CPU THEFT PREVENTION SYSTEM

LUQMAN ARIF BIN MOHAMED NAJIB

This report is submitted in partial fulfilment of the requirements for the
Bachelor of Computer Science (Software Development)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2016

DECLARATION

I hereby declare that this project report entitled

CPU THEFT PREVENTION SYSTEM

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ _____ Date : 19/9/2016

(LUQMAN ARIF BIN MOHAMED NAJIB)

SUPERVISOR : _____ Date : 19/9/2016

(MADAM NOOR AZILAH BINTI DRAMAN@MUDA)

DEDICATION

I would like to dedicate this thesis project to my beloved dad, Mohamed Najib Bin Mohamed Isa and mom, Harirah Binti Zakaria who have been giving me positive support and motivation throughout my project.

ACKNOWLEDGMENT

Bismillahirrahmanirrahim.

First of all, all the praise be to Allah for giving me strength to complete the thesis project. With his blessed, I am able to finish this thesis project. Alhamdulillah.

I want to thanks my beloved father, Mr Mohamed Najib bin Mohamed Isa, and mother, Madam Harirah Binti Zakaria who always be my main supporter while I am doing this project. They always gave me advices and supportive words when I am having difficulty doing this project. I would also like to express my sincere gratitude to my supervisor, Madam Noor Azilah Binti Draman@Muda, who gives me an opportunity and gives me a lot of constructive criticism and advice. With her support and advice that this project can be completed. I also want to give appreciation to my friends especially my course-mate who always share the knowledge, lending their devices to be used by me to do this project without hesitation, help me in my hard situation, and give a moral support.

Lastly, thanks for those who helped me either directly or indirectly. I pray that all who have helped me during the completion of the project will be blessed. Thank you.

ABSTRACT

Computer components loss is a major problem that happens at our surroundings whether at home, lab, or office. This is due to the cost of each components inside the computer that are expensive and may attract people to stole it. For example, for a graphic card only it can cost more than RM400 which may vary on each computers. CPU Theft Prevention System (CTPS) can help solve the problem by providing a way for owner to prevent their computer from being stole. The CTPS will give an sms alert to the owner if their CPU being taken away from its place. This is due to the CTPS help scan and detect the QR Code that is being place on the side of the CPU and if the scanner detects it, it will give an alert to the owner of the CPU. CTPS used Agile methodology because it allows the developer to made changes after the initial planning. The application is develop on Android platform by using the Android Studio and SQLite Database.

LIST OF TABLES

LIST OF FIGURE

TABLE OF CONTENTS

CHAPTER **SUBJECT** **PAGE**

CHAPTER III ANALYSIS

CHAPTER IV DESIGN

CHAPTER V IMPLEMENTATION

CHAPTER I

INTRODUCTION

1.1 Introduction

The proposed application, CPU Thief Prevention System (CTPS) is an Android application which can detect a QR code that will be attached to the CPU. The CTPS will be installed in an Android phone where it will act as QR code scanner to send SMS alert to user phones. The Android phone will detect QR code that is attached on top of the CPU, if the CPU is being drag out from its place, the Android phone will scan the QR code and automatically send a message to the registered user to give alert about the event.

1.2 Problem statement(s)

Presently, there are many cases related to the thieving of computer desktop components such as monitor and CPU. Some of the prevention application in the market only record the image of the thief, without giving alert to the owner for them to take immediate action to catch the thief. The current prevention application out there also cost a lot for owner to buy the devices to protect their desktop computer belongings. With the CTPS, owner only needs one Android mobile phones which they can download the CTPS application from the Google store. The CTPS is much more affordable for the owner to use than buying any other security devices in the market to protect their computer belongings.

There are three main problem statement that can be found:

1. There are many problems related to CPU missing in commercial area, universities or at home.
2. User does not get instant notification of the loss
3. Reduce cost by using automated application as a security

The CTPS application is a re-creation of existing prevention application but with an enhanced features in part of giving alert to the owner, and the usage of only one Android phones without using added devices.

1.3 Objective

This project embarks on the following objectives:

1. To provide an effective ways which to prevent and reduce crime in monitored area

2. To provide instant notification to the user of the thieving event

3. To provide a much more affordable security option

1.4 Scope

There are two types of project scope:

1.4.1 System

The CTPS needs to be mobile, and can be use on devices that is easier to manage and place on computer. Therefore Android platform is choose as the project platform as it can be install on mobile devices which are suitable to be used as sensor and can be use anywhere by the owner as android mobile are the main usage smartphone in the world.

1.4.2 User

The targeted user of CTPS is the computer owner whether as personal or in company and the technician of computer labs in school or university.

1.5 Project Significance

This project can be a huge benefits to owner of personal computer at home as the CTPS only needs one Android smartphone that not being used anymore and does not need to buy any other external devices. The CTPS only need to be install on the Android phone and one will function as alert receiver to send SMS alert to user. User need to register first with the apps to allow the application to send SMS alert using their phone numbers. By doing that, only the registered user can start or stop the scanner from being used.

1.6 Expected Output

From this project, the CTPS can be a major security application that can be enhanced by utilizing the function of Android smartphone such as camera to capture thief image and sensor to provide security in certain area. The current CTPS will be one of the application that can be used by anyone to protect their CPU belongings in home or office.

1.7 Conclusion

As for conclusion, this chapter explains the project that will be developed and the targeted user. The CTPS is an Android application that can which can be very much help on providing security to any type user to prevent from their CPU being theft from it place. The next chapter will explain the previous research and the methodology that will be used for this project.

CHAPTER 2

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Literature review discusses the information in a particular place within a certain time period. It can also give an overview of the topic to the reader. A project methodology refers to the framework that is used to structure, plan, and control the process of developing an information system. This chapter will focus on the literature review of previous research that have been done and the methodology being use for the development of the project. This chapter will explain on how previous research have impact on the development of this project and how it is being implemented.

2.2 Facts and Findings

The facts and finding that are associated to the project development will be discussed in this section. This part is discussed about the case study of existing application. The case study of existing application will assist developer to develop a new software application based on the strength and weakness of the existing application.

2.2.1 Domain

The domain of this project is categorized under Information and Communication Technology (ICT) in Security System as the project is focusing on preventing and alerting user of the thieving process of the computer components. This project mainly develop for providing a security application for anyone who has desktop computer. By attach the QR Code to the CPU, the Android phone that work as a scanner will detect any movement of the QR Code where it will send SMS alert to the user phone.

2.2.2 Existing System

There are several type of Android applications in the market right now that are related with the project. Some of them are the research of students and mostly the related application is already develop to be sell to users. Although CTPS does not developed to replace any other current application, still it is required to make a research on existing application to ensure that the CTPS can become much better in providing it features to the user.

One of the previous research done is Indoor Surveillance on Android Device over Wi-Fi. The application connected with surveillance camera where the security can only keep track of all screen on their Android devices. This due to the problem if the security get out of the security room, they cannot keep track the current location of the intruder in the building. The application make full use of the Android devices which already has several sensors and can store videos and audio which are more mobile to bring anywhere.

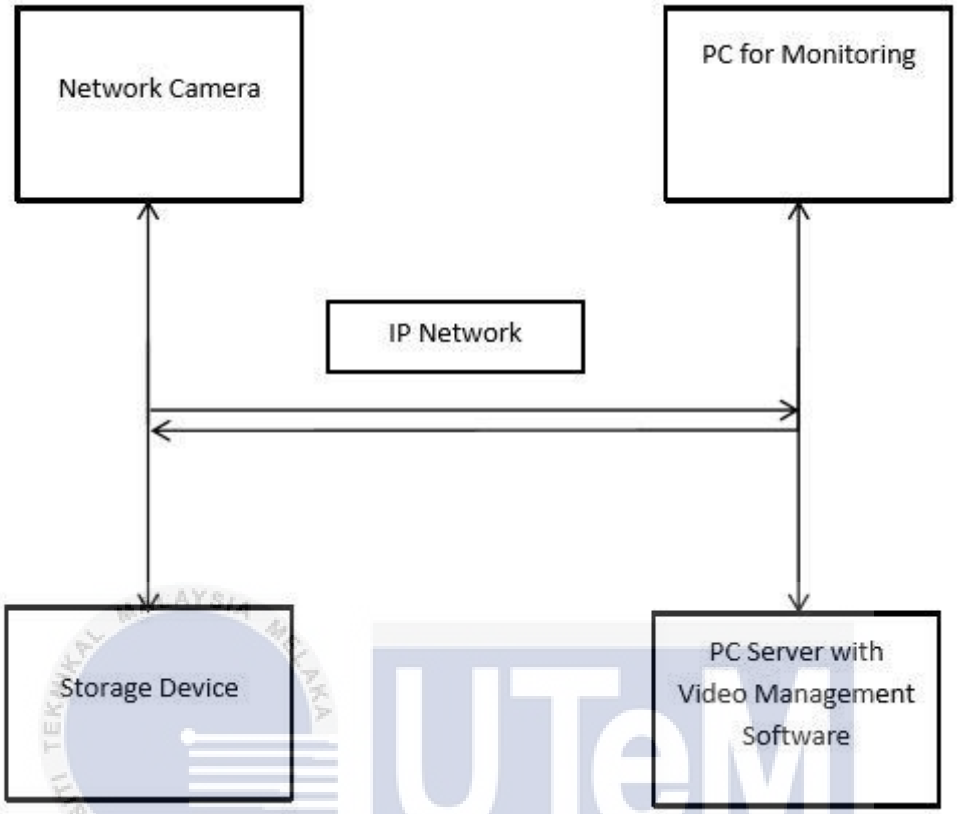


Figure 2.1 IP Camera Connection Setup

This application fully used the motion sensor and external camera where CTPS tried to take implement but used an internal camera of the smartphone. The sensor motion detector which is being replaced by using QR code scanner which much more simple and easy to use and can be place anywhere for the camera to scan it. The previous application also used a PC as a medium for user to monitor the area which will connect with the external camera.

