

MOBI P.



STEM

MOHAMAD NAZWAN BIN SHAFIE

THESIS SUBMITTED IN FULFILMENT OF THE DEGREE OF
BACHELOR OF COMPUTER SCIENCE (COMPUTER
SYSTEMS & NETWORKS) WITH HONOURS

FACULTY OF COMPUTER SYSTEMS AND SOFTWARE
ENGINEERING

2013

0/1/14 PERPUSTAKAAN G UNIVERSITI MALAYSIA PAHANG	
No. Perolehan 087001	No. Panggilan TK 7895
Tarikh 01 JUL 2014	. 012 N39 2013 - BC -

ABSTRACT

Parking space it is very important to park the vehicle, the existing car parking system in FSKKP required the driver to find out free parking space to park their car. The increasing the number of car can cause the number parking space become decrease. As the result the driver need to waste their time to circle the parking lot area to find out the free parking space to park their car. This paper investigates about problem and the weakness about the parking that exists in the FSKKP and finally it proposed the Mobi Parking Navigator System (client-side) to prevent this problem from occurs again. The implementation of this mobi apps system can show about the information of the parking space that is available or not available. These mobi apps will support android as a platforms of the mobi operating system to easy to use it. The result of the of this mobi apps will reduce time to find the parking lot and easy to know where is the parking lot still available to park the car.

ABSTRAK

Ruangan tempat letak kenderaan adalah amat penting bagi untuk meletakkan kenderaan, sistem tempat meletakkan kenderaan di FSKKP memerlukan pemandu untuk mencari kenderaan bagi kenderaan mereka. Peningkatan jumlah bilangan kenderaan boleh menyebabkan tempat untuk meletakkan kenderaan semakin berkurangan. Hasilnya pemandu terpaksa menghabiskan masa mereka untuk mengelilingi kawasan tempat letak kenderaan untuk mencari tempat untuk meletakkan kenderaan yang kosong untuk meletakkan kenderaan mereka. Tesis ini ditulis untuk menyiasat tentang masalah dan kekurangan pada parking lot yang sedia pada FSKKP dan akhirnya telah mencadangkan Mobi Parking Navigator System (client-side) untuk mengelakkan daripada masalah yang sama berulang lagi. Semasa proses implementasi terhadap aplikasi mobi dapat menunjukkan maklumat tentang kekosongan pada tempat letak kenderaan atau tidak. Aplikasi mobi ini juga dapat digunakan oleh semua mobi sistem operasi dan ianya juga mudah untuk digunakan. Sebagai kesimpulannya aplikasi ini dapat mengurangkan masa untuk mencari tempat letak kenderaan dan senang untuk mengetahui dimanakah letaknya lokasi yang masih kosong di tempat letak kenderaan.

TABLE OF CONTENTS

STUDENT'S DECLARATION	ii
SUPERVISOR DECLARATION.....	iii
DEDICATION	iv
ACKNOWLEDGEMENTS	v
ABSTRACT.....	vi
ABSTRAK.....	vii
LIST OF TABLE.....	xi
LIST OF FIGURE.....	xii
LIST OF ABBREVIATIONS.....	xiii
CHAPTER 1	1
INTRODUCTION	1
1.1 Background.....	1
1.2 Problem Statement.....	2
1.3 Motivation.....	2
1.4 Objective.....	3
1.5 Project Scope	4
1.6 Methodology.....	5
1.7 Thesis Organization	7
CHAPTER 2	9
LITERATURE REVIEW	9
2.1 Introduction.....	9
2.2 Parking.....	9
2.3 Mobile parking.....	10
2.4 Existing System	11
2.5 Development tools	13
2.5.1 IBM worklight	13
2.5.2IBM Worklight Client Architecture.....	13

2.5.3 Comparison software between IBM worklight and PhoneGap.....	14
2.6 MySQL	14
2.6.1 Advantage of MySQL.....	15
 CHAPTER 3	 16
PROPOSED WORK.....	16
3.1 Introduction.....	16
3.2 Mobi parking navigator system (client-side)	17
3.3 Logical Design	18
3.6 Data dictionary.....	21
3.7 Design Prototype interface.....	22
3.8 Hardware Requirement	24
3.9 Software Requirement	25
 CHAPTER 4	 26
IMPLEMENTATION.....	26
4.1 Introduction.....	26
4.2 System Interface.....	27
4.3 Declaration of the Code	28
4.3.1 IBM Worklight Adapter SQL statement.....	28
 CHAPTER 5	 29
RESULT AND DISCUSSION	29
5.1 Introduction.....	29
5.2 Result Analysis	29
5.3 Advantage and Disadvantage.....	32
5.4 Future Work.....	32
 CHAPTER 6	 33
Conclusion	33
References.....	34
Appendices A.....	36
Appendices B.....	39

