MYBANJIR UPDATE SYSTEM USING MOBILE APPLICATION

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MYBANJIR UPDATE SYSTEM USING MOBILE APPLICATION

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I hereby declare that the work in this thesis e n t i t l e d "*MYBANJIR UPDATE SYSTEM USING MOBILE APPLICATION*" is my own research except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree amd is not concurrently submitted in the candidature of any other degree.

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Date : .....

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ABSTRACT

Nowadays, the usage of mobile technology has become a trend in a huge area such as education, entertainment, online business and other kind of area that gives benefits. Mobile applications enable new ways of working in an increasingly connected and mobile world. Enterprises realize the advantages and are gearing up to get ahead. With the increasing numbers of mobile applications being deployed, it's important for organizations to make the most efficient investments for their enterprise mobility needs. Mobile development platforms with multi-channel deployment capabilities, security, management and back-end integration capabilities make a whole lot of sense. Besides, mobile application allows fast and effective data management through the internetwork facilities. Data can be sent via wireless network from mobile device to the web server in a very fast connection. The MyBanjir Update System is the interactions between the web based servers communicate to mobile application. Flood information sometimes is not being announced in a suitable condition. The information usually spread in television and radio but when floods occurred, the electricity around the area is break down. This is the main problem for user to stay in touch with the flood reports. Using this MyBanjir Update Mobile Application helps them to get directs update using their smartphones together with the internet connection. The MyBanjir Update System for the web server is responsible for staff in Jabatan Meteorologi Pahang to pass the flood information to the user using the mobile application. The result of using this MyBanjir Update Mobile Application is much faster and can be used in anytime and anywhere as long as there is an internet connection.

ABSTRAK

Pada masa kini, penggunaan teknologi mudah alih telah menjadi satu trend di kawasan yang besar seperti pendidikan, hiburan, perniagaan dalam talian dan jenis lain kawasan yang memberikan manfaat. Aplikasi mudah alih membolehkan cara bekerja yang baru dalam dunia yang semakin berhubung dan mudah alih. Perusahaan menyedari kelebihan dan sedang menyiapkan diri untuk maju. Dengan nombor yang semakin meningkat aplikasi mudah alih yang digunakan, adalah penting bagi organisasi untuk membuat pelaburan yang paling berkesan untuk keperluan mobiliti perusahaan mereka. Platform pembangunan mudah alih dengan keupayaan pelbagai saluran penghantaran, keselamatan, pengurusan dan keupayaan Integrasi membuat banyak seluruh rasa. Selain itu, aplikasi mudah alih membolehkan pengurusan data yang cepat dan berkesan melalui kemudahan Internetwork. Data boleh dihantar melalui rangkaian wayarles dari peranti mudah alih ke pelayan web yang berkaitan yang sangat cepat. The MyBanjir Sistem Update adalah interaksi antara pelayan web berasaskan berkomunikasi dengan aplikasi mudah alih. Maklumat Banjir kadang-kadang tidak diumumkan dalam keadaan yang sesuai. Maklumat ini biasanya tersebar di televisyen dan radio tetapi apabila banjir berlaku, elektrik di sekitar kawasan ini rosak. Ini adalah masalah utama bagi pengguna untuk terus berhubung dengan laporan banjir. Menggunakan MyBanjir ini Kemaskini Permohonan Bergerak membantu mereka untuk mendapatkan kemas kini mengarahkan menggunakan telefon pintar mereka bersama-sama dengan sambungan internet. Sistem MyBanjir Kemaskini untuk pelayan web bertanggungjawab untuk kakitangan di Jabatan Meteorologi Pahang untuk lulus maklumat banjir kepada pengguna menggunakan aplikasi mudah alih. Keputusan Permohonan menggunakan MyBanjir Update Bergerak ini adalah lebih cepat dan boleh digunakan bila-bila masa dan di mana-mana sahaja selagi ada sambungan internet.

