CHAPTER 1

INTRODUCTION

1.1 INTRODUTION

The background research shows obtained information about the project that was constructed and drafted in a correctly manner. According to the World Health Organization (WHO), 0.7% of all deaths worldwide — or more than 500,000 deaths each year1 — are due to unintentional drowning.2 Since some cases of fatal drowning are not classified as such according to the codes of the International Classification of Disease, this number underestimates the real figures, even for high-income countries,3 and does not include drownings that occur as a result of floods, tsunamis, and boating accidents.

Drowning is a leading cause of death worldwide among boys 5 to 14 years of age.2 In the United States, drowning is the second leading cause of injury-related death among children 1 to 4 years of age, with a death rate of 3 per 100,000,4 and in some countries, such as Thailand, the death rate among 2-year-old children is 107 per 100,000.5 In many countries in Africa and in Central America, the incidence of drowning is 10 to 20 times as high as the incidence in the United States. Key risk factors for drowning are male sex,4 age of less than 14 years,6 alcohol use,7 low incomes,1 poor education,5 rural residencies,5 aquatic exposures,6,7 risky behaviors,6,7 and lack of supervision.6 For people with epilepsy, the risk of drowning is 15 to 19 times as high as the risk for those who do not have epilepsy. Exposure-adjusted, person-time estimates for drowning are 200 times as high as such estimates for deaths from traffic accidents.9 Coastal drownings are

estimated to cost more than $273 million per year in the United States10 and more than $228 million per year (in U.S. dollars) in Brazil. For every person who dies from drowning, another four persons receive care in the emergency department for nonfatal drowning.

It is essential to call for emergency medical services and to undertake rescue and resuscitation immediately. If conscious, the person should be brought to land, and basic life support should be started as soon as possible. For a person who is unconscious, in-water resuscitation may increase the likelihood of a favorable outcome by a factor of more than three, as compared with taking the time to bring
by a highly trained rescuer, and it consists of ventilation alone.

Attempts at chest compression are futile as long as the rescuer and drowning person are in deep water, so assessment for a pulse does not serve any purpose. Drowning persons with only respiratory arrest usually respond after a few rescue breaths. If there is no response, the person should be assumed to be in cardiac arrest and be taken as quickly as possible to dry land, where effective CPR can be initiated

Injuries to the cervical spine occur in less than 0.5% of persons who are drowning, and immobilization of the spine in the water is indicated only in cases in which head or neck injury is strongly suspected (e.g., accidents involving diving, water skiing, surfing, or watercraft).When rescuing a person from the water, rescuers should try to maintain the person in a vertical position while keeping the airway open, which helps to prevent vomiting and further aspiration of water and stomach contents

1.2 PROBLEM STATEMENT

The aim of this project was to overcome time taken problem when saving drowned victims during emergency. The statistic shows that drowning victims were increasing from years to years. Moreover, natural disasters such as flood and high tide on the sea always occurred in Malaysia. With this tool, it helps safety personnel to save victims quicker and also reduced the death rates of drowning cases in each year.

According to the new definition adopted by the WHO in 2002, “Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid.”13 The drowning process begins with respiratory impairment as the person's airway goes below the surface of the liquid (submersion) or water splashes over the face (immersion). If the person is rescued at any time, the process of drowning is interrupted, which is termed a nonfatal drowning. If the person dies at any time as a result of drowning, this is termed a fatal drowning. Any submersion or immersion incident without evidence of respiratory impairment should be considered a water rescue and not a drowning. Terms such as “near drowning,” “dry or wet drowning,” “secondary drowning,” “active and passive drowning,” and “delayed onset of respiratory distress” should be avoided.

A uniform way to report data after a drowning event in order to allow comparison among different medical centre is to adopt the UT stein template for categorization of drowning. Many persons who are drowning are able to help themselves or are rescued in time by bystanders or professional rescuers. In areas where lifeguards operate, less than 6% of all rescued persons need medical attention4 and just 0.5% need CPR.21 In one report of rescues by bystanders, almost 30% of persons rescued from drowning required CPR. 23 Untrained rescuers must also avoid drowning23 and, if at all possible, should provide help from out of the water. Safe rescue techniques include reaching to the drowning person with an object such as a pole, towel, or tree branch or throwing a buoyant object. These quick, safe responses are often neglected and should be taught as part of water safety

1.3 OBJECTIVES

Objectives for project subject that compulsory to be taken by all students of Diploma in Electronic Engineering (communication) at **POLYTECHNIC SULTAN SALAHHUDIN ABDUL AZIZ SHAH** are:
The main objectives of this projects can be described as:

1. To design a remote control boat for drown victim that can reduce the time taken problem

1.4 SCOPE OF THE PROJECT

The scope of this system consists of two parts, hardware and software specifications. For the hardware it consists of a push button, 2 radio frequency module, motor driver, a buzzer, battery, Led, motor and Arduino Nano. As for the software part, Arduino programming language is used to command the hardware coding of input and output to execute dedicated tasks in an embedded system.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Literature research is an important aspect that should be done in the production of a project. With a careful study and all the information that will be required will be easily obtained. A project can be done easily and systematically according to the schedule and planned schedule. In addition, this study is also very important so that the resulting project will achieve the desired and quality objectives with the minimum cost of insurance coverage for consumers.

2.2 RC RES-Q SURFBOARD LITERATURE REVIEW

The present invention relates to a drone-type lifesaving equipment dropping device, and more particularly, to a drone-type lifesaving equipment dropping device of a new configuration which can quickly approach a drowning sufferer by use of an

unmanned aerial vehicle which can be operated by remote control, thereby dropping a lifebuoy or other lifesaving equipment for the sufferer.

In the case where a person falls into water, for example, due to sinking of a ship in a sea or river, or tidal waves or offshore currents near a shore, quick rescue operations are necessary to rescue the person from drowning. If the rescue operations are delayed, it is not possible to save a life. Actually, if a person falls into water, a prime time to save the life is just a few minutes. Accordingly, after a rescue worker sees a drowning person, a process of driving a boat to approach the person and dispensing a lifesaving equipment usually exceeds the prime time, resulting in a failure of rescuing one from drowning.

2.2.1 SUMMARY OF THE INVENTION

Accordingly, the present invention has been made in view of the above-mentioned problems occurring at disaster accident, and an object of the present invention is to provide a drone-type lifesaving equipment dropping device of a new configuration which can quickly transport a lifebuoy or other lifesaving equipment for a person who falls into water due to sinking of a ship in a sea or river or tidal waves or offshore currents near a shore, and can drop the lifebuoy for the sufferer.

To accomplish the above-mentioned object, according to one aspect of the present invention, there is provided a drone-type lifesaving equipment dropping device including: an unmanned aerial vehicle having a propeller and a rotor configured to rotate the propeller; a holding member which is installed to the unmanned aerial vehicle and configured to be operated by wireless control; and a lifesaving equipment which is detachably engaged to the holding member and is dropped from the holding member after the lifesaving equipment is disengaged from the holding member.

According to one feature of the present invention, the lifesaving equipment is a lifebuoy, the holding member is switched between a first state in which the holding member holds or supports the lifebuoy and a second state in which the holding member

releases the lifebuoy or is retracted from a position to support the lifebuoy, and the unmanned aerial vehicle is provided with a camera which is operated by remote control and wirelessly sends a video.

According to another feature of the present invention, the holding member includes at least one horizontal frame, a plurality of support arms arranged on the horizontal frame so that the support arms are expanded or retracted in a diametric direction, a motor disposed at a center of the horizontal frame, and a link member configured to connect the motor and each proximal end of the support arms and transfer rotating movement of the motor to expanding or retracting movement of the support arms, and the holding member supports the lifebuoy in the first state by expanding the support arms so that the support arms are inserted into slots formed on an inner peripheral surface of the lifebuoy, are brought into close contact with the inner peripheral surface of the lifebuoy, or expand to a bottom of the lifebuoy, while the support arms are retracted in the second state, so that the lifebuoy is separated from the holding member.

According to the other aspect of the present invention, there is provided a rescuing method using a drone-type lifesaving equipment dropping device, the rescuing method including: receiving information about occurrence of distress accident and a position of the accident in a sea, a river or a lake through surveillance of a guardian, accident information obtained from a third party, or a monitoring apparatus; approaching an unmanned aerial vehicle having a lifesaving equipment holding member which can be operated by remote control and a camera for taking a video and wireless sending a video, to a scene of the accident in an unmanned flight manner or an autonomous navigation manner; and figuring out an appropriate drop zone of the lifesaving equipment by the guardian at a remote place while the guardian is watching the video sent from the camera which is taken from the scene of the accident, to dispatch the unmanned aerial vehicle to the drop zone, and dropping the lifesaving equipment by operating the holding member by remote control.

According to the present invention, the unmanned aerial vehicle is equipped with the lifesaving equipment, for example, the lifebuoy, by the holding member, and approaches the scene of a distress accident in the unmanned flight manner or the autonomous navigation manner. And then, the lifesaving equipment is dropped from the holding member by the remote control. Therefore, in the case where a rescue boat is hard to approach to the scene of accident, such as sinking of a ship in a sea, or the lifesaving equipment is hard to be sent to the scene of accident, it is possible to quickly and accurately approach to the spot of the accident along the most direct route through the unmanned flight, and to drop the lifesaving equipment for the sufferer. The possibility of saving a life within a prime time can be maximized.

Also, according to the present invention, the lifesaving equipment is a lifebelt, that is, the lifebuoy. The holding member is switched between the first state in which the holding member holds or supports the lifebuoy and the second state in which the holding member releases the lifebuoy or is retracted from the position to support the lifebuoy. In addition, the unmanned aerial vehicle is provided with the camera which is operated by remote control and wirelessly sends the video in real time. When a guardian working at a guard post or a control center finds a person who falls into water, the guardian can dispatch the unmanned aerial vehicle to the spot of the accident by the remote control or the autonomous navigation, and then drop the lifebuoy for the sufferer, thereby providing the sufferer with the lifebuoy in the least amount of time and thus saving the life within the prime time. In this instance, since the camera 8 mounted to the unmanned aerial vehicle to take the video of the spot of the accident and the surroundings in real time and wirelessly sends the video, the guardian can approach the unmanned aerial vehicle to the scene of the accident while visually figuring out the correct position of the accident, and can drop the lifebuoy, thereby quickly and correctly approaching the scene of the disaster and thus saving the life within the prime time.