2.3. Project Methodology

In this application, agile software development methodology is used. In agile method, small incremental releases made visible to the product owner and product team through its development help to identify any issues early and make it easier to respond to change.

There are few benefits when using agile development methodology, such as:

1. Better product quality

Agile methods have excellent safeguard to make sure that quality produce is high as possible by conducting sprint before every new sprint, allows improvement processes and work. It also allow continuous integration and daily testing into the development process where issues that arose can be address while it is still newly found.

2. Increased collaboration and ownership

The developer and the client work closely together on weekly basis. The meeting let developer to organiz around work completed, future work, and roadblocks. During sprint reviews the developer can demonstrate and discuss the product directly with stakeholders.

3. Improved performance visibility

By using agile, developer has the opportunity to know how the project is going at any given time. Weekly meetings, weekly sprint reviews and visible progress charts offer concrete ways to see progress.

4. Increased project control

There are many opportunities to inspect and adapt throughout agile projects allow the developer and client to exercise control and ultimately create better products.

5. Reduced risk

Agile techniques virtually eliminate the chance of absolute project failure:

- Developing in sprints, ensuring a short time between initial project investment and either failing fast or knowing that a product or an approach will work
- Always having a working product, starting with the very first sprint, so that no agile project fails completely
- Developing requirements to the definition of done in each sprint so that project sponsors have completed, usable features, regardless of what may happen with the project in the future
- Providing constant feedback on products and processes through daily scrum meetings and constant development team communication, sprint reviews and retrospectives, and releases in which the end user can see and react to new features on a regular basis
- Generating revenue early with self-funding projects, allowing organizations to pay for a project with little up-front expense.

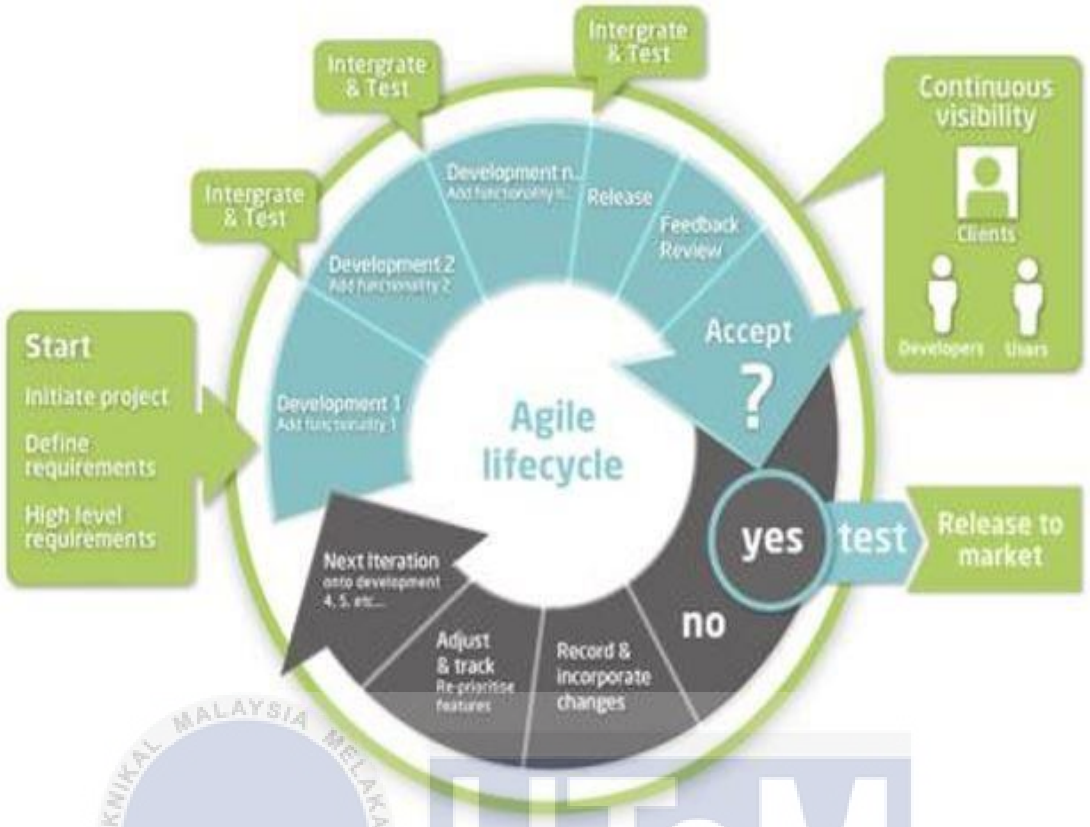


Figure 2.2 Agile Development Model

2.4 Project Requirements

The projects requirements will describe the details about software and hardware requirements that using.

2.4.1 Software Requirement

This application is developed using some software such as Android Studio. It is a software used to design front end and back end of the Android application. SQLite Database is being used to stored data. All software used are easy to use and understand when developing an Android applications. Table 2.4 shows the software requirement needed to develop this application.

Table 2.1 Software Requirements

Software	**Description**
Android Studio	Android Studio is an Integrated Development Environment (IDE) which contain of workspace and drag and drop function to design an interface for the application.
SQLite	SQLite is an open source SQL database that stores data to a text file on a device. It also supports all the relational database features. SQLite has methods to create, delete, execute commands and perform other common database management tasks.
Genymotion	Genymotion is an emulator used to run and test the Android application which have been developed in Android Studio.

2.4.2 Hardware Requirement

Table 2.2 Hardware Requirements

Hardware	**Purpose**
Processor	Intel(R) Core (TM) i5-4200U CPU @ 1.6Ghz
Ram	8GB DDR4
System Type	64 – bit OS
Printer	To print all documents
Smartphone	To access and view the application

2.5 Project Schedule and Milestones

A project schedule and milestone is important event in the course of a project that is used to give visual progress in achieving the goals. These two things are required to manage and end up their works on time. Failure to meet a schedule and milestones indicates that the project did not proceed to plan and normally trigger corrective action by management. Project schedule and milestones are shown in Figure 2.3

Task Mode	Task Name	Duration	Start	Finish
	Submission of Proposal	5 days	Mon 22/02/16	Fri 26/02/16
	Proposal Correction And Chapter 1 Improvement	3 days	Mon 29/02/16	Wed 2/03/16
	Developing Android Application for User	2 wks	Fri 4/03/16	Thu 17/03/16
	Chapter 1	3 days	Fri 4/03/16	Tue 8/03/16
	Developing Android as Camera Sensor	2 wks	Wed 9/03/16	Tue 22/03/16
	Chapter 2	3 days	Wed 9/03/16	Fri 11/03/16
	Android Application Development Process	3 wks	Sat 12/03/16	Thu 31/03/16
	Chapter 3	3 days	Fri 1/04/16	Tue 5/04/16
	Android Application Development Process	7.8 wks	Wed 6/04/16	Sun 29/05/16
	Chapter 4	3 days	Fri 20/05/16	Tue 24/05/16
	Final Presentation with Supervisor and Evaluator	5 days	Mon 30/05/16	Fri 3/06/16
	Revision and Correction of Project Report	5 days	Mon 6/06/16	Fri 10/06/16

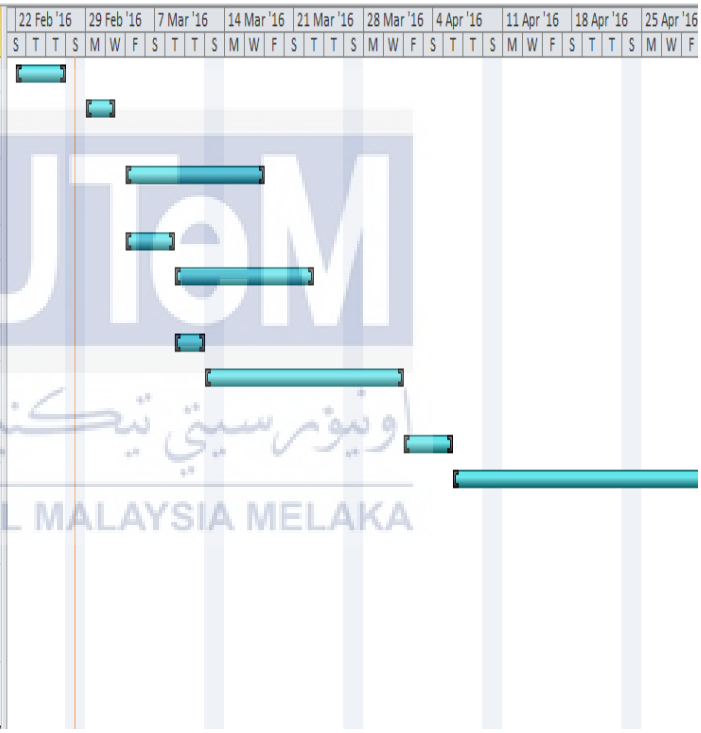


Figure 2.3 Project Milestones

2.6 Conclusion

This chapter has explained in details about the literature review and project methodology that will be applied in the CPU Theft Prevention System. The part of facts and findings is used as reference that consists of some existing application of expenditures and earning budget which is can be lead to the developer to build the application. The Agile methodology is a series of processes that can guide to the development of an application and milestones is the guide for developer to manage and finishing their job on time. Chapter III will covers about analysis of the application for current and new application.

