POLITEKNIK

SULTAN SALAHUDDIN ABDUL AZIZ SHAH

KIOSK CHARGING PHONE USING RFID

NAME	REGISTRATION NO
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JABATAN KEJURUTERAAN ELEKTRIK

SESI I 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 ELEKTRIK

SESI I 2022/2023

CONFIRMATION OF THE PROJECT

The project report titled "Kiosk charging phone using RFID" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by:

Supervisor's name : YAAKUB BIN OMAR

Supervisor's signature:

Date :

Verified by:

Project Coordinator name : WAN MOHD ZAMRI BIN WAN AB RAHMAN

Signature of Coordinator :

Date :

"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature :

Name : **MUHAMMAD RAFIQ IZZUDDIN BIN ROSLAN**

Registration Number : **08DEP20F2025**

Date :

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : KIOSK CHARGING PHONE USING RFID

SESSION: SESI 1 2021/2022

1. I, Muhammad Rafiq Izzuddin bin Roslan is a final year student of **Diploma in Electrical Engineering, Department of Electrical, Politeknik Sultan Salahuddin Abdul Aziz Shah**, which is located at **Persiaran Usahawan, 40150 Shah Alam, Selangor**. (Hereinafter referred to as 'the Polytechnic').

2. 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;

a) MUHMMAD RAFIQ IZZUDDIN) .
(Identification card No: - 021105030461) ..…….
) **MUHAMMAD RAFIQ**

In front of me, **YAAKUB BIN OMAR** (Click here to enter text.)) .....……
) **YAAKUB BIN OMAR**
As a project supervisor, on the date:

ACKNOWLEDGEMENTS

I put forth a lot of effort on this project. It would not have been possible, however, without the kind support and cooperation of many individuals and organisations. I'd like to thank each and every one of them from the bottom of my heart. I am grateful to Sir Yaakub bin Omar for their advice and regular supervision, as well as for providing critical information about the Project and assisting with its completion.

I'd want to express my appreciation to my parents and Polytechnic Sultan Salahuddin Abdul Aziz Shah members for their assistance and support in completing this project. I'd like to express my heartfelt appreciation and gratitude to industry professionals for their time and attention.

My thanks and appreciation also go to my colleague in the Project's development, as well as others who have generously shared their abilities with me.

ABSTRACT

A smartphone is a type of cell phone that can do more than just make phone calls and send text messages. Smartphones, like computers, can access the Internet and run software programmes. Smartphones allow consumers to interact with them via a touch screen. There are thousands of smartphone apps available, including games, personal-use, and business-use tools. The image depicts an Apple iPhone, one of the most popular smartphones on the market today. RFID is similar to barcoding in that data from a tag or label is collected by a device and saved in a database. RFID, on the other hand, provides certain advantages over barcode asset tracking software systems. The primary distinction is that RFID tag data may be read from a distance, whereas barcodes must be aligned with an optical scanner. RFID belongs to the Automatic Identification and Data Capture technology area (AIDC). AIDC approaches recognise items, collect data about them, and enter that data directly into computer systems with little or no human intervention. The Smartphone Charging Kiosk project's goal is to create smartphone charging kiosks that are safe and only accessible to persons with permission. The major RFID component is a card that is used to activate security by opening and closing a kiosk structured like a locker. The goal of this project is also to enable students utilise charging kiosks properly, with no occurrences of phone loss or theft.

(Keywords : Smartphone, RFID, Charging Kiosk, IoT)

ABSTRAK

Telefon pintar ialah sejenis telefon bimbit yang boleh melakukan lebih daripada sekadar membuat panggilan telefon dan menghantar mesej teks. Telefon pintar, seperti komputer, boleh mengakses Internet dan menjalankan program perisian. Telefon pintar membolehkan pengguna berinteraksi dengan mereka melalui skrin sentuh. Terdapat beribu-ribu apl telefon pintar yang tersedia, termasuk permainan, alat kegunaan peribadi dan kegunaan perniagaan. Imej itu menggambarkan iPhone Apple, salah satu telefon pintar paling popular di pasaran hari ini. RFID adalah serupa dengan pengekodan bar dalam data daripada tag atau label dikumpul oleh peranti dan disimpan dalam pangkalan data. RFID, sebaliknya, memberikan kelebihan tertentu berbanding sistem perisian pengesanan aset kod bar. Perbezaan utama ialah data tag RFID boleh dibaca dari jauh, manakala kod bar mesti diselaraskan dengan pengimbas optik. RFID tergolong dalam kawasan teknologi Pengenalpastian Automatik dan Tangkapan Data (AIDC). Pendekatan AIDC mengenali item, mengumpul data mengenainya, dan memasukkan data tersebut terus ke dalam sistem komputer dengan sedikit atau tiada campur tangan manusia. Matlamat projek Kiosk Pengecasan Telefon Pintar adalah untuk mencipta kiosk pengecasan telefon pintar yang selamat dan hanya boleh diakses oleh orang yang mempunyai kebenaran. Komponen RFID utama ialah kad yang digunakan untuk mengaktifkan keselamatan dengan membuka dan menutup kiosk berstruktur seperti loker. Matlamat projek ini juga adalah untuk membolehkan pelajar menggunakan kiosk pengecasan dengan betul, tanpa berlaku kehilangan atau kecurian telefon.

(Kata kunci : Telefon Pintar, RFID, Kiosk Pengecasan, IoT)

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CHAPTER 1

1 INTRODUCTION

1.1 Introduction

A smartphone is a cell phone that lets you do more than make phone calls and send text messages. Smartphones can browse the Internet and run software programs like a computer. Smartphones use a touch screen to allow users to interact with them. There are thousands of smartphone apps including games, personal-use, and business-use programs that all run on the phone. The picture is an example of the Apple iPhone, one of the most popular smartphones available today.

Cell phone charging stations are exactly what they sound like, mobile kiosk units that allow patrons to charge their cell phones and certain other types of mobile devices, like tablets and media players, for free. For those wanting to monetize foot traffic, mobile phone charging stations are a great way to do it. Patrons simply walk up to one of the available mobile phone charging stations, find the appropriate charging cable for their phone or other mobile device, plug in and charge. While patrons wait for their phones to charge, the cell phone charging stations display consumer friendly digital ads about what products, services, or events the hosting venue wants to highlight.

This Smartphone Charging Kiosk project aims to produce smartphone charging kiosks in a secure and accessible state to individuals with permission only. The main component that uses RFID is a card to activate security by using a verification card to open and close a kiosk shaped like a locker. The purpose of this project is also to help students use charging kiosks safely without any cases of loss or theft of the phone.

1.2 Background Research

In this project, I'm exploring for ways to lessen strain in people's lives using RFID smart phone charging lock systems. Is it true that employing a smart lock system will improve overall security? And what kind of prototype will be built to ensure that the transfer is seamless?

1.3 Problem Statement

This smart phone charging kiosk project is chosen because students and staff who visit the mechanical workshop often lack a charging switch to charge smart phones. When the switch is only available in a certain corner, the students and staff need to charge smart phones in an open environment and away from the owner the smartphone.

As a result, charging a smartphone out in the open and away from the owner will only exacerbate issues like the possibility of theft or loss.to prevent a number of issues in the event that this smartphone is stolen or lost. Because there is a security system that uses RFID, installing this smartphone charging kiosk can reduce the occurrence of unwanted issues.

1.4 Research Objectives

1. Prevent the occurrence of theft or loss of the smartphone by using the RFID system.
2. Activate security by using an authentication card to open and close the locker-shaped kiosk.
3. Able to charge the smartphone without experiencing problems or worries when leaving the smartphone in the kiosk after it is locked.

1.5 Scope of Research

Phone charging kiosks using RFID are built for safer use for staff and students. In addition, this system has also used waves or through sensors only to unlock the kiosk. Staff and students can register access cards for phone charging kiosks using RFID on the side of the kiosk when picking up access cards.

This project was built for the Polytechnic Shah Alam Electrical Workshop. This project was developed to repair and help overcome phone problems from cases of loss at any time. Constraints define limitations for project including time, resource and performance Project will be completed within 20 days, cost of developing project is RM350.00, hardware resources are available for two months.

1.6 Project Significance

The need for protection has grown in these days of rising crime rates. The RFID smart phone charging lock system prototype will be able to answer the rising demand for an upgraded security system. Furthermore, given the current state of the economy, everyone anticipates a less expensive system with higher commercial value. As a result, the prototype will be able to assist in cost reduction and providing more for what customers pay for.