In addition, the holding member includes at least one horizontal frame, the plurality of support arms arranged on the horizontal frame so that the support arms are expanded or retracted in the diametric direction, the motor disposed at the center of the

horizontal frame, and the link member configured to connect the motor and each proximal end of the support arms. With the simple configuration, distal ends of the support arms are expanded and are inserted into the slots formed on the inner peripheral surface of the lifebuoy, are brought into close contact with the inner peripheral surface of the lifebuoy, or expand to the bottom of the lifebuoy. If the support arms are retracted, the lifebuoy is separated from the holding member, and then is dropped, thereby surely performing the engaging and disengaging operation of the lifebuoy.

Figure 2.1 RC RES-Q Surfboard

2.3 SURFBOARD

The present invention is directed to training and a exercise equipment for swimming and, more particularly, to variable resistance kickboard for swimmers.

In the past, various kickboards have been available to help swimmers improve their swimming ability. One such kickboard is described in U.S. Pat. No. 3,945,068 to Carbonero. The kickboard described in that patent has an upturned forward end and a

downturned rearward end. The forward end of the board is upturned for minimizing any tendency of the board to dive into the water caused by the downturned rearward end. A pair of flexible loops are secured to a top surface of the board. The loops are centrally located on the top surface and adapted for engagement of the hands of a swimmer during use of the board. In use, the swimmer's hands are inserted under the loops with the palms abutting the top surface of the board. The swimmer is then propelled in the water by kicking.

U.S. Pat. No. 4,518,364 to Jacobson discloses a flat kickboard. The kickboard is buoyant to float on water and has a bottom surface in contact with the water. A top surface of the board faces upwardly and away from the water and is adapted to receive a swimming instruction card. The purpose of providing the swimming instruction card is to permit the swimmer to review the individualized swimming instructions prior to a practice session.

When using the kickboard described by Jacobson, the swimmer is generally positioned immediately behind the board. In such a position, it may be difficult to perceive the writing on the swimming instruction card since the viewing angle is quite small. Accordingly, it is desirable to provide a message which is perceptible when viewed from a trailing edge of the kickboard.

One disadvantage of the prior art kickboards is that drag (resistance opposing the motion of the swimmer) of the kickboards cannot be varied. A primary purpose of a kickboard is to provide resistance to a swimmer, in order to strengthen the swimmer's legs while maintaining good body position. However, as the swimmer's ability improves, more resistance is needed so that the kickboard will actually benefit the swimmer in proportion to his ability. If a kickboard is designed for rehabilitating a patient or helping a beginning swimmer, it would not be very helpful in developing the muscles of a competitive swimmer since it does not have variable resistance. Since a competitive swimmer's strength is much greater than that of a beginner, a greater resistance is needed to further develop the competitive swimmer's muscles. However, even the ability and strength between two competitive swimmers may be quite diverse. Accordingly, to maintain

maximum effectiveness, it is desirable to vary the drag of a kickboard to accomodate each swimmer's needs, whatever his ability and body type.

Another disadvantage of such prior art kickboards, is that the buoyancy of such kickboards is not variable. A kickboard that is highly buoyant may put the swimmer at an unnatural angle or posture when using the board. A kickboard which is not buoyant enough may provide too much drag for a beginning swimmer to tolerate. Additionally, an individual swimmer may need a different kickboard buoyancy for each different swimming stroke. For example, a buoyant board may be desirable when practicing a butterfly kick whereas a nonbuoyant board may be desirable for the same swimmer when practicing a breaststroke kick.

In a typical practice, a swimmer using a kickboard will kick a preselected distance and then rest a designated time interval. For example, a coach instructing a swim team may require each swimmer to kick 100 yards, rest for 30 seconds, and then kick another 100 yards, etc. Since a typical swim team has swimmers of diverse abilities; i.e., faster and slower swimmers, each swimmer will be kicking at different rates and, consequently, resting at different times. If the coach desires to talk to the swimmers while they are resting, he must talk to each swimmer individually since they are not all resting at the same time. This reduces the effectiveness of the coach as he cannot observe the swimmers who are swimming when he is instructing the swimmers who are resting. Accordingly, it is desirable to provide a kickboard which is capable of handicapping each swimmer such that they will all be kicking and/or resting simultaneously.

2.3.1 SUMMARY OF THE INVENTION

- An object of the present invention is the provision of an improved kickboard which overcomes the above discussed disadvantages, as well as others, of the prior art.
- Another object of the present invention is the provision of a kickboard in which the drag may be varied.

- A further object of the present invention is the provision of a kickboard having a variable buoyancy.
- A still further object of the present invention is the provision of a kickboard which is capable of handicapping each swimmer on a swim team such that all swimmers kick at the same rate.
- A still further object of the present invention is the provision of a subliminal message on the surface of a kickboard which is perceptible when viewed from a trailing edge of the kickboard.

In general, the present invention is a kickboard comprising a first portion, a second portion, and a plurality of hand grasping locations. The second portion extends from one edge of the first portion. The first portion defines a first planar surface and the second portion defines a second planar surface. The first and second planar surfaces form an obtuse angle. The hand grasping locations are disposed about a periphery of the kickboard. A pair of hand grasping locations are laterally opposite each other on the periphery. Grasping different pairs of hand grasping locations varies the flow characteristics of the kickboard by varying its position in the water. Thus, the drag of the kickboard is varied.

More particularly, the first portion defines a rectangular shape and the second portion defines a semicircular shape. In one form of the invention, the kickboard includes a hollow portion which may be filled with a substance to vary the buoyancy of the board. An aperture and plug are provided to permit insertion of the substance within the hollow portion. Thus, the buoyancy of the board may be varied. Another feature of the invention is a subliminal message on one of the board's surfaces which is perceptible when viewed from a sharp angle.

Figure 2.2 Surfboard

CHAPTER 3

METHODOLOGY

3.1. INTRODUCTION

The research methodology is a neat plan in terms of the course of this semester project. In order to smooth out the final project, the methodology should be best prepared. With this, each stage of the project ‘s journey will not go out of its predetermined track or, more accurately, the final outcome of the study will meet the requirements of the problems to be resolved. Hence it important to know and understand in depth each of the processes in the research methodology. Information obtained through a variety of sources including internet , books, and journals. Through these sources can not be searched for titles that are appropriate to the Final Year Project taken.

The support components such in this case means component such as Arduino , DC motor, RF module and Delay module. Information about these components can be easily obtained from the store that sells the components and ask opinions from the supervisor to the appropriate type of component used. Things to consider are the selection of components that are appropriate to the system used so as not to interface with project travel.

In every project revenue, the testing process needs to be done to get good results. Therefore, research on the work that needs to be done to ensure no problem will arise when it is operating. With that, the efficiency of the operating system can be enhanced.

3.2 FLOW CHART

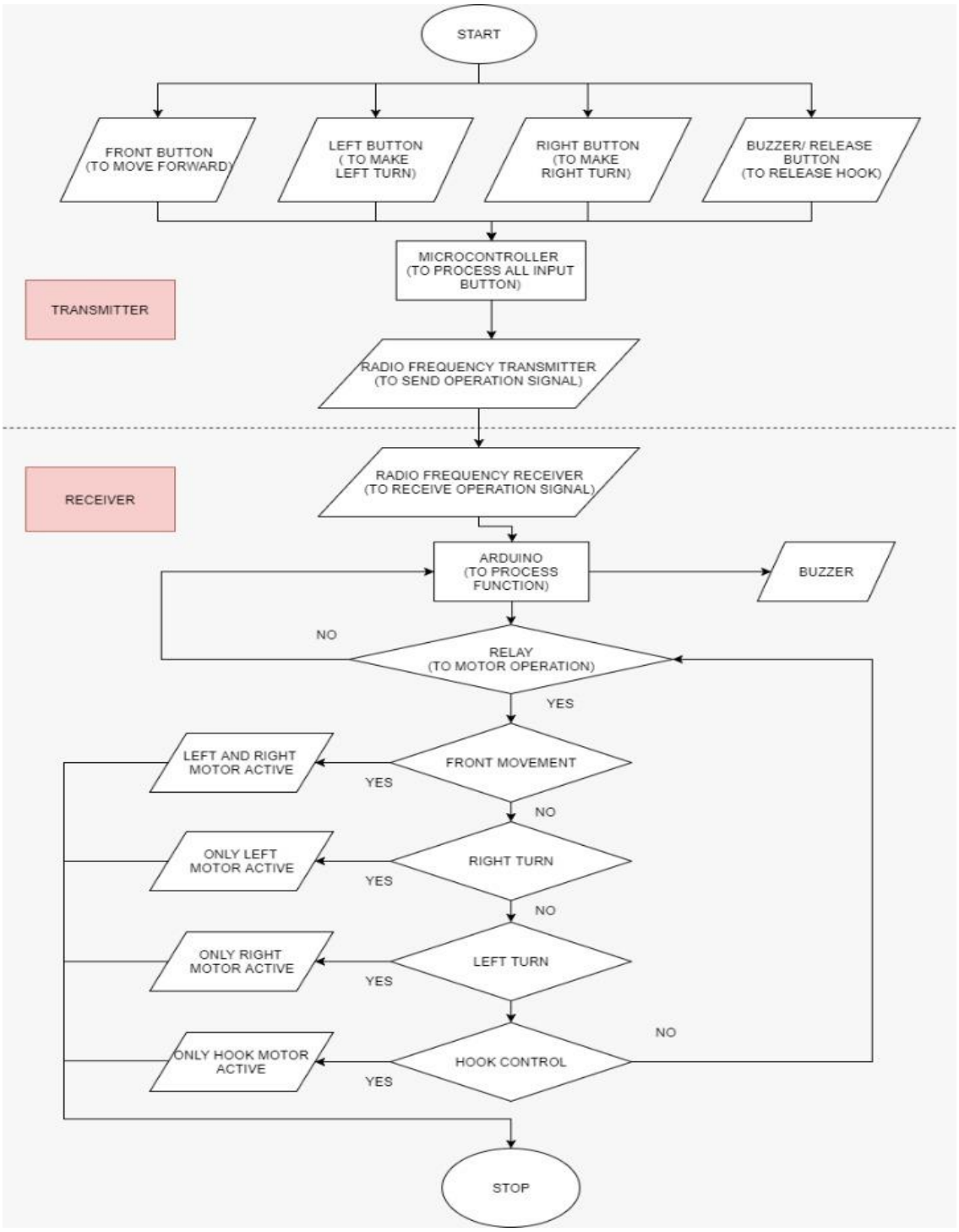

Figure 3.1 Flowchart Function Project

Based on the above flowchart, firstly we need to switch on the remote control (transmitter). This remote control has four buttons, consisting of front button, left button, right button and buzzer / release buttons. The four buttons will go through the microcontroller for the process of all the buttons and transmitted through the RF transmitter.