CHAPTER III

ANALYSIS

3.1 Introduction

In this chapter, the problem analysis is shown and how it is used to gather requirement for the application. The aims of problem analysis are to analyze and understand the current business process and application, to determine the problems and attempt to provide the alternative solution to the identified problems. To understand project goals, analyze the situation and detailing on what need to be done, the application need to be breaking down into different pieces. The analysis process allows developers to get much better understanding regarding the problems and requirements after the analysis of the software project is complete.

This chapter discuss the analysis of the problem and the analysis requirement need to be identified during development period. Scenario of existing application will be analyzed and identified. Data requirement, functional requirement and non – functional requirement will also be identified. Besides that, the analysis phase of the application developed will be explain in detail on how the application flow. The analysis of the application will be carried out by detailing using sequence diagram, flowchart, data dictionary and contect diagram.

3.2 Problem Analysis

The detailed information of problem is start by finding facts and information which is by understanding the situation. From the current situation, the problem is that user did not have instant notification whenever robbery situation occured. User cannot go to the location instantly as they only know of the situation happen after they come and see the place being monitor and the product that have lost. This is a disadvantages of the current situation which the current product does not give instant notification to the user. Beside that, the current situation does not allow user to move freely whenever the monitor is on to secure the computer. Thus, with this application, user can move anywhere and still can monitor and get alert even they are outside of their place.

3.2.1 Current System Analysis

CTPS application is being developed without the means to replace any specifics current application. The analysis that being done is to understand how the flow of the current application in providing security related with Android and scanner. Many current application used external devices such as cctv, webcam camera and others to be used with the Android application.

The current application that already been mentioned as the project previous research features a connection between Android application, CCTV and PC in the guard room. It is suitable to used for a large place like offices or labs where there are many computers in one place. The security application cost more to the user that include the external devices and application. Although it is highly efficient but still it cost much more for a mere user who want to protect their computer devices especially CPU. The application being research also lack instant alert to the user at the same time the theft incident took place. This problem will cause trouble to the security if they failed to detect any suspicion activity via the security camera.

3.3. Requirement Analysis

Requirement analysis is the process of determining user expectations for a new or modified product. It is used to determine specific features expectations in the application whenever it communicate with the user. In this section, there are four types of requirements that will be discussed which include data requirement functional requirement, non – requirement and other requirement.

3.3.1 Data Requirement

This section briefly shows the database of the application. Data dictionary is a DBMS component which stored metadata about data. Therefore, the data dictionary contains the data definitions as well as its characteristics and relationship. Data dictionary also includes data shows database structure and data dictionary.

For the CTPS, the data needed to enable this application meet all user requirement is only the user registration data. This application required user to login before it can being used as a safety precaution for user to receive an SMS alert notification.

3.3.2 Functional Requirement

This section defines and describes the functional requirement of the CPU Thief Prevention System. The detail of the requirement shown in Tables :

Table 3.1 Functional Requirement

FR No	Requirement	Description
FR_01	Register new user	This button allow new user to register into the application
FR_02	Login CTPS	This button allow user to use the application
FR_03	Generate CPU name using QR Code generator	This button allow user to generate QR Code based on user input and the QR Code image will be saved in phone gallery.
FR_04	Send attachment via email	This button allow user to access email to send QR Code image as an attachment to user email for them to print it out
FR_05	Start the scanner	This button start up the QR Code scanner which will read any qr code that being moved in front of the smartphone camera before alerting the user via sms

The use case is the summarization in graphical modeling of who (actor) uses the CPU Theft Prevention System applications and what the actor can do with it. Figure 3.1 below shows use case diagram for CTPS.

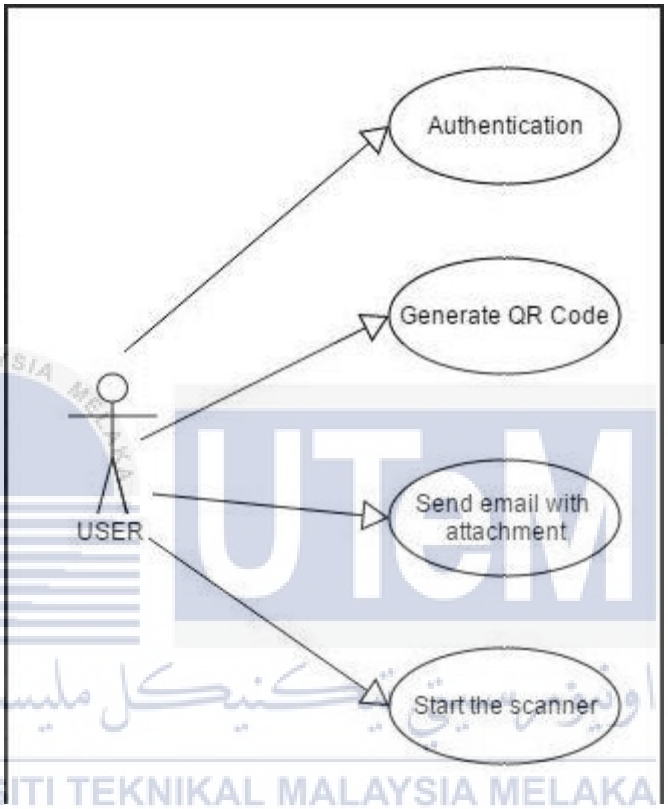


Figure 3.1 Use case diagram for CTPS

Sequence diagram is an interaction diagram that shows how processes operate with one another and what is their order. It shows object interactions arranged in time sequence. There are several sequence diagrams in CTPS

1. Authentication CTPS

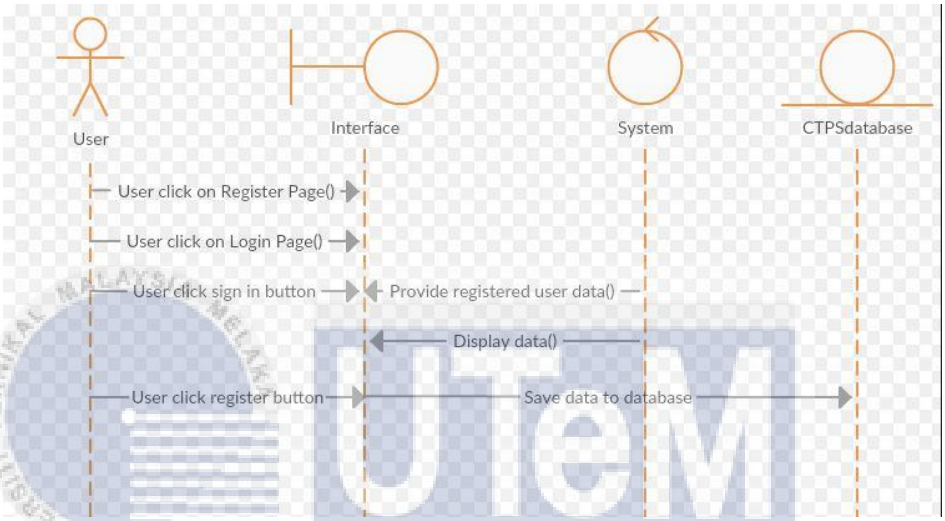


Figure 3.2 Sequence Diagram for Authentication CTPS

2. Generate QR Code

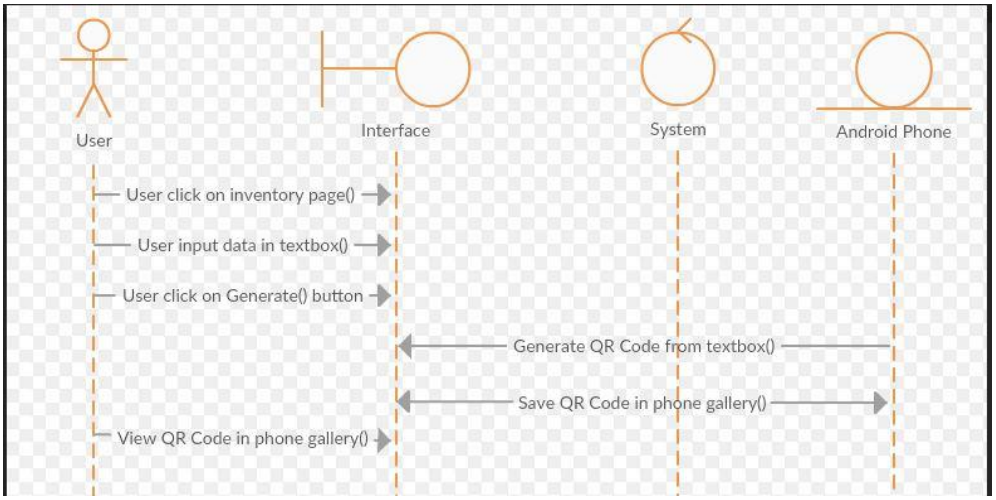
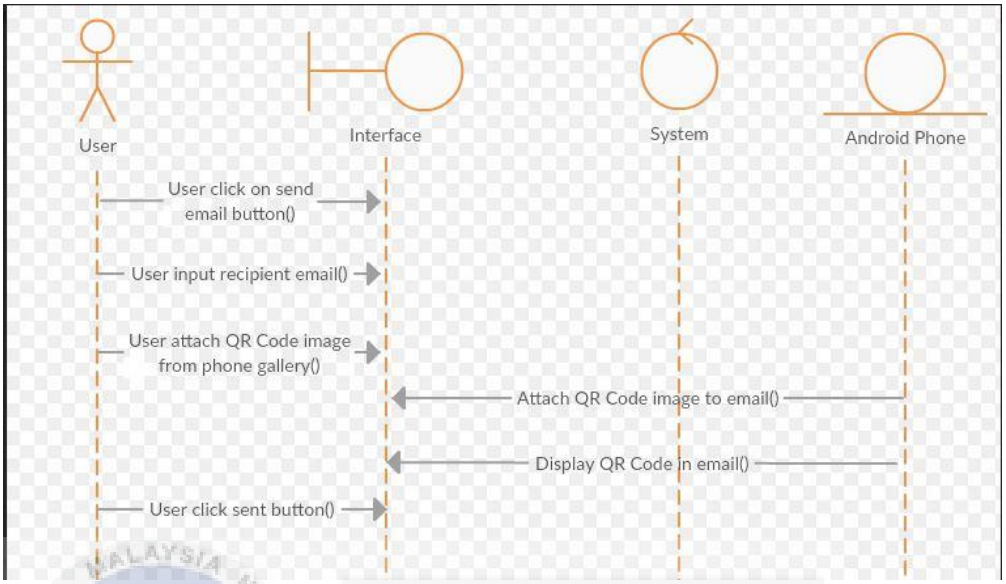


