



WIRELESS PORTABLE CAR JACK VIA APP CONTROLLER APPLICATION TECHNOLOGIES

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**JABATAN KEJURUTERAAN ELEKTRONIK PERUBATAN
SESI 1 2022/2023**

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*This report submitted to the Electrical Engineering Department in fulfillment of
the requirement for a Diploma in Electrical Engineering*

**JABATAN KEJURUTERAAN ELEKTRONIK PERUBATAN
SESI 1 2022/2023**

CONFIRMATION OF THE PROJECT

The project report title “Wireless portable car jack via app controller application technologies” has been submitted, reviewed and verified as a fulfills the conditions and requirement of the project writing as stipulated

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DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : Wireless portable car jack via app controller application technologies

SESSION : SESI 1 2022/2023

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2. I I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.
3. I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the **Diploma in Electrical Engineering** to me.

Made and in truth that is recognized by:

MUHAMMAD AMIR FARHAN BIN NOOR AZMAN

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NOOR AZMAN**

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As a project supervisor, on the date:

.....
**ENCIK KHAIRUL NAPISHAM BIN
ABD RAZAK**

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Special thanks to ENCIK KHAIRUL NAPISHAM BIN ABD RAZAK who helped me to achieve a successfully wireless portable car jack via app controller application technologies.

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ABSTRACT

A car jack is a device used to lift up the cars while changing the tires during an emergency. Car jacks are available at the market has some disadvantages such as requiring more energy to operate, are not suitable for women and cannot be used on the uneven surface. The purpose of this project is to modify the design of the existing car jack in terms of its functionality and also human factors considerations. To optimize the existing design, the hand lifter has been replaced by technology as it can reduce energy usage. In addition, ergonomic factors are also taken into consideration in order to reduce and simplify how to use a car jack. In the process of obtaining a suitable design, the customer needs will be translate to the engineering characteristic to obtain the concepts that need to be modified and fabricated. The best concept had been selected using the weighted rating method, next step was to determine the part and component that can be modified by arrange the part with the component according to the function or system. From this step, it can be determined which component can be reduced or modified. Then the configuration design was analyzed according the function factor and critical issue so that the design that had been implementing was according to the specification and customer requirement.

ABSTRAK

Bicu kereta ialah alat yang digunakan untuk mengangkat kereta semasa menukar tayar semasa kecemasan. Bicu kereta yang terdapat di pasaran mempunyai beberapa kelemahan seperti memerlukan lebih tenaga untuk beroperasi, tidak sesuai untuk wanita dan tidak boleh digunakan pada permukaan yang tidak rata. Tujuan projek ini adalah untuk mengubah suai reka bentuk bicu kereta sedia ada dari segi fungsinya dan juga pertimbangan faktor manusia. Untuk mengoptimumkan reka bentuk sedia ada, pengangkat tangan telah digantikan dengan teknologi kerana ia dapat mengurangkan penggunaan tenaga. Selain itu, faktor ergonomik juga diambil kira bagi mengurangkan dan memudahkan cara menggunakan bicu kereta. Dalam proses mendapatkan reka bentuk yang sesuai, keperluan pelanggan akan diterjemahkan kepada ciri kejuruteraan untuk mendapatkan konsep yang perlu diubah suai dan direka. Konsep terbaik telah dipilih menggunakan kaedah penarafan wajaran, langkah seterusnya adalah menentukan bahagian dan komponen yang boleh diubah suai dengan menyusun bahagian dengan komponen mengikut fungsi atau sistem. Daripada langkah ini, dapat ditentukan komponen mana yang boleh dikurangkan atau diubah suai. Kemudian reka bentuk konfigurasi dianalisis mengikut faktor fungsi dan isu kritikal supaya reka bentuk yang telah dilaksanakan adalah mengikut spesifikasi dan kehendak pelanggan.

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1.1 Introduction

Now, the country is developing and the future has provided a lot of facilities to animals, plants and humans. The era is developed from zero to the present. In the past, if we wanted to go somewhere we had to walk, but now a lot has changed, especially the convenience of vehicles. Here I mean the car. Car is automobile has a motor vehicle with wheels. Using a car can take us somewhere quickly and safely. However, in every available facility there will definitely be unexpected problems will come. What I mean is the problem while traveling by car. During the trip we don't know how the suspensions present such as a leaky or broken tire. If this happens to a strong man, he is able to solve this problem easily, but if this problem is faced by an old man or a woman, he may not be able to solve this problem because it's hard work to change a tire. I have identified this problem to be solved. With the changing times that are becoming more advanced and modern, I want to produce a control device only through a smartphone to control the car jack so that it is easier. So no need to use full energy anymore. With the facilities that I have created, I am sure that this will provide convenience to users, whether old or young, regardless of gender, it can be solved.

Wireless portable devices, such as smartphones and tablets, have become increasingly prevalent in recent years. These devices offer a wide range of functionality, from the ability to make phone calls and send text messages, to the ability to access the internet, take photos, and play music. One of the key technologies that enables these devices to be wireless and portable is Bluetooth.

Bluetooth is a wireless communication technology that allows devices to connect and communicate with one another over short distances. It operates in the 2.4 GHz ISM band and uses a technique called frequency hopping to avoid interference from other devices that may be operating in the same band. Bluetooth devices can be paired with one another, allowing them to share data and perform various tasks, such as streaming music or sending files.

An App controller application is a software application that allows the user to control, manage and monitor the connected devices over Bluetooth. These applications are available for different operating systems such as iOS and Android. They can be used to control the device settings, power on and off, connect to other devices and perform other tasks.

In summary, Bluetooth technology enables wireless portable devices to connect and communicate with one another, while App controller applications give users the ability to control and manage these devices. Together, they provide a convenient and efficient way to use wireless portable devices.