Appendices C.....43
Appendices D.....48

LIST OF TABLE

TABLE NO.	TITTLE	PAGE
2.1	Comparison between Current Mobi Applications	11
3.1	The data of the parking status in the database	21
3.2	Hardware Requirement	24
3.3	Software Requirement	25
4.1	The modules and the details in the MPNS	26

LIST OF FIGURE

FIGURE NO.	TITTLE	PAGE
1.1	Rapid Application Development methodology	5
1.2	Thesis Organization	7
2.1	IBM worklight Client Architecture	14
3.1	MPNS System Architecture	16
3.2	Client-Side Flow Process	18
3.3	Context Diagram	19
3.4	DFD Find Parking level 1	19
3.5	DFD availability parking space level 1	20
3.6	The Main Prototype Interface	22
3.7	Prototype interface of user	22
3.8	Prototype Interface of view map	23
4.1	Splash screens of the apps	27
4.2	List of the university to select	27
4.3	Menu to select	28
4.4	Adapter SQL statements	28
5.1	Parking view at FSKKP	30
5.2	Reference parking view at FSKKP	31
5.3	Map view form difference location	31
5.4	Send report and picture	32

LIST OF ABBREVIATIONS

FSKKP	Faculty of System Computer & Software Engineering
UMP	Universiti Malaysia Pahang
MPNS	Mobi Parking Navigator System (client-side)
OS	Operating System
DFD	Data Flow Diagram
GPS	Global Positioning System

CHAPTER 1

INTRODUCTION

1.1 Background

It is difficult to imagine if the world without mobile phones today. Instead of just being a communication device, the mobile phone has evolved as technical tools to handle so much. Mobile phone hardware and software industry are the one of the largest world market. [1] Current smartphone can enable user to do everything in their hand only.

There a lot of application that was develop to optimize the uses of the smartphone and can be download in Google play, iTunes and so on. All that of the application that was develops to help the user to make their life as a simple and easy. One of the problems that occur in nowadays is about the parking lot space. Parking spaces are very complicated problem for the driver to find the parking lot space. According the increasing the number of the car user and the fix space for the parking space can make the driver to circle for a several time for find the free parking area.

Many applications for smartphone was developing to prevent this problem occur and all of the mobi apps are very useful for the settle down this problem. There are many features on the current mobi apps such as can find the parking space using GPS, can feed the parking meter without go to the parking meter and so on. However, all of this application does need to solve the parking space problem for FSKKP UMP because need the high cost and need the branded requirement to make it. Besides that, the concept of parking lot of FSKKP UMP is a very simple and small parking lot (refer appendices A).

To solve the problem parking space in FSKKP the Mobi Parking Navigator System (client-side) will develop. By using the mobi parking navigation system user firstly need to install this application first in user smartphones, and then the user need to login to use it. This system it is very easy to the user to find the parking lot, with the system it can help the user to manage their time and notify the available parking lot. The user also does not rushing to find their parking lot. User just only can seat any ware and online by their hand pone and just search the available the available. This system will connect through the database and from the database will sent the pop up if the parking is available.

1.2 Problem Statement

Parking lot is very important to avoid being sued, stolen and damaged. Lack of parking will also pose complex problems have rush to get a parking spot and had to repeatedly make the rounds to get the parking lot .This situation is similar to the problems faced by the Universiti Malaysia Pahang with the increasing number of the staff also complicates the problem of finding parking for their vehicles. All UMP staff and the driver must come early to prevent from their parking lot full or not available. Besides that, they must circling for a few time to find out their available parking lot, by this way it can waste their time and maybe will be late to come to their office, class, meeting and so on.

1.3 Motivation

The parking space problem is a general problem on the FSKKP parking lot to provide this solution the mobi parking navigator system will be develop to help and control the parking space problem. The purpose to do this mobi app is to develop the technology of mobi app and then to optimize the using of smartphones application. Besides that, to provide an effective parking lot system that has to organize parking lot with sensor wireless monitoring. The driver that uses this mobi app will not circle the parking lot to find an available parking space.