Next, the transmitter will send the operation signal. The RF receiver will receive the signal from RF transmitter. After RF transmitter receive the operation signal, the signal will sent to Arduino and Arduino will process the function. The buzzers will receive the process function from Arduino to tune the sound. Relay going to receive the process for Arduino. If the Relay doesn't receive process from Arduino, the process need to start again form Arduino. After Relay receive the process, the front movement, right turn, left turn, and hook control are ready to process. If front movement success to process the left and right motor are active, if not the command will start again from Relay. If right turn success to process only left motor are active, if not the command will start again from Relay. If left turn success to process, only right motor are active, if not the command will start again from Relay.

If hook control are success to process only hook motor will active, if not the command will start again from Relay. If all process successful the process will switch of manually and the end.

3.3 FLOW CHART PROJECT

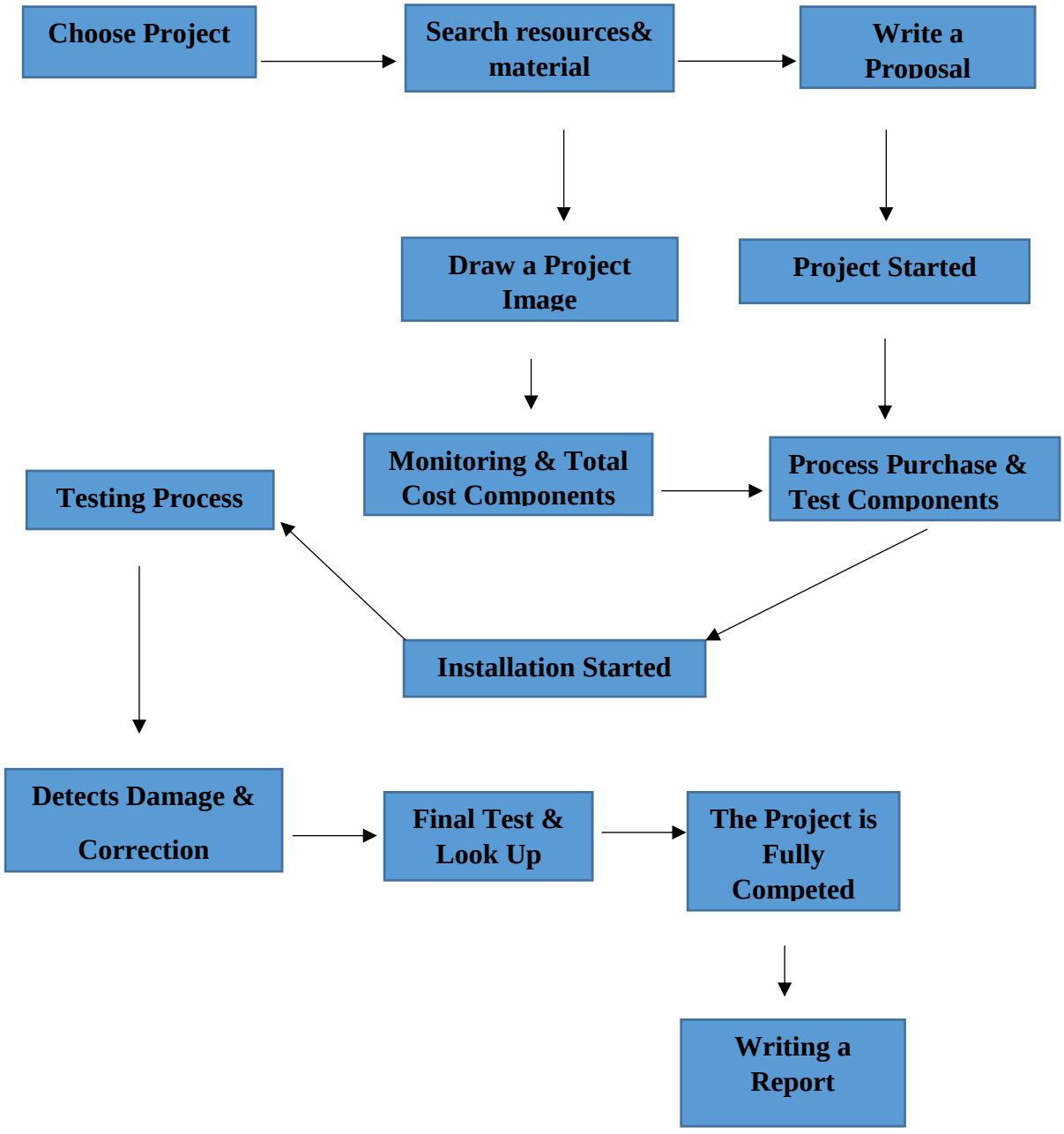

Figure 3.2 Project Implementation Flow Chart

Based on the diagram above, firstly we need to choose the project that we are going to do.

Next we must research the resource and the material of the project. after that, we need to write a proposal and draw the project images. therefore, we must monitoring and identify the total cost of the component and we will to start our project. Moreover, we can start to purchase and test the component that we buy and start install it.

Next, we going to testing the process and detect damage and make correction, if have any error. After that, we need to final test the project and the project must fully complete. lastly, if the project are fully complete, we must write a report.

3.4 BLOCK DIAGRAM

3.4.1 Transmitter

Figure 3.3 Block Diagram Transmitter

The button function as input. The button while receive signal consists of forward, left, right and hook release. The button will send signal at the microcontroller as a process. And the signal from microcontroller go to RF transmitter.

3.4.2 Receiver

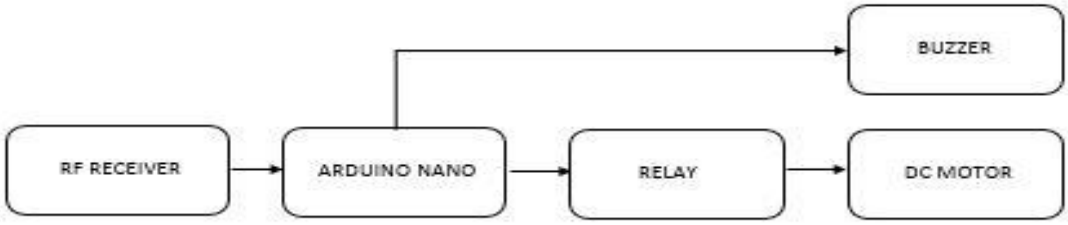

Figure 3.4 Block Diagram Receiver

The RF receiver will receive signal from RF transmitter and the signal will go to Arduino NANO for process. The relay function is to control the speed of motor. And the motor as a ouput.

3.5 SCHEMATIC CIRCUIT

3.5.1. TRANSMITTER

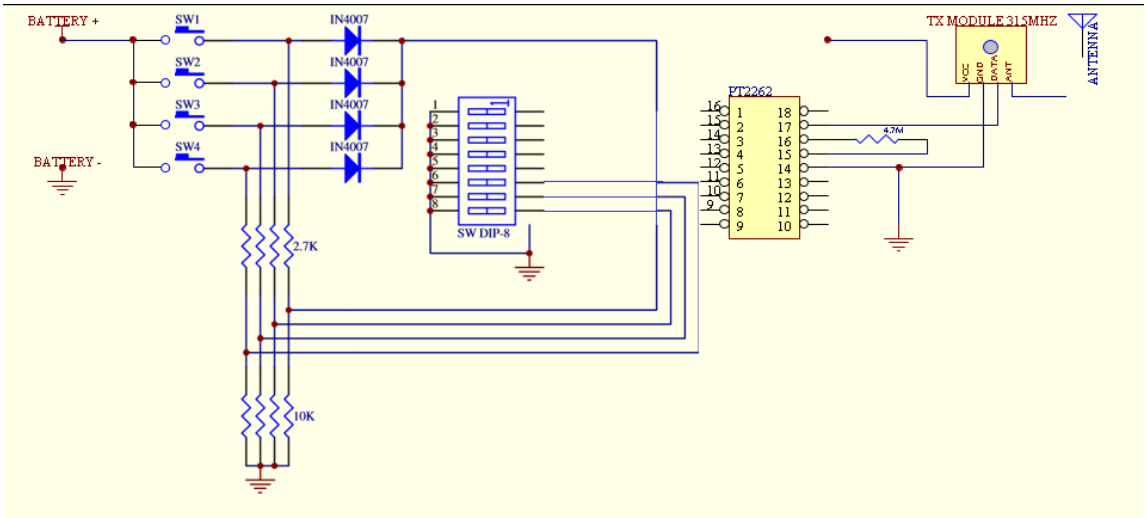

Figure 3.5.1 Transmitter Circuit

When the on button is pressed, the circuit will be active. Each received instruction will be transmitted via RF transmitter (remote control) to the RF receiver (boat) to be processed. At this transmitter (remote control) 4 buttons are front button, left button, right button and buzzer button

3.5.2. RECEIVER

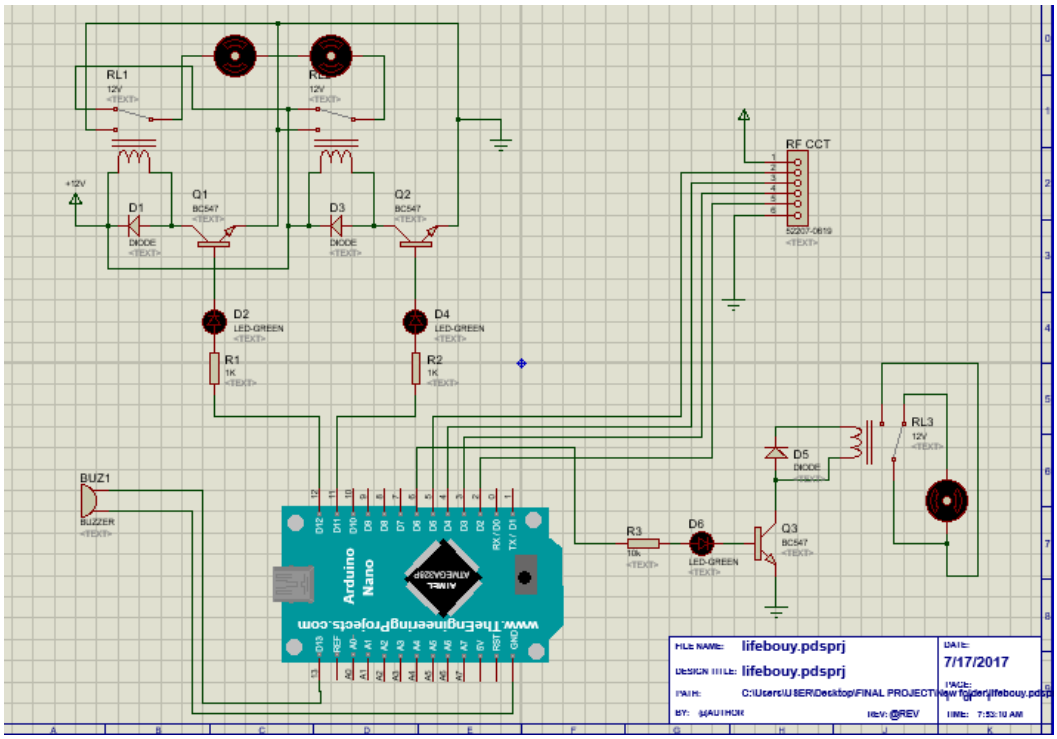

Figure 3.5.2 Receiver Circuit

At the receiver, the information sent by the transmitter will be received by the RF receiver, upon receipt of the information instructions it is sent to the Arduino Nano for processing. Once processed, the Arduino will give command to the affected component to work.

