

BORANG PENGESAHAN STATUS TESIS*

JUDUL: MOBILE GLOBAL POSITIONING SYSTEM (GPS) SYSTEM

SESI PENGAJIAN: 2013 / 2014

Saya MOHD SYAHMI IKHWAN BIN CHE MOHD NOOR

mengaku membenarkan tesis Projek Sarjana Muda ini disimpan di Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dengan syarat-syarat kegunaan seperti berikut:

1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. ** Sila tandakan (/)

 SULIT (Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)

 TERHAD (Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

 TIDAK TERHAD

M. Syahmi Ikhwan

(TANDATANGAN PENULIS)

Alamat tetap: LOT 3615, NO. 8,
TAMAN GEMILANG, Kg. BALAI BESAR

23000 DUNGUN, TERENGGANU

Tarikh: 30 August 2013



(TANDATANGAN PENYELIA)

MASHANUM OSMAN
Nama Penyelia

Tarikh: 30 August 2013

CATATAN: * Tesis dimaksudkan sebagai Laporan Projek Sarjana Muda (PSM).

** Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

MOBILE GLOBAL POSITIONING SYSTEM (GPS) SYSTEM

MOHD SYAHMI IKHWAN BIN CHE MOHD NOOR

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

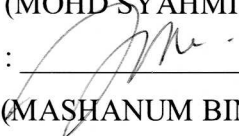
FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2013

DECLARATION

I hereby declare that this project report entitled
MOBILE GLOBAL POSITIONING SYSTEM (GPS) SYSTEM

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

STUDENT : m. Syahmikhwan Date: 30-08-2013
(MOHD-SYAHMI IKHWAN BIN CHE MOHD NOOR)

SUPERVISOR :  Date: 30-08-2013
(MASHANUM BINTI OSMAN)

DEDICATION

My dedication goes to my beloved parents Mr Che Mohd Noor Bin Muda and Mrs Rozaimah binti Abd. Ghani. They give continuous support to complete my final year project. I really thank to them and dedicate this project to them as symbol of my love to them. Besides, fellow friends and my housemate that is really helpful in finishing my final year project. Furthermore, a special thanks to my supervisor Madam Mashanum Binti Osman and all my classmate for support me direct and indirect to finish my project successfully.

ACKNOWLEDGEMENTS

I would like to thank Allah S.W.T who gives me strength all the time to complete this project. Without Him nothing is possible.

I would also like to thank my supervisor Madam Mashanum Binti Osman who keeps giving me support, idea and guide, without her guidance and help this project could not have been where it is today.

Special thanks go to all of my friends for their help, contribution, and support during my time in Universiti Teknikal Malaysia Melaka (UTeM).

Last but not least, I would like to thank my family for their unconditional love and for always being there whenever I need them through thick and thin. With their love and support I can finish this project smoothly.

ABSTRACT

Mobile GPS System is a mobile based application for the Android OS that will be focusing in the geo-location where Google maps is integrated and able to show users current location using the GPS or internet, and current places near the user. Although GPS system is still new, the demands of user that want this kind of system grow rapidly. Mobility has become a trend nowadays and people bring their mobile phones, personal digital assistant (PDA), netbook everywhere they go. Global positioning system (GPS) has been used widely especially in mobile sectors. The satellite is used to provide information about the location. User needs a GPS receiver which usually has been integrated on most phones. Numerous of tasks can be done by GPS such integrate in the maps to allow the user to know their locations, to navigate and to track. This application also provides information about the current traffic in certain area, places of interest, tourist information such as places of interest, facts and related website and also map layers such as normal, hybrid, satellite and terrain. In addition, user are able to search any available spot in the application such as hotel, restaurant, zoo and historical place.