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LIST OF ABBREVIATIONS

FSKKP	Faculty of System Computer & Software Engineering
UMP	Universiti Malaysia Pahang
OS	Operating system
DFD	Data Flow Diagram
RAD	Rapid Application Development
UI	User Interface
PHP	Hypertext Preprocessor
PC	Personal Computer
SQL	Structured Query Language
HTML	HyperText Markup Language

CHAPTER 1

INTRODUCTION

1.1 Background

Nowadays, having a smartphones is one of the most important gadgets to have among the individual. A smartphone is capable of much more than making calls. This device is essentially a cell phone combined with a miniature computer that can surf the Web, send emails, store and play music, take photographs and videos. According to research studies, 70 percent of teens aged 13 to 17 now use smartphones and 79 percent of young adults between the ages of 18 and 24 own a smartphone (Nielsen, 2014).

In general, most smartphones use an application based interface, which allows users to download individual programs that can perform a variety of tasks. Apple's iPhone runs the iOS, and BlackBerry smartphones run the BlackBerry OS.

Other devices run Google's Android OS and Microsoft's Windows Phone (Cell Phone About, 2014). Most of the operating system supports their own mobile application that can be downloaded from the market when there is Internet connectivity. There many kind of applications such as calendar, games, reading item, photo editing tools or social application. The creation and developing the mobile application is limitless.

Basically, mobile application was built to solve problems and making life much easier. The smartphones itself are easily to carry and access compare to personal computers that much bigger and expensive than a smartphones. Besides, the function of the personal computer is much likely as same as the smartphones. The number of smartphones in use around the world will pass that of PCs for the first time this year (Gartner, 2014),. This shows that smartphones are most useable gadgets that can be done anything through smartphones.

1.2 Problem Statement

Catastrophe is one of the most frighten thing happen to anyone. It is a sudden and widespread disaster that has severe consequences, usually accompanied by destruction of assets and loss of life (Business Dictionary, 2014). One example of catastrophe that is often happened is the sudden flood. Flood cause by heavy rain that are nonstop until the water level rise (Wikipedia 2014). Many of the victims have lost their valuable things in just a second. They usually happened to be at work and realize their house has been devastated.

News and update that are being shown about this tragedy sometime are not being clearly stated and published (Reactions Net, 2013). Some of the report about the incident happened to be published in the newspaper or in the television.

People nowadays are not recently got any information about the weathers or any other information through newspaper and television (Street Wise, 2013). In that case some of the important things update or alert about flood in certain area might not be known by the citizens.

Besides that, sudden flood sinks almost the entire house and destroys their belongings. The victim did not know where the nearby evacuation center to secure their families. This can be a very important issues to save someone life. It is safer when the victim get to know the alerts and update about the flood so that they can be well prepared. In this case, MyBanjir Update System using mobile application is where they can get update about this thing. They only have to bring their smartphones and have the internet connection to get the alert about the flood news so that the citizens can be well prepared.

1.3 Goal & Objective

The goal of this project is to develop the MyBanjir Update System, the following *objectives* are set:

- To identify the need of the project to develop the system.
- To design the interface and architecture for MyBanjir Update using mobile application.
- To test the system performance of MyBanjir Alert from the user.

1.4 Project Scope

1. System Functionality

This system provides direct updates features from Jabatan Meteorologi Pahang about the catastrophe happened in Pahang state. The staff from the Jabatan Meteorologi Pahang will be sending an update of the flooding incident directly. Then, the updates are sent through mobile application that runs in Android operating system. The user will be alert with the flood incident happening around Pahang area. User can be well prepared after receiving this alert through their smartphones.

2. System User

There are 3 type of user for using this system. The first one is the user from the citizens mainly in Pahang. Each of the user should have their own smartphones and the operating system should be in Android base because this system only supported in Android. Second type of user is the staff of Jabatan Meteorlogi Pahang. Staff will be update the alert about the flood incident immediately so that the user will receive early information. The third user is the admin. Admin is the only one who can control overall system. It includes from adding new staff, deleting and editing the information of the system.

3. Operating System

Running on Android operating system.

1.5 Methodology

For the methodology, Rapid Application Development (RAD) is being used in this project. It is a methodology to compress the analysis, design, build and test phases into a short or quick iterative development cycles. . When developing the system using the RAD development path meet the needs of their users effectively and have low maintenance cost. Figure 1.1 is the phases of the RAD.