1.2 Background Research

Today's importance on technology expansion has projected a good design and quality product in a lesser time to ease the complicated process of human being. The development of software has become a vital in the digital world to satisfy a number of demands of the user or applications. In order to accomplish the demand of current era, the article has been modelled a design for a mobile enabled hydraulic screw jack system. Screw jack used for automobiles is emerging as necessary technology expansion in the industry of automobiles to produce application that allows lifting heavy load on applying less effort. The primary importance of the design of automobile screw jack is to reduce human involvement and their contribution to lift a load. Further there is a significance increases in the efficiency of screw jack model and its designs as ergonomically, neglecting of the complex operating as well as positioning of the screw jack by the operators. On usage of hydraulic system and pneumatic system, the system reduces involvement to lift load on basis of the computation calculation. Hence, we have to design a jack for car which is motorised for easiness of use. But somehow in any case of failure in this electronic system, then the jack will be not able to work further manually. The important functionality of this project is controlled using Arduino Uno which controls all the motors by obtaining signals from the app with help of a Bluetooth, Importance of this model is to make system as effortless and fast response in weight lifting, further it reduces the physical fatigue felt by the weight lift operating employee. Experimental results prove that proposed model outperforms the existing Bluetooth based model on terms of the efficiency and accuracy

1.3 Problem Statement

Nowadays in this country, most cars are equipped with a car jack. We found that the car jack was very difficult to be used especially by women because this type of jack needed more strength and energy to operate this jack by turning the lead screw. Thus, we want to develop a product based on the problem faced by the users who drive a car regarding to this issue. To overcome this problem, research has been conducted to find the solution on how to design a car jack for the car using the simplest and cheapest way while it is energy saving. Although there were many ways to solve this problem, we recommend that the design of this car jack system is the practical way when we considered all the factors and consequences, especially the analysis to develop this product. During the research, we have found that most car user has difficulties in maintaining their vehicle breakdown especially cars in the scope of changing tires. The normal car jack we have in the market is operated using bare hands and is time- consuming. It also requires energy from the person to rotate the jack. Hence, this report had been prepared to recommend the design of the car jack that is user-friendly and easier.

1.4 Research objective

This research aims to include electronic control with necessary mechanism that will make the work of jacking car for maintenance easier and friendly. The system will control the upward movement of the car jack through the remote control. This will help to conserve energy and save time. The jack is controlled downwards manually adjusting the valve for downward movement control of the jack. The vehicle should be lifted for certain type of works. This cannot be done manually. To avoid such problem a jack was invented. To make the work easier than a screw jack we have introduced a new concept called wireless portable car jack via app controller application technologies. We can easily lift the vehicle up and down by using the mobile application. The entire assembly is controlled by app which is made on app maker and the brain of this project.

1.5 Scope Research

My main focus of the wireless portable car jack via app controller application technologies is to complete the technologies environment for the future. This was really great thing for our generation to create more things with technology. My project is to make people feel more save time and energy by just controlling it from a smartphone. The types of car jack that we used in this project were a hydraulic car jack as it is more reliable and easy to operate. For optimizing human power, the concept that will be used in this product was replacing the full energy twisting hands just with control by smartphone. By this, the mechanical advantage while lifting can be reduced. Therefore, our car jack uses an Arduino system with Bluetooth connector for people to use it. From our analysis, I will propose the best concept for the car jack in terms of friendly user and lower cost in product development.

1.6 Project Significance

To the service centre car, personal user, society, all gender in nation is Malays, Chinese, Indians and other races in Malaysia and abroad who use this tool to help people more easier to change car tyre thru smartphone.

1.7 Summary

In order to better understand our surroundings and make wise judgements, research is necessary. It enables us to collect data, evaluate it, and then make judgements based on the results in order to test ideas and hypotheses. Our ability to recognise issues and create solutions to them is also aided by research. The advancement of knowledge and the creation of new technologies and therapies are two other key outcomes of research. Additionally, it assists in making sure that the project data we rely on for decision-making is accurate and trustworthy.

CHAPTER 2

2.1 Introduction

A literature study, also known as a literature review, is an in-depth analysis of existing research on a specific topic. It is a crucial step in the research process as it provides a comprehensive overview of the current state of knowledge in a field and identifies gaps in the existing research.

The purpose of a literature study is to critically evaluate the available literature on a topic, identify key themes and trends, and determine the need for further research. It also helps to establish the context and background of the research, and to identify any conflicting findings or inconsistencies in the existing literature.

Conducting a literature study involves searching for and collecting relevant literature on the topic, reading and analyzing the literature, and synthesizing the information to create a comprehensive overview. This process can include a wide range of sources, such as academic journals, books, conference proceedings, and government reports.

In addition to providing valuable information for the researcher, a literature study can also be used as a tool for communicating the existing knowledge on a topic to others. It can be an important component of a research proposal, thesis or dissertation and it is required in most scientific and academic fields.

Overall, a literature study is an essential step in the research process that helps to identify existing knowledge, understand the current state of research, and guide the direction for future research.

2.2 Literature Review

NO.	TITLE/AUTHOR	OBJECTIVE	METHOD	RESULT
1	<p>Novel Home Automation System using Bluetooth and Arduino - Kannapiran S, -Dr. Arvind Chakrapani</p>	<p>Android mobile with Bluetooth module are serves as the transmitter for sending commands to control the appliances. Arduino UNO controller board is a microcontroller that serves as the central control unit for the system and interfaces with the loads (appliances) using electromagnetic relays. Electromagnetic relays use devices that allow the Arduino controller to control the power supply to the appliances. Home appliances are the devices being controlled by the system, such as lights, fans, and other household appliances. Smart phone or tablet which are supported by Android OS, act as the remote control for the system and allow the user to send commands to the Android mobile with Bluetooth module.</p>	<p>Using an Android mobile with Bluetooth module to control the home appliances. Using GUI (graphical user interface) commands to control the appliances. Using MIT App Inventor, an Android app creator tool, to design the home automation system (HAS). Using blocks in MIT App Inventor to design the app without the need for coding languages like Java or PHP. Using the internet connection to create the app, but allowing it to be used offline once it is installed on an Android phone or tablet with Bluetooth module.</p>	<p>Cost-effective and low maintenance: The system is designed to be affordable and easy to maintain. User-friendly: The system is designed to be easy to use, especially for elderly and differently abled people. Centralized control: The system allows the user to control the appliances from a single location, using an Android phone. Time-saving: The system allows the user to operate the appliances more efficiently, saving time. Reduced wiring: The system reduces the need for wires compared to conventional switch systems. Remote control and monitoring: The system allows the user to control the appliances and monitor their</p>