ABSTRAK

Mobile GPS Sistem adalah sebuah aplikasi berasaskan telefon mudah alih untuk OS Android yang akan memberi tumpuan dalam geo-lokasi di mana Google maps adalah bersepadu dan dapat menunjukkan lokasi semasa pengguna menggunakan GPS atau internet, dan tempat-tempat yang berhampiran semasa pengguna. Walaupun sistem GPS masih baru, permintaan pengguna yang mahu sistem seperti ini berkembang pesat. Mobiliti telah menjadi trend masa kini dan orang membawa telefon bimbit mereka, pembantu digital peribadi (PDA), netbook mana-mana mereka pergi. Sistem kedudukan global (GPS) telah digunakan secara meluas terutama dalam sektor mudah alih. Satelit ini digunakan untuk memberikan maklumat tentang lokasi. Pengguna memerlukan penerima GPS yang biasanya telah bersepadu pada kebanyakan telefon. Banyak tugas yang boleh dilakukan oleh GPS seperti mengintegrasikan dalam peta untuk membenarkan pengguna untuk mengetahui lokasi mereka, untuk mengemudi dan untuk mengesan. Permohonan ini juga menyediakan maklumat tentang lalu lintas semasa di kawasan tertentu, tempat-tempat menarik, maklumat pelancongan seperti tempat-tempat menarik, fakta dan laman web yang berkaitan dan juga lapisan peta seperti biasa, hibrid, satelit dan kawasan. Di samping itu, pengguna dapat mencari mana-mana tempat yang ada dalam aplikasi seperti hotel, restoran, zoo dan tempat bersejarah.

TABLE OF CONTENTS

CHAPTER	SUBJECT	PAGE
	DECLARATION	II
	DEDICATION	III
	ACKNOWLEDGEMENTS	IV
	ABSTRACT	V
	ABSTRAK	VI
	LIST OF TABLES	X
	LIST OF FIGURES	XII
	LIST OF ABBREVIATIONS	XIV
CHAPTER 1	INTRODUCTION	1
	1.1 Project Background	1
	1.2 Problem Statements	2
	1.3 Objectives	3
	1.4 Scopes	4
	1.4.1 User	4
	1.4.2 Modules	4
	1.4.3 Software	5
	1.4.4 Hardware	5
	1.5 Project Significant	6
	1.6 Expected Output	6
	1.7 Conclusion	6
CHAPTER 2	LITERATURE REVIEW & METHODOLOGY	7
	2.1 Introduction	7
	2.2 Facts Finding	8
	2.3 Gps Maps using Nokia Map	13
	2.4 Gps Traffic Map	14
	2.5 Project Methodology	15
	2.6 Project Requirement	18
	2.6.1 Software Requirements	18
	2.6.2 Hardware Requirements	20
	2.6.3 Other Requirements	20
	2.7 Project Schedule and Milestones	21
	2.8 Conclusion	22

CHAPTER 3	ANALYSIS	23
	3.1 Introduction	23
	3.2 Problem Analysis	24
	3.3 Requirement Analysis	27
	3.3.1 Functional Requirement	27
	3.3.2 Non-Functional Requirement	32
	3.3.3 Other Requirement	34
	3.4 Conclusion	36
CHAPTER 4	DESIGN	37
	4.1 Introduction	37
	4.2 High Level Design	37
	4.2.1 System Architecture	38
	4.2.2 User Interface Design	39
	4.3 Detail Design	47
	4.3.1 Software Design	47
	4.4 Conclusion	59
CHAPTER 5	IMPLEMENTATION	60
	5.1 Introduction	60
	5.2 Software Development Environment Setup	61
	5.2.1 Software Architecture Setup	63
	5.2.2 Hardware Architecture Setup	64
	5.3 Software Configuration Management	65
	5.3.1 Configuration Environment Setup	65
	5.3.2 Version Control Procedure	66
	5.4 Implementation Status	67
	5.5 Conclusion	68
CHAPTER 6	TESTING	69
	6.1 Introduction	69
	6.2 Test Plan	70
	6.2.1 Test Organization	70
	6.2.2 Test Environment	71
	6.2.3 Test Schedule	72
	6.3 Test Strategy	73
	6.3.1 Classes Of Test	74
	6.4 Test Design	76
	6.4.1 Test Description	76
	6.4.2 Test Result	79
	6.4.3 Test Data	83
	6.5 Test Result and Analysis	84
	6.6 Conclusion	85

CHAPTER 7	CONCLUSION	86
	7.1 Observation on Weakness and Strengths	86
	7.2 Propositions for Improvement	87
	7.3 Contribution	87
	7.4 Conclusion	88
	REFERENCES & BIBLIOGRAPHY	89
	APPENDIX A – USER MANUAL	90