Following that, the lock systems that will be developed can be owned by the entire local community. It will indirectly improve product sales and profit. The prototype is user-friendly due to its simple operation and ease of learning. Furthermore, the technology is environmentally benign and does not hurt the environment.

1.7 Chapter Summary

In this chapter, I have provided an overview of the upcoming project and detailed the background of the original concept for the beginning of this project, as well as the challenges that are occurring. In addition, I presented the project's objectives. I also remember the project's significance based on the study's objectives. I hope that this project will benefit a large number of people.

CHAPTER 2

2 LITERATURE REVIEW

2.1 Introduction

A literature review is the foundation for high-quality medical education research, helping to maximise relevance, originality, generalizability, and impact. A literature review provides context, educates methodology, promotes innovation, reduces duplicative research, and ensures adherence to professional standards. Iterative literature reviews are time-consuming and should be done throughout the research process. Human resources, search technologies, and current literature should all be used to their full potential by researchers.

Our project outperforms all existing products. Our proposal consists mostly of a mechanism that opens the lock when an authorised card is scanned on the system. If the card is misplaced, a different random card can be used to scan the system, which will send a notification to the owners' cell phones.

This allows the owner to authorise or deny the access attempt to their property. If the owner or someone the owner recognises is about to enter, the owner always has control. This also ensures that the owner notices any strange attempts to access their homes, making them cautious and prompting them to take additional action.

2.2 Security Challenge in Our Daily Life

Human security is translated relatively differently in different cultures and at different eras depending on the level of development, democratic orientation, ethics, societal attitudes toward gender, and ethnic group, opinion, and belief disparities. It is related to basic needs and basic human rights, as well as their fulfilment and respect. The idea of equilibrium/balance between needs and resources, rights and duties, and order and tolerance is central to the concept of human security.

A lack of balance causes issues in a variety of areas. Unbalanced economic globalisation, for example, leads to economic crisis and poverty; unbalanced use of natural resources leads to environmental destruction, pollution, and famine; unbalanced provision of basic health services leads to the spread of pandemics; and unbalanced security measures, combined with declining civic responsibility, leads to urban violence and, ultimately, terrorism.

2.3 Control System

A control system governs, commands, directs, or regulates the behaviour of other devices or systems through control loops. It can range from a single thermostat-controlled home heating controller to large industrial control systems used to operate processes or machinery. The control engineering method is used to design control systems. A feedback controller is used to operate a process or operation automatically for constantly modulated control. The control system compares the value or status of the controlled process variable to the desired value or setpoint and uses the difference as a control signal to bring the plant's process variable output to the setpoint. For sequential and combinational logic, software logic, such as that found in a programmable logic controller, is used.

There are two types of control actions: open loop and closed loop. In an open-loop control system, the controller's control action is independent of the process variable. A feedback loop in a closed-loop controller ensures that the controller controls a process variable at the same value as the setpoint. As a result, closed-loop controllers are also sometimes referred to as feedback controllers.

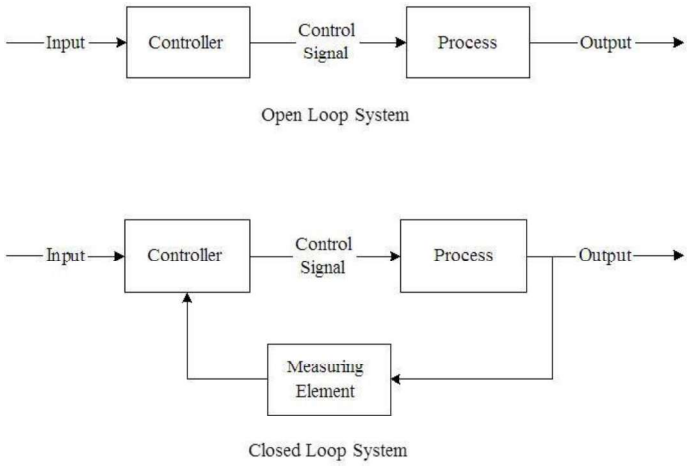


Figure 2.1: Block diagram of open loop and closed loop system

2.3.1 Microcontroller

"Microcontroller" is an excellent name because it emphasises the distinguishing aspects of this product category. The phrase "controller" suggests a better ability to undertake control tasks, while the prefix "micro" denotes smallness. This functionality is the result of combining a digital processor and digital memory with additional hardware designed to aid the microcontroller in interfacing with other components.

2.3.2 ESP8266 Wi-Fi Module

The ESP8266 Wi-Fi Module is a self-contained SOC with an integrated TCP/IP protocol stack that allows any microcontroller to connect to your Wi-Fi network. The ESP8266 may run programmes or offload whole Wi-Fi networking activities from another processor. An ESP8266 Wi-Fi module is a single-chip microcontroller that is mostly used to build end-point IoT (Internet of things) applications. It is known as a standalone wireless transceiver, and it is relatively cheap. It connects a variety of embedded system applications to the internet.

2.3.3 Arduino

The Arduino UNO is an excellent learning tool for electronics and coding. If this is your first time experimenting with the platform, the UNO is the best place to start. The Arduino UNO is the most popular and well-documented Arduino board. The Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital I/O pins (of which 6 can be used as PWM outputs), 6 analogue inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button.

2.4 Chapter Summary

The first section of this chapter concentrates on the project's findings, with some summary from the research papers regarding the project's development process. The second section offers information about the technical part, such as the controller type. This chapter also highlights and explains the technologies or approaches used by prior researchers to respond to the problem statement. An Arduino Uno will serve as the primary controller in this project.

CHAPTER 3

3 RESEARCH METHODOLOGY

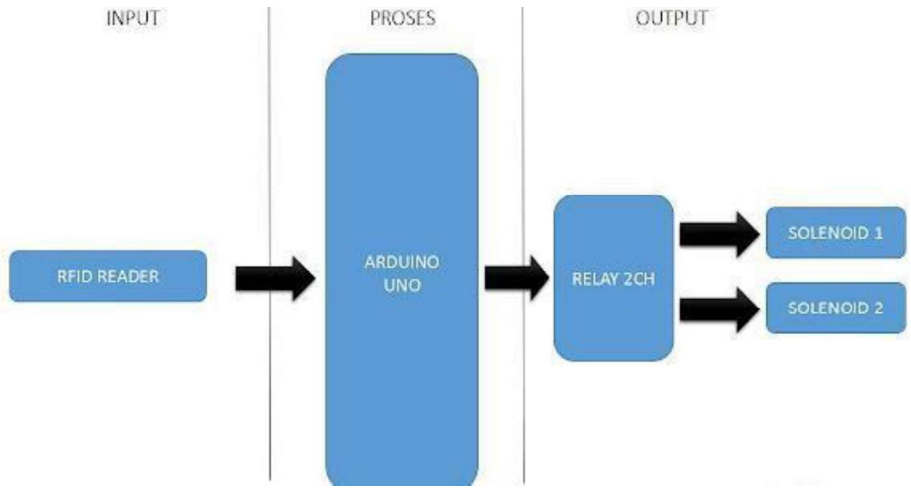
3.1 Introduction

Study methodology refers to the practical "how" of any given piece of research. It is largely concerned with how a researcher designs a study in order to obtain accurate and reliable data that address the research aims and objectives. A comprehensive approach is being taken to realise this project as a ready-to-use device with safety features. To ensure that the Project is completed on time, a step-by-step approach is used.

3.2 Project Design and Overview.

The designed controller, as mentioned in the previous chapter, employs a closed-loop system using Arduino as the primary controller. The controller circuit is designed using Arduino with components such as wire jumper cable, adapter, RFID reader, salenoid, and relay 2 channel, which is then realised using Proteus Software and converted to PCB circuit.