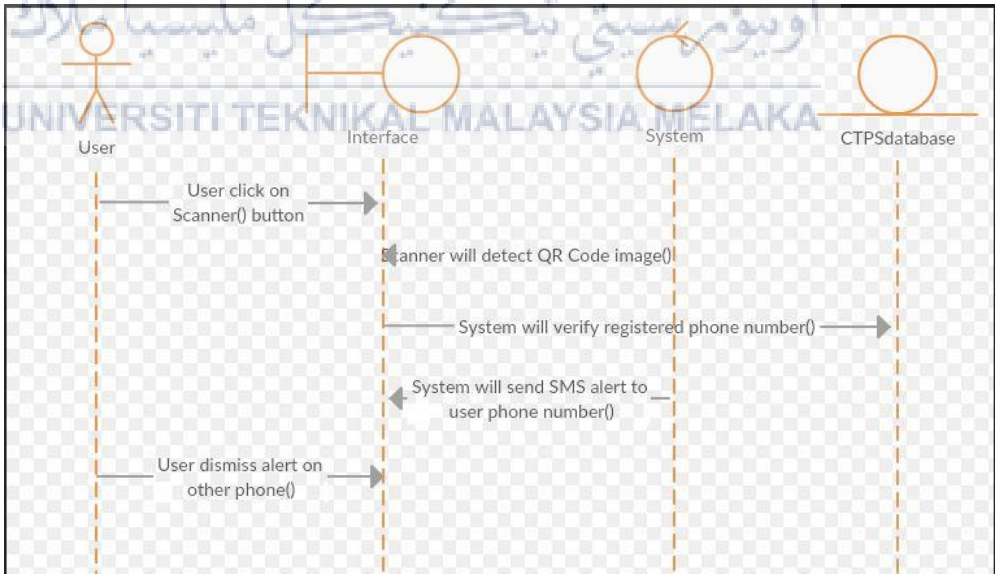
Figure 3.3 Sequence Diagram for Generate QR Code

3.Send Email with attachment



3.4 Sequence Diagram for Send Email with attachment

4. Start the scanner



3.5 Sequence Diagram for Start the scanner

3.3.3. Non-functional Requirement

The non – functional requirement for this application is that it use Android Platform. Hence, the data that can be store using the database might be minimal and the byte to download is small and takes less time to download this application. This application is develop on one laptop only so only apk file can be distributed to other user.

NFR No	Requirements	Description
NFR 1_1	Availability	The application has simple user interface and can be accessed at anywhere and anytime by user.
NFR 2_1	Redundancy	The application should be not allow the duplication of data.
NFR 3_1	Maintainability	The application should be easy to maintain. Means, easy to correct the defects or replace faulty of the application.

Table 3.2 Non Functional Requirement

3.3.4 Others Requirement

SR No	Type	Description	Software
SR_01	Operating System	Windows 10 is the OS platform to develop the application	Microsoft Windows 10
SR_02	Database	SQLite is the database mostly used by developer to build Android application	SQLite
SR_03	Android development platform	Application is develop using Android Studio which provide lots of library and API to be use for the application	Android Studio
SR_04	Documentation Tool	There are several platform and usage for documentation such as : • Writing report • Draw diagram	• Microsoft Office 2015 • Drawio

Table 3.3 Other requirement

3.3.5 Hardware Requirement

The main of hardware will be used to carry out of this project is a laptop. So, for this project I used a laptop that has following specifications. This hardware was selected because it is enough to complete this project. Table 3.4 below shows the hardware requirement needs to develop this application.

Table 3.4 Hardware Requirements

Hardware	**Purpose**
Processor	Intel(R) Core (TM) i5-4200U CPU @ 1.6Ghz
Ram	8GB DDR4
System Type	64 – bit OS
Smartphone	To access and view the application

3.4 Conclusion

As a conclusion, this chapter analyze and describe the problem of the application. Problem analysis used to collect the information to assist application development and help our findings about the problem occurs on the current application. The functional requirement is the explanations about the activities of the application as it associated to the function of the application. Non-functional requirement describes about the quality attribute of the application. Other requirements cover about the software and hardware requirements of this application. Chapter IV will explain more about the design of the application that covers about high-level design and application architecture.

CHAPTER IV

DESIGN

4.1 Introduction

In this chapter explains about the overall design process which included the application architecture, components, modules, interfaces and data for the application to meet specific needs for CTPS. This application developed using application software to build mobile application. CTPS is developed based on observation and analysis that have been conducted to enhanced the security for computer components especially CPU. Furthermore, this application is build according to the modern environment which suited to be used.

This chapter will discuss about the design of the application of CPU Theft Prevention System and shows the interfaces and functionality of the application and will be explained in detail.

4.2 High-Level Design

The system architecture being used for the application is a smartphone with Android based system. This application will shows how the application structure consisting the components, relationship between them will work together to implement the overall system.

4.2.1 System Architecture

System architecture is used to explain the in general about the design and structure of the application. Systems Architecture is a reaction to the conceptual and practical difficulties of the description and the design of complex application. It is also is a practitioner-oriented guide to designing and implementing effective architectures for our application.

The architecture of CTPS used Client – Server Architecture which consists of Android XML and Android devices and also the database server side that is SQLite Database. This application use Java language for Android.

Figure 4.1 Client – Server Architecture

4.2.2. User Interface Design

System design is the process of defining and developing an application to meet the needs of specific users. User interface design (UI) or user interface engineering is the design of user interface for machines and software, such as computers, home appliances, mobile devices and other electronic devices, with the focus on maximizing the user experience.

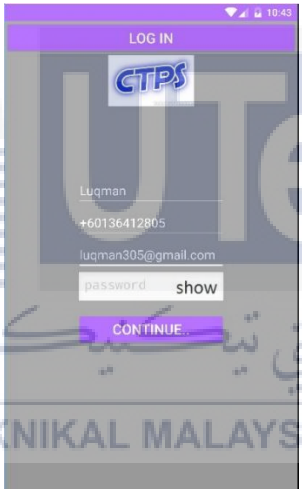


Figure 4.2 Register Page

This page allow new user to register with the application

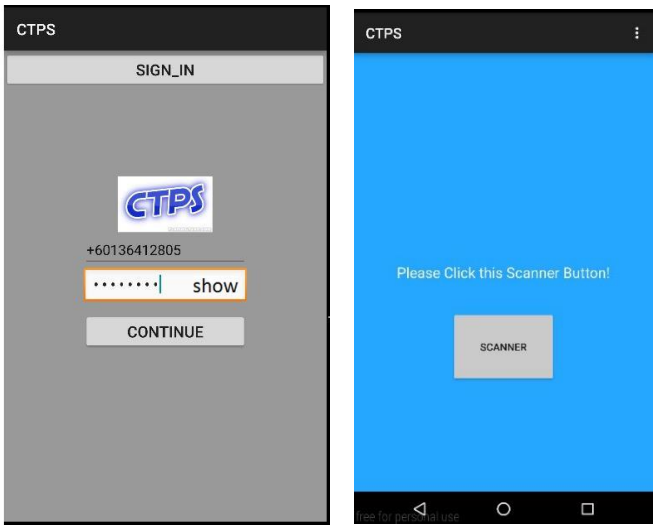


Figure 4.3 Login and Register Interface

This interface allow user to login to the application. The right one is the home page of the application which user can activate the scanner by clicking the button.

Figure 4.4 View Profile

This interface shows user profile which they can only view their name and password.

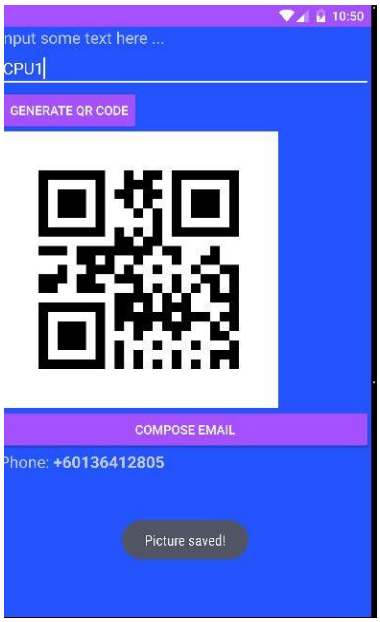


Figure 4.5 Inventory and Generate QR code

This interface allow user to input data and then generate it using QR code generator within the application. The image will be save into a newly created folder in the gallery. After that user can retrieve and print the QR code generate via email which they can attach the image from the gallery.