LIST OF TABLES

TABLE	TITLE	PAGE
Table 2.1:	Comparison Table of Similar Application	14
Table 2.2:	Project Milestones	21
Table 3.1:	Software Requirement	34
Table 3.2:	Hardware Requirement	35
Table 3.3:	Network Requirement	36
Table 5.1:	Implementation Environment	61
Table 5.2:	Hardware Setup	64
Table 5.3:	Mobile GPS System Versions	66
Table 5.4:	Implementation Status for Each Module	67
Table 6.1:	Responsibilities of Personnel in Testing Process	70
Table 6.2:	Test Environment Specification	71
Table 6.3:	Testing Test Schedule	72
Table 6.4:	Splash Screen Test Description	76
Table 6.5:	Internet Connection Test Description	76
Table 6.6:	About Us Menu Test Description	76
Table 6.7:	Exit Application Test Description	77
Table 6.8:	Tourist Information Menu Test Description	77
Table 6.9:	GPS Navigation Menu Test Description	78
Table 6.10:	Details Map View Menu Test Description	78

Table 6.11:	Find Your Spot Menu Test Description	79
Table 6.12:	Splash Screen Test Result	79
Table 6.13:	Internet Connection Test Result	79
Table 6.14:	About Us Menu Test Result	80
Table 6.15:	Exit Application Test Result	80
Table 6.16:	Tourist Information Menu Test Result	80
Table 6.17:	GPS Navigation Menu Test Result	81
Table 6.18:	Details Map View Menu Test Result	82
Table 6.19:	Find Your Spot Menu Test Result	82
Table 6.20:	Number of Test Data in Testing	83
Table 6.21:	Test Result	84

LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 2.1:	Screenshot of Gps Maps using Nokia Map Application	13
Figure 2.2:	Screenshot of Gps Traffic Map	14
Figure 2.3:	Prototyping Model	17
Figure 3.1:	Current Manual System Flowchart	25
Figure 3.2:	Mobile GPS System flowchart	26
Figure 3.3:	Class Diagram of Mobile GPS System	27
Figure 3.4:	Use Case Diagram of Mobile GPS System	28
Figure 3.5:	Activity Diagram (Navigate Map)	29
Figure 3.6:	Activity Diagram (Search Map and Route)	30
Figure 3.7:	Sequence Diagram of Mobile GPS System	31
Figure 3.8:	Non-Functional Requirement	32
Figure 4.1:	System Architecture of Mobile GPS system	38
Figure 4.2:	Application Icon	39
Figure 4.3:	Splash Screen Page	39
Figure 4.4:	Main Menu Page	40
Figure 4.5:	Tourist Information Page	40
Figure 4.6:	Places of Interest Page	41

FIGURE	TITLE	PAGE
Figure 4.7:	Facts Page	41
Figure 4.8:	URL Page	42
Figure 4.9:	Help Page	42
Figure 4.10:	GPS Navigation Page	43
Figure 4.11:	Layers and Markers Page	43
Figure 4.12:	Find Your Spot Page	44
Figure 4.13:	About Us Page	44
Figure 4.14:	Back to Main Menu Page	45
Figure 4.15:	Exit Application Page	45
Figure 4.16:	Navigation Design	46
Figure 4.17:	Interface of Main Menu	48
Figure 4.18:	Interface of Tourist Information Page	50
Figure 4.19:	Interface of GPS Navigation Page	52
Figure 4.20:	Interface of Details Map View Page	54
Figure 4.21:	Interface of Find Your Spot Page	56
Figure 4.22:	Interface of About Us Page	58
Figure 5.1:	System Architecture of Mobile GPS system	62
Figure 5.2:	Software Architecture of Mobile GPS System	63
Figure 6.1:	Bottom-up Testing Module	73

LIST OF ABBREVIATIONS

PSM	-	Projek Sarjana Muda
GPS	-	Global Positioning System
PDA	-	Personal Digital Assistant
SDK	-	Software Development Kit
JDK	-	Java Development Kit
USB	-	Universal Serial Bus
GIS	-	Geographic Information System
OS	-	Operating System
HTC	-	High Tech Computer Corporation
LG	-	Lucky Geumseong Corporation
WRT	-	Web Runtime
IDE	-	Interactive Development Environment
SDM	-	Software design methodology
SSADM	-	Structured System Analysis and Design Methodology
RAD	-	Rapid Application Development
OOAD	-	Object Oriented Analysis and Design

CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

Global positioning system (GPS) has been used widely especially in mobile sectors. GPS is a space-based global navigation satellite system. It used the satellite to provide information about our location. To access these, the user will need a GPS receiver which nowadays has been integrated on most phones. There is a lot of things that can be done by GPS such as it can be integrate in maps to allow the user know their locations, can be used in navigation in transport, as a tracking device, GPS tours where user can know the point of interest and other geographical related things.