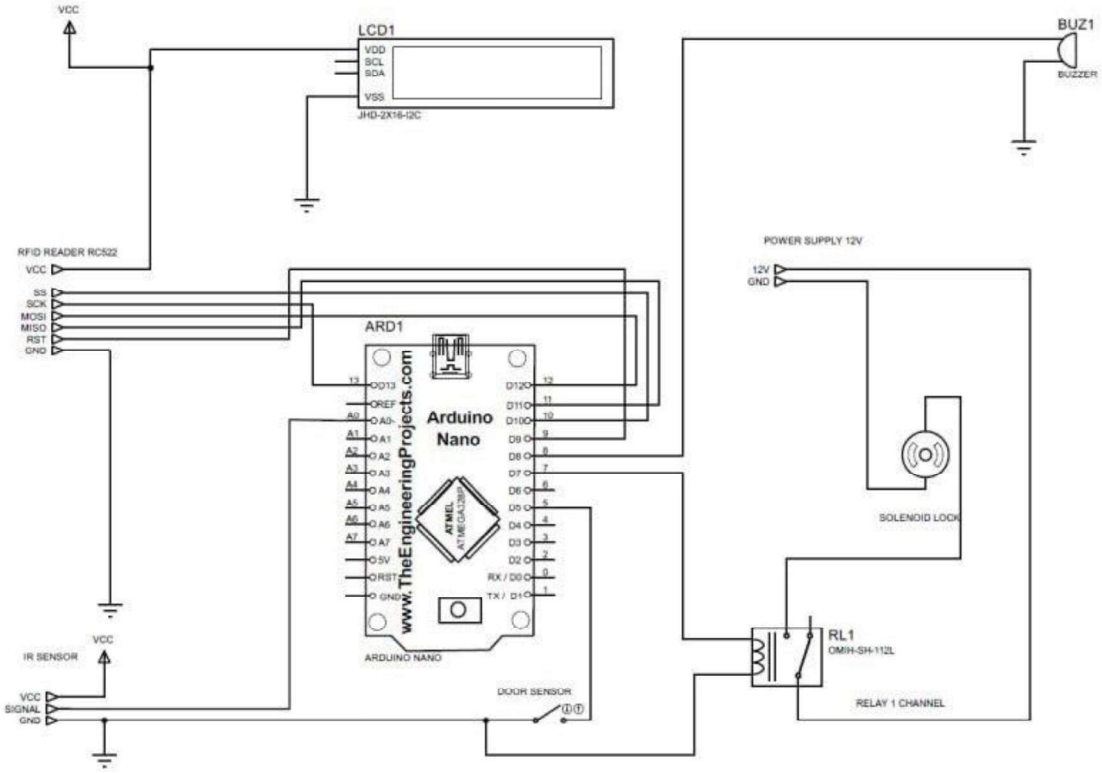
3.2.1 Block Diagram of the Project



3.3 Project Hardware

The controller circuit is designed using Arduino with components such as wire jumper cable, adapter, RFID reader, salenoid, and relay 2 channel.

3.3.1 Schematic Circuit



3.3.2 Description of Main Component

The main components for this circuit are Arduino, RFID reader, and relay 2 channel with wire jumper cable, adapter, and salenoid.

3.3.2.1 Arduino Uno

The ATmega328P-based Arduino UNO is a microcontroller board. It contains 14 digital I/O pins (of which 6 can be used as PWM outputs), 6 analogue inputs, a ceramic resonator operating at 16 MHz, a USB connection, a power jack, an ICSP header, and a reset button. It comes with everything you need to support the microcontroller; simply connect it to a computer through USB or power it is using an AC-to-DC adapter or battery to get started.

3.3.2.2 RFID Reader

RFID is an abbreviation for Radio Frequency Identification. The Parallax RFID Reader Serial + Tag Sampler comes with a variety of RFID tags. This guide will walk you through the process of connecting the RFID Card Reader to the Propeller microcontroller. It will next demonstrate how to read a tag's ID number and utilise that data in a programme. The RFID Card Reader - Serial requires two Propeller I/O pin connections in addition to 5V and ground. P2 will be set to output in order to enable the RFID reader. P1 will be set to input in order to read the serial data from the RFID Reader. Because the reader emits a 5 V signal and the Propeller chip is a 3.3 V device, a 2.2 k-ohm resistor is used for this connection.

3.3.2.3 Relay

A relay is a type of electrical switch. It is made up of an input terminal for a single or more control signals and an operating contact terminal. The switch may have an unlimited number of contacts in various contact forms, such as make contacts, break contacts, or combinations of the two. Relays are employed when an independent low-power signal must control a circuit or when numerous circuits must be controlled by a single signal. Relays were first utilised as signal repeaters in long-distance telegraph circuits: they refresh the signal coming in from one circuit by transmitting it on another. Relays were widely employed to conduct logical operations in telephone exchanges and early computers.

3.4 Project Software

This circuit is being simulated in this project using the Proteus application. The Arduino programme is the software that we use to design the coding for our project. Proteus can create a circuit design before we start prototyping. This software can help us simulate the circuit and ensure that current flows through all of the components. This is also to guarantee that all of the components function properly. Because it allows us to evaluate our component in software before testing it on the prototype, this programme can also help us protect it from overvoltage. After the coding is finished, the Arduino software can check it for bugs before converting it to a hex file for simulation in the Proteus application. After the coding has been applied to the Arduino in Proteus, this software may check to see if all of the components work properly. This can save time while diagnosing a problem, whether it's a coding problem or a circuit problem.

3.5 Prototype Development

A prototype is a look-alike or a copy of a part that demonstrates the product features and explores all possibilities before investing in the part's full construction. A prototype might range from a detailed pen and paper drawing to a fully functional commercial version. As a result, prototype development is just a set of processes taken by the manufacturer in order to construct the prototype.

3.5.1 Mechanical Design/Product Layout

3.6 Sustainability Element in The Design Concept

RFID stands for "radio-frequency identification" and refers to a technology that uses radio waves to capture digital data encoded in RFID tags or smart labels (described below). RFID is comparable to barcoding in the sense that data from a tag or label is taken by a device and stored in a database. RFID, on the other hand, has a number of advantages over systems that use barcode asset tracking software. The most apparent difference is that RFID tag data may be read from a distance, whereas barcodes must be aligned with an optical scanner. RFID is one of a category of technologies known as Automatic Identification and Data Capture (AIDC). With little or no human intervention, AIDC methods automatically recognise items, collect data about them, and enter that data straight into computer systems. RFID systems accomplish this by utilising radio waves. RFID systems are made up of three parts: an RFID tag or smart label, an RFID reader, and an antenna. RFID tags have an integrated circuit and an antenna that transfer data to an RFID reader (also called an interrogator). The radio waves are then converted by the reader into a more useable kind of data. The data acquired from the tags is subsequently sent to a host computer system via a communications interface, where it can be saved in a database and evaluated later.

An RFID tag, as previously said, is made up of an integrated circuit and an antenna. The tag is also made of a protective substance that binds the parts together and protects them from the elements. The protective substance used is determined on the application. Employee ID badges with RFID tags, for example, are normally composed of sturdy plastic, with the tag implanted between the layers of plastic. RFID tags are available in a range of shapes and sizes, and they can be passive or active. Because they are smaller and less expensive to install, passive tags are the most commonly used.This Smartphone Charging Kiosk project seeks to create smartphone charging kiosks that are safe and only accessible to persons with permission. The major RFID component is a card that is used to activate security by opening and closing a kiosk structured like a locker. The goal of this project is also to enable students utilise charging kiosks properly, with no occurrences of phone loss or theft.

3.7 Chapter Summary

This chapter detailed the project design and overview, including a flowchart of the project and a block diagram of the project. Aside from that, this chapter discusses the component used in this project.