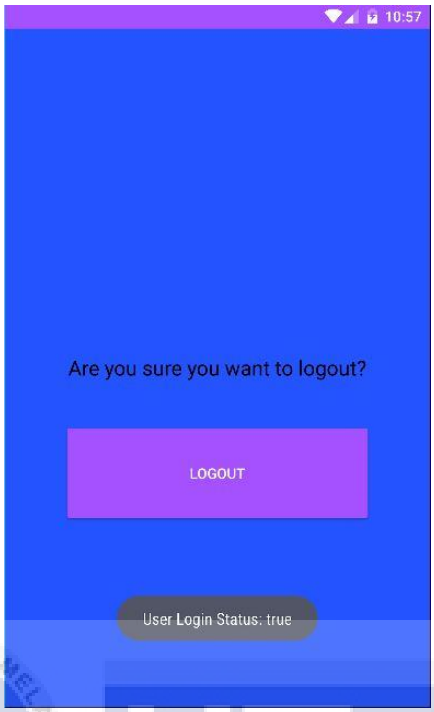


Figure 4.6 Logout page

This interface allow user to confirm logout from the application.

4.2.2.1 Navigation Design

Cpu Theft Prevention System (CTPS) is an Android based application that is used by user in home and computer labs. The user can activate the scanner in the application by register and login into the application. The application also provide a page for user to generate QR code and send it via email to be printed by the user. The printed QR code will be glued into any computer components that user want to secure via the CTPS application.

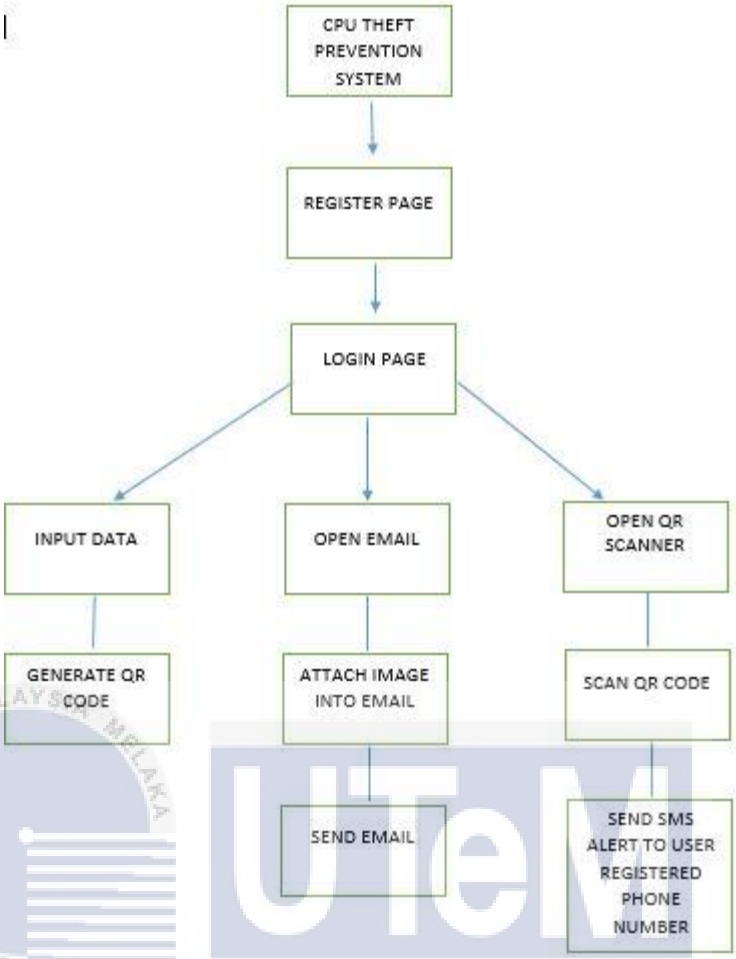


Figure 4.7 Navigation System

4.2.2.2 Input Design

Input design will define about what user will do and click to use the application from the first page until the end.

Input	Input Type	Data Type	Validation
UserId	Textbox	Integer	• Required Field
Name	Textbox	Varchar	• Required Field
Email	Textbox	Varchar	• Required Field • Format example@gmail.com
PhoneNo	Textbox	Integer	• Required Field • Format number & not more than 13

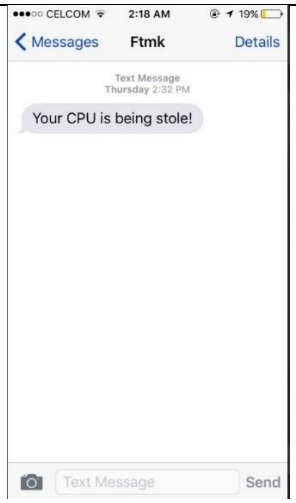
Table 4.1 Data dictionary

4.2.2.3 Output Design

Output design is the output of what the users to view from the application. The output comes from the input user gives. Table 4.2 shows the output design for this application.

Table 4.2 Output Design

Input	Type	Example
QR code generate from input data	Image	
Email receive with QR Code attachment from the application	Email	

Alert receive after QR Code have been scan	Notice via sms	

4.2.3 Database Design

4.2.3.1 Conceptual and Logical Database Design

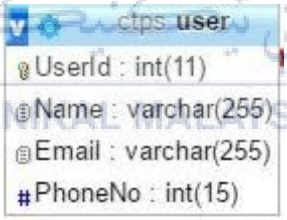


Figure 4.8 User Table

Database design is significant for an application to work out perfectly. It is used to stored data every time new user insert new registration into the application through the interface. The CTPS database only have one table as the application does not need any complicated database design. The database used for this application are only used to stored user data.

4.3 Detailed Design

Detailed design is about the design where we will go through overall structure of the application to know deeper about the application that we are going to develop. The main purpose is to make sure that we able to know and identify what might be the critical issue in the application. This application is using OOAD method ,so we will analyze the application by each cases in use case including the state transitions.

4.3.1 Software Design

Table 4.3 Software Design

Task	**DDL Syntax**
Create table USER	Create table if not exists USER (NAME varchar, MOBILE_NO varchar UNIQUE, EMAIL_ID varchar, PASSWORD varchar,FLAG varchar)

4.3.2 Physical Database Design

Table 4.4 Physical Database Design

COLUMN	TYPE	NULL	DEFAULT	COMMENTS
NAME	Varchar	No		
MOBILE_NO	Varchar	No		UNIQUE
EMAIL_ID	Varchar	No		
PASSWORD	Varchar	No		

4.4. Conclusion

The overall design shows that the on the whole of the process happen in the application. The database design compose the. Besides, the design also allows us to see the flow of the application from beginning to the end. Chapter V will explain more about activities involved in implementation phase of this project and expected output when completing this phase.

CHAPTER V

IMPLEMENTATION

5.1 Introduction

This chapter is about the implementation of the application. System implementation is the process of defining how the application should be developed and ensuring that application is operational and used. It is important to ensure that the application meets quality standards. The purpose is to make the application availability with standard set of users guide and the positioning on – going support and maintenance of the application within the organization. In this phase, IT technician and team member will carry out execution plan, method and design for the application to be implemented. The execution includes the installation, configuration, running, testing and making necessary changes of the application.

5.2 Software Development Environment Setup

In this software development environment setup, there are several software used to develop the application. The details are given in the following sub section:

5.2.1 Android Studio IDE

Android Studio is an Integrated Development Environment (IDE) which contain of workspace and drag and drop function to design an interface for the application. Android Studio most commonly use by the android developer to develop Android application as its functionality provides an Android specific refactoring and quick fixes. It also allow user to design the template which is based on drag and drop UI components.

Android Studio also allows freedom for users to set the Android API which determined whether the develop apps can or cannot be run on low API or higher API.

5.2.2 Genymotion Emulator

Genymotion is an emulator used to run and test the Android application which have been developed in Android Studio.

5.2.3 Windows 10

This project is developed using Windows 10 laptop which will be used to deploy the project and for the Android Studio IDE.

5.2.4 Asus Zenfone (Android 4.4.2)

This project will be run on Asus Zenfone smartphone where it will be used for testing the application on real device.