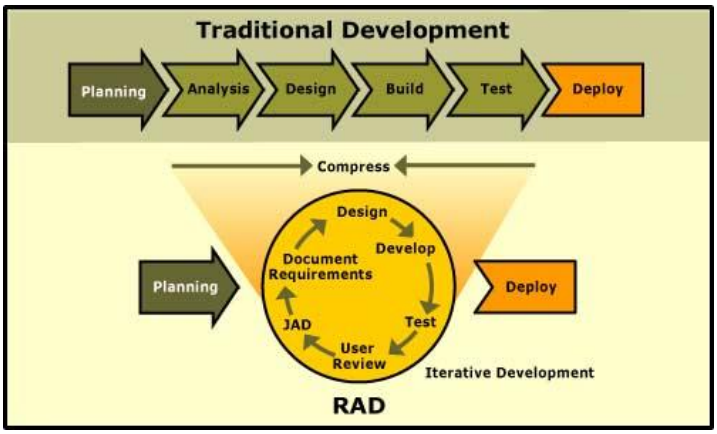


Figure 1.1: RAD Phase

These are the descriptions about each of the phases in RAD development:

i. Requirements Planning

This stage is where the brainstorming of the idea to create the project of MyBanjir Update using mobile application. The requirements are being studies throughout this process. The objective number one can be achieve in this phase.

ii. User Design

This stage needs to model the system's data and processes and to builds a working prototype of critical system components. To develop the MyBanjir Update using mobile application, the design must meet the criteria to make ease the user using this application. The objective number two can be achieve in this phase.

iii. Construction

Development Stage- This stage completes the construction of the physical application system, builds the conversion system, and develops user support and implementation work plans.

iv. Deployment

Deployment Stage- This stage includes final user testing and training, data conversion and the final implementation of the application system.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, it will discuss on six subtopics that will cover the definition of mobile application, the existing system, and the software requirement for developing the system.

Subtopics 2.2 will explain about the definition of mobile application in general. Subtopic 2.3 will discuss on the alert system while 2.3.1 will discuss the flood alert system. Subtopic 2.4 will cover the existing system. Subtopic 2.5 will explain the comparison of the existing system functionality. The last subtopics 2.6 will explain the development tools used in this MyBanjir Alert system by comparing the other tools.

Overall contents in this chapter will provide the detailed information of implementation that will carried out in this project.

2.2 Mobile Application

Mobile application is one of the most interesting software applications that are designed to run on a smartphones or tablet. Technically, mobile application serve to provide users with services, games or any kind of things that can be access through PCs. The different is that, mobile apps are generally small, that have limited function. The app is program by JavaScript or HTML5 to provide interaction, navigation or any other functional system (Appypie, 2014).

There are many kind of mobile application such as native application, web application, and hybrid application. Three type of this application have their own advantages and disadvantages. In mobile development section, native application is developing the app using the programming language and interface for a specific operating system and device(IBM Worlight, 2013). For the web application, it is just a web browser that delivers through mobile device and for the hybrid application, it compromise between native and Web. The hybrid application develop in industry-standard Web programming languages, such as HTML5 and JavaScript, then package in a natively installable format for app store distribution (Web Based Programming, 2013) . It is actually save cost with reusing the codes.

On the article by Priya Wiswanathan an application developer said that mobile app development is emerging more popular and becoming one of the best technologies in the world (Mobile Device About, 2014). Besides, mobile app development becomes a veritable treasure-trove for the developer to make a decent sum of money every month, by way of creating mobile applications.

2.3 Alert System

Alert system is an application or software that gives alert, warning or update about any kind of situation such as flood, earthquake, medical, and tornado. Technically, alert system is developed to give a warning sign much more in catastrophe incident or in emergency situation (National Weather Service, 2014). Alert systems are intended for extraordinary phenomena expected to be of a scale that will far exceed the warning criteria (Disaster Warning, 2014). Warnings and advisories continue to be issued in their current form so that citizens will take extra precautions.

2.3.1 Flood Alert

Flood Alert is a process that gives immediate update and warning about flood in certain area (National Whether, 2013). The systems are view sometimes in mobile application, a device or in software on a computer. Most of the flood alert nowadays comes in a device that place in rural area nearby the river. It gives out a loud siren to warn the villagers. This device may have some disadvantages for people that are not in home. They maybe are outside working or doing any important things without knowing what is happening to their house.