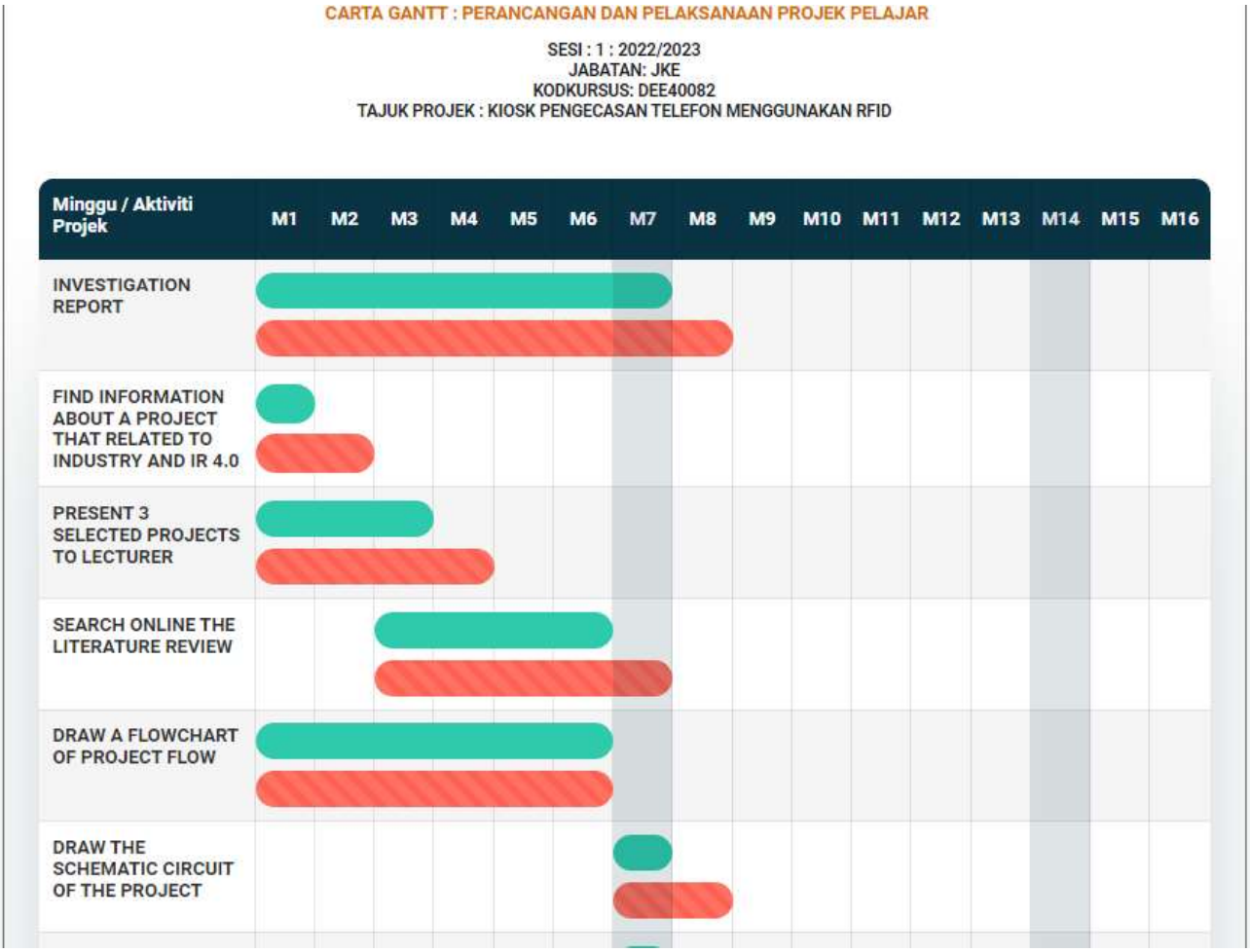
CHAPTER 4

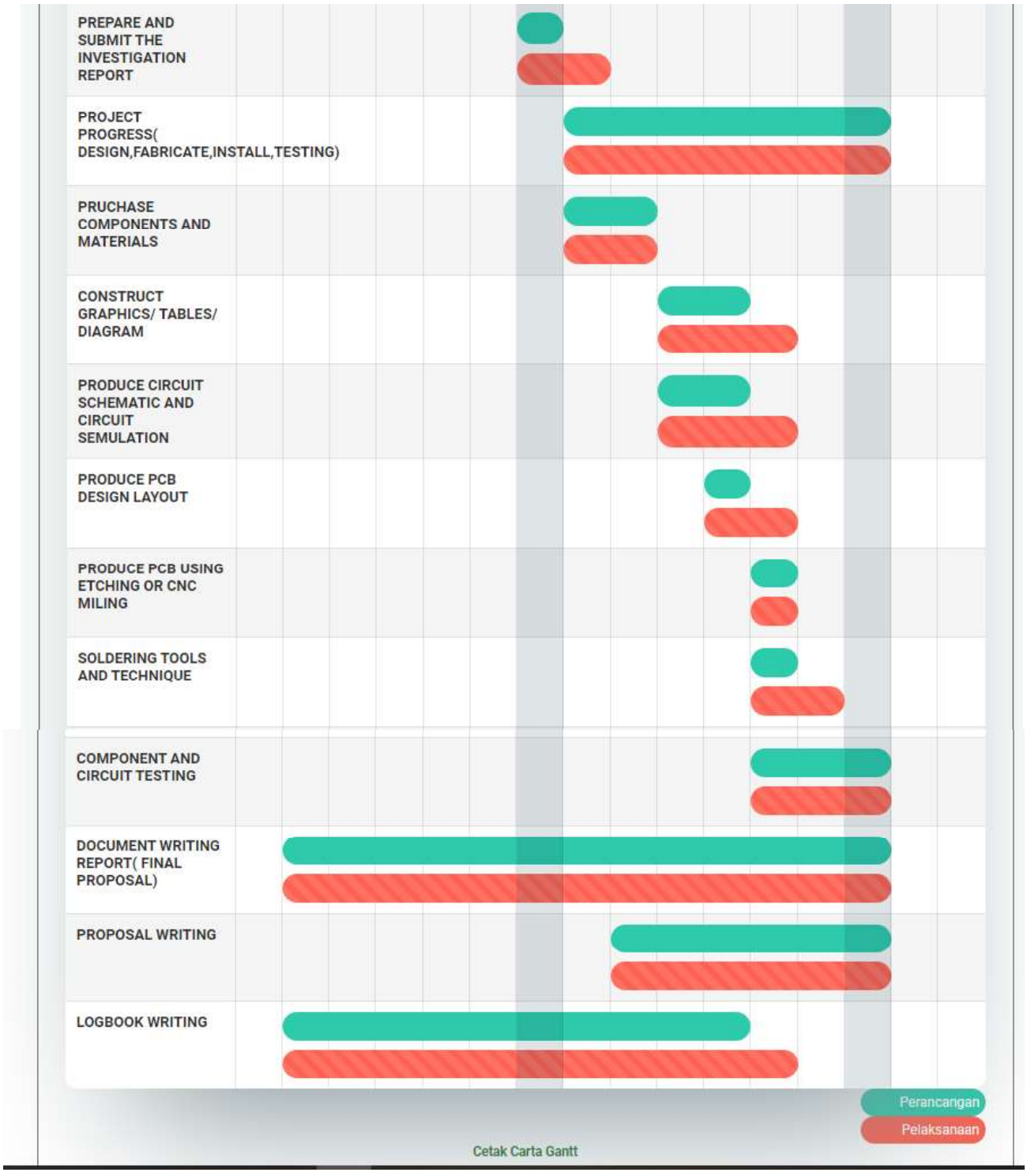
4 PROJECT MANAGEMENT AND COSTING

4.1 Introduction

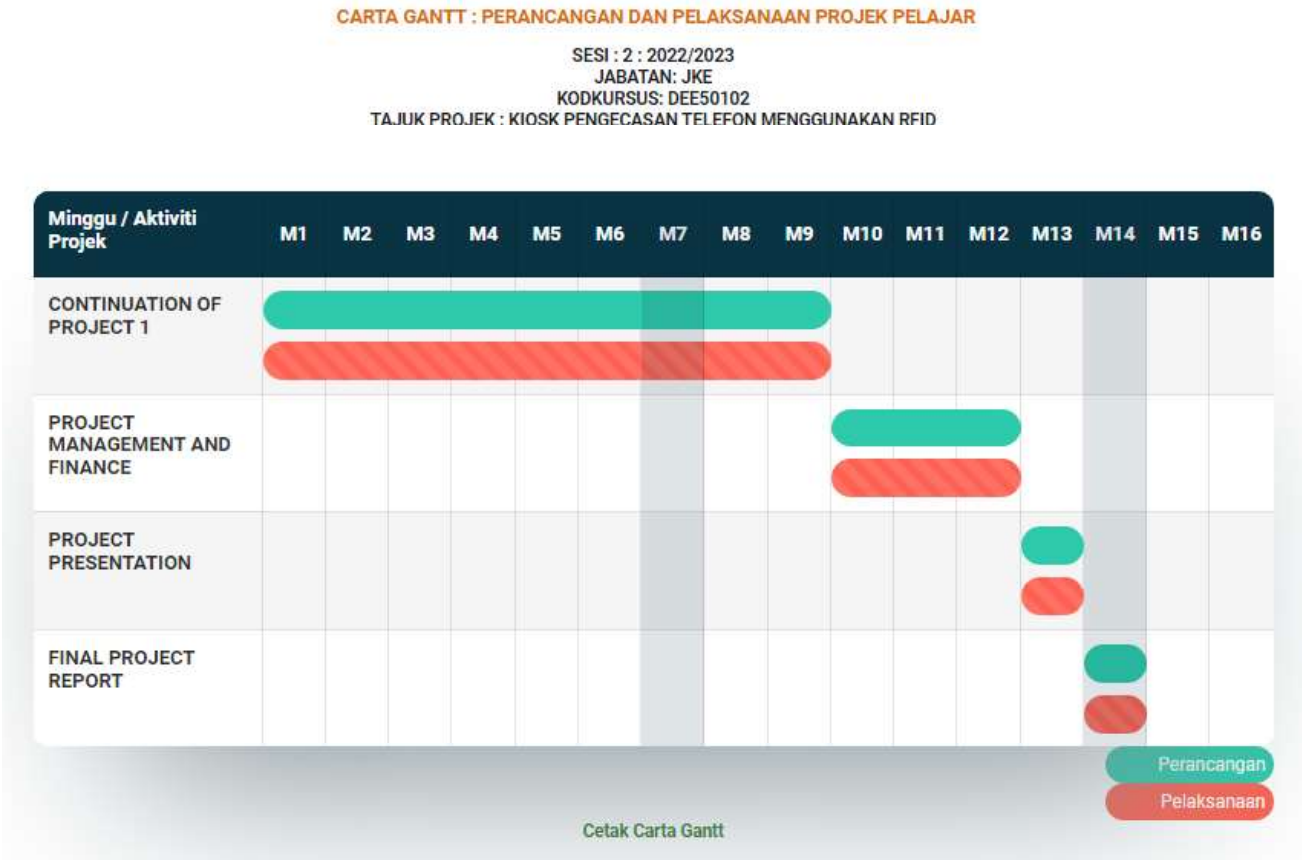
This chapter presents the project management and costing for overall project that were planned and is done after taking consideration of each values and aspects in order to fulfill all of the things needed for a successful project.