3.6 MAIN COMPONENT

3.6.1. ARDUINO NANO

Arduino Nano is a surface mount breadboard embedded version with integrated USB. It is a smallest, complete, and breadboard friendly. It has everything that Diecimila/Duemilanove has (electrically) with more analog input pins and onboard +5V AREF jumper. Physically, it is missing power jack. The Nano is automatically sense and switch to the higher potential source of power, there is no need for the power select jumper.

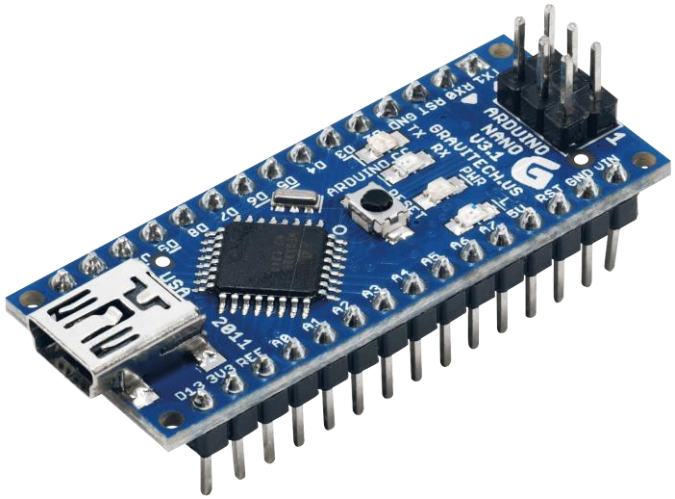

Figure 3.6 Ardiuno Nano

Nano’s got the breadboard-ability of the Boarduino and the Mini+USB with smaller footprint than either, so users have more breadboard space. It’s got a pin layout that works well with the Mini or the Basic Stamp (TX, RX, ATN, GND on one top, power and ground on the other). This new version 3.0 comes with ATMEGA328 which offer more programming and data memory space. It is two layers. That make it easier to hack and more affordable.

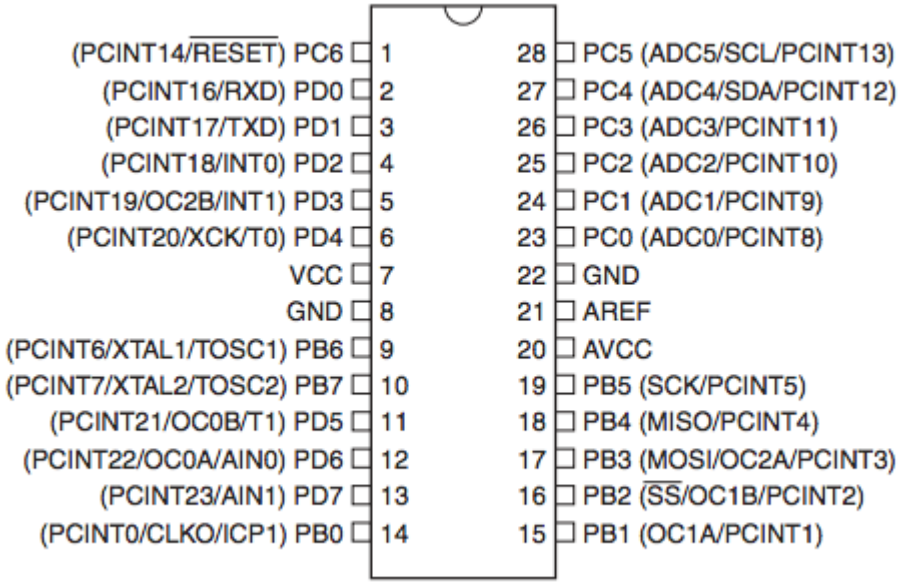

Figure 3.7 Schematic Arduino Nano

3.6.2 MICROCONTROLLER (PT2272)

PT 2272 is a remote control decoder paired with PT 2262 utilizing CMOS Technology. It has 12 bits of tri-state address pins providing a maximum of531,441 (or 312) address codes; thereby, drastically reducing any code collision and unauthorized code scanning possibilities. PT 2272 is available in several options to suit every application need : variable number of data output pins, latch or momentary output type.

Figure 3.8 Microcontroller (PT2272)

PT2272 decodes the waveform received and fed into the DIN pin. The Waveform is decoded into code word that contains the address, data and sync bits. The decoded address bits are compared with the address set at the address input pins. If both addresses match for 2 consecutive code words, PT2272 drives - (1) the data output pin(s) whose corresponding data bit(s) is then decoded to be a “1” bit, and (2) the VT output -- to high voltage (high state).

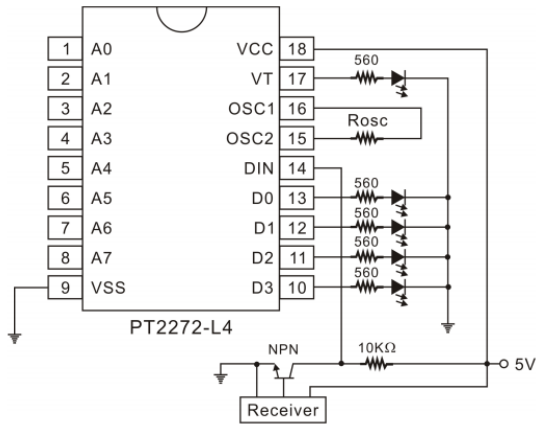

Figure 3.9 Schematic Microcontroller (PT2272)

3.6.3 RF MODULE

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. This wireless communication may be accomplished through optical communication or through radio frequency (RF) communication. For many applications the medium of choice is RF since it does not require line of sight. RF communications incorporate a transmitter and a receiver. They are of various types and ranges. Some can transmit up to 500 feet. RF modules are widely used in electronic design owing to the difficulty of designing radio circuitry. Good electronic radio design is notoriously complex because of the sensitivity of radio circuits and the accuracy of components and layouts required to achieve operation on a specific frequency. In addition, reliable RF communication circuit requires careful monitoring of the manufacturing process to ensure that the RF performance is not adversely affected.

Finally, radio circuits are usually subject to limits on radiated emissions, and require Conformance testing and certification by a standardization organization such as ETSI or the U.S. Federal Communications Commission (FCC). For these reasons, design engineers will often design a circuit for an application which requires radio communication and then "drop in" a pre-made radio module rather than attempt a discrete design, saving time and money on development.

3.6.3 RF transmitter

An RF transmitter module is a small PCB sub-assembly capable of transmitting a radio wave and modulating that wave to carry data. Transmitter modules are usually implemented alongside a micro controller which will provide

data to the module which can be transmitted. RF transmitters are usually subject to regulatory requirements which dictate the maximum allowable transmitter power output, harmonics, and band edge requirements.

Figure 3.10 RF transmitter

3.6.3.2 RF receiver

An RF receiver module receives the modulated RF signal, and demodulates it. There are two types of RF receiver modules: superheterodyne receivers and super-regenerative receivers. Super-regenerative modules are usually low cost and low power designs using a series of amplifiers to extract modulated data from a carrier wave. Super-regenerative modules are generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage.[citation needed] Superheterodyne receivers have a performance advantage over super-regenerative; they offer increased accuracy and stability over a large voltage and temperature range.

This stability comes from a fixed crystal design which in the past tended to mean a comparatively more expensive product. However, advances in receiver

chip design now mean that currently there is little price difference between superheterodyne and super-regenerative receiver modules.

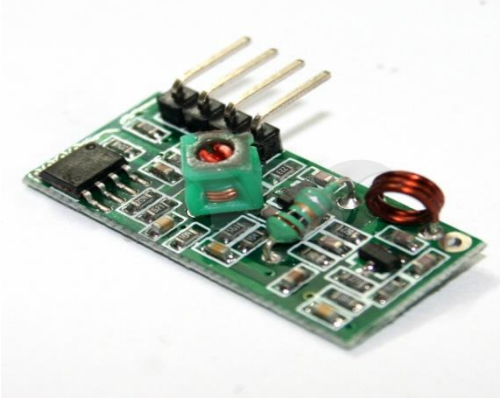

Figure 3.11 RF receiver

3.6.4. DC MOTOR

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

Figure 3.12 DC motor

DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight motor used for portable power tools and appliances. Larger DC motors are used in propulsion of electric vehicles, elevator and hoists, or in drives for steel rolling mills. The advent of power electronics has made replacement of DC motors with AC motors possible in many applications.

3.6.5 RELAY

Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. As relay diagrams show, when a relay contact is normally open (NO), there is an open contact when the relay is not energized. When a relay contact is Normally Closed (NC), there is a closed contact when the relay is not energized. In either case, applying electrical current to the contacts will change their state.