Technically, flood alert system that has been created must connect with a trusted weather agency in certain area to get the forecast of the water level and rainfall (Meta Office, 2013). This is because, the information that are going to spread all of the citizens must be 100% accurate. It needs to get the citizens to be well prepared.

2.3.2 Disaster Whether Alert

Disaster whether alerts is a system that detects any disaster happened when monitoring the weather. The alert is much heavier such as tsunami, hurricane, volcanoes and many more. Warning about the disaster happened sometimes is shown in television or newspaper but there are some citizens not always review from that medium. Based on the research from Pew Research Center, the percentages of citizens listened to radio news, read a newspaper and watching television have steadily declined over the past two decades that is from 39% to 25% (Pew Research Center, 2014). On the other hand, the percentage of online news in mobile device has increased rapidly throughout the years. This shows that, online news is more relevant in this new era.

Disaster whether alert are famous in mobile application. Nearly 1.5 million global users who stay connected and informed with Disaster Alert in Android and IOS (Pacific Disaster Center, 2014). By accessing the Disaster AWARE platform, it provides users with near real-time access to data on active hazards globally, showing events that are designated potentially hazardous to people, property, or assets. Disaster Alert makes complex technical and scientific information easy to understand.

2.4 Existing System

Several studies have been made to find the different type of the application but have the same functional throughout the system. The existing applications are run through Android that can be downloaded through Android Market. These applications are not supported between the users in Malaysia. The application is only applicable in Europe area. Reviews and disadvantages about of the applicationns are discussed in next sub-section.

2.4.1 Flood Warning

Flood Warning is an Android base mobile application for giving a warning to the certain flooded area. This Android Application provides updated 24/7 information from the National Weather Service for Flood Warnings and Reports for 49 states plus Territories except Guam and Hawaii. Besides that, it also provides National Forecasts as well as Severe Weather alerts that are happening across the country. Based on the googleplaystore.com, this application get a high rating compare from others application that has same functionality.

Figure 2.1 shows the screenshot for the homepage of this application. It previews some of state and places that is being monitor. When user clicks to the certain area for example Alabama, it previews the flood forecast including the readings of the water level in Alabama. Basically this application only has one functional that is viewing the flood forecast of the infected area.

Figure 2.1: Screenshot on flooding places

2.4.2 Flood Alert

Flood Alert enables you to quickly check the current situation both nationwide and in user local area (Google Playstore, 2013). User can do this by checking the flood forecasts and the river and sea levels on the Environment Agency or Natural Resources Wales websites, by listening to local news and weather forecasts or now by simply opening the Flood Alert application on the smartphone or tablet.

Flood Alert allow user to monitor live status of flood alerts that are relevant to user current location. Besides that, user can monitor live flood alert information displayed by regions, local authority areas or counties that is display in Google Map. Figure 2.2, shows the map that is infected with flood. The alerts are being post within approximately 5km from the area. Literally, this application has limited function such as it did not provide a direction to specific safe house when there is incoming flood around the area.

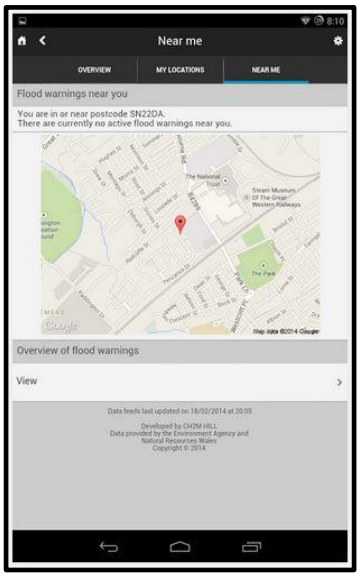


Figure 2.2: Screenshot of a map showing flooded area

2.4.3 Disaster Alert

Disaster Alert is one of the Android applications that preview active hazards on the interactive map and in a list as they are occurring around the globe. Additional hazard information can be viewed and shared. The term "Active Hazards" refers to a collection of current and real-time incidents which have been designated potentially hazardous to people, property, or assets. The advantage of this application is that it includes all disaster such as hurricane, earthquake, flood and any other disaster. The application is not specific to the flood alert.