				status from a remote location. Potential for further application: The system could potentially be used for automation in industries, malls, and hospitals.
2	<p>Bluetooth Based Smart Automation System Using Android</p> <p>-Poonam V. Gaikwad - Yoginath R. Kalshetty</p>	<p>Control operating devices with minimal or reduced human effort, using wireless technology. To use Bluetooth, a low-cost communication, technology, to control household appliances and provide security for elderly and disabled people. Control home appliances such as lights and fans. To provide home security and emergency alerts. To save energy by automatically turning off lights at night time. Next, detect smoke or gas leaks and provide alerts to the user. Finally, provide increased quality of life and comfort to users.</p>	<p>Control home appliances like turn ON/OFF lights in every room and Turn off fan, turn it on LOW/HIGH speed within Bluetooth range from android Smartphone application. In terms of lighting control system, it is easy to AUTO OFF lights at night time by setting time for saving wastage of energy in residential passage. Smoke detector can detect smoke or gas leakage condition causing alert notification highlighted on user's smartphone. Able to know current temperature in room in degree Celsius. When user is in home or out of home activation of door security, when door opened by thief, buzzer started continues alarm tone for alert notification.</p>	<p>Control of household appliances such as lights and fans. Automatic turning off of lights at night time based on a set schedule. Ability to monitor and display the current temperature. Home security features, including alerts for smoke detection and gas leaks, as well as security alarms for doors and windows. Feasibility due to low cost. Potential to be especially beneficial for elderly and disabled people.</p>

<p>3</p>	<p>Bluetooth Controlled Car with Arduino</p> <p>-K.M. Tousif Bin Parve -Mohiuddin Khan Mahin -Kazi Tanvir Ahmed -Palash Mia -Md. Mahmudur Rahman Sarkar</p>	<p>To design and build an Arduino-based remote-controlled car with using Bluetooth technology to control the car remotely. Next, to enable the car to be controlled by any smart device with Android operating system. Thus, the Arduino microprocessor with a program that allows the car to be controlled through Bluetooth. Finally, test the car's mobility and Bluetooth control functionality.</p>	<p>Give command using app or remote and send it through wireless or bluetooth system. Then receive data from the app using Bluetooth module. Recognize data command by the microprocessor. Execute the instruction by controlling the motor drives.</p>	<p>A prototype of an Arduino-based remote-controlled car has been designed and built. ³ The car can be controlled remotely using either Bluetooth or infrared. Car has basic mobility features, including the ability to move forward, backward, and turn. Additional functionality, such as line tracking and custom mode, can be added to the software using an ultrasonic sensor and modifying the code. Finally, car's Bluetooth control functionality and mobility have been tested and found to be satisfactory.</p>
<p>4</p>	<p>Android Controlled Automatic Jack System for Vehicle</p> <p>- Sourabh Savadatti , Amit Doddamani, Vijaylaxmi N Nadagouda, Sahana</p>	<p>Project is to design and develop an automatic car jack system that can be controlled using an Android app. The goal is to make it easier and more convenient for people to change a flat tire, by eliminating the</p>	<p>The "My JACK" Android app is downloaded from the Google Play store and used to control the movement of the car jack. The app is built using "TheAppBuilder" software and requires the user to sign in and</p>	<p>An inbuilt automatic car jack system has been designed and developed, which can be easily attached to any currently manufactured chassis and frame.</p>

	<p>M Konnur , Chetan Patil</p>	<p>need to manually operate a traditional car jack. The system will use a 12V power supply obtained from the car battery and will be placed in the middle of the vehicle's chassis. The operator will be able to control the movement of the jack using the app, without having to work in a bent or squatting position for an extended period of time. The project aims to improve upon existing car jack technology to address the common problem of difficulty and inconvenience in changing a flat tire.</p>	<p>create an account for security purposes. Once the user has logged in, they can choose between front and back alignment options to position the jack between the front or back tires of the vehicle. The user can then use the "complete" button to finalize the positioning of the jack. The "OPEN" and "CLOSE" options are used to control the movement of the jack, with "OPEN" lifting the vehicle and "CLOSE" returning the jack to a vertical position. The app can be installed on the dashboard of the car or used on a mobile device, and communicates with the Arduino board through the Wi-Fi module using an IP address.</p>	<p>The jack is mounted centrally to the front suspension of the vehicle between its front wheels, and is capable of achieving horizontal levelling according to topological conditions. The movement of the jack from front to back and vice-versa is possible using a 12V car battery as the power source. The Android app can be installed on the dashboard of the car to display the movement of the jack. The design of the automatic jack system has been improved upon existing car jacks in terms of features and design, with an emphasis on safety, reliability, and the ability to raise and lower the vehicle using the internal car battery and Android app. The automatic jack system has been tested and found to be safe</p>
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				to use, with sufficient torque to lift vehicles weighing up to 2500 Kg.
5	<p>ROBOTIC CAR USING ARDUINO WITH BLUETOOTH CONTROLLER</p> <p>- Vijayalakshmi - Archana m</p>	<p>The objective of this project is to design and develop an Android-controlled temperature sensing RoboCar using Arduino, a DC motor driver, a temperature sensor (DHT11), and a Bluetooth module. The RoboCar will be able to sense the temperature of its environment and transmit this information to a smart device with the Android operating system using Bluetooth technology. The device can be controlled remotely using the smart device, and the location of the car can be viewed using the AirDroid app. The RoboCar is intended to be used for sensing the environment in military operations, and can be programmed using the Arduino code and simulated on software before being interfaced with the hardware.</p>	<p>An Android mobile phone is used to control the movement of a robotic car by touching buttons on the phone's screen. The car is equipped with Arduino, DC motors, a motor driver (L293D), a battery, and a Bluetooth module (HC-06). The Bluetooth module is placed in the car and operates in slave mode, receiving commands from the Android mobile phone, which acts as the transmitting device. The car has two DC motors, one at the front and one at the rear, which are used to control the direction and movement of the car, respectively. The front motor is used for turning the car left or right, while the rear motor is used for driving the car forward and backward. The AirDroid application is used to connect the mobile camera device to the PC, allowing the car's movements to be viewed on the PC.</p>	<p>After simulating the circuit connections, it will be used to detect the Temperature and Humidity of the environment. Connections were made as per the circuit diagram and the file of the code of arduino was attached to the Arduino uno.</p>

2.3 Summary

I learned about relevant literature reviews in chapter 2, which was quite helpful to me when working on this research. Examining the advantages and disadvantages of earlier study in the same area might help researchers adopt a more effective innovation and sustainability for control of their studies.