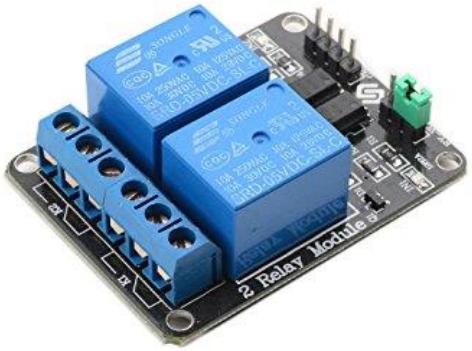

Figure 3.13 Relay

Relays are generally used to switch smaller currents in a control circuit and do not usually control power consuming devices except for small motors and Solenoids that draw low amps. Nonetheless, relays can "control" larger voltages and amperes by having an amplifying effect because a small voltage applied to a relays coil can result in a large voltage being switched by the contacts. Protective relays can prevent equipment damage by detecting electrical abnormalities, including overcurrent, undercurrent, overloads and reverse currents. In addition, relays are also widely used to switch starting coils, heating elements, pilot lights and audible alarms.

3.6.6 BOAT

Figure 3.14 RC boat

Length: 880 mm

Width: 250 mm

Height: 200 mm

Control: Remote control

Speed: 46.3 km/h

Range: Below 100 meter

3.6.7 SURFBOARD

Figure 3.15 Surfboard

Length: 900 mm

Width: 280 mm

Support : below 90 Kg

3.7 COST

Table 3.1 Component cost

NO	COMPONENT	QUANTITY	TOTAL (RM)
1	Arduino Nano	1	34.00
2	DC motor	3	56.00
3	Microcontroller (PT2272)	1	8.00
4	Relay	2	8.90
5	On/off switch	2	0.80
6	RF module	1	29.90
7	Buzzer	1	2.00
8	LED	3	1.50
9	Push button	4	3.60
10	Surfboard	1	80.00
11	Black box	1	8.50

CHAPTER 4

DATA ANALYSIS & DISCUSSION

4.1 INTRODUCTION

After a search and research on this project, we have received a lot of information from sources such as books, internet and we are confident we will produce a Successful project. We already understand the circuit and the functions of the components used in this project. We have come to understand the logic of the circuit and how to test the circuit of this project. Through discussion with group members, we have successfully completed our project prototype and we look forward to making it a reality in the next semester.

4.2. ANALYSIS

4.2.1 DATA QUESTIONAIRE

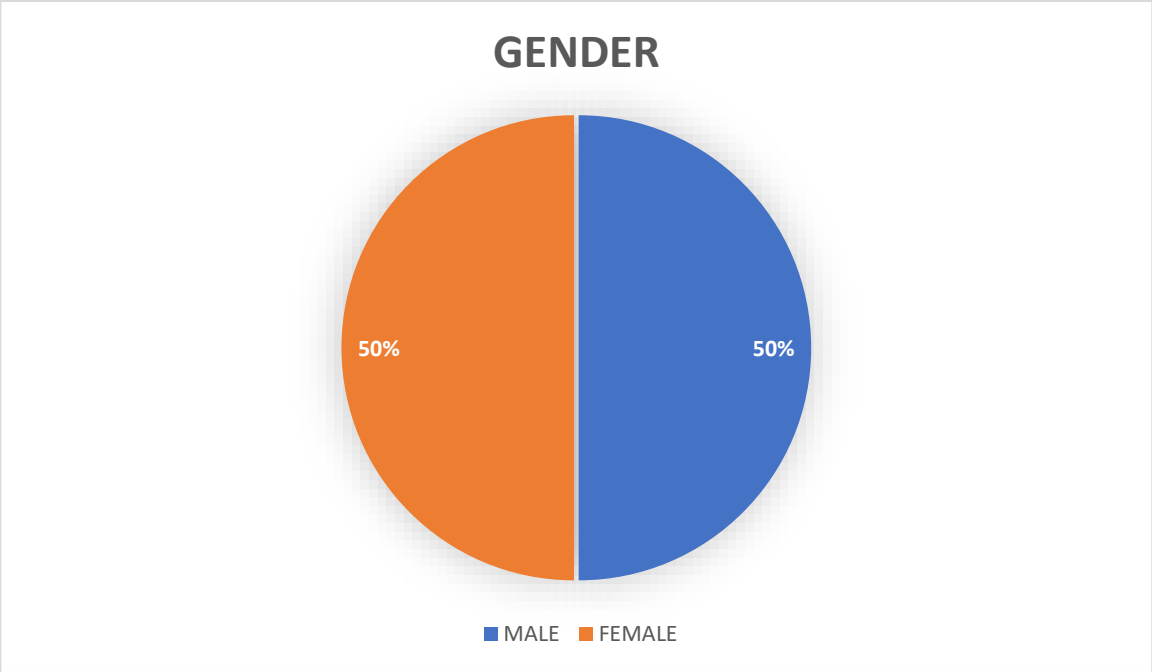

Figure 4.1 Graph of data, gender

This diagram above shows that 40 respondents from citizens, were gave their response to the survey about our project RC Res-Q Surfboard. The consisting of 20 males and 20 females.

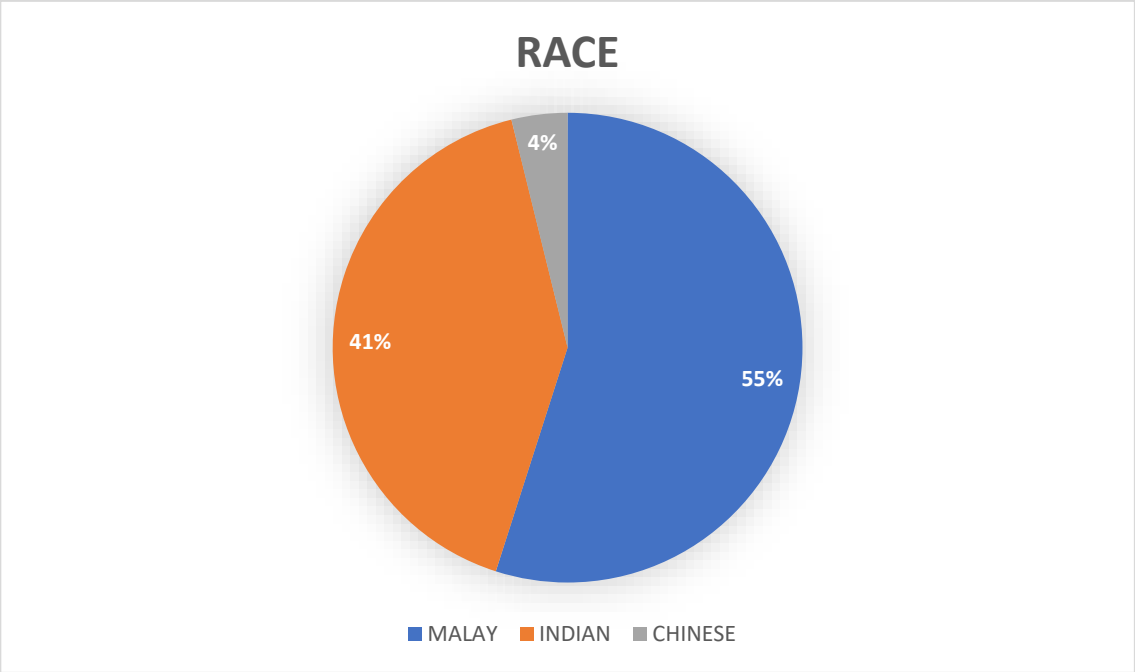

Figure 4.2 Graph of data, Race

This pie chart shown that, we distribute survey to different races.55% consist on malay,41% Indian and 4% Chinese

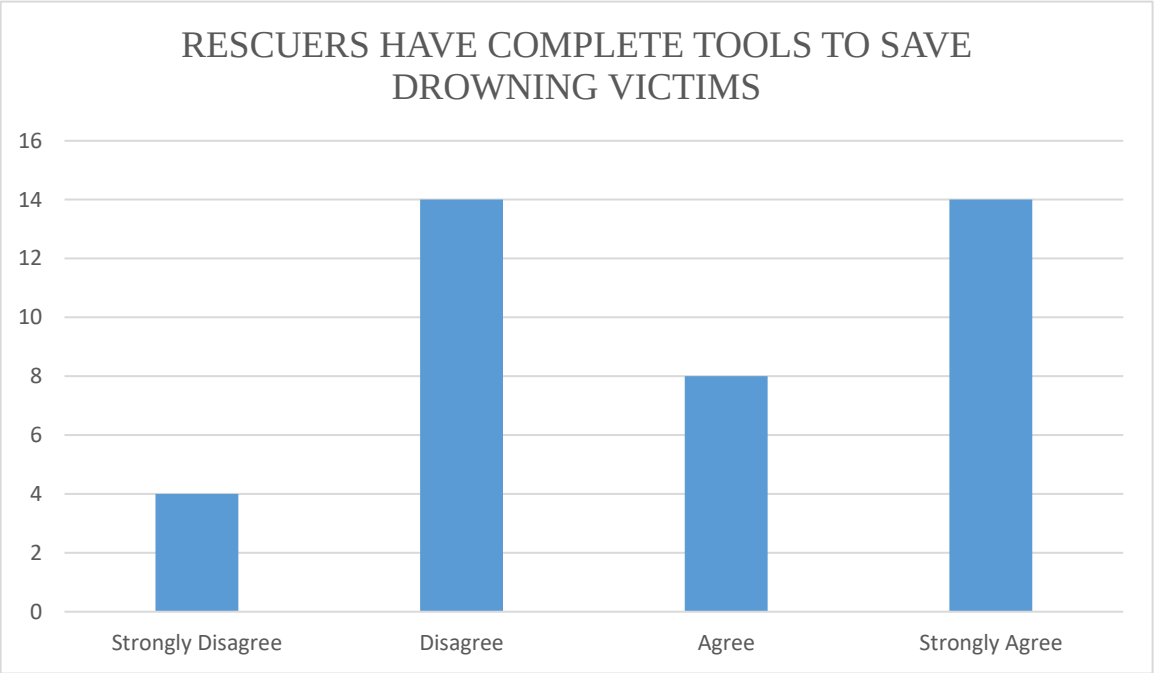

Figure 4.3 Rescuers have complete tools to save drowning victims

Based on the bar graph, 14 respondents strongly agree and 8 respondents agree about this statement. 14 respondents disagree and 4 strongly disagree because the drowning incident caused a lot of death because the rescuer was to slow to save the victim and lack of equipment.