1.4 Objective

To achieve the Mobi Parking Navigator System (client-side) purposes, the following objectives are set:

- To investigate the mobile application that has in market are available to search the parking lot space
- To design the interface and architecture by using Mobi application
- To develop mobile application using software IBM Worklight

1.5 Project Scope

1. The scope of this project are:

- a. Mainly focus in FSKKP UMP parking lot area that have been set the sensor
- b. The staff at UMP Gampang only.
- c. Parking navigator system is a system that using database to acquire the parking data

2. Tools that used to build the interface and the database:

Software:

- MYSQL
- IBM Worklight

Hardware:

- Laptop
- Computer

1.6 Methodology

Rapid Application Development Methodology

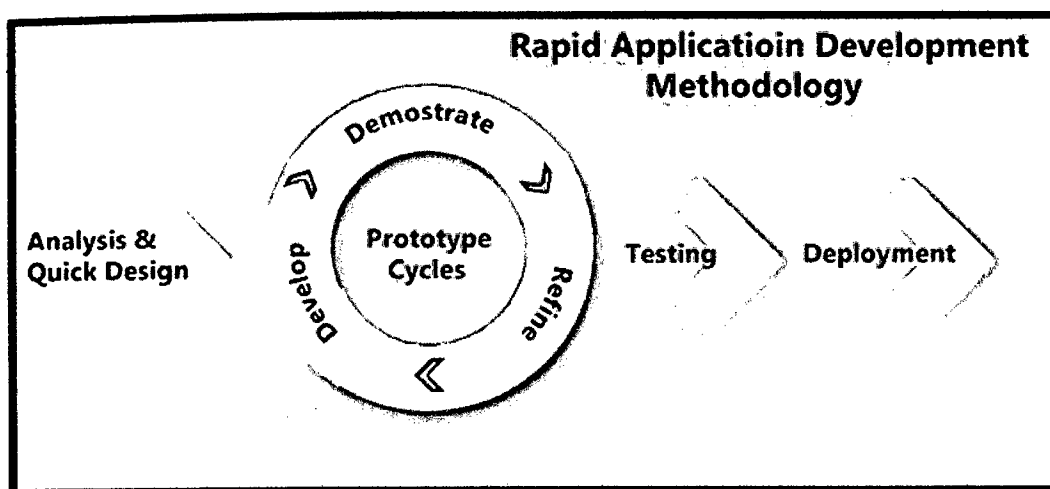


Figure 1.1: Rapid Application Development methodology

Figure 1.1 shows Mobi Parking Navigator System (client-side app) use the Rapid Application Development (RAD) as the methodology of this system. From this methodology it will describe about the system flow process detail from beginning until the end of the process these methodologies consist 4 phase in process to development the system.

Analysis & Quick Design

In this first phase is about the analysis and quick design, firstly need to define the problem by investigate the problem first. After that must list the all the entire possible requirement that need to develop the system. In this process also need to make the some design to represent as first design before actual design will make. So it will be clear be understanding what need to do in the first phase.

Prototype Cycles

The second phase is about the prototype cycles that will include the 3 process in developing the prototype system. In the prototype cycles stage, firstly need to develop the

system by the information that give from the user requirement after that try to demonstrate the system to show the system will design as user need or not. If the requirement is not achieve as objective need, try to refine again about the problem that until the objective meet. So this stage will cycle the again from process develop, demonstrate and refine.

Testing

The testing phase is the most of important part to check the system is successfully or not. In this part the system will test by the UMP staff the. The testing process will be test by the different smartphone and the tablet that based on the android platform. The result from the testing phase must be acceptance with the objective of the system make.

Deployment

This phase is deployment. In the deployment phase will determine the software are going to use, in this system will use the IBM Worklight as a tools to create interface and to make the coding of this system. During this phase also will implement the database the database that will use is MySQL to store the information about the parking. Lastly create the apk file install to the smartphone and tablet

