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DIPLOMA OF CIVIL ENGINEERING

FINAL REPORT PROJECT

“SMART WATER TANK SENSOR”

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To Me.

(Made and truly acknowledged

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Abstract

Each product produced is intended to meet objective requirements the actual project. The product you want to produce also needs to be improved from time to time according to the suitability of its use. Given the variety of problems which arises as a result of the malfunction of the problem in terms of its mode of operation and storage of the project, then various types of designs are produced according to the wishes of users who always have trouble to detect the source of water tank overflow. With the new innovation, the water overflow tank detector that uses the new innovation that is the system (IOT) is an important aid to detect and be able to examine water tank overflow via mobile phone. It is a water overflow detector that is easy to detect when the water tank cannot function properly due to a faulty internal system. Because of its importance, then we need to ensure that this tank overflow detector can be used and take effect when the water storage tank overflows and that more importantly it is safe and does not damage or impact such as water pollution. Therefore, this tank water overflow detector is necessary maintained periodically or once a month. It is intended to assure that the tool the tank water overflow detector can operate effectively and safely. Problem the main one faced by water tank users in their respective residences is the difficulty to detect water overflows that occur in home tanks. The Smart Water Tank Sensor is specially created to assist and also alert home water tank users detect water overflow that occurs. It can also prevent the occurrence of water wastage due to overflow. This product is designed in a creative way which uses a new system and uses coding for this sensor to work well and safely. With the availability of this product residents in the residence can find out and detect water overflows in their tanks more easily as the system will provide a signal about an overflow of water on a house tank. In addition, the system also has a signal which are carefully and securely connected on a respective smartphone². In general, this system can be helpful and convenient residents in residences to detect water overflows on their respective residential tanks with new innovations we created.

Keywords - Smart Water Tank Sensor

Abstrak

Setiap produk yang dihasilkan adalah bertujuan untuk memenuhi keperluan objektif projek sebenar. Produk yang ingin dihasilkan juga perlu diperbaiki dari semasa ke semasa mengikut kesesuaian penggunaannya. Memandangkan pelbagai masalah yang timbul akibat kerosakan masalah dari segi cara operasi dan penyimpanan projek, maka pelbagai jenis reka bentuk dihasilkan mengikut kehendak pengguna yang sentiasa menghadapi masalah untuk mengesan sumber limpahan tangki air. Dengan inovasi baharu itu, pengesanan tangki limpahan air yang menggunakan inovasi baharu iaitu sistem (IOT) merupakan bantuan penting untuk mengesan dan dapat meneliti limpahan tangki air melalui telefon bimbit. Ia adalah pengesanan limpahan air yang mudah dikesan apabila tangki air tidak dapat berfungsi dengan baik kerana sistem dalaman yang rosak. Kerana kepentingannya, maka kita perlu memastikan pengesanan limpahan tangki ini boleh digunakan dan berkuat kuasa apabila tangki simpanan air melimpah dan yang lebih penting ia selamat dan tidak merosakkan atau memberi kesan seperti pencemaran air. Oleh itu, pengesanan limpahan air tangki ini perlu diselenggara secara berkala atau sebulan sekali. Ia bertujuan untuk memastikan alat pengesanan limpahan air tangki boleh beroperasi dengan berkesan dan selamat. Masalah utama yang dihadapi oleh pengguna tangki air di kediaman masing-masing ialah kesukaran untuk mengesan limpahan air yang berlaku di tangki rumah. Sensor Tangki Air Pintar dicipta khas untuk membantu dan juga memberi amaran kepada pengguna tangki air rumah mengesan limpahan air yang berlaku. Ia juga dapat mengelakkan berlakunya pembaziran air akibat limpahan. Produk ini direka bentuk dengan cara kreatif yang menggunakan sistem baharu dan menggunakan pengekodan untuk penerima ini berfungsi dengan baik dan selamat. Dengan adanya produk ini penduduk di kediaman tersebut dapat mengetahui dan mengesan limpahan air dalam tangki mereka dengan lebih mudah kerana sistem akan memberikan isyarat tentang limpahan air pada tangki rumah. Selain itu, sistem ini juga mempunyai isyarat yang disambungkan dengan teliti dan selamat pada telefon pintar masing-masing. Secara umumnya, sistem ini boleh membantu dan memudahkan penduduk di kediaman untuk mengesan limpahan air pada tangki kediaman masing-masing dengan inovasi baharu yang kami cipta.

Kata kunci - Smart Water Tank Sensor

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

All housing in Malaysia still uses water tanks therefore Smart Water Tank Sensor project is one of the solutions to solve the water tanks problem faced by homeowners (Sarah, 2019). There are different varieties of water tanks, such as plastic water tanks, iron water tanks, and so on (Raya, n.d.). It is also according to the suitability of a housing where according to the water storage capacity of the house. A water tank serves as a temporary storage facility for water before it is distributed to homes, ponds, and other areas.

Furthermore, the issue with the water tank is damage to the internal system, which is unable to provide a signal or early warning in the event of a water overflow (Raven, 2021). As a result, smart water tank sensors that use a new change known as the addition of system (IOT) can provide users with an early warning.