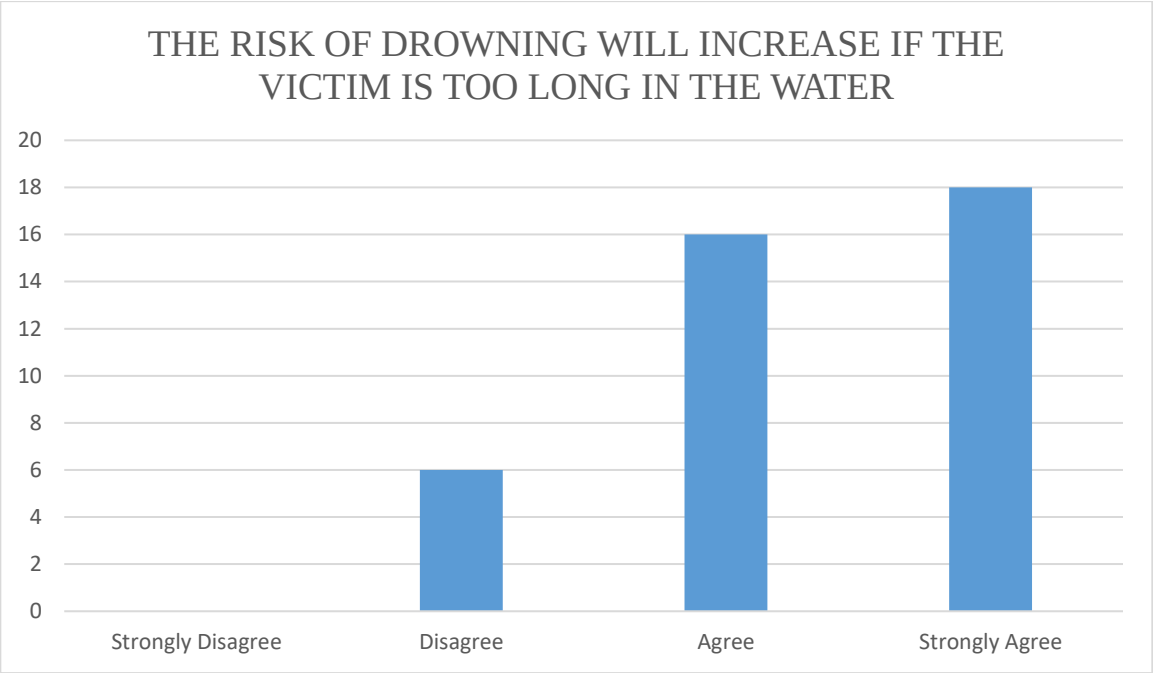

Figure 4.4 The risk of drowning will increase if the victim is too long in the water

The bar graph shown that, majority of respondents reacted positive for this statement.16 respondents agree and 18 respondents strongly agree the risk of drowning will increase if the victim is too long in the water. Only 6 respondents disagree about this statement.

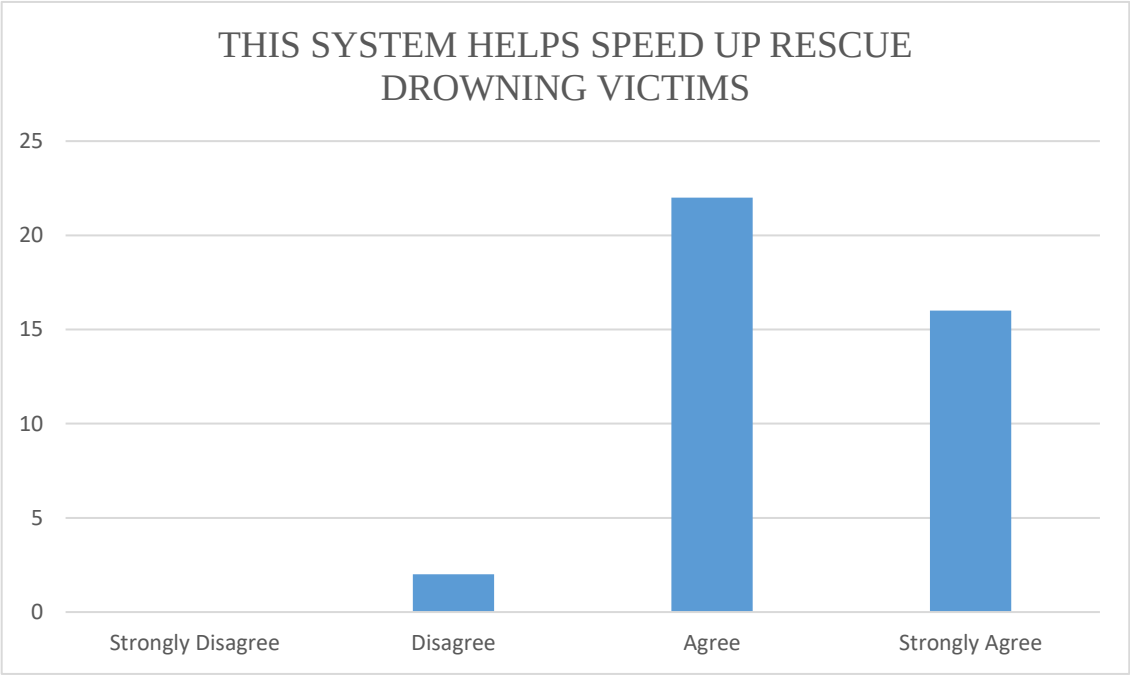

Figure 4.5 This system helps speed up rescue drowning victims

Overall, the respondents reacted positive to this statement. 22 respondents agree and 16 strongly agree because this project can help the rescuer to overcome the lack of time taken when rescuer rescue the drown victim. Only 2 respondents disagree and strongly disagree about this statement

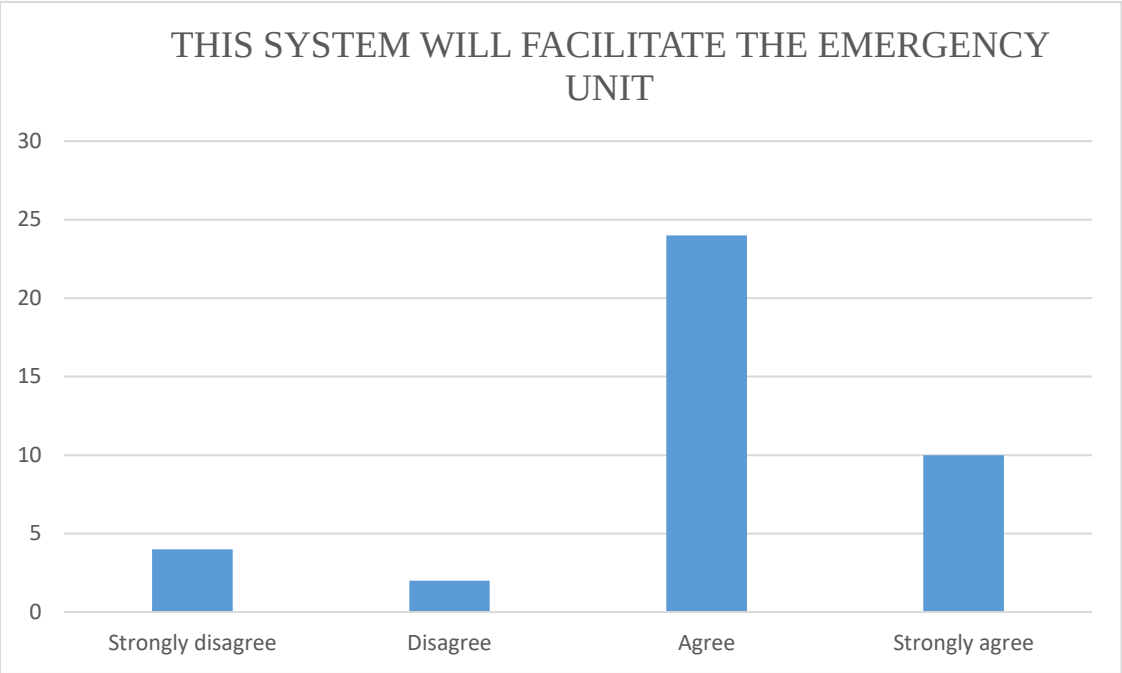

Figure 4.6 This system will facilitate the emergency unit

Based on the data obtained, 24 respondents are agree and 14 respondents also strongly agree about this system will facilitate the emergency unit. Only 6 respondents are disagree and strongly disagree about this statement

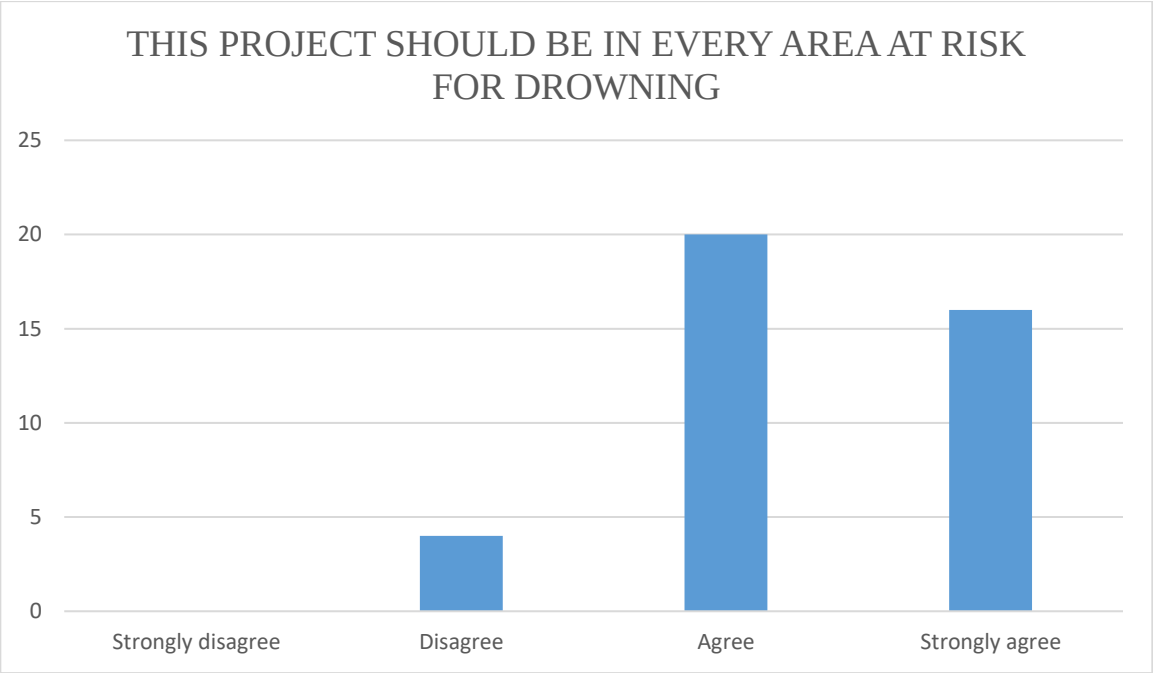

Figure 4.7 This project should be in every area at risk for drowning

From this graph, we find that 14 respondents agree and 14 respondents also strongly agree about this statement because this project is specially designed for drowning victim. 10 people are disagree and strongly disagree about this statement.