4.2 Gantt Chart and Activities of the Project during Project 1




PREPARE AND SUBMIT THE INVESTIGATION REPORT
PROJECT PROGRESS(DESIGN,FABRICATE,INSTALL,TESTING)
PRUCHASE COMPONENTS AND MATERIALS
CONSTRUCT GRAPHICS/ TABLES/ DIAGRAM
PRODUCE CIRCUIT SCHEMATIC AND CIRCUIT SEMULATION
PRODUCE PCB DESIGN LAYOUT
PRODUCE PCB USING ETCHING OR CNC MILING
SOLDERING TOOLS AND TECHNIQUE
COMPONENT AND CIRCUIT TESTING
DOCUMENT WRITING REPORT(FINAL PROPOSAL)
PROPOSAL WRITING
LOGBOOK WRITING
Perancangan
Pelaksanaan
Cetak Carta Gantt

4.3 Gantt Chart and Activities of the Project during Project 2



4.4 Cost and Budgeting

Table 1: List of Components and Materials

No.	Component and materials	The unit price	Quantity	Total
1	Arduino UNO set	RM 23.50	3	RM 70.50
2	Stainless steel chopstick (for level sensor)	RM 2.00	1	RM 2.00
3	Water flow meter sensor	RM 30.00	1	RM 30.00
4	ESP 8266 node mcu	RM 19.40	2	RM 38.80
5	Electromagnetic Relay	RM 5.90	3	RM 18.70
6	Solenoid valve	RM 47.00	1	RM 47.00
7	PVC pipe	RM 30	1	RM 30
8	LCD Display	RM 7.90	2	RM 15.80
9	Other materials	RM 50	-	RM 50
			Total :	**RM 302.80**
	List of other costing			
1	Transportation			
2	Postage			
3	Craft Work			
4	Internet			
5	Application			
			Total :	**RM397.20**
			Overall total	**RM700.00**

CHAPTER 5

5 RESULTS, DISCUSSION & CONCLUSION

5.1 Introduction

This chapter presents the results obtained from the data analysis which has been made through several questionnaire where testimony is given to both users and Industrial. Apart from that, the whole process of collecting and analyzing data is discussed properly in order to fully understand the problem occurred and how it is solved for a successful project and lastly this chapter will conclude all parts of the project.

5.2 Results

As a result, A smartphone is a cell phone that lets you do more than make phone calls and send text messages. Smartphones can browse the Internet and run software programs like a computer. Smartphones use a touch screen to allow users to interact with them. There are thousands of smartphone apps including games, personal-use, and business-use programs that all run on the phone. The picture is an example of the Apple iPhone, one of the most popular smartphones available today.

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5.3 Discussion

5.3.1 Challenges and Trends

Challenges:

Charging phones using RFID technology at a kiosk can present several challenges. While RFID can be used for identification and authentication purposes, it is not typically used for power transfer or charging devices directly. However, I'll outline some potential challenges you may encounter if you intend to implement a phone charging system using RFID technology at a kiosk:

1. Power Transfer: RFID tags or cards are passive devices that do not have their power source. They rely on the energy emitted by the RFID reader to power them. This energy is typically used for communication and data transfer, not for charging devices. To charge a phone using RFID, you would need to find a way to transfer power from the kiosk to the phone, which may require additional hardware or modifications.

2. Power Capacity: Charging a phone requires a significant amount of power, especially for modern smartphones with larger batteries. RFID technology is generally designed for low-power applications, such as identification or tracking. The power capacity of most RFID systems is insufficient to charge a phone within a reasonable time frame.

3. Compatibility: Phones use various charging standards and connectors, such as USB Type-C or Lightning. RFID technology does not inherently support these charging standards. Therefore, you would need to ensure that the kiosk's charging mechanism is compatible with different phone models and their respective charging interfaces.

4. Security and Authentication: Charging stations in public places should address security concerns to protect users' devices and data. RFID technology can provide identification and authentication capabilities, but it may not be sufficient to ensure secure charging. Additional measures, such as encryption or secure communication protocols, may be required to safeguard user information and prevent unauthorized access to devices.

5. User Experience: Users expect charging stations to be intuitive and user-friendly. Integrating RFID technology for charging may introduce complexity and inconvenience. Users would need to understand how to initiate the charging process using RFID tags or cards, and this might not be as straightforward as simply plugging in a charging cable.

Considering these challenges, alternative solutions for phone charging at kiosks may be more practical and efficient. Technologies like wireless charging pads, equipped with standard charging interfaces like USB ports or Qi wireless charging, are commonly used in public spaces for convenient and universal phone charging.

Trends:

As of my knowledge cutoff in September 2021, the use of RFID technology for charging phones at kiosks was not a widely adopted trend. However, technology trends can evolve rapidly, and new advancements

may have emerged since then. While I cannot provide real-time information, I can offer some potential developments or considerations that could shape the trend of kiosk charging using RFID:

1. Power Enhancement: If there have been advancements in RFID technology, such as improvements in power transfer capabilities, it may become more feasible to charge phones using RFID. Enhanced power transfer efficiency could enable faster and more efficient charging, addressing one of the significant challenges of using RFID for charging high-power devices like smartphones.

2. Integrated Solutions: The integration of RFID technology with other charging technologies could create more comprehensive solutions. For example, combining RFID-based authentication with wireless charging pads or fast-charging USB ports could provide a seamless user experience while ensuring compatibility with various phone models.

3. Customization and Personalization: Kiosk charging systems using RFID could potentially offer personalized charging experiences. By storing user preferences or charging profiles on RFID tags or cards, kiosks could tailor charging parameters, such as charging speed or battery optimization, to individual user requirements.

4. Security Enhancements: If RFID-based charging systems gain popularity, there may be a focus on addressing security concerns. Implementing robust authentication protocols, encryption, and secure data transfer mechanisms could be essential to protect user devices and data from potential vulnerabilities.

5. Integration with Smart Infrastructure: As smart city initiatives continue to evolve, kiosk charging systems could integrate with broader smart infrastructure. For instance, RFID-based charging kiosks could connect to a city-wide network, enabling centralized monitoring, remote management, and data analytics for optimizing charging services and resource allocation.

It's important to note that the above points are speculative, and the actual trends and developments in the field may differ. To gain the most accurate and up-to-date information on current trends regarding kiosk charging using RFID, I recommend conducting market research or consulting industry experts and technology providers in the field of charging solutions.

5.3.2 Validation and characterization

A validation kiosk charging a phone using RFID (Radio Frequency Identification) technology is an interesting concept. However, as of my knowledge cutoff in September 2021, I am not aware of any widespread implementation or specific product that combines these two functionalities. I can provide you with a general overview of how such a system could potentially work based on existing technology.

1. RFID-enabled Validation Kiosk: The kiosk would be equipped with an RFID reader capable of wirelessly communicating with RFID tags embedded in various objects, including phones.

2. Phone with RFID Tag: The phone would need to have an RFID tag or a compatible RFID sticker attached to it. The tag/sticker would contain necessary identification information, such as user account details or payment information.