CHAPTER 3

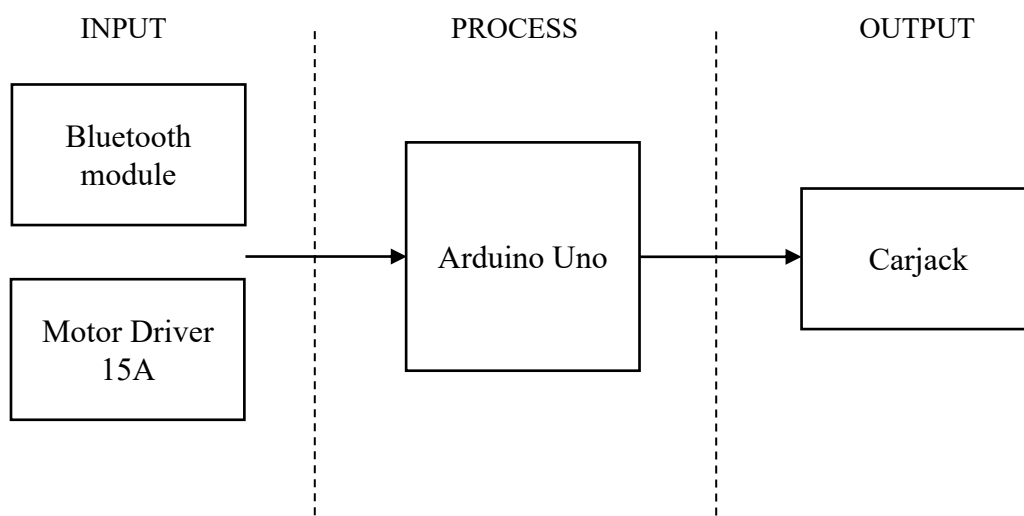
3.1 Introduction

To develop a system that allows a smartphone to control a car jack for electric cars using Bluetooth technology. Our methodology will consist of several steps including design and implementation of the car jack, smartphone application development, and integration of the smartphone and car jack. We will be using Bluetooth for wireless communication between the smartphone and car jack. Bluetooth is a power-efficient version of Bluetooth technology which is well suited for low-power devices such as smartphones and car jacks. The smartphone application will be developed using a cross-platform mobile app development framework such as React Native or Flutter. The app will allow users to remotely control the car jack and receive real-time feedback on the car jack status. One of the potential challenges that we may encounter during the implementation is the security risks associated with Bluetooth communication. To overcome this, we will be using secure communication protocols and implement user authentication to protect against unauthorized access. In the following sections, we will provide more details of the methodology and its components as well as its implementation and testing.

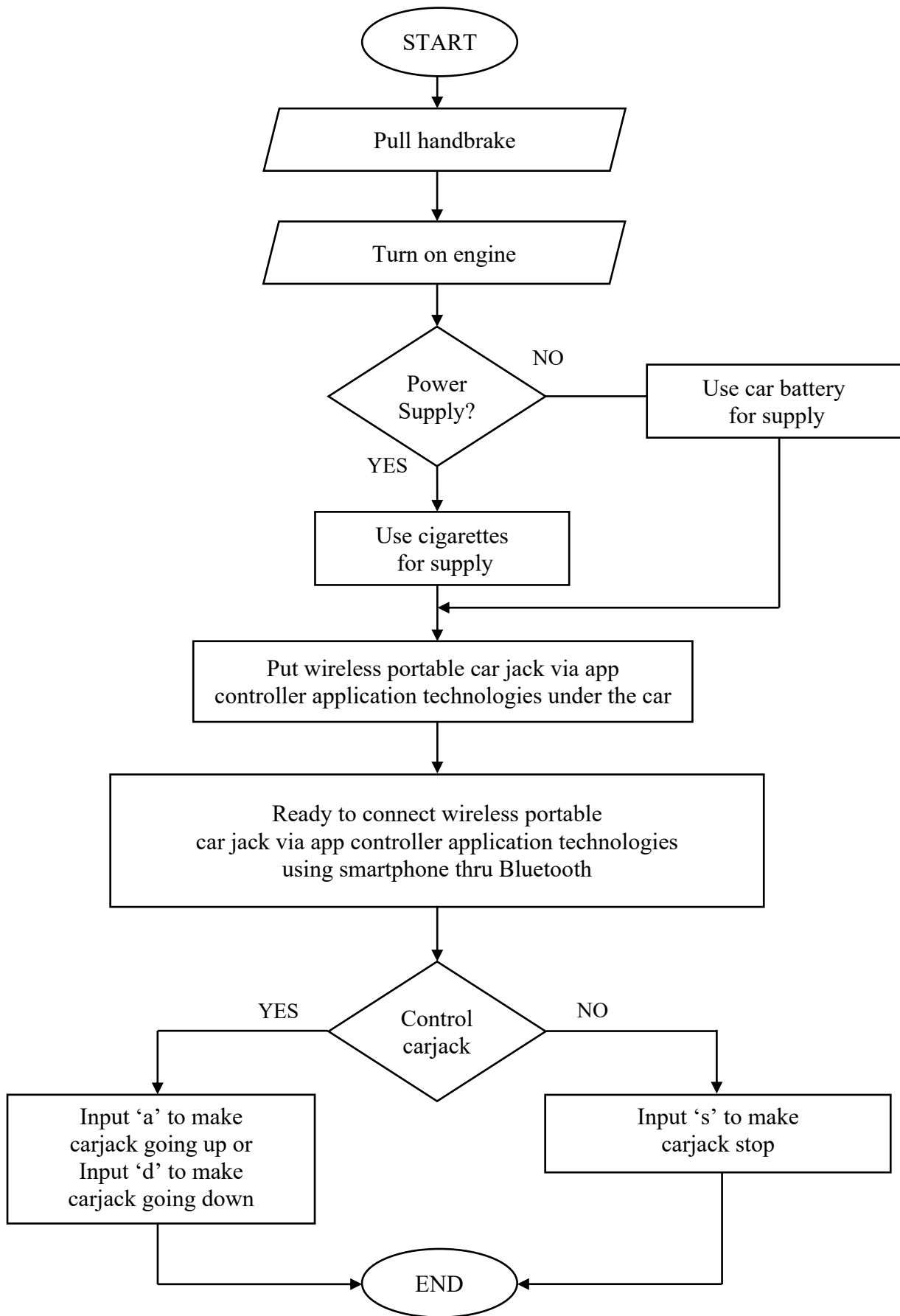
3.2 Project Design and Overview

As mention in the previous chapter, the designed controller is using controlling by Bluetooth system with Arduino as the main controller. The design of the controller circuit using Arduino realizes using code is programmed in Arduino.