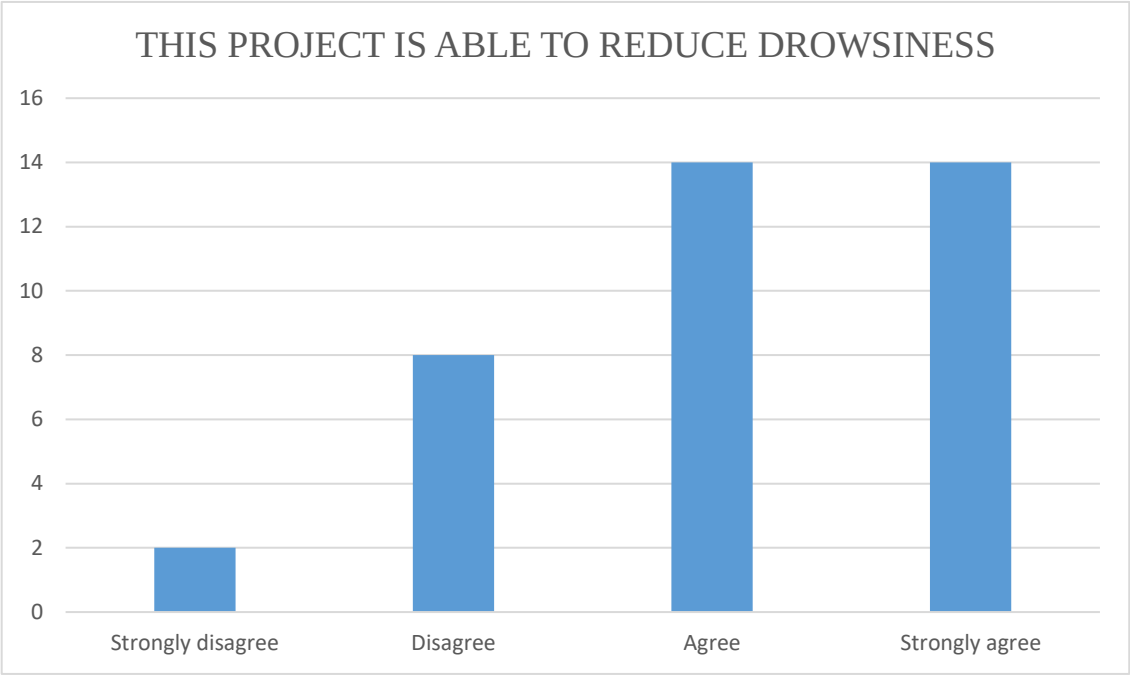

Figure 4.8 This project is able to reduce drowsiness

From this graph, we find that majority of respondents are agree and strongly agree about this statement. This project should be in every area at risk for drowning as a precaution. Only 4 respondents are disagree about this statement.

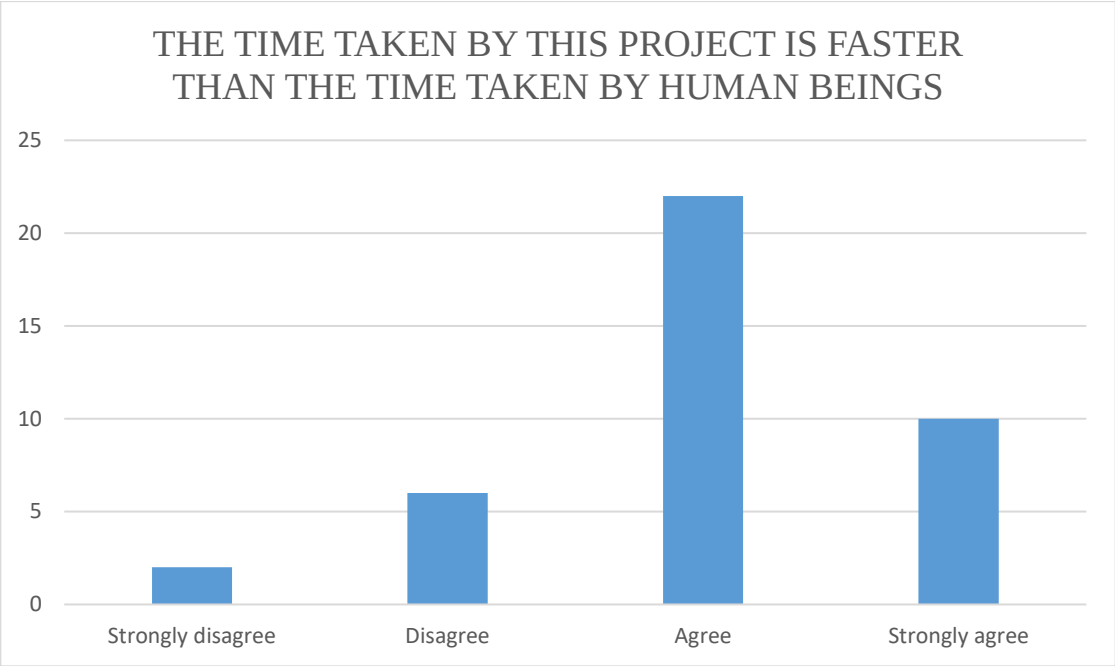

Figure 4.9 The time taken by this project is faster than the time taken by human beings

Overall, the respondents reacted positive to this statement. 23 respondents are agree and 10 respondents are strongly agree that the time taken by this project is faster than human beings. Based on the analysis our did, this project are move faster than human. 8 respondents are disagree and strongly agree to this statement.

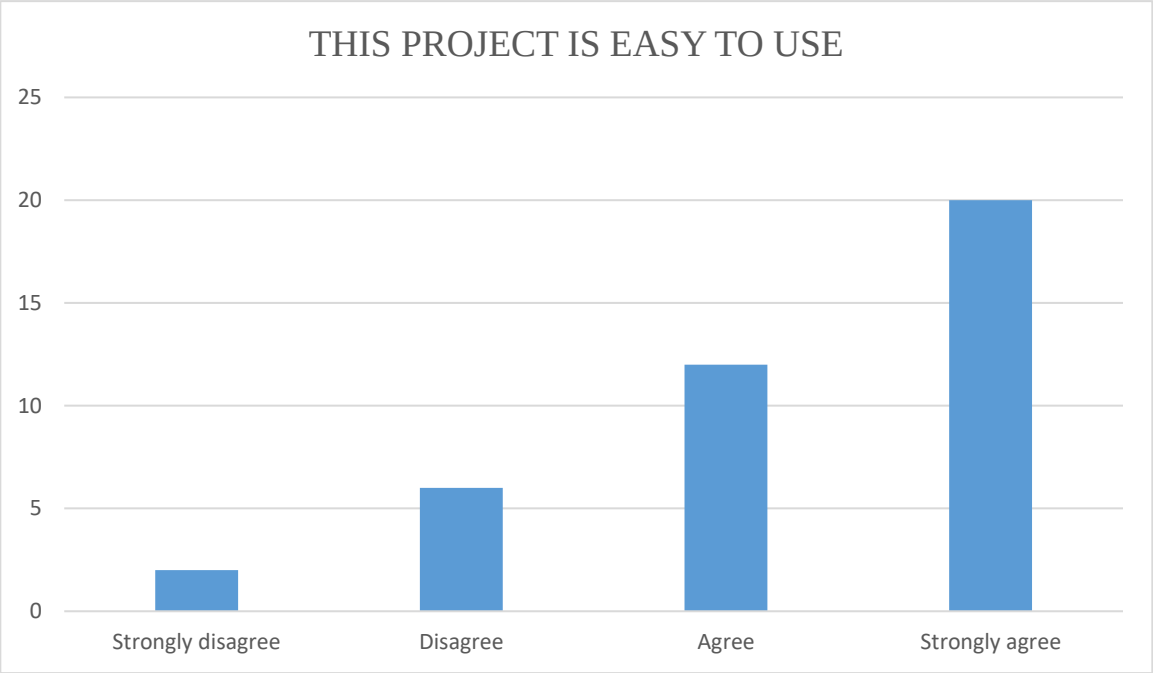

Figure 4.10 This project is easy to use

Bar graph shown that, overall the respondents are agree and strongly agree to this statement. 20 respondents strongly agree and 12 respondents agree because this project is easy to control and same concept with remote control boat. And 6 respondents disagree and 2 respondents strongly disagree to this statement.

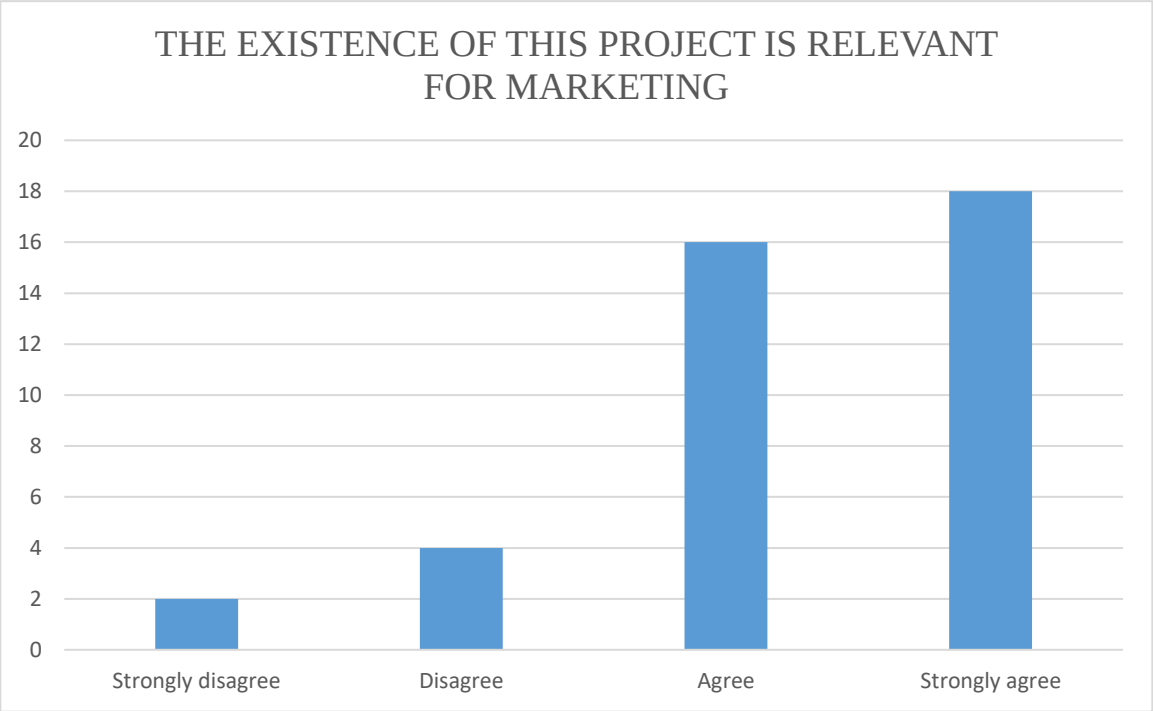

Figure 4.11 The existence of this project is relevant for marketing

Based on the data obtained, majority of respondents are reacted positive about this statement. 18 respondents are strongly agree and 16 respondents agree because this project is not yet on the market and this project is very helpful. 6 respondents are strongly disagree and disagree about this statement.