5.3 Software Configuration Management

Software configuration management is important which is how the configuration of the software to develop the application. The details is given in the following sub section:

5.3.1 Configuration Environment Setup

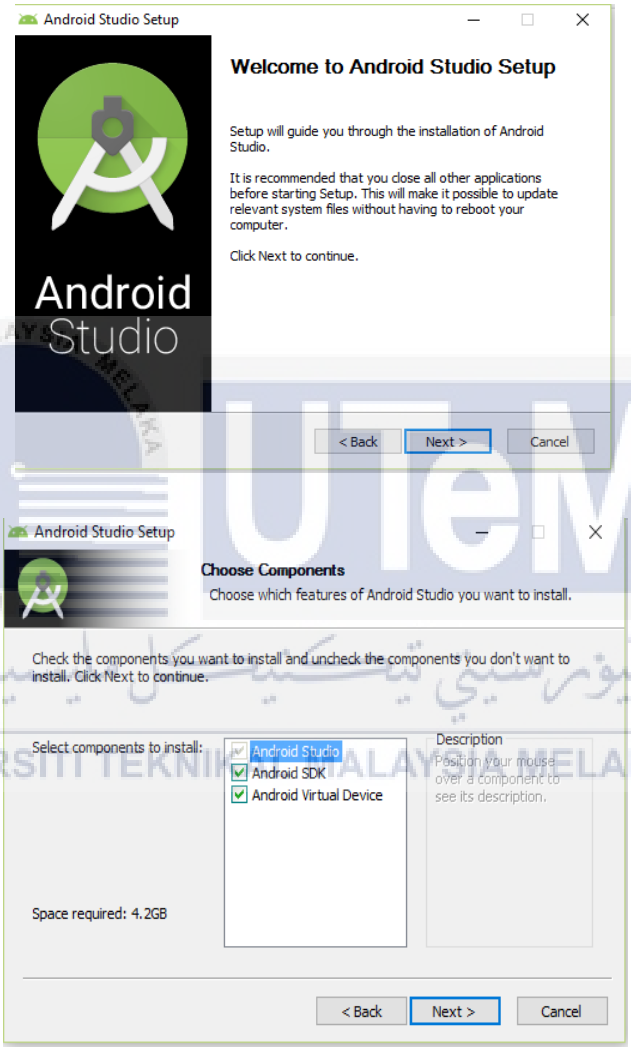
Software configuration need to be managed well. Purpose for need in software management is to test the whole application and defines the error of any codes error, misconfiguration in both software and hardware.

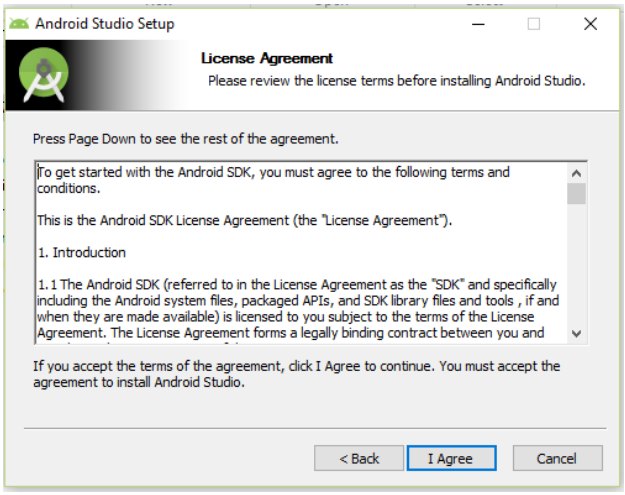
a) Installation of Android Studio IDE

1. Download Android Studio IDE from

https://developer.android.com/studio/index.html

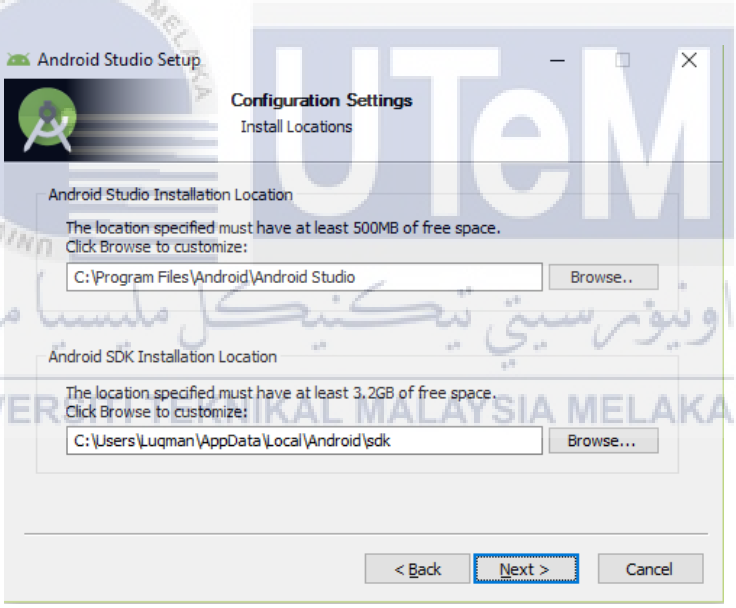
2. Run the installation and proceed with the steps.



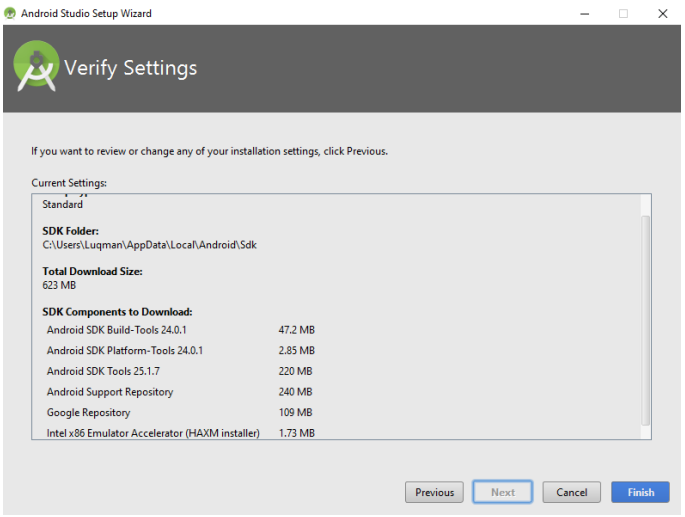


3. Tick all the components to be installed with the Android Studio.

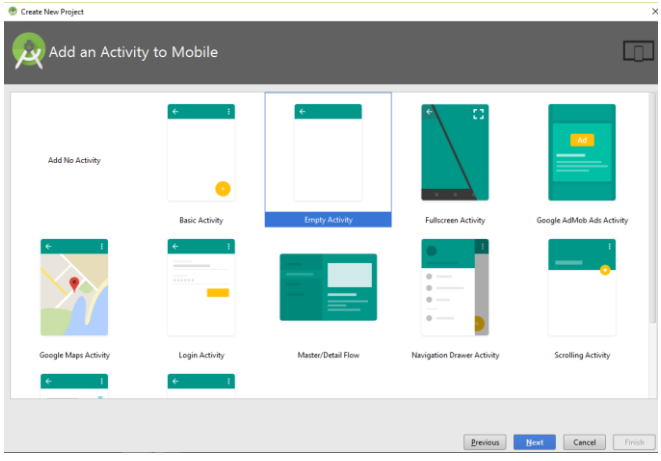
4. Accept the term and condition and the program will install



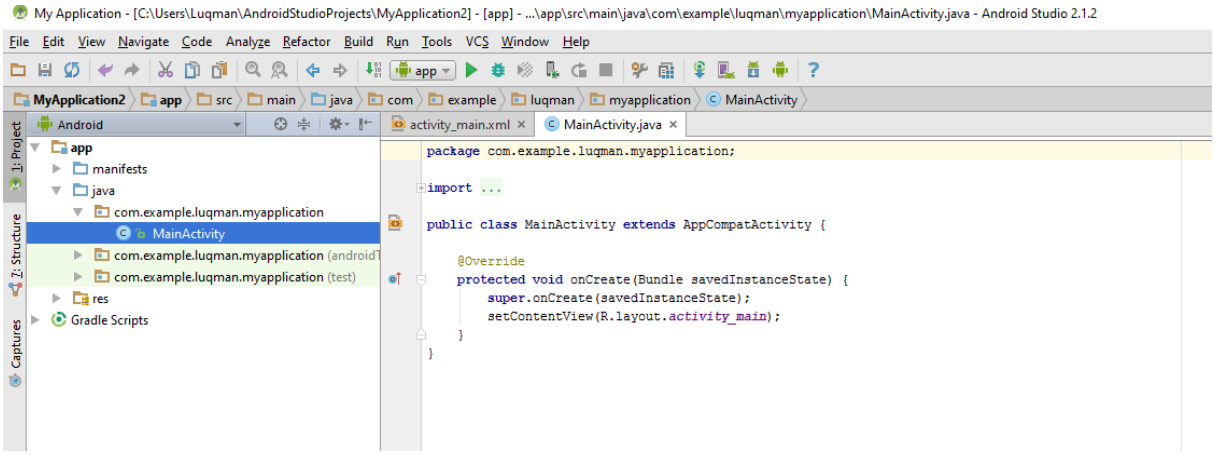
5. Select the location which the program will be install



6. After finish the installation, continue to verify optional update to be install for the Android Studio.



7. To create new project, Select File > New > New Project. Continue by naming the project and choose any activity as the main activity and rename the activity.



8. Example of activity to create the application

5.3.2 Version Control Procedure

Version control is used to manage multiple versions of computer filed and programs. Version control procedure allows user to track back their history files or any changes that have been made on that file.

Table 5.1 Version Control Procedure of CPU Theft Prevention System

Page	Version	Date	Author	Description
Signin.java	1.0	20/3/2016	Luqman	Registration of new user
Login.java	1.0	20/3/2016	Luqman	User enters registered email and password
Home.java	1.0	26/3/2016	Luqman	Display main page of apps after login
SessionManager.java	1.0	26/3/2016	Luqman	Function which will save unique ID session of register user for any page
QRCodeEncoder.java	1.0	23/4/2016	Luqman	Function which will access the smartphone camera and scanning QR code
InventoryActivity.java	1.0	9/4/2016	Luqman	Allow user to generate QR code and send to email
ViewActivity.java	1.0	9/4/2016	Luqman	Allow user to view their registered information
DatabaseHelper.java	1.0	19/3/2016	Luqman	File which contains the process of database
SmsReceiver.java	1.0	7/5/2016	Luqman	Function which will send sms to phone number after scanning QR code.
Logout.java	1.0	26/3/2016	Luqman	Destroy session and back to login page

5.4 Implementation Status

The implementation status established the schedule of the application development progress. It will define each component/module and their description, duration of completion and date complete.