The project is a water overflow detector that employs an Internet of Things (IoT) technology as previously stated. In a nutshell, the Internet of Things (IoT) is a concept in which equipment, machines, sensors, and gadgets are linked to the internet and data is collected and transferred via a network (Gillis, n.d.).

Next, the Smart Water Tank Sensor can solve several difficulties that arise in residential dwellings, such as providing early warning to water tank users and effectively detecting water overflow. The water tank is unable to work effectively due to a malfunctioning internal system, resulting in this difficulty. In 1.3, a more detailed description of the situation will be provided.

In addition, the Smart Water Tank Sensor product can bring numerous advantages to consumers, particularly those in residential settings, as well as minimize water waste due to overflow. This product, for example, can alert consumers to a water overflow in their house tank before it becomes a serious problem.

1.1 PROJECT BACKGROUND

The new project or innovation that will be implemented is the Smart Water Tank Sensor (SWTS) which is a tool and system to detect and signal to the users of the tank to experience water overflow caused by the internal system of the tank is damaged. In addition, the existence of this system can make it easier for a person to detect the presence of overflowing water in the tank and can take steps to deal with it quickly.

The concept used is a sensor and its addition uses coding, namely the Internet of Things (IoT) system. In fact, the device uses a waterproof material to protect the sensor from damage, and the sensor will be encoded into a smartphone system called the Smart Sensor application to signal to water tank users. This can save users time knowing the signal easily and can help users when an emergency occurs.

1.2 PROBLEM STATEMENT

In order to solve the problem, this project discovered that tank overflow construction should take into account tank maintenance parameters. Homeowners frequently have tank water overflow problems, but they are unable to notice the overflow. Damage to the buoy, which causes water overflow, is a common problem in the internal system of a water tank (Wilson, 2010). Furthermore, due to undetectable water overflow, water waste will increase. If not addressed, this issue could result in a significant increase in water bills. Additionally, individuals who are unable to identify an overflow of water tanks in their homes may experience undesired events. According to the post, the house's ceiling was damaged due to a tank leak.

Based on the article founded concerning the overflow of water from a storage tank in the form of a swimming pool reported that the tank had technical problems, causing residents to be concerned about the overflow of water, which could threaten children playing in the water (Aziz, 2018). With the Smart Water Tank Sensor (SWTS), this can be avoided since the party monitoring the tank will receive an early signal or warning connected to the overflow of the pool tank and will be able to take action swiftly, preventing water waste.

1.3 PROJECT OBJECTIVES

The objectives of this project are basically to try to do something to solve the problem that is needed. The objectives of the project:

- a) Generate water tank overflow systems using apps (Arduino IDE software).
- b) Test the effectiveness of overflow systems using sensors by researching in apps.

1.4 PROJECT QUESTIONS

- a) Is the Smart Water Tank Sensor (SWTS) able to work well to solve the problem of water tank overflow in the home?

1.5 PROJECT SCOPE

The scope of this project focuses on the following:

- a) This project is designed specifically for residential tank houses, including terrace houses and bungalows.
- b) This is a common project for tanks that are located both outside and within the home. All kinds of water tanks are appropriate for this project.

1.6 PROJECT SIGNIFICANCE

In implementing a project, conducting research is very important for ensuring that the project produced can overcome the problem and meet the needs of users.

Among the significance of the project are:

- a) Demonstrate the effectiveness of the Smart Water Tank Sensor (SWTS) (SWTS) system with a typical water tank without an overflow control system.
- b) Focusses on problem solving overflow of water tanks in residences.

1.7 DEFINITION OF TERMS / DEFINITION OF OPERATIONS

a) Water Tank

The function of a water tank is a place to store water temporarily, before it is distributed to houses or ponds and so on. Either the tank on the ground or the tank on the tower.

b) Sensor

This water tank sensor is dedicated to detecting the overflow of water tank that occurs in the home tank, its use is three combinations of sensors, buzzers and a new innovation that is the system (IoT) where this system needs to be coded.

c) Internet of Things (IoT)

The Internet of Things or known as IoT is a term used for all technologies that allow the connection of devices to the Internet network. These technologies rely on radio frequency ranges including short-range solutions such as Bluetooth and RFID, medium-range solutions such as Wi-Fi, Thread and ZigBee, as well as long-range solutions such as NB-IoT, LTE-Cat M1, LoRaWAB and Sigfox.

1.8 CONCLUSION

In conclusion, this new invention needs to be used in every water tank in residential areas to ensure that the project works more efficiently. Smart Water Tank Sensor (SWTS) is a new product or a new innovation to detect the source of water overflow and can also give an early signal about the water tank overflow to users. This aims to save users time and energy in the event of an emergency. The main problem is that water overflows occur drastically, and it is not possible to detect the cause of this quickly. Therefore, the focus of this study is to address the problem by designing a tool that has not been born in Malaysia. Finally, at present, the issue of water wastage in Malaysia is quite a concern. Therefore, this problem is also associated with the problem of tank leakage. On average, Malaysians use 221 liters each people a day compared to international standards. Overall, in this chapter, the problem statement, project objectives and project scope have discussed ways to address the issue of overflowing tanks that result in water wastage in our country of Malaysia.