1.7 Thesis Organization

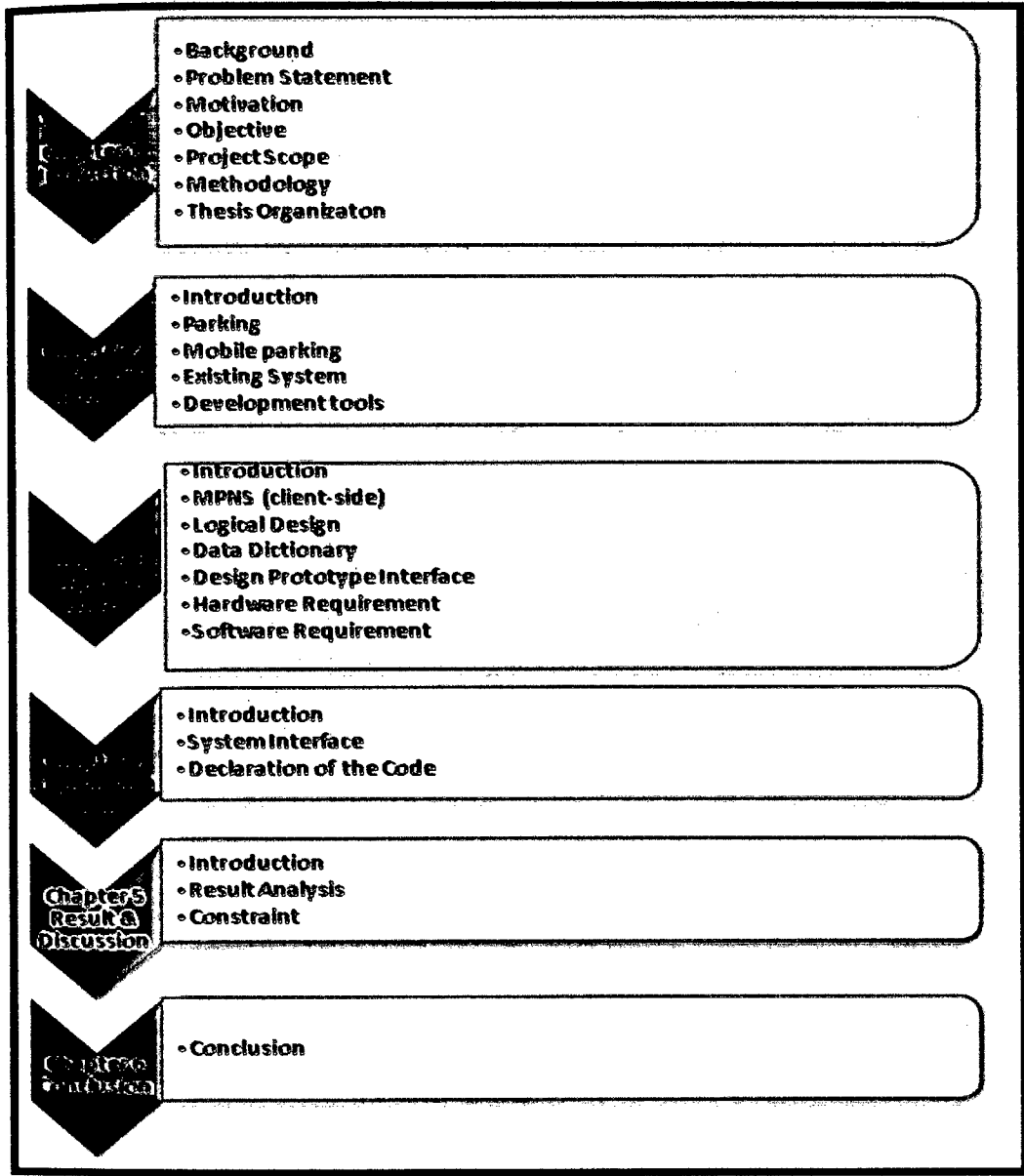


Figure 1.2 Thesis organization

This thesis consists of five chapters. Chapter 1 will discuss on introduction of the system, problem statement that face by current system, objectives and scope of the development.

Chapter 2 is a literature review that discuss the existing system and technique or software that use in that existing system.

Chapter 3 is methodology. The purpose of this chapter is to discuss what methodology will be used while develop this system. This chapter also explains about the justification of methodology used and hardware and software necessity.

Chapter 4 involves implementations that discuss about compilation of the data and table that is use based on SQL.

Chapter 5 is about result, discussion and conclusion. The elements that should have in this chapter include result analysis, the problems of build project and suggestion of the project approach to the next research. This chapter also includes summary of project.

Chapter 6 is about the overall conclusion of the MPNS (client-side) application. The conclusion will conclude from the beginning till the end of the system build.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discuss about literature review of system. In this chapter will tell about the parking, mobi apps and the existing system that relate with Mobi Parking Navigator System (client-side)

2.2 Parking

There are many type of parking lot in the world, as known by many people parking lot is a place to place where people leave the vehicle for period of time to go somewhere else. There are two types of parking lots there are indoor and outdoor parking. Indoor parking it is very important to protect the vehicle from steal by the thief or broken from the disaster. Meanwhile, the outdoor parking are very useful when need park the vehicle at supermarket, office, school, university and so on. The current existing system car park does not a systematic system to manage the parking [2].