Table 5.2 Implementation Status of CPU Theft Prevention System

Module	**Description**	**Time**	**Date Complete**
Authentication	The user need to enter valid email, password and phone number for registration. The email and password will be verify in the database later for login process of the user. The phone number will later be used for sms receiver during the process of scanning QR code.	1 months	1/4/2016
Database	The creation of Data Manipulation Language (DML) and Data Definition Language (DDL) for the application which will stored data entered by the user.	7 days	29/3/2016
View	User can view their registered information	3 days	20/4/2016
QR code Receive	The application will scan the QR code which will be detected via smartphone camera and the notification will be send to the registered user phone number.	1 month	1/5/2016
QR code generate and send	The registered user will manually key in the name of pc (ex : PC-Luqman) and the application will generate the QR code based on the user input. User will then allow to send the generated QR code to the preffered user email for them to print out the QR code	1 month	1/6/2016

5.5 Conclusion

The chapter concludes that the application implementation is a very important part for development of the application. It involves the installation, configuration, testing and making neccesary changes to the application. Application testing need to be done carefully to ensure that the application is built and can be implemented correctly.

CPU Theft Prevention System can be access by apk file which can be installed in the Android smartphones. This application is fully built on JAVA language for Android based on Android Gradle. The application has undergo many testing process to ensure that the application will run perfectly and does not have glitch which can prevent user from fully used the functions in the application.

CHAPTER VI

TESTING

6.1 Introduction

System testing is a process of testing an application after the coded, tested and urdergoes integration testing. Testing is an essential process before the applicatoin is being launch and published to the consumer because this phase can ensure whether the application scope has been fulfilled and met the requirement of the initial plan of the project. For the testing process, this application used black box testing method which will focused on the output generated in response to the initial input and execution conditions. The tester must test the application to know whether it is functional or not. The tester need to test to ensure that the application meet the earlier objective of developing the application.

For the CPU Theft Prevention System,the testing process must be done to ensure that all the functions in the application run perfectly without any flaws or problem and also meet the objective and requirement of the project.

6.2 Test Plan

Test plan is a document which describes the scope, approach, resources and schedule of intended testing activities. Test plan will identifies the test items, features that need to be tested, person to do the testing process, and risk that can occur that need any contigency plan. The details are in the following sub section :

6.2.1 Test Organization

Test organization describes the person who involves in the testing phases. The person should be responsible to test each of the application functionality and application module. A group or a person of professional has been selected to do the testing process.

Table 6.1 Test Organization of CPU Theft Prevention System

Testing Activity	Tester
Unit Testing	Luqman Arif
Integration Testing	Luqman Arif
System Testing	Luqman Arif
User Acceptance Testing	Puan Noor Azilah Muda

6.2.2 Test Environment

Test environment is the hardware and software selection which the testing process will be done, and any other software and hardware that will be used to interact with the application such as smartphones and laptop.

Table 6.2 Test Environment of CPU Theft Prevention System

Software Configuration (Smartphones)	**Specification**
Operating System	Android 4.4.2
Database	SQLite
RAM	2 GB
Processor	Quad-core 2.3 Ghz

6.2.3 Test Schedule

Test schedule consists of testing types, desccription of the each testing types, start date and end date of the application testing process. The details are given in this following table.

Table 6.3 Test Schedule of CPU Theft Prevention System

Testing Type	Description	Start Date	End Date
Unit Testing	To test each module in the application whether it meets the requirements or not	27/7/2016	30/7/2016
Integration Testing	To test the integrated application of each module	28/7/2016	30/7/2016
System Testing	To test the whole application whether it can perform in a proper way or not	31/7/2016	10/8/2016
User Acceptance Testing	To test the satisfaction of the end user towards the application	10/8/2016	17/8/2016

6.3 Test Strategy

Test strategy outlines the testing approach and everything else that surrounds it. It is different with the test plan, in the sense that the test strategy is actually a part of test plan. It is the most important part of in the form of text document that is an extent generic and static.

6.3.1 Classes Of Test

Classes of test consists four kind of testing which are unit testing, integration testing, system testing and user acceptance testing. The details are given in this following sub section.

6.3.1.1 Unit Testing

It is the lowest level of software testing. It usually has few inputs and mostly only one input. Unit testing involves only those characteristics that are vital to the performance of the unit that is being tested. This encourages developers to modify the source code without immediate concerns about how such changes can affect the functions of other unit or the application as a whole. Once all the unit is being tested and are determine to be working in efficient and error free, larger components of the program will be tested in the integration testing.

Unit testing can takes time to be done where it demands patience and thoroughness of the tester. Unit testing must be done with an awareness that it may not be possible to test a unit for every input scenario that will occur when the application are being publish to the consumer.

In the application, user input of email and password are being tested for any error input. Example of login input is as below.

Figure 6.1 Login of CPU Theft Prevention System

6.3.1.2 Integration Testing

Integration testing is a software development process which program units are combined and tested as groups in multiple ways. In this context, a unit is defined as the smallest test part of the application. Integration testing can expose any problems with the interrelated interface of each components before the application problem occur when it is publish to the consumer. There are two major ways to do integration testing, called bottom – up method and the top – down method. Bottom – up method begins with unit testing, followed by tests of progressively higher level combinations of units called modules. In top – down method, the highest level modules are tested first and progressively lower level modules are tested after that.

For this application, users data must connect with the scanning process which makes it easier for the whole application to be connected to each other.

Figure 6.2 Home Page of CPU Theft Prevention System

6.3.1.3 System Testing

System testing is the testing process which determine the behaviour of a complete and fully integrated software product based on specified requirements. In this phase, tester concentrated on finding any bugs or defects, fixed errors to determine that it met its required result. It is important because it will check if the application meets functional requirements or not.

In this application, full requirements must be applied for tester to test the application if it can function as intended. For example, user that generate the QR code can send email to the specific email that is being input and receive the QR code image the email that have been sent.

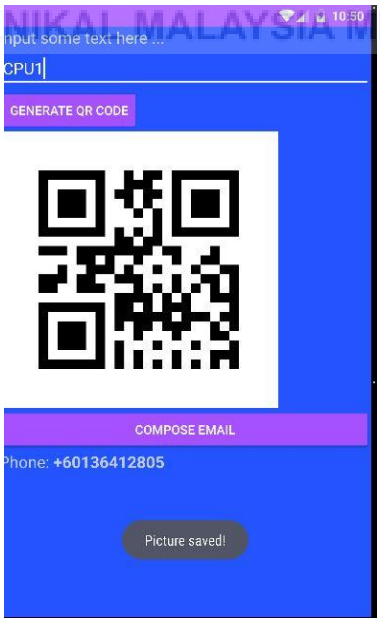


Figure 6.3 QR Code generator in CPU Theft Prevention System

6.3.1.4 User Acceptance Testing

User acceptance testing (UAT) alse known as beta testing, is a phase of software development in which the software is tested in the 'real world' by the intended consumer. UAT can be done by in house testing such as volunteer or paid intended subjects to use the application by making the test version available for downloading. Most UAT done by providing free trial to the intended volunteers where user experience are being gathered by the developers to make any final changes on the products before it is being distributed as the final version to the consumers.

After CPU Theft Prevention System finished the development phase, it is being distributed to several volunteers to be tested to ensure the functionality of the application meets it requirements and to get feedback from the earlier users.

6.4 Test Design

Test design consists test description and test data. The details are given in the following sub section.

6.4.1 Test Description

Test description consists test case id, description and expected result. The details are given in table A.1 in appendix A.

Table 6.4 Test description of CPU Theft Prevention System

No	Test Case ID	Description	Expected Result
1	Register_User_Phonenum	To test the system when the field is blank when it is submitted	Display "enter valid number"
2	Register_User_Email	To test the system when the field is blank when it is submitted	Display "enter valid email"
3	Register_User_Password	To test the system when the field is blank when it is submitted	Display "password must be in 8 characters"
4	Login_User_Phonenum	To test the system when the field is blank when it is submitted	Display "enter valid phone number"
5	Login_User_Password	To test the system when the field is blank when it is submitted	Display "Enter valid password"

6.4.2 Test Data

Test data consists modules, field of modules and test data which is valid data and invalid data when testing the application. The details are given in the following table.

Table 6.5 Test data for CPU Theft Prevention System

No	Module	Field	Test Data	
			Valid Data	**Invalid Data**
1	Register	Full name	Luqman Arif	12345
		Phone number	+60136412805	Asddsa
		Email	Luqman305@gmail.com	Luqman305.com
		Password	Testing123	123456
2	Login	Phone number	+60136412805	Asdsas
		Password	Testing123	123456
3	QR Code generator	Cpu name	Computer1	Computer 2

6.5 Test Result And Analysis

Test result and analysis consists test case ID, results and remarks. The details can be refer in Appendix A.

Table 6.6 Test result of CPU Theft Prevention System

No	Test Case ID	Result	Remark
1.	Register_User_Phonenum_Blank	Pass	none
2.	Register_User_Phonenum_Invalid Data	Pass	none
3.	Register_User_Email_Blank	Pass	none
4.	Register_User_Email_Invalid Data	Pass	none
5.	Register_User_Password_Blank	Pass	none
6.	Register_User_ Password _Invalid Data	Pass	none
7.	Login_User_Phonenum_Blank	Pass	none
8.	Login_User_Phonenum_Invalid Data	Pass	none
9.	Login_User_Password_Blank	Pass	None
10.	Login_User_Password_Invalid Data	Pass	None

The pass result indicated that the result of testing is success while the none remark indicated that result of testing did not have any error.