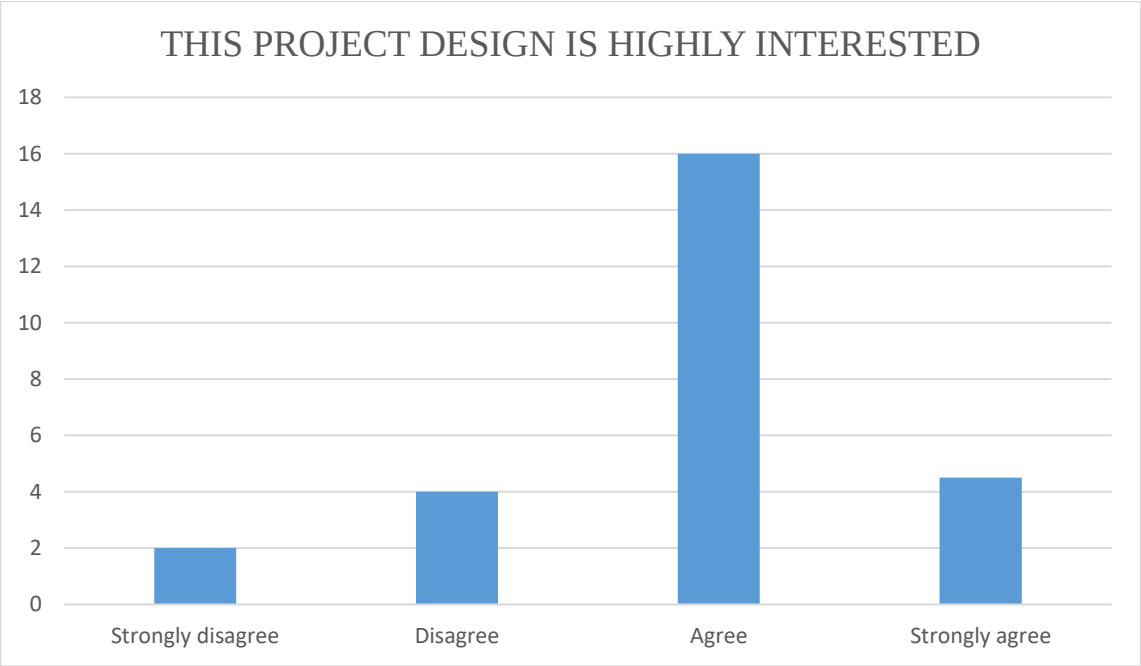

Figure 4.12 This project design is highly interested

The bar graph shown that, 16 respondents agree and 5 respondents strongly agree because this project specially designed for rescue activities. 4 respondents disagree and 2 respondents strongly disagree.

4.2.2 RESULT

Table 4.1 Final Result

	RC RES-Q SURFBOARD	LIFEGUARD
RANGE	50 m	50 m
SPEED	1.28 m/s	0.57 m/s
TIME	39 seconds	1 minutes 28 seconds

Based on the table shown, the comparison between RC Res-Q Surfboard and lifeguard. The speed for lifeguard is 0.57 m/s in range 50 meter. Meanwhile, speed for RC Res-Q Surfboard is 1.28 m/s in 50 meter . This data proves that the RC Res-Q Surfboard is faster than the lifeguard.

4.2.3 GANTT CHART

SESSION : JUN 2017
DEPARTMENT : JABATAN ELEKTRIK
COURSE/CODE : DEE 6032 PROJEK 2

WEEKS / PROJECT ACTIVITY	STATUS	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15
FIND THE EQUIPMENT AND STUDY ABOUT CIRCUIT	P															
	C															
DESIGN CIRCUIT USING PROTEUS SOFTWARE	P															
	C															
WRITE THE ASSEMMBLY LANGUAGE CODE-Arduino BY USING VISUAL BASIC SOFTWARE	P															
	C															
INSTALL ALL THE RF AND COMPONENT ON BOARD	P															
	C															
DESIGN CASING PROJECT	P															
	C															
BUILD THE PROJECT HARDWARE	P															
	C															
INSTALL CIRCUIT AND COMPONENT INTO CASING OF PROJECT	P															
	C															
TO TEST AND TROUBLESHOOTING THE PROJECT	P															
	C															
DATA ANALYSIS	P															
	C															
WRITING REPORT FOR PROJECT	P															
	C															

P : PLAN

C : COMPLETE

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

At the end of this project, we design a tool that is able to safe drowning victim and decrease the time taken by rescuer to safe the drowning victim. At the same time, rescuer around that area can receiving information about occurrence of a distress accident and a position of the distress accident in a sea, a river or a lake through surveillance of a guardian, a distress accident information obtained from a third party, or a monitoring. While the present invention has been described with reference to the particular illustrative embodiments, it is not to be restricted by the embodiments but only by the appended claims. It is to be appreciated that those skilled in the art can change or modify the embodiments without departing from the scope and spirit of the present invention.

The present invention is mostly suitable to the water accident, but can be applied to various disasters, such as building fire, mountain accident, avalanche, earthquake, or the like, by appropriately modifying the lifesaving equipment.

5.2 RECOMMENDATION

In the future we want to improve the RC RES-Q surfboard by combining the boat and kickboard together. This way, the boat is no longer just sending lifebuoy but bringing the victim to a safe place. Furthermore, the speed of the motor and the pressure of the wave should be taken into account as the weight of the victim is slowed down the RC RES-Q surfboard movement. we propose to use a brushless motor because the motor is faster than the usual DC motor. In addition, the use of jet motors can increase the speed of the boat by twice as it inhales pressurized water and reloads with little pressure from the jet motor

In the case of establishing a sea rescue system using the drone-type lifesaving equipment dropping device according to the present invention, a disaster monitoring center constructed at a beach or the like may be provided with a remote control controller for the unmanned aerial vehicle 2, a video receiving device for displaying a video sent from the camera 8, and the like. Also, the disaster monitoring center may be provided with a drone with no lifesaving equipment for the purpose of surveillance, thereby monitoring occurrence of the disaster or accident in advance by making the unmanned flight in a surveillance area or a danger area.

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APPENDICES A

PROGRAMMING CODE

```
int Depan= 8;
int Kiri= 9;
int Kanan= 10;
int Alarm=11;

int bz= 12;
int M1= 3;
int M2= 4;
int RLY= 5;

void setup(){

  pinMode(Depan, INPUT);
  pinMode(Kiri, INPUT);
  pinMode(Kanan, INPUT);
  pinMode(Alarm, INPUT);
  pinMode(M1, OUTPUT);
  pinMode(M2, OUTPUT);
  pinMode(bz, OUTPUT);
  pinMode(RLY, OUTPUT);

}

void loop()
{
  if(digitalRead(Depan)==1){
    digitalWrite(M1,HIGH);
    digitalWrite(M2,HIGH);
   }

 if( digitalRead(Kanan)==1){
    digitalWrite(M1,LOW);
    digitalWrite(M2,HIGH);
   }

if (digitalRead(Kiri)==1){
```

```
  digitalWrite(M1,HIGH);
  digitalWrite(M2,LOW);
 }
 if ((digitalRead(Kiri)==0)&&(digitalRead(Kanan)==0)&&(digitalRead(Depan)==0)){
  digitalWrite(M1,LOW);
  digitalWrite(M2,LOW);
 }

if (digitalRead(Alarm)==1){
 digitalWrite(M1,LOW);
  digitalWrite(M2,LOW);
  digitalWrite(bz,HIGH);
  delay(500);
  digitalWrite(bz,LOW);
  delay(100);
  digitalWrite(bz,HIGH);
  delay(500);
  digitalWrite(bz,LOW);
  delay(100);
  digitalWrite(bz,HIGH);
  delay(500);
  digitalWrite(bz,LOW);
  delay(100);
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  delay(500);
  digitalWrite(bz,LOW);
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  delay(500);
  digitalWrite(bz,LOW);
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  delay(100);
  digitalWrite(bz,HIGH);
  delay(500);
  digitalWrite(bz,LOW);
  delay(100);
  digitalWrite(bz,HIGH);
  delay(500);
  digitalWrite(bz,LOW);
  delay(100);
  digitalWrite(bz,HIGH);
```
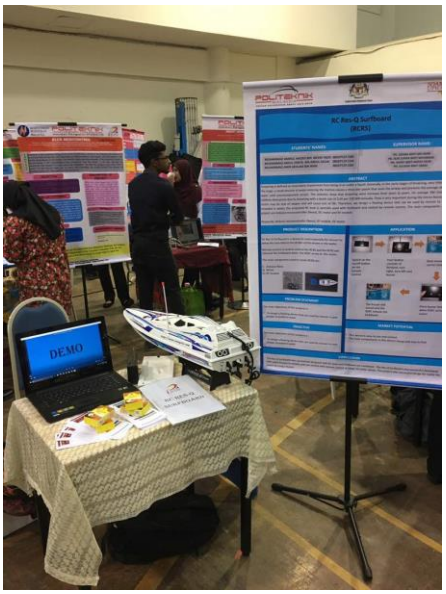

```
    delay(500);
    digitalWrite(bz,LOW);
    delay(100);
    digitalWrite(bz,HIGH);
    delay(500);
    digitalWrite(bz,LOW);
    delay(100);
    digitalWrite(RLY,HIGH);
    delay(5000);
   }
}
```

APPENDICES B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