User must take time to find the parking lot. Sometimes waste time to the user to find available parking .User also must circle the parking lot area to until found an empty parking lot space. This problem occurs because when the number of vehicle is higher than the number of available parking lot .This condition occurs because the not implement of the technology in the parking lot area. Various systems have been done to ensure smoothness of traffic in car park areas. From manual implementations used in the old systems, they have evolved into fully automated, computerized systems. Car park entrances can be controll by the barrier gates that locate at the parking tickets are used extensively for access purpose. With the growth of technology, these systems have been simplified in many ways. As proposed by[3].

RFID technology can be used to enter and out of the parking area. By using this approach, the queuing time gain entry and payment when leavingbe completely eliminated.

However this method is not solve the problem of users having to search for available parking. One way to overcome this problem is to show number of parking spaces available at each level in parking lot using the LCD display. Another way is to installation indicator lights above each parking for inform consumers about the availability of parking. Weakness this method is that while searching time is reduced, users still must need to circle around to find out the an empty space area parking lot[4].

2.3 Mobile parking

The mobile parking is the new technology in Malaysia. This technology is developing to improve the systematic parking system and will be more effective feedback to the user that uses it. With existing the mobile parking the user can know when the peak hour that has been use by the other user. So it can prevent from the parking lot full. Using wireless parking sensors, the space availability data has been collected and sent to the database, through the smartphone app, user can see on a map where the place that available the parking spaces

This innovative parking technology opens a wealth of opportunities for all parking operators. Getting driver into parking spaces more quickly is clearly beneficial for the driver and also for the environment. Reducing the amount of time spent driving around searching for a space to park in saves time and reduces traffic congestion. It also brings great benefits for the driver spend less time parking and more time enjoying the visit to their destination.

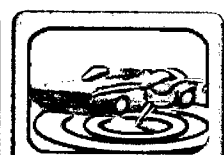
The biggest benefit, however, the system allows to respond to the demand for parking space monitoring accommodation and to reduce the number of empty parking spaces. Maximize the revenue potential of each car park put parking operators in a strong position to control their parking resources to deliver efficiency and reduce waste.

The ability to see maps showing where the available parking lot spaces are located on the same application used notify to another driver that the parking lot have the park, by this mobile app making the process of parking and go to park quick and easy.

2.4 Existing System

There are several mobile parking applications in the world, but in Malaysian country there are not famous because not all people in Malaysia use the smartphone for their daily life. To make mobi parking navigator system are effectively use. It will be setup in FSKKP UMP parking lot.

Table 2.1 Comparison between Current Mobi Applications



Features supports	Current mobile application	Mobi park	Park Mobile	Where Did I Park	Find My Car
Android OS		X	X		
BlackBerry OS		X			
IOS		X	X		X
Symbian OS		X			
Window OS		X		X	
Freeware					
Version update					X
Gps maps			X		
Take photo of car				X	X
Feed parking meter			X		
Extend parking lot time		X	X		
Track the car					X

Mobi Park

Based on the table 2.1 above shows that, Mobi Park can be run in many mobile (OS), such as Android BlackBerry and Window OS. This application also can be finding on the iTunes, Google, and Windows .This application also can easy to feed parking meter and can extend the parking lot time. Unfortunately, to use this application must user must buy this application.

Park Mobile

Based on the table 2.1 shows that this application good run in the android and IOS, beside that it also can connect through the internet so it can show more detail about the parking lot. This application also can easy to the user to feed up the parking meter without go to the parking meter user just only can make transaction online to pay the parking then can avoid user from line up parking, reduce stress when time is tight or weather is not good.

Where Did I Park

Based on the table 2.1 shows that this application can support mobile window OS. By using this application user can take photos of where they park their car, is its very useful when user park their can in a large area. Beside that's, also can set reminder to user for parking time so it can protect user from be sue.

Find My Car

Based on the table 2.1 shows that this application cam smooth run in IOS and android, the version also can be updated (required IOS 4.3 or later).This application was link with the GPS connection so user does not worry if their forget or misplace their car in the parking lot, this application can track in the user can

2.5 Development tools

Development tools show what the software use to develop this system. IBM worklight is used to help for design interface of the mobi apps and to create the programing language meanwhile MySQL as the database language.