3. Authentication and Charging: When a user approaches the validation kiosk with their phone, the RFID reader would scan the RFID tag/sticker to authenticate the user and retrieve the associated account information. The kiosk would then initiate the charging process for the phone.

4. Power Transfer: The kiosk would provide a means to transfer power to the phone wirelessly or through a physical connection, such as a charging cable. Wireless charging could be achieved using technologies like Qi wireless charging.

5. Validation and Usage Monitoring: While the phone is being charged, the kiosk could also validate the user's access rights or track the usage duration for billing purposes. This information could be stored locally or transmitted to a central server for further processing.

It's important to note that the implementation and availability of such a system may vary, and it's advisable to check with relevant vendors or service providers for the latest information on RFID-based charging solutions.

Characterization of a kiosk charging a phone using RFID technology involves describing its key features, functionality, and potential benefits. Here's a characterization of such a kiosk:

1. RFID Charging Kiosk: The kiosk is designed to provide a convenient and secure charging solution for phones using RFID technology.

2. RFID Reader: The kiosk is equipped with an RFID reader capable of detecting and communicating with RFID tags or stickers embedded in compatible phones.

3. User Authentication: The RFID reader scans the RFID tag/sticker on the phone to authenticate the user. This process ensures that only authorized individuals can use the charging service.

4. Charging Capability: The kiosk offers a charging mechanism, either wirelessly or through a physical connection, such as a charging cable. It utilizes the RFID authentication to initiate the charging process for the phone.

5. Power Transfer: Depending on the chosen charging method, the kiosk transfers power to the phone either wirelessly, utilizing technologies like Qi wireless charging, or through a physical connection.

6. Usage Monitoring: The kiosk may incorporate usage monitoring features to track the duration and usage patterns of the charging service. This information can be utilized for billing, analytics, or resource management purposes.

7. Value-added Services: The kiosk may provide additional services or features, such as displaying advertisements, offering promotions, or providing access to relevant information or apps while the phone is being charged.

8. Security and Privacy: The kiosk should prioritize the security and privacy of user data. It should implement appropriate measures to protect user information during authentication and charging processes.

9. Customization and Integration: The kiosk can be customized to fit different environments, such as public spaces, airports, shopping malls, or offices. It can also be integrated with existing systems or loyalty programs to enhance user experience and engagement.

10. Convenience and Accessibility: By combining phone charging with RFID technology, the kiosk offers a convenient and hassle-free solution for users to charge their phones while ensuring a secure and authenticated experience.

It's worth noting that this characterization is based on a hypothetical scenario combining RFID technology with phone charging. As mentioned before, the specific implementation and availability of such a system may vary, and it's recommended to consult relevant vendors or service providers for the most accurate information**.**

5.4 Conclusion

In conclusion, a kiosk charging a phone using RFID technology offers a convenient and secure solution for users to charge their phones. By combining an RFID reader with charging capabilities, the kiosk can authenticate users and initiate the charging process based on RFID tags or stickers embedded in compatible phones. The power transfer can be done wirelessly or through a physical connection, depending on the chosen charging method. The kiosk may also include usage monitoring features, value-added services, and customization options to enhance the user experience. Overall, the RFID charging kiosk provides a convenient and accessible charging solution while ensuring user authentication and privacy.

Radio Frequency Identification (RFID) technology is a widely used and versatile system that has revolutionized various industries and applications. RFID enables the wireless identification and tracking of objects using radio waves, allowing for automatic data capture and real-time visibility.

RFID systems consist of tags or transponders, readers or interrogators, and a backend database or software system. The tags contain a unique identifier and can store additional information, such as product details or location data. Readers communicate with the tags by emitting radio waves, which power the tags and receive their transmitted data.

One of the key advantages of RFID is its ability to automate data collection and improve efficiency in various processes, including inventory management, supply chain logistics, asset tracking, and retail operations. RFID technology can enhance accuracy, speed, and productivity by enabling quick and accurate identification and tracking of items without the need for line-of-sight or manual intervention.

RFID has found applications in diverse sectors, including retail, healthcare, manufacturing, transportation, and agriculture. In retail, RFID enables real-time inventory management, reduces out-of-stock situations, and enhances the overall shopping experience. In healthcare, RFID can improve patient safety, streamline asset tracking, and enhance medication management. In manufacturing, RFID facilitates process automation, quality control, and supply chain visibility.

While RFID offers numerous benefits, there are also considerations to keep in mind. Implementation costs, compatibility with existing systems, privacy concerns, and security vulnerabilities are among the challenges associated with RFID deployment. Safeguarding data integrity, protecting against unauthorized access, and addressing privacy issues require appropriate security measures and adherence to regulatory guidelines.

Looking ahead, RFID technology continues to evolve, with advancements in tag miniaturization, improved read ranges, and increased data storage capabilities. Integration with other technologies such as the Internet of Things (IoT) and artificial intelligence (AI) further enhances the potential of RFID in creating intelligent and interconnected systems.

In conclusion, RFID technology has made significant contributions to various industries, revolutionizing processes and enabling greater efficiency, visibility, and control. As technology continues to advance, RFID is expected to play a crucial role in the digital transformation of businesses, driving innovation and shaping the future of automated identification and tracking systems.

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6 APPENDICES

APPENDIX A- DATA SHEET

7th INTERNATIONAL CONGRESS OF EURASIAN SOCIAL SCIENCES
27-30 April 2023 Bodrum, Mugla, TURKEY (Online)

PRESENTER CERTIFICATE

Dear MR. YAAKUB OMAR

Hosted by International Vision University; with the contributions of the Korint Publishing, International Journal of Eurasia Social Sciences, International Journal of Education Technology and Scientific Researches and the International Journal of Eurasian Education and Culture, in the 7th International Congress of Eurasian Social Sciences which was held on 27-30 April 2023, participated with a paper titled "**PHONE CHARGİNG KİOSK USİNG RFID**".

Prof. Dr. Kubilay YAZICI
Head of the Organizing Committee

7th INTERNATIONAL CONGRESS OF EURASIAN SOCIAL SCIENCES
27-30 April 2023 Bodrum, Mugla, TURKEY (Online)

PRESENTER CERTIFICATE

Dear MUHAMMAD RAFIQ IZZUDDIN BIN ROSLAN

Hosted by International Vision University; with the contributions of the Korint Publishing, International Journal of Eurasia Social Sciences, International Journal of Education Technology and Scientific Researches and the International Journal of Eurasian Education and Culture, in the 7th International Congress of Eurasian Social Sciences which was held on 27-30 April 2023, participated with a paper titled "**PHONE CHARGİNG KİOSK USİNG RFID**".