3.2.1 Block diagram



3.2.2 Flowchart project



3.2.3 Project Description

The topic of wireless communication is a portable automobile jack that can be operated by an app. Bluetooth allows the wireless portable vehicle jack to connect wirelessly to the app controller. With a range of up to 8 metres, this enables a safe and dependable connection between the vehicle jack and the smartphone. Smartphone programme. A smartphone user can download the app controller as a mobile application. It enables customers to remotely manage the automobile jack and get real-time updates on its condition. The programme will work on Android smartphones. Motor control is next. A high-torque engine that can lift a car up to one tonne in weight powers the automobile jack. A microprocessor controls the motor by receiving orders from the smartphone app and carrying them out. not just that, Safety features are also very important. To guarantee its safe use, the automobile jack contains a number of safety measures. This features sensors that identify if the car is not correctly positioned on the jack, an automated shut-off when the vehicle is fully lifted, and a safety lock mechanism to prevent unintentional vehicle lowering. Durability: The automobile jack is composed of strong, premium materials that can survive the elements. Its small size and portability make it simple to carry when travelling, and its light weight makes handling effortless.

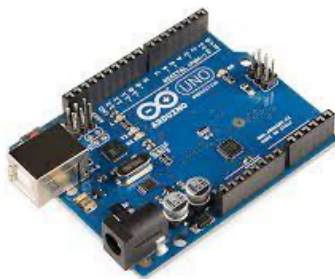
3.3 Project Hardware

As mentioned in the previous chapter, Arduino UNO as the microcontroller that controls the project. Then, there are some components like Bluetooth Arduino HC-05, motor driver 15A are using for this my project.

3.3.1 Description of main Component

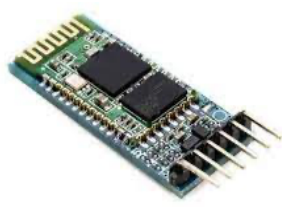
The materials used in this project are highly emphasized in terms of the required characteristics, reasonable cost, function of the material, the level of safety found in each material, and more. This is to ensure that this project is a high-quality project.

1. Arduino UNO



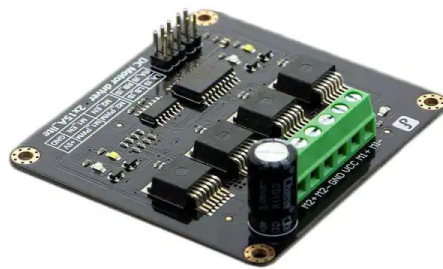
Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

2. Bluetooth Arduino HC-05



Wireless communication is swiftly replacing the wired connection when it comes to electronics and communication. Designed to replace cable connections HC-05 uses serial communication to communicate with the electronics. Usually, it is used to connect small devices like mobile phones using a short-range wireless connection to exchange files. It uses the 2.45GHz frequency band. The transfer rate of the data can vary up to 1Mbps and is in range of 10 meters. The HC-05 module can be operated within 4-6V of power supply. It supports baud rate of 9600, 19200, 38400, 57600, etc. Most importantly it can be operated in Master-Slave mode which means it will neither send or receive data from external sources.

3. Motor Driver 15A



This DC Motor Driver can be used in 4WD mobile robot platforms, combat robots, smart car competition, to drive pumps, electric fans, conveyors, etc. This module uses 4 high-performance & high-current driver chips - BTS7960 with the function of current short, over temperature, over voltage protection. You can control 2 motors with only 4 digital IO at the same time. Dual 15A@13.8V max output current, good responsiveness & braking performance. Four indicator leds are provided for easy and convenient debugging without motors. This DC Motor Driver module is directly compatible with Arduino.

3.4 Project software

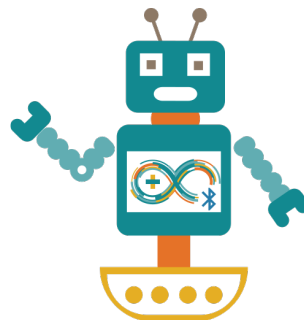
A software project is the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to the execution in a specified period of time to achieve intended software product. In this project I use Arduino IDE software to run the project to be realistic for project use in daily routine.