2.5.1 IBM worklight

IBM worklight one of the platform to create mobi apps platform and can help an organization to extend to the mobile device. It provide comprehensive, open and for advance user to create, run, and manage the mobi app. By using the IBM worklight also can effective in development the mobi apps, rum and to manage HTML5, native apps and hybrid. IBM worklight also can reduce the cost during development and can enhance mobile app security and governance. The Worklight can support multi mobile OS, easy to connect, synchronize and also include safeguard for mobile security. [5]

2.5.2IBM Worklight Client Architecture

The important thing element in the IBM Worklight Archicture is Apache Cordova.IBM Worklight offer development flexibility with high level and it also allow developer to utilize the same of architecture with the web,hybrid application and native that all based on the business need or requiremnt from an organization. [6]

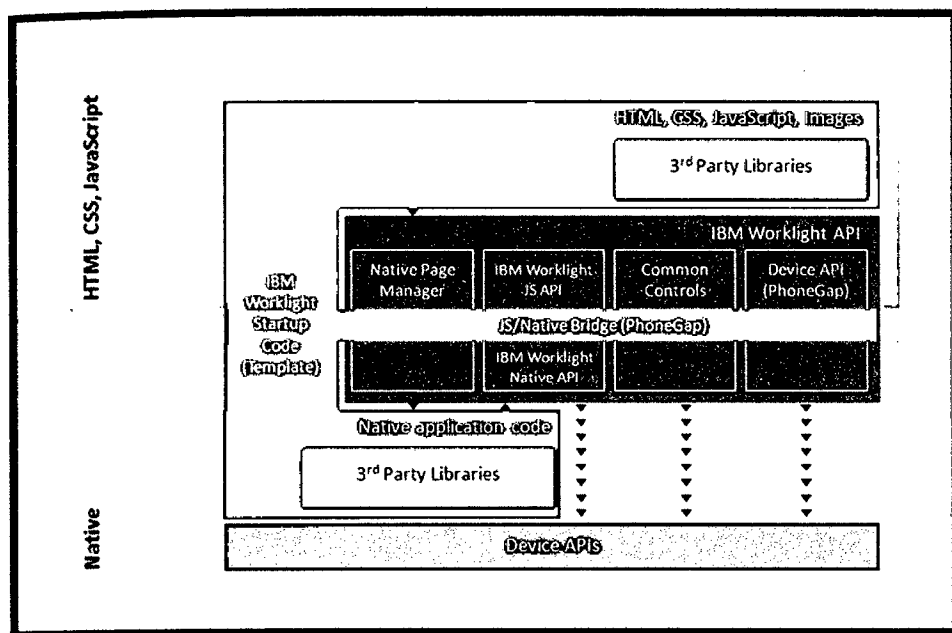


Figure 2.1 IBM worklight Client Architecture

2.5.3 Comparison software between IBM worklight and PhoneGap

There is lot of tools to create the mobi application in the smartphone, such as IBM worklight, Phone Gap, Free Mobi app builder in the internet. Many of the people have talked about what are difference between PhoneGap application and IBM worklight application IBM worklight based on the mobile solution making. However PhoneGap one of packaged that include in the IBM worklight but this application is not deep as IBM worklight for more detail about the comparison (refer appendix B for the comparison between PhoneGap and IBM worklight).

2.6 MySQL

There a lot of the databases that can be used in develop of this system. In this MPNS (client –side application) use The MySQL as a database .MySQL is an open source Relational Database Management System. MySQL is a very flexible Database Management System and multi-threaded for the multi user Relational Database Management System, it also very high

performance. MySQL become popular because this database is free and almost compatible with all the platforms. The MySQL run in multiple OS. It also was built to handle a large volume of the data can be stored in once time at the very fast speed. Verity of the application can use the MySQL as the database but mostly it use for database web application. [7]

2.6.1 Advantage of MySQL

- i. **Performance and Reliability**
 - MySQL is a very a high performance and reliable to many the database

- ii. **Cross-platform support**
 - MySQL can support multiple OS platform but for the major OS that use are Microsoft Window, Linux and UNIX.

- iii. **Powerful and uncomplicated software.**
 - MySQL are very easy database that can be used also very fast, It also capabilities corporate database system application.

- iv. **Certified developer and trained**
 - The MySQL are the most popular relational database management system in the world because it open source [7]