Prof. Dr. Kubilay YAZICI
Head of the Organizing Committee

APPENDIX B- PROGRAMMING

Coding blynk

```
// Template ID, Device Name and Auth Token are provided by the Blynk.Cloud
// See the Device Info tab, or Template settings
#define BLYNK_TEMPLATE_ID           "TMPLKlMGIeEe"
#define BLYNK_TEMPLATE_NAME         "Quickstart Device"
#define BLYNK_AUTH_TOKEN            "3YrGnyRw4L-VvaTttKUcmQFHMpN_v0Zt"


// Comment this out to disable prints and save space
#define BLYNK_PRINT Serial


#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>


char auth[] = BLYNK_AUTH_TOKEN;

// Your WiFi credentials.
// Set password to "" for open networks.
char ssid[] = "Pavitra";
char pass[] = "12345678";

int FLUSH=0;
int Rly1=0, Rly2=0, Rly3=0, Rly4=0, Rly5=0, Rly6=0,  Rly7=0,  Rly8=0;
int Val1=90, Val2=0, Val3=0, Val4=0, Val5=0, Val6=0,  Val7=0,  Val8=0;
String Temp1x="";
String PHx="";
String Temp2x="";
String Temp1y="";
String PHy="";
String Temp2y="";
String Temp3y="";
String Temp3x="";
String Temp4y="";
String Temp4x="";
String Temp5y="";
String Temp5x="";
String Temp6y="";
String Temp6x="";
String Temp7y="";
String Temp7x="";
String Temp8y="";
String Temp8x="";
String Temp9y="";
String Temp9x="";
String Temp10y="";
String Temp10x="";
```

```
int DataIn=0;
float Sens1,WaterLevel=0;
int DDLAY=700,Capasity=3;

BlynkTimer timer;

int pos=0;
bool led_set[2];
long timer_start_set[2] = {0xFFFF, 0xFFFF};
long timer_stop_set[2] = {0xFFFF, 0xFFFF};
unsigned char weekday_set[2];

long rtc_sec;
unsigned char day_of_week;

bool led_status[2];
bool update_blynk_status[2];
bool led_timer_on_set[2];

// This function is called every time the Virtual Pin 0 state changes


// This function is called every time the device is connected to the Blynk.Cloud
BLYNK_CONNECTED()
{
  // Change Web Link Button message to "Congratulations!"
 // Blynk.setProperty(V3, "offImageUrl", "https://static-
image.nyc3.cdn.digitaloceanspaces.com/general/fte/congratulations.png");
 // Blynk.setProperty(V3, "onImageUrl",  "https://static-
image.nyc3.cdn.digitaloceanspaces.com/general/fte/congratulations_pressed.png");
 // Blynk.setProperty(V3, "url", "https://docs.blynk.io/en/getting-started/what-do-i-need-to-
blynk/how-quickstart-device-was-made");
}

// This function sends Arduino's uptime every second to Virtual Pin 2.
void myTimerEvent()
{

}

BLYNK_WRITE(V10)
{
  Rly1 = param.asInt(); // assigning incoming value from pin V1 to a variable

  if (Rly1==1){
Serial.println("!");

  }
   if (Rly1==0){

  Serial.println("@");
```

```
  }

  // process received value
}

BLYNK_WRITE(V11)
{
  Rly2 = param.asInt(); // assigning incoming value from pin V1 to a variable
 if (Rly2==1){
Serial.println("#");

  }
   if (Rly2==0){

  Serial.println("$");
  }

}


BLYNK_WRITE(V12)
{
  Rly3 = param.asInt(); // assigning incoming value from pin V1 to a variable


}

BLYNK_WRITE(V13)
{
  Rly4 = param.asInt(); // assigning incoming value from pin V1 to a variable


  // process received value

  // process received value
}

BLYNK_WRITE(V14)
{
  Rly5 = param.asInt(); // assigning incoming value from pin V1 to a variable

  if (Rly5==1){

  }

  // process received value
}

BLYNK_WRITE(V6)
{
  Rly6 = param.asInt(); // assigning incoming value from pin V1 to a variable
```

```
  if (Rly6==1){

  }

  // process received value
}



BLYNK_WRITE(V1)
{
 Capasity = param.asInt(); // assigning incoming value from pin V1 to a variable
  Serial.print("*");
 Serial.print(Capasity);
  Serial.println("#");


  // process received value
}

BLYNK_WRITE(V9)
{
  unsigned char week_day;

  TimeInputParam t(param);

if (t.hasStartTime() && t.hasStopTime() )
  {
    timer_start_set[0] = (t.getStartHour() * 60 * 60) + (t.getStartMinute() * 60) +
t.getStartSecond();
    timer_stop_set[0] = (t.getStopHour() * 60 * 60) + (t.getStopMinute() * 60) + t.getStopSecond();

    Serial.println(String("Start Time: ") +
                   t.getStartHour() + ":" +
                   t.getStartMinute() + ":" +
                   t.getStartSecond());

    Serial.println(String("Stop Time: ") +
                   t.getStopHour() + ":" +
                   t.getStopMinute() + ":" +
                   t.getStopSecond());

    for (int i = 1; i <= 7; i++)
    {
     if (t.isWeekdaySelected(i))
     {
       week_day |= (0x01 << (i-1));
       Serial.println(String("Day ") + i + " is selected");
     }
     else
```

```
      {
        week_day &= (~(0x01 << (i-1)));
      }
    }

    weekday_set[0] = week_day;
  }
  else
  {
    timer_start_set[0] = 0xFFFF;
    timer_stop_set[0] = 0xFFFF;
  }
}

//
################################################################################
#########################


void setup()
{

  Serial.begin(9600);

  Blynk.begin(auth, ssid, pass);
  // You can also specify server:
  //Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);
  //Blynk.begin(auth, ssid, pass, IPAddress(192,168,1,100), 8080);

  // Setup a function to be called every second
  timer.setInterval(1000L, myTimerEvent);


  pos=0;
}

void loop()
{

  Blynk.run();
  timer.run();
  //--------------------------------------------------
   while (Serial.available()) {
    // get the new byte:
    char inChar1 = (char)Serial.read();
  if (inChar1 == '*') {
      DataIn++;

    }

     if (inChar1 == 'Y') {
```

```
    }

if (inChar1 == '$'){
 Blynk.virtualWrite(V2,"1");
}

    while (DataIn > 0){
        while (Serial.available()) {
    // get the new byte:
    char inChar = (char)Serial.read();
    if (inChar == '*') {
      DataIn++;

    }
    if (inChar != '*' && inChar != '#' && DataIn==1) {
      Temp1x+=inChar;

    }
    if (inChar != '*' && inChar != '#' && DataIn==2) {
      Temp2x+=inChar;

    }
    if (inChar != '*' && inChar != '#' && DataIn==3) {
      Temp3x+=inChar;

    }
     if (inChar != '*' && inChar != '#' && DataIn==4) {
      Temp4x+=inChar;

    }
      if (inChar != '*' && inChar != '#' && DataIn==5) {
      Temp5x+=inChar;

    }
      if (inChar != '*' && inChar != '#' && DataIn==6) {
      Temp6x+=inChar;

    }
      if (inChar != '*' && inChar != '#' && DataIn==7) {
      Temp7x+=inChar;

    }
      if (inChar != '*' && inChar != '#' && DataIn==8) {
      Temp8x+=inChar;

    }
      if (inChar != '*' && inChar != '#' && DataIn==9) {
      Temp9x+=inChar;
```

```
  }
   if (inChar != '*' && inChar != '#' && DataIn==10) {
   Temp10x+=inChar;

  }


  if (inChar == '#') {
    DataIn=0;
   Temp1y=Temp1x;   PHy=PHx;     Temp2y=Temp2x;  Temp3y=Temp3x;  Temp4y=Temp4x;
   Temp5y=Temp5x;
   Temp6y=Temp6x;
   Temp7y=Temp7x;
   Temp8y=Temp8x;
   Temp9y=Temp9x;
   Temp10y=Temp10x;
   Temp1x="";
   PHx="";   Temp2x="";
   Temp3x="";
   Temp4x="";
   Temp5x="";
   Temp6x="";
   Temp7x="";
   Temp8x="";
   Temp9x="";
   Temp10x="";
   Blynk.virtualWrite(V0, Temp1y);
   Blynk.virtualWrite(V1, Temp2y);
    Blynk.virtualWrite(V2, Temp3y);
   Blynk.virtualWrite(V3, Temp4y);


  }
     }

  }


//*************************************************************************
**************************************


//*************************************************************************
**************************************

}
//-----------------------------------------------
```

```
}
```