Arduino IDE



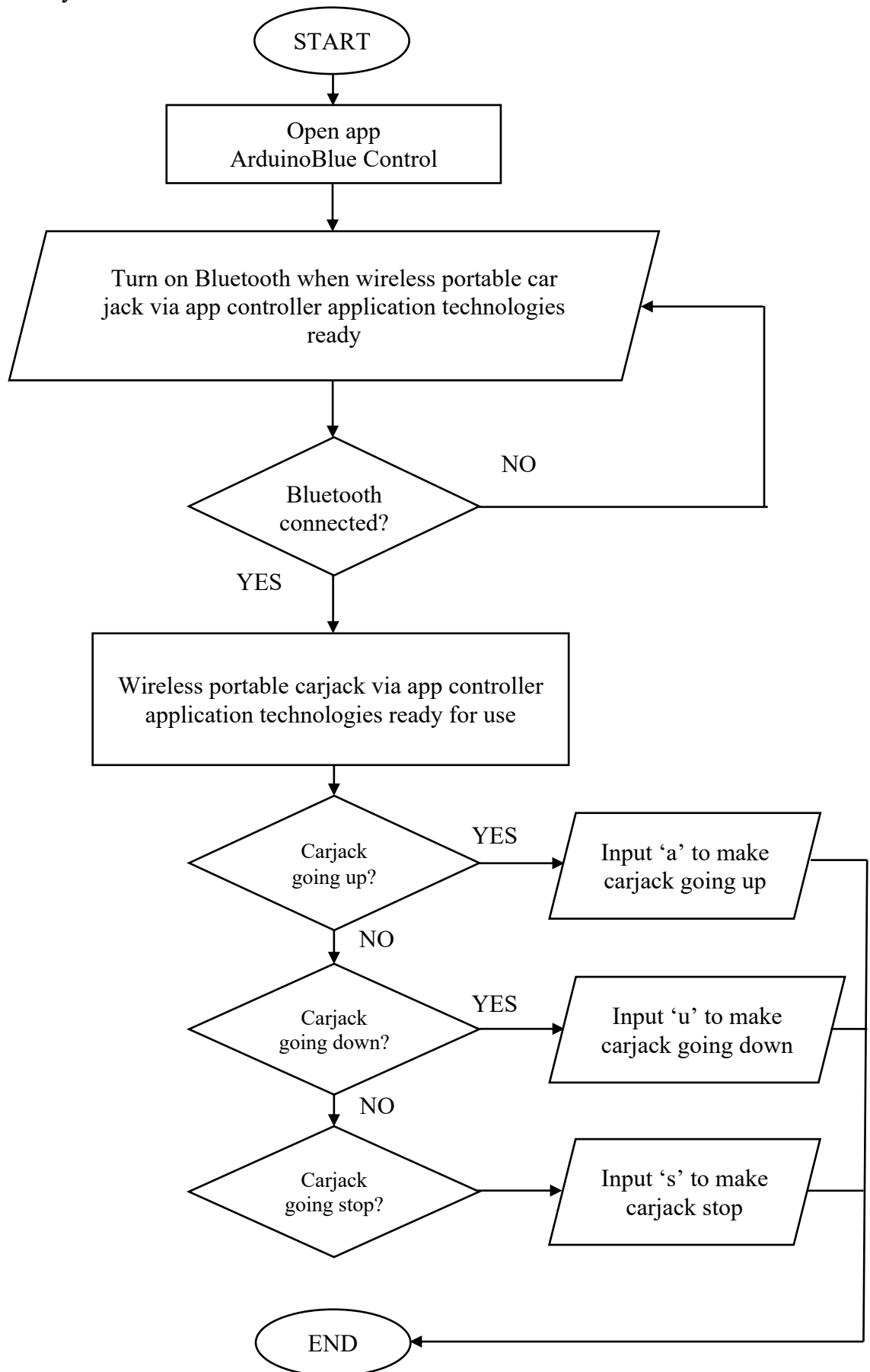
- Arduino is a cross-platform application written in C and C++ functions. It is used to build and upload programmes to Arduino compatible boards, but also to other vendor development boards using third-party cores.

Arduino BlueControl



- This Bluetooth app can be installed through the play store and is easy to set up. So, I just use the terminal from that app to run the carjack.

3.4.1 Flowchart system



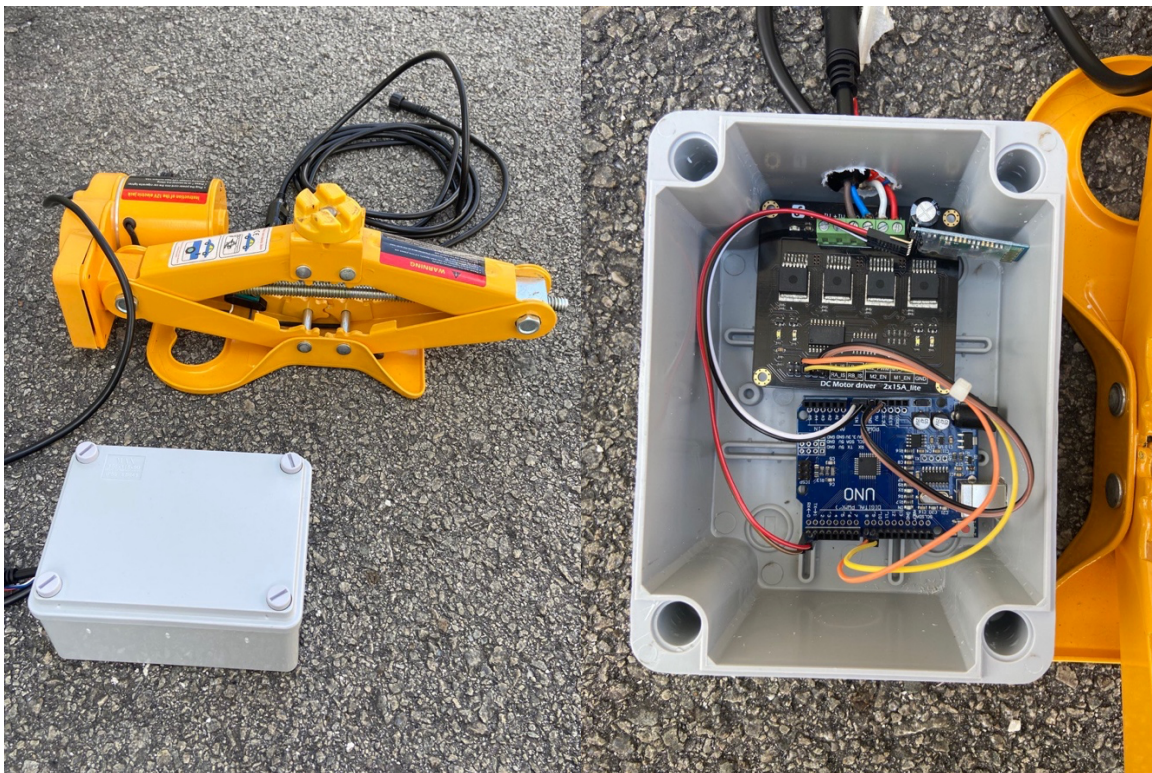
3.4.2 Description Flowchart

Here is a flowchart system for users who want to utilise the app controller application technologies to use our wireless vehicle jack. My systems are integrated and easy to utilise. We primarily use smartphones to stay connected here. To begin, we must access the programme and confirm that the automobile jack is turned on. Once linked, the user may download an application to control the vehicle jack.

3.5 Prototype Development

A prototype is most crucial benefit that it describe the real and future product. It can assist entice clients to buy for the product. High quality products can market products abroad and domestically.

