model used in this study, and it was found from the results of this selection that the estimated model error curve spots within the critical limits at a significant level (5%) as shown in the Fig. 3, and accordingly there is no need to divide the period of this Study into smaller periods and can be dealt with as one period of time.

Heteroscedasticity Test (ARCH)

ARCH test based. According to the following hypotheses:
    H0: There is no variance inhomogeneity problem.
    H1: There is a variance inhomogeneity problem.
    The test values can be seen in Fig. 4.
    Through the results shown in Fig. 4, the Fisher statistic, F-statistic $= 0.71$ which is greater than 0.05, which means that the null hypothesis is accepted, meaning that the model does not contain the problem of variance instability at the level of significance of 5%.

Heteroskedasticity Test: ARCH

| F-statistic | 0.282692 | Prob. F(1,61) | 0.5969 |
| Obs*R-squared | 0.290614 | Prob. Chi-Square(1) | 0.5898 |

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/27/21   Time: 01:00
Sample (adjusted): 2005Q2 2020Q4
Included observations: 63 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.66E+16	1.26E+16	3.696782	0.0005
RESID^2(-1)	0.067307	0.126591	0.531688	0.5969

R-squared	0.004613	Mean dependent var	5.00E+16
Adjusted R-squared	-0.011705	S.D. dependent var	8.51E+16
S.E. of regression	8.56E+16	Akaike info criterion	80.84531
Sum squared resid	4.47E+35	Schwarz criterion	80.91334
Log likelihood	-2544.627	Hannan-Quinn criter.	80.87207
F-statistic	0.282692	Durbin-Watson stat	1.954948
Prob(F-statistic)	0.596873		

Fig. 4 Heteroscedasticity test (ARCH). *Source* Prepared by the researcher based on the E-Views program

5   Conclusions and Recommendations

5.1   Results

Through the results of the model analysis, the study reached the following conclusions. First, there is a positive, long-term, statistically significant effect of the gross domestic product on foreign direct investment. Second, there is a positive, long-term, statistically significant effect on workers' compensation on foreign direct investment, and it has the highest effect on FDI. Third, there is a positive, long-term, statistically significant effect of the size of the industrial market on foreign direct investment. Fourth, there is a positive, long-term, statistically significant effect of trade openness on foreign direct investment, and it has lowest effect on FDI. Fifth, there is a long-term, statistically significant negative impact of political instability on foreign direct investment. and it has the lowest effect on FDI. Sixth, there is a long-term,

statistically significant negative impact of taxes on foreign direct investment. and it has the highest effect on FDI.

References

1. Aladelusi, K.B., Olayiwola, H.O.: Foreign direct investment and employment creation in Nigeria. Can. Soc. Sci. **17**(1), 16–24 (2021)
2. Nosova, O.: Foreign direct investment and labour productivity: relationship and interconnection. Appl. Bus. Issues Solutions 3–9 (2022)
3. Bekmurodova, G.: Theoretical features of FDI (Foreign Direct Investment) and its influence to economic growth. Int. J. Manag. Sci. Bus. Adm. **6**(2), 33–39 (2020)
4. ABBAS, A.: Robust and fragile determinants of foreign direct investment: an extreme bounds analysis. RMIT University (2020)
5. Park, J., Yoon, W.: A foreign subsidiary's largest shareholder, entry mode, and divestitures: the moderating role of foreign investment inducement policies. Eur. Res. Manag. Bus. Econ. **28**(3), 100197 (2022)
6. Schaufelbuehl, J.M.: The advantage of being inside the wall when it is built. US multinationals' direct investments in the Common Market, the balance of payments deficit and Bretton Woods (1958–74). J. Eur. Integr. **43**(6), 667–682 (2021)
7. Sobirov, Y., et al.: Do FDI and trade openness matter for economic growth in CIS Countries? Evidence from panel ARDL. J. East-West Bus. 1–30 (2023)
8. Hamilton, S.F., et al.: Farm labor productivity and the impact of mechanization. Am. J. Agr. Econ. **104**(4), 1435–1459 (2022)
9. Apriliyanti, I.D., Dieleman, M., Randøy, T.: Multiple-principal demands and CEO compliance in emerging market state-owned enterprises. J. Manag. Stud. (2023)
10. Alessa, A.T., et al.: Changes in FDI outflow resulting from Jordan's response to the Syrian crisis. AZKA Int. J. Zakat Soc. Financ. 154–181 (2022)
11. Nsor-Ambala, R., Asafo-Adjei, E.: The government revenue–expenditure nexus in Ghana: a wavelet analysis. Cogent Econ. Financ. **11**(1), 2213014 (2023)
12. Phillips, P.C., Perron, P.: Testing for a unit root in time series regression. Bbiometrika **75**(2), 335–346 (1988)
13. Stock, J.H., Watson, M.W.: A simple estimator of cointegrating vectors in higher order integrated systems. Econometrica: J. Econometric Soc. 783–820 (1993)

Correction to: AI in Business: Opportunities and Limitations

Reem Khamis and Amina Buallay

Correction to:
R. Khamis and A. Buallay (eds.), *AI in Business:*
Opportunities and Limitations, **Studies in Systems, Decision**
and Control 515, https://doi.org/10.1007/978-3-031-48479-7

In the original version of the book was inadvertently published with chapter author's incorrect name. The name has been updated from "M. R. Meshan" to "M.R. Eshan" in the published version of chapter 22 and in chapter 25 incorrect author name "Kiran Babu" has been updated as "N.C. Kiran Babu"

    The correction chapters and the book have been updated with the changes.

The updated versions of these chapters can be found at
https://doi.org/10.1007/978-3-031-48479-7_22,
https://doi.org/10.1007/978-3-031-48479-7_25

Correction to: Impact of Supply Chain Quality Management Practices on the Purchasing Efficiency of Service Organizations

Ch. Raja Kamal , **Arti Singh** , **Khodakyvskyy Volodymyr** ,
Olena Rusak , **Rybak Mariia** , **and Nadiia P. Reznik**

Correction to:
Chapter 49 in: R. Khamis and A. Buallay (eds.), *AI*
in Business: Opportunities and Limitations, **Studies**
in Systems, Decision and Control 515,
 https://doi.org/10.1007/978-3-031-48479-7_49

The original version of the book was inadvertently published with an incorrect author's name in Chapter 49, which has now been updated from "Ruska Olena" to "Olena Rusak". The correction book has been updated with the changes.

The updated version of this chapter can be found at
https://doi.org/10.1007/978-3-031-48479-7_49