RFID Coding

```
#include <SPI.h>
#include <MFRC522.h>
#include <SoftwareSerial.h>

#include <Wire.h>


#include <LiquidCrystal_I2C.h>

SoftwareSerial ss(2, 3); //(RX,TX)


LiquidCrystal_I2C lcd(0x27, 16, 2);
const int pinClk = A0;
const int pinDta = A1;


int DOORACC=0;
int pos=0;

#define SW 5
#define IR A0
#define Relay 6
#define Buzz 8
#define RST_PIN         9          // Configurable, see typical pin layout above
#define SS_PIN          10         // Configurable, see typical pin layout above
#define SV 7


#define TEST_DELAY   2000

int IRCHECK=0;
long IDINT=0;
int RD=0;
int OKU=0;
int TMAX=10;
int TT=20;
int TFMODE=0;
int TTM=0;
int State=0;
int Alarm=0;
int TX=0;
int Mode=0;
int DataIn=0;
int TLC=0;
int TM=0;
```

```
int TS=0;
int TH=0;
int TMx=4;
int TSx=0;
int THx=4;
int OPP=0;
int MMODE=1;
int DY=20;
int DM=7;
int DYR=2019;
int user1=0; int user2=0;
int display=0;
int COUNTER=0;
int distance1;
String ID;
int Second=0;
int Read=0;
//Tukar ID ikut ID tag yang dikesan pada paparan LCD
String Code1 = "417815162163101128";
String Name1 = "HADI";
float result1 = 0;
int mode=0;
String Code2 = "45630226142101129";
String Name2 = "YUSRI";
float result2 = 0;
String Code3 = "146196118137";
String Name3 = "Zaharah";
float result3 = 0;
String Code4 = "519014227";
String Name4 = "RANJIT";
float result4 = 0;
String Code5 = "519014227";
String Name5 = "SEW LIN";
float result5 = 0;
String Code6 = "519014227";
String Name6 = "FARID";
float result6 = 0;
String Code7 = "519014227";
String Name7 = "FIRDAUS";
float result7 = 0;
int MAILCOUNT=0;
String Temp1x="";
String PHx="";
String Temp2x="";
String Temp1y="";
String PHy="";
String Temp2y="";
String Temp3y="";
String Temp3x="";
String Temp4y="";
String Temp4x="";
```

```
int MODE=0;
int ALM=0;
int MODEX=1;
int hh1=0, hh2=0, hh3=0, hh4=0;
int mm1=0, mm2=0, mm3=0, mm4=0;
int hh=0, mm=0, ssv=0, ssx = 0;
int dd=26, ddx=1, mth=9, yy=2017;
int Timerx=0;
int counter=0;
int DoorStat=0;


MFRC522 mfrc522(SS_PIN, RST_PIN);   // Create MFRC522 instance.

// Number of known default keys (hard-coded)
// NOTE: Synchronize the NR_KNOWN_KEYS define with the defaultKeys[] array
#define NR_KNOWN_KEYS   8

byte knownKeys[NR_KNOWN_KEYS][MFRC522::MF_KEY_SIZE] =  {
    {0xff, 0xff, 0xff, 0xff, 0xff, 0xff}, // FF FF FF FF FF FF = factory default
    {0xa0, 0xa1, 0xa2, 0xa3, 0xa4, 0xa5}, // A0 A1 A2 A3 A4 A5
    {0xb0, 0xb1, 0xb2, 0xb3, 0xb4, 0xb5}, // B0 B1 B2 B3 B4 B5
    {0x4d, 0x3a, 0x99, 0xc3, 0x51, 0xdd}, // 4D 3A 99 C3 51 DD
    {0x1a, 0x98, 0x2c, 0x7e, 0x45, 0x9a}, // 1A 98 2C 7E 45 9A
    {0xd3, 0xf7, 0xd3, 0xf7, 0xd3, 0xf7}, // D3 F7 D3 F7 D3 F7
    {0xaa, 0xbb, 0xcc, 0xdd, 0xee, 0xff}, // AA BB CC DD EE FF
    {0x00, 0x00, 0x00, 0x00, 0x00, 0x00}  // 00 00 00 00 00 00
};


void setup()
{

pinMode(IR,INPUT);

pinMode(SW,INPUT);
digitalWrite(SW,HIGH);
  pinMode(Buzz,OUTPUT);
  pinMode(Relay,OUTPUT);
  Serial.begin(9600);
  ss.begin(9600);
//Serial.print("Hello");

  lcd.begin();
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Initializing..");
  lcd.setCursor(0, 1);
  lcd.print("pls wait");
```

```
 delay(2500);

   lcd.clear();
 lcd.setCursor(0, 0);
 lcd.print("   WELCOME");
 delay(1500);
 lcd.clear();
 lcd.setCursor(0, 0);
 lcd.print("CHARGING STATION");
// lcd.noBacklight();

 //lcd.backlight();


 int i,k;

 while (!Serial);            // Do nothing if no serial port is opened (added for Arduinos based on
ATMEGA32U4)
   SPI.begin();               // Init SPI bus
   mfrc522.PCD_Init();        // Init MFRC522 card
 delay(2000);



 digitalWrite(Buzz,HIGH);

 delay(30);
  digitalWrite(Buzz,LOW);

 delay(30);
  digitalWrite(Buzz,HIGH);

 delay(30);
  digitalWrite(Buzz,LOW);

 delay(30);







}

void dump_byte_array(byte *buffer, byte bufferSize) {
   for (byte i = 0; i < bufferSize; i++) {

     // Serial.print(buffer[i] < 0x10 ? " 0" : "");
     // Serial.print(buffer[i], HEX);
      ID += buffer[i];
   }
```

```
}

boolean try_key(MFRC522::MIFARE_Key *key)
{
   boolean result = false;
   byte buffer[18];
   byte block = 0;
   byte status;

Wong PSA, [5/25/2023 6:06 PM]
// Serial.println(F("Authenticating using key A..."));
   status = mfrc522.PCD_Authenticate(MFRC522::PICC_CMD_MF_AUTH_KEY_A, block,
key, &(mfrc522.uid));
   if (status != MFRC522::STATUS_OK) {
      // Serial.print(F("PCD_Authenticate() failed: "));
      // Serial.println(mfrc522.GetStatusCodeName(status));

      return false;
   }

   // Read block
   byte byteCount = sizeof(buffer);
   status = mfrc522.MIFARE_Read(block, buffer, &byteCount);
   if (status != MFRC522::STATUS_OK) {
      // Serial.print(F("MIFARE_Read() failed: "));
      // Serial.println(mfrc522.GetStatusCodeName(status));

   }
   else {
      // Successful read
      result = true;
      Serial.print(F("Success with key:"));
      dump_byte_array((*key).keyByte, MFRC522::MF_KEY_SIZE);
      Serial.println();
      // Dump block data
      Serial.print(F("Block ")); Serial.print(block); Serial.print(F(":"));
      dump_byte_array(buffer, 16);
      Serial.println();
   }
   Serial.println();

   mfrc522.PICC_HaltA();       // Halt PICC
   mfrc522.PCD_StopCrypto1();  // Stop encryption on PCD
   return result;
}

void loop()
{

  if (OPP==0 && digitalRead(IR)==1){
  lcd.clear();
```

```
  lcd.setCursor(0, 0);
  lcd.print("Please scan CARD");
  lcd.setCursor(0, 1);
  lcd.print("to use..");
delay(100);
  }

  if (digitalRead(IR)==0){
   lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("CHARGER IN USE..");

delay(100);
  }

  if (digitalRead(SW)==1){
TLC++;
  }
   if (digitalRead(SW)==0){
TLC=0;
  }
  if (TLC>50){
     lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("CLOSE THE DOOR");
    digitalWrite(Buzz,HIGH);
    delay(100);
    digitalWrite(Buzz,LOW);
    delay(30);

  }


if (MMODE==1){
//lcd.backlight();
//-------------------WAIT RFID FIRST-----------------------------
    // Look for new cards
    if ( ! mfrc522.PICC_IsNewCardPresent())
       // return;
        CheckTime();

    // Select one of the cards
    if ( ! mfrc522.PICC_ReadCardSerial())
        return;
    ID = "";
    // Show some details of the PICC (that is: the tag/card)
    //Serial.print(F("Card UID:"));
    dump_byte_array(mfrc522.uid.uidByte, mfrc522.uid.size);
   // Serial.print("X,");
```

```
  Serial.println(ID);

 Read=1;
   digitalWrite(Buzz,HIGH);
delay(30);
 digitalWrite(Buzz,LOW);
delay(30);
 digitalWrite(Buzz,HIGH);
delay(30);
 digitalWrite(Buzz,LOW);



    if (ID=="149208200226" && Read==1){
      COUNTER=0;
      lcd.clear();
lcd.setCursor(0, 0);
lcd.print("   WELCOME..");
lcd.setCursor(0, 1);
    //  Serial.print(Name1);
    //   Serial.println("  IN");
      result1=1;
      DOORACC=0;
      digitalWrite(Relay,HIGH);
      delay(4000);
      digitalWrite(Relay,LOW);


      if (Read==1){

       State=1;  Read=0;

      }


  }


if (ID=="45630226142101129" && Read==1){
      COUNTER=0;
      lcd.clear();
 lcd.setCursor(0, 0);
 lcd.print(Name2);
 lcd.setCursor(0, 1);
 lcd.print("WELCOME..");
    //  Serial.print(Name1);
    //   Serial.println("  IN");
      result1=1;


      if (Read==1){
```

```
        State=1;  Read=0;

       }
digitalWrite(Relay,HIGH);
delay(4000);
digitalWrite(Relay,LOW);



   }



  if (Read==1){
  // Serial.println("User ID Unknown!!");
                  lcd.clear();
 lcd.setCursor(0, 0);
 lcd.print("UNKNOWN ID!!");
 lcd.setCursor(0, 1);

          mode=0;
          Read=0;
          digitalWrite(Buzz,HIGH);
            delay(2000);
            digitalWrite(Buzz,LOW);
  }

       ID = "";




}


}




void CheckTime(){


}
```

APPENDIX C- PRODUCT POSTER