3.5.1 Mechanical Design



3.6 Sustainability Element in Design Concept

In this subtopic, one should be aware of and gather crucial information on the project's design criteria, whether they be social or environmental (such as eco- and user-friendly) factors. The pricing of the goods is affordable, for instance, and this might have a positive impact on the economy. The device's marketing potential, potential as an entrepreneurial product, and ease of use are benefits for the nation. The proposed project's contribution to society is its ability to assess the significance of public health.

3.7 Summary

Chapter 3, I concentrate more on the project's manufacturing process. By using this methodology, we can learn more about the specifics of the manufacturing process for our innovation product. The methodology also outlines the procedures that must be followed in order to complete the project.

CHAPTER 4

4.1 Introduction

In my project in title wireless portable car jack via app controller application technologies based on input given form user, the result is ready to show to supervisor. In this chapter, the matter about the technical information of the project and the result will be discussed.

4.2 Result And Analysis

The project aimed to develop a system for controlling a carjack using Bluetooth and a smartphone. The system consisted of a Arduino uno board, Bluetooth module, motor driver and a carjack. The Arduino uno board was programmed to receive commands from a smartphone via Bluetooth and use the motor driver module to control the carjack.

The system was successfully developed and tested. The Arduino uno board was programmed using the Arduino IDE, and the Bluetooth module was configured to communicate with a smartphone using the HC-05 Bluetooth. The motor driver module was used to control the carjack and the system was able to lift and lower the car as expected.

The system was tested in a variety of conditions, including different loads on the carjack and different distances between the smartphone and the Arduino uno board. The system was found to be reliable and responsive, with no significant delays or errors in the communication between the smartphone and the microcontroller board.

Overall, the project was a success and the system developed has the potential to be useful in a variety of applications where remote control of a carjack is required. However, it is important to note that working with carjacks can be dangerous, and appropriate safety precautions should always be taken when using the system.

4.3 Discussion

Based on the result, the development of a system for controlling a carjack using Bluetooth and a smartphone has several potential benefits. One of the main advantages of this system is that it allows for remote control of the carjack, which can be useful in situations where the user needs to lift or lower a car from a distance. For example, if a car is parked in a tight space and the user needs to lift it to change a tire, the Bluetooth-controlled carjack can be a convenient solution. However, it is important to note that working with carjacks can be dangerous, and appropriate safety precautions should always be taken when using the system. The user should ensure that the car is properly supported and that the carjack is stable before lifting or lowering the car. Additionally, the user should be aware of the weight capacity of the carjack and avoid exceeding it.

4.4 Chapter Summary

The project's goal was to create a technology that would allow a smartphone and Bluetooth to control a carjack. Arduino uno board, Bluetooth module, motor driver and a carjack made up the system. The motor driver module was used to control the carjack while the microcontroller board was designed to accept instructions from a smartphone through Bluetooth. The system was successfully created and put through testing, where it was discovered to be dependable and responsive. However, it is crucial to utilise the system securely and take the necessary measures when working with carjacks. The system has the potential to be helpful in a range of applications where remote control of a carjack is necessary.

CHAPTER 5

5.1 Introduction

A way for controlling a carjack using Bluetooth and a smartphone was successfully developed as part of the project wireless portable car jack using app controller application technologies. An Arduino Uno board, a bluetooth module, a motor driver, and a carjack made up the system. The motor driver module on the Arduino uno board was configured to take commands from a smartphone through Bluetooth and operate the carjack. The technology has the potential to be helpful in a variety of applications where remote control of a carjack is necessary because it was found to be dependable and quick. When dealing with carjacking, it's crucial to utilise the system safely and take the necessary safety measures.

5.2 Conclusion

In conclusion, the project wireless portable car jack via app controller application technologies successfully developed a system for controlling a carjack using Bluetooth and a smartphone. The system consisted of a arduino board, Bluetooth module, motor driver and a carjack. The Arduino uno board was programmed to receive commands from a smartphone via Bluetooth and use the motor driver module to control the carjack. The system was found to be reliable and responsive, and has the potential to be useful in a variety of applications where remote control of a carjack is required.

The development of this system demonstrates the potential of Bluetooth and smartphone technology to improve the functionality and convenience of carjacks. By allowing users to control the carjack remotely, the system can make it easier and safer to lift and lower cars in a variety of situations. For example, the system could be used in a garage or workshop to lift cars for maintenance or repairs or in a parking lot to change a tire or perform other minor repairs.

The system has the potential to be utilised in educational settings to teach students about the fundamentals of robotics and automation in addition to its practical applications. Students may learn the fundamentals of Arduino Uno, Bluetooth connectivity, and motor control by creating and programming the system. The upcoming generation of engineers and inventors could be motivated by this.

However, it is important to use the system safely and take appropriate precautions when working with carjacks. The user should ensure that the car is properly supported and that the carjack is stable before lifting or lowering the car. Additionally, the user should be aware of the weight capacity of the carjack and avoid exceeding it.

The research was successful overall and has the potential to be beneficial in many other fields and applications. Even more sophisticated and practical methods for regulating carjacks and other kinds of machinery may be created as a result of more research and development in this field. We can continue to enhance the use and ease of our tools and equipment by utilising Bluetooth and smartphone technologies, which will make our lives simpler and more productive.

5.3 Suggestion future works

For every project always can be improve. So here are some improvement can I listed for next plan.

1. Increase the weight capacity of the carjack: The current system was tested with a relatively light load, and it may not be suitable for lifting heavier vehicles. Future improvements could focus on increasing the weight capacity of the carjack to make it more versatile.
2. Improve the range of the Bluetooth module: The current system was tested with the smartphone in close proximity to the microcontroller board, and it may not work reliably over longer distances. Future improvements could focus on improving the range of the Bluetooth module to allow for remote control from greater distances.
3. Add safety features: While the system is designed to be safe, accidents can still happen. Future improvements could focus on adding safety features such as sensors to detect when the car is properly supported, or emergency stop buttons to quickly stop the carjack in case of an emergency.
4. Explore other control methods: While Bluetooth and smartphone control is convenient, it may not be suitable for all applications. Future improvements could explore other control methods such as Wi-Fi, radio frequency, or wired control.

The technology created for this project has a lot of promise for advancements and uses in the future. The system might become even more adaptable and helpful in a range of sectors and applications by fixing some of the shortcomings and including new features.