Besides, Global positioning system is a system focusing to locate the location of the user. It can store geographical data of the user. The system used a GPS antenna and sent the signal to satellite to determine the location of the user. Although GPS system is still new, the demands of user that want these kinds of systems grow rapidly. Mobility has become a trend nowadays and people bring their mobile phones, personal digital assistant (PDA), netbook everywhere they go. So the system will be designed to suit these needs thus it will be developed for mobile phone user.

Therefore, this mobile based application will be focusing in the geo-location where Google maps will be integrate, show users current location using the GPS or internet, show current places near the user and the picture of the places thus allow the user to know the places more easily.

1.2 PROBLEM STATEMENT

1.2.1 Lack of map understanding

User hard to understand the map itself. A normal traditional map is complicated to use as the user usually can't point where their exact locations on the map is.

1.2.2 Misguided

The user have to figure out which route need to take either it is a traffic jam or not and even worse user end up in the middle of nowhere.

1.2.3 Lack of traffic information

User can't even know how to avoid a traffic jam during pick hour and of course can't do anything if user stack in the traffic jam because user don't know what is current traffic information.

1.2.4 Time Consuming

So much time has been wasted to figure out which route, travel time just to get to a certain destination which should be done in a minute.

1.2.5 Wasted in term of cost and space

User need to have map in different scale because sometime certain user is looking for the nearest train station, hotel or restaurant.

1.3 OBJECTIVES

1.3.2 Objective 1

To create a mobile map that allow the user to know their location with the help of GPS.

1.3.3 Objective 2

To provide a place of interest in the maps on map marker such as restaurant, shopping mall and so on.

1.3.1 Objective 3

To allow the user to pin-point their location where they can gain information about their location.

1.3.4 Objective 4

To reduce travelling time and save cost.

1.3.5 Objective 5

To provide search method for users to find a place that has given.

1.4 SCOPES

1.4.1 User

- i. Location View
 - a) User can view the location by opening the map application on mobile phone.
 - b) User will need Google Maps on the mobile phone as this system will integrate GPS with the maps. (All android phone has a built-in Google Maps).

- ii. User Interface
 - a) Provide a simple user-interface for the user to navigate through the system even for the first time.

- iii. Mobility
 - a) User can bring anywhere as it is intended for mobile phone user.
 - b) No need to bring a map anymore as it can fit in the pocket.

1.4.2 Modules

- i. User will able to find and retrieve their location information with mobile phone via internet and GPS.
- ii. User can also search the location all over the world with the application.
- iii. User will able to zoom-in for detailed view and zoom-out to see overall map by tapping the screen.
- iv. User able to see places of interest of icon marker provided on selected area. (Malacca)

1.4.3 Software

In order to develop the software android software development kit (SDK) is needed. As android application is based on java, java development kit (JDK) is also needed. Eclipse is used to develop this application as it provides the android plugin in the compiler. With the use of android plugin we can use the android emulator to debug the code. So it is optional to use android mobile phone as we already have the emulator that work exactly as the real phone.

- i. Windows 7
- ii. Java
- iii. Eclipse (with Android plugin)
- iv. Android SDK
- v. Android OS (4.0.3 Ice Cream Sandwich)

1.4.4 Hardware

- i. Android Mobile Phone
- ii. Laptop
- iii. Mobile Phone USB Cable

1.5 PROJECT SIGNIFICANT

- i. With this application, user can view the alternative route and use it to arrive the destination as user can zoom in and out to see the road. So user can decide which road to take. As user move along the path, the system will auto update the current location so user will know where the user are.

1.6 EXPECTED OUTPUT

Expected output from this project is the system will be able to change the manual use of traditional map into computerized such as mobile phone-based system using android operating system that will be focusing in the geo-location where Google maps will be integrate, show users current location using the GPS or internet, show current places near the user and the picture of the places thus allow the user to know the places more easily.

1.7 CONCLUSION

As the conclusion, hopefully this system which is Mobile GPS System will able to show users current location using the GPS or internet, show current places near the user and the picture of the places thus allow the user to know the places more easily.