6.6 Conclusion

In this chapter, The description of the test plan for the application are explained. From this test case, the application has concluded all the specifications needed. In order to resolve any constraints, the arrangements of the application in proper ways are needed to prove that the application has achieved all the requirements.

Lastly, within the testing results, Any problems needs to be solved to ensure the application is useful and it will functions as intended for the users.

CHAPTER VII

CONCLUSION

7.1 Introduction

This report explains and shows in details of application flows that has been developed starting from planning until testing phase. This last chapter will concludes all chapters which are the literature review, methodology, analysis and design, implementation and testing. In addition, it also shows the strength and weakness of the system or application. So, suggestion of improvement will be applied to the application to improve the application.

7.2 Observation of Strengths and Weaknesses

The strengths that have been identified in the CPU Theft Prevention System (CTPS) during implementation phase are :

- Application can be used without the need of internet.
- Application can be used as the main security to help prevent the computer belongings from being stolen.
- Application can be improve much more by applying the usage of security camera, sensors and gps based location.

The weaknesses that have been identified in the CTPS during the implementation phase are :

- Application have problem adapting with dim light to scan the QR code using the camera.
- Needs for extra smartphone that not being used to work as the scanner.
- The usage of the application drain smartphone battery quickly

7.3 Propositions for Improvement

Suggestions for the improvement of the CTPS are :

- Using cctv camera as the application scanner.
- Implement the usage of sensors that are already embedded in the latest smartphone available (if still using smartphone as scanner)

7.4 Conclusion

This last chapter shows the flows of overall in the application starting from designing until implementation and testing phase to ensure the success of the application. There are several improvement that can greatly improve to further help tighten the security of consumers belongings which can further develop in the future of this application development.

REFERENCES

Sushant Arora (2013) “Indoor Surveillance On Android Device Over Wifi” Record

https://oatd.org/oatd/record?record=%22oai%5C%3Aetd.ohiolink.edu%5C%3Acase1375110881%22

Wikipedia contributors (2016) – Agile Software Development

https://en.wikipedia.org/wiki/Agile_software_development

APPENDICES

APPENDIX A Test Case of CPU Theft Prevention System

APPENDIX A

Test Case for CPU Theft Prevention System

Test Case 1

Function Requirement	Test Requirement	Test Status	Pre-condition	Input/Test Data	Steps	Expected Result	Test Script
Input Data for Register (Pass)	User need to register the name, telephone number, email and password	Pass / Fail	User need to fill all the textbox field	Name: Luqman Telephone no: 0136422805 Email: luqman305@gmail.com Password: Luqman1	1. User need to input all the field for name, telephone number, email, password. 2. User need to click “continue” button. 3. The application successful register.	User should able to register	DO until EOF Input Data Record Send data name to “Name field” Send data telephone no to “Telephone no field” Send data email to “Email field” Send data password to “Password field” Send data Continue IF **Success**, THEN user get to login
Input Data for Register (Fail)	User need to register the name, telephone number, email and password with the wrong format	Pass / Fail	User need to fill all the textbox field	Name: Luqman Telephone no: 01364228o5 Email: luqman305@gmail.com Password: 1234	1. User need to input all the field for name, telephone number, email, password. 2. User need to insert the telephone number using incorrect format such as include the alphabet or symbol and input the password within 4 character in the field. 3. User need to click “continue” button. 4. This application not allow user to continue to other screen. 5. The application fail to register.	User will not able to register	DO until EOF Input Data Record Send data name to “Name field” Send data telephone no to “Telephone no field” Send data email to “Email field” Send data password to “Password field” Send data Continue IF **Fail**, THEN user need to register back

					6. User need to register back into the application using correct format.		
Input Data for Register (Null)	User no need to register the name, telephone number, email and password	Pass / Fail	User no need to fill all the textbox field	Name: NULL Telephone no: NULL Email: NULL Password: NULL	1. User no need to input all the field for name, telephone number, email, password. 2. User need to click “continue” button. 3. The application failed to register. 4. User need to field the textbox required	User will not able to register	DO until EOF Input Data Record Send data null to “Name field” Send data null to “Telephone no field” Send data null to “Email field” Send data null to “Password field” Send data Continue IF **Fail**, THEN user need to field textbox required.

Test Case 2

Function Requirement	Test Requirement	Test Status	Pre-condition	Input/Test Data	Steps	Expected Result	Test Script
Authenticate (Pass)	User login with telephone no and password	Pass / Fail	User must register the account first	Telephone no: 0136422805 Password: Luqman1	1. User need to input the data for telephone no and password that have register. 2. User need to click “continue” button. 3. The application successfully login.	User should able to login	DO until EOF Input Data Record Send data telephone no to “Telephone no field” Send data password to “Password field” Send data Continue IF **Success**, THEN user can use the system
Authenticate (Fail)	User login with invalid telephone no and password	Pass / Fail	User must register the account first	Telephone no: 01364228o5 Password: 1234	1. User need to input the data for telephone no and password that have register with the wrong password. 2. User need to click “continue” button. 3. The application failed login.	User will not able to register	DO until EOF Input Data Record Send data telephone no to “Telephone no field” Send data password to “Password field” Send data Continue IF **Fail**, THEN user need to login back to the system.
Authenticate (Null)	User no need to enter the telephone no and password	Pass / Fail	User must register the account first	Telephone no: NULL Password: NULL	1. User need to input the data for telephone no and password. 2. User need to click “continue” button. 3. The application failed login. 4. User need to field the textbox required.	User will not able to register	DO until EOF Input Data Record Send data null no to “Telephone no field” Send data null to “Password field” Send data Continue IF **Fail**, THEN user need to field the textbox required.

Test Case 3

Function Requirement	Test Requirement	Test Status	Pre-condition	Input/Test Data	Steps	Expected Result	Test Script
Compose Email (Pass)	User login with account that have register to compose the email	Pass / Fail	User must have the account to login	Telephone no: 0136422805 Password: Luqman1 Email: ali@gmail.com Attach file: image 1 (QR code image)	1. User need to login to the application. 2. User need to click “inventory” button. 3. User need to compose the email. 4. User need to choose the medium that use to send the email (example: Gmail). 5. User need to input the receiver email and attach the code that save in the gallery. 6. User need to send the email.	User should able to compose the email	DO until EOF Input Data Record Send data Gmail to “Medium share” Send data receiver email to “Receiver field” Send data attach file to “Attach field” Send data “SEND email” IF **Success**, THEN the receiver will receive the email.
Compose Email (Fail)	User login with account that have register to compose the email	Pass / Fail	User must have the account to login	Telephone no: 0136422805 Password: Luqman1 Email: ali@gmil.com Attach file: image 1 (QR code image)	1. User need to login to the application. 2. User need to click “inventory” button. 3. User need to compose the email. 4. User need to choose the medium that use to send the email (example: Gmail). 5. User need to input the invalid receiver email and attach the code that save in the gallery. 6. User need to send the email.	User should not able to compose the email	DO until EOF Input Data Record Send data Gmail to “Medium share” Send data receiver email to “Receiver field” Send data attach file to “Attach field” Send data “SEND email” IF **Fail**, THEN the receiver will not receive the email and sender need to send with the correct email.
Compose Email	User login with account that have register to	Pass / Fail	User must have the account to login	Telephone no: 0136422805 Password: Luqman1	1. User need to login to the application.	User should not able to	DO until EOF Input Data Record

(Null)	compose the email			Email: NULL Attach file: NULL	2. User need to click “inventory” button. 3. User need to compose the email. 4. User need to choose the medium that use to send the email (example: Gmail). 5. User no need to input the receiver email and the attach file. 6. User need to send the email.	compose the email	Send data Gmail to “Medium share” Send data null to “Receiver field” Send data null to “Attach field” Send data “SEND email” IF **Fail**, THEN the receiver will not receive the email and sender need to input the receiver email address.

Test Case 4

Function Requirement	Test Requirement	Test Status	Pre-condition	Input/Test Data	Steps	Expected Result	Test Script
Scan QR Code (Pass)	User need to scan the QR Code and user need to have credit balance	Pass / Fail	User must have the account to login	Telephone no: 0136422805 Password: Luqman1	1. User need to login to the application. 2. User need to click “scanner” button. 3. User need to scan the QR Code. 4. The application successfully scan and send the message to the owner.	User should able to scan the QR Code	DO until EOF Input Data Record Send data “scanner” Send data message to “owner number” IF **Success**, THEN the owner will receive the message.
Scan QR Code (Fail)	User need to scan the QR Code and user no need to have credit balance	Pass / Fail	User must have the account to login	Telephone no: 0136422805 Password: Luqman1	1. User need to login to the application. 2. User need to click “scanner” button. 3. User need to scan the QR Code. 4. The application successfully scan but the message will not sent because no credit balance in owner mobile phone.	User should not able to scan the QR Code	DO until EOF Input Data Record Send data “scanner” Send data message to “owner number” IF **Fail**, THEN the owner need to add the balance of credit and scan back the QR Code
Scan QR Code (Null)	User no need to scan the QR Code and user no need to have credit balance	Pass / Fail	User must have the account to login	Telephone no: 0136422805 Password: Luqman1	1. User need to login to the application. 2. User need to click “scanner” button. 3. User need to scan other bar code. 4. The application will not successfully scan because the scanner will not detect the code.	User should not able to scan the QR Code	DO until EOF Input Data Record Send data “scanner” IF **Fail**, THEN the owner need to scan the QR Code and need to have credit balance in the mobile phone.