5.4 Chapter Summary

The project successfully developed a system for controlling a carjack using Bluetooth and a smartphone. The system consisted of Arduino uno board, Bluetooth module, a motor driver, and a carjack. The Arduino uno board was programmed to receive commands from a smartphone via Bluetooth and use the motor driver module to control the carjack. The system was found to be reliable and responsive and has the potential to be useful in a variety of applications where remote control of a carjack is required.

The creation of this system shows how Bluetooth and smartphone technologies may be used to enhance the usefulness and practicality of carjackings. The device can make it simpler and safer to raise and lower automobiles in a variety of scenarios by giving users remote control over the carjack. The device might be used, for instance, to elevate automobiles in a garage or workshop for maintenance or repairs, or in a parking lot to change a tyre or do other small repairs.

The system has the potential to be utilised in educational settings to teach students about the fundamentals of robotics and automation in addition to its practical applications. Students may learn the fundamentals of microcontrollers, Bluetooth connection, and motor control by constructing and programming the system. The upcoming generation of engineers and inventors could be motivated by this.

However, it is important to use the system safely and take appropriate precautions when working with carjacks. The user should ensure that the car is properly supported and that the carjack is stable before lifting or lowering the car. Additionally, the user should be aware of the weight capacity of the carjack and avoid exceeding it.

Suggestions for future improvements include increasing the weight capacity of the carjack, improving the range of the Bluetooth module, adding safety features, developing a user-friendly app and exploring other control methods. By addressing some of the limitations and adding new features, the system could become even more versatile and useful in a variety of industries and applications.

Overall, the project was a success and has the potential to make a positive impact in a variety of industries and applications. By harnessing the power of Bluetooth and smartphone technology, we can continue to improve the functionality and convenience of our tools and equipment, making our lives easier and more efficient.

CHAPTER 6

6.1 Introduction

Here, I pick up knowledge about budgeting, costing, and project management. The use of strategies, methods, skills, knowledge, and experience to accomplish project goals in compliance with project acceptance criteria while keeping within predetermined boundaries is known as project management. The purpose of costing is to determine and manage expenses during a project in order to maintain costs within the parameters of the allocated budget.

6.2 Gantt Chart

21	Task Name	Implementation	Duration (Days)	Cost (RM)	Date	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14		
						(9.02.2023 - 15.02.2023)	(16.02.2023 - 22.02.2023)	(23.2.2023 - 1.03.2023)	(2.3.2023 - 8.03.2023)	(9.03.2023 - 15.03.2023)	(23.03.2023 - 29.03.2023)	(30.3.2023 - 5.04.2023)	(6.4.2023 - 12.04.2023)	(13.04.2023 - 19.04.2023)	(20.04.2023 - 26.04.2023)	(4.05.2023 - 10.05.2023)	(11.05.2023 - 17.05.2023)	(18.05.2023 - 24.05.2023)	(25.05.2023 - 31.05.2023)		
22	INSTALLATION	Plan	84	0.00																	
		Actual	84	0.00																	
23	INSTALLATION OF COMPONENTS ON PCB	Plan	35	0.00																	
		Actual	42	0.00																	
24	INSTALLATION OF WIRING	Plan	28	0.00																	
		Actual	35	0.00																	
25	INSTALLATION OF SOFTWARE	Plan	35	0.05																	
		Actual	42	0.00																	
26	INSTALLATION OF CONTROL CIRCUIT / SYSTEM	Plan	42	0.00																	
		Actual	28	0.00																	
27	INSTALLATION OF PROJECT CASING	Plan	35	0.00																	
		Actual	35	0.00																	
28	TESTING	Plan	91	0.00	XX/XX/XXXX																
		Actual	91	0.00	XX/XX/XXXX																
29	TEST THE ELECTRONIC PART	Plan	35	0.00	XX/9/XXXX																
		Actual	42	0.00	XX/9/XXXX																
30	TEST THE MECHANICAL PART	Plan	28	0.00	XX/9/XXXX																
		Actual	35	0.00	XX/9/XXXX																
31	TEST THE OVERALL PROCESS / PROJECT	Plan	28	0.05	XX/9/XXXX																
		Actual	28	0.00	XX/XX/XXXX																
32	DOCUMENTS	Plan	98	0.00	XX/XX/XXXX																
		Actual	98	0.00	XX/XX/XXXX																
33	PREPARATION OF SLIDE PRESENTATION	Plan	28	0.00	10/08/2023																
		Actual	35	0.00	10/08/2023																
34	PREPARATION OF LOGBOOK	Plan	98	0.00	05/09/2023																
		Actual	98	0.00	05/09/2023																
35	PREPARATION OF PROJECT 2 FINAL REPORT	Plan	42	0.00	24/05/2023																
		Actual	49	0.00	25/05/2023																
36	PREPARATION OF INSTRUCTION MANUAL	Plan	7	0.00	25/05/2023																
		Actual	7	0.00	25/05/2023																
37	END	Plan	7	0.00	25/05/2023																
		Actual	7	0.00	25/05/2023																

6.3 Cost and Budgeting

Components and materials will need to be acquired along the procedure. The Arduino Uno, Bluetooth module, motor driver and carjack are cost-related components. To save time and money, all of these components were purchased online.

No.	Component	Unit Price	Quantity	Total
1.	Arduino Uno	RM39	1	RM39
2.	Carjack 12V	RM210	1	RM210
3.	Bluetooth module	RM30	1	RM30
4.	Jumper Arduino male male	RM10	1 set	RM10
5.	Jumper Arduino male female	RM10	1 set	RM10
6.	Jumper Arduino female female	RM10	1 set	RM10
7.	Enclosure box (casing)	RM8.9	1	RM8.9
8.	Motor Driver 15A	RM226	1	RM226
Total				RM543.9

6.4 Financial Recourse

The financial resources of the project are self-financed and parents support through the purchase of some basic components. At first I wanted to use 100% of my own money but my parents wanted to give as a sign of supporting my final project. I am thankful that my project is still affordable which does not reach up to thousands of ringgit

6.5 Chapter Summary

For the project I completed, I have put out the Gantt chart and the activities. The cost and budget that I have suggested for the project development procedures is the last item. The main parts of this chapter are the description of how the finished system works, the project planning (Gantt Chart) that was developed from the start of the project, and the budget costing that was established during the project development.

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