CHAPTER 2

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 INTRODUCTION

This chapter will discuss on literature review conducted and methodology used to develop the Mobile GPS System. The project methodology is an approach to meet the goals and objectives for this system. Besides, project requirements are such as software, hardware and other related requirement will be identified in this chapter.

A project methodology explain how to manage projects from start to finish. It describes every step in the project life cycle in depth. It also helps to complete tasks faster than before. In the proposed project, Prototyping has selected as the methodology.

In today's phone, it is common to have a built in GPS. But in the early days about 10-15 years ago when the GPS was being introduced, the price of the GPS device was really expensive. Furthermore when GPS was first introduced it doesn't really compact and mobile like GPS today. The size of GPS device is bulky and big. Back then, GPS is one separate device such as Garmin or PapaGo. After a few years later, GPS is started being used in a car. GPS become more and more popular. Although GPS is small enough to be fit in a car, people still can't bring it to whenever they want. They want all in one device. Mobile phone is one of the perfect choices to become all in one device. Hence, the phone manufacturer started to create a phone with built-in GPS.

From that, GPS become a trend in mobile phone these days. Aside from the hardware, more applications regarding GPS is being developed. For example, an application that allow user to see traffics and Geographic Information System (GIS).

2.2 FACTS FINDING

Fact finding is an extremely important component of the communication process which presents its own special set of problems and opportunities to people working to increase the constructiveness of intractable conflicts. Furthermore, the facts and finding also can be based on the major components of the enhanced system such as backup and recovery, system architecture, export and import data and integrity within different applications.

2.2.1 Domain

Mobile GPS System is an application that develops for android user especially Malacca's tourist. Module that has been specified in this system is based on a research or application to help user on finding places of interest around Bandar Hilir, Malacca and providing route towards certain place or area systematically. Mobile GPS system is concern about online GPS system which guiding user towards place of interest and other related places. Planning phase need to be done properly so the best solution can be made and problems can overcome without doubt.

2.2.2 Operating System

The operating system (OS) is the core system of today's smartphone. The OS allow the user to have the experience of having similar experience to computer for example similar computer based function in their phone, to control overall operation of the phone, to be responsible for the management of hardware and other various component in the computer. There are lots of popular mobile OS such as android which is developed by Google and widely used by High Tech Computer Corporation (HTC), Lucky Geumseong Corporation (LG), Samsung Corporation, and Sony Ericsson Corporation, iOS is widely used by Apple in their iPhone and iPad. Bada is a smartphone platform newly developed OS by Samsung and last but not least Symbian a popular OS that has been used in many Nokia phones. All of them have their own advantages and disadvantages. The best OS need to be chosen in order to develop the GPS application.

2.2.3 Symbian

Symbian OS is an open source OS developed by Symbian Ltd. It was formed in 1998 with its shareholder Ericsson, Nokia, Panasonic, Motorola, Psion, Siemens and Sony Ericsson. Symbian Ltd was acquired by Nokia in 2008 and since then Symbian become an open source OS. This means Symbian has become a platform where anyone can write or sell or even giveaway end user applications.

Symbian devices can be programmed by using Python, Java Mobile Edition, Flash Lite, and .NET, Web Runtime (WRT), Widgets and standard C or C++. Symbian is written mainly in C++ and optimised for use in small-battery powered devices with extensive communication capabilities. This can be seen in most smartphone nowadays where Symbian powered mobile phone have a longer battery life compared to other OS. Symbian has provided a free Software Development Kit (SDK) which allows anyone to develop application under Windows environment using the Symbian Emulator. Programming Symbian devices required a basic knowledge of C++.

The Symbian OS have a different segment for various levels of mobile phones. There are three types of Symbian OS which is Pearl, Quartz and Crystal. Pearl is targeted for low level or average handset, Quartz (S60) is developed for smartphone also can be considered as middle level and Crystal is developed for handheld pc which is the high end level.

2.2.4 iOS

Apple is a late comer in a smartphone market yet it still provides a great competitor to other mobile OS and become the second popular smartphones OS in the market after Nokia. iOS is an operating system developed by Apple. iOS is originally developed for iPhone. After become successful with iPhone they used it in iPad, iPod Touch and Apple TV. Unlike Symbian, iOS is not an open source OS which mean apple have the full control of the software and the hardware. There is much restriction in order to developed application for iPhone as it is a close OS. All