Figure 2.3 shows the active hazards to the certain area. There are 3 different labels defining different situation that is warning, watch and advisory. The alerts shown are not being categorized in each state or places. It shows all of the disaster happens in all around the world.

Figure 2.3: Screenshot of warning sign on flooded area

2.5 Comparison of Existing System

There are still many other applications that have been developed by a developer who has been in the online market. Only three applications that are selected to be develop and improve. According to the plan, the application will be only take the important features to user. Table 2.1 shows the comparison of the functionality between the three existing system and also the MyBanjir Alert application. It shows the features on each of the application have.

Table 2.1: Table comparing existing system and MyBanjir Alert

	Flood Warning	Flood Alert	Disaster Alert	MyBanjir Update
Android OS	✓	✓		✓
Flood update	✓	✓	✓	✓
Geolocation		✓		✓
Warning sign			✓	✓
Safe house				✓
Specific catastrophe	✓	✓		✓
Make report				✓

For the first existing system Flood Warning, it support on Android operating system, it provide flood updates and it shows only one catastrophe that is flood. This application does not have geolocation, warning sign and the safe house guide. It may be difficult for the victim if their house has been vanished. For the second existing system Flood Alert, it has all the criteria except warning sign and the safe house guide. On the third existing system, it only supports two functionality that is flood update and warning sign. Based on review from the applestore.com, these applications are not very compatible and less usability.

Among those systems that exist in the market, they do not have complete functionality in one application. To create a proper mobile flood alert application, it must have all those

criteria so that it will make ease the user if there is a flood happening. In order to help user to get better flood update, the application must have a complete functionality and direct information from the real whether office.

2.6 Development Tools

Development tools show what the software use to develop this system. Eclipse has been used to build native android and help for design interface of the MyBanjir Alert and to create programming language on the apps meanwhile MySQL as the database language.

2.6.1 Eclipse

Eclipse is a community for individuals and organizations who wish to collaborate on commercially-friendly open source software. Its projects are focused on building an open development platform comprised of extensible frameworks, tools and runtimes for building, deploying and managing software across the lifecycle. According to a recent report on developer productivity, the largest user base and a vast number of plugins and integrations into the development world, Eclipse is where most developers start off when it comes to writing code. It shows that Eclipse is the best software to use compares to others such Netbeans, RAD or any other software.

Eclipse provides a common user interface model for working with tools. It is designed to run on multiple operating systems while providing robust integration with each underlying OS. Plug-ins can program to the Eclipse portable APIs and run unchanged on any of the supported operating systems.

At the core of Eclipse is architecture for dynamic discovery, loading, and running of plug-ins. The platform handles the logistics of finding and running the right code. The platform UI provides a standard user navigation model. Each plug-in can then focus on doing a small number of tasks well such as defining, testing, animating, publishing, compiling, debugging and diagramming.

Table 2.2 shows the comparison of Eclipse and Netbeans. In order to create MyBanjir Alert using mobile application, it is more suitable using the Eclipse. This is because there are some features that Eclipse has but not in Netbeans. Besides, many of Android developers used this Eclipse as a medium to develop their projects.

Table 2.2: Comparison Eclipse and Netbeans

Eclipse	Netbeans
The software is an open source platform.	It is open source platform after it was acquired by Sun in 1999.
The features a whole plethora of plugins, which makes it versatile and highly customizable.	Offers tools and editors which can be used for HTML, PHP, XML, JavaScript and more.
Works for you in the background, compiling code and showing up errors as when they occur.	Its Database Explorer enables you easily create, modify and delete tables and databases within the IDE.
Eclipse's multitasking, filtering and debugging are yet other pluses.	NetBeans tools tend to be a little more standardized as part of the Sun/Oracle brand.

2.6.2 MySQL

There a lot of the databases that can be used in develop of this system. Over the years MySQL databases have been the best performers when compared with various databases that are available in the market. Based on howtomysql.net, MySQL is an open source Relational Database Management System. It shows that, any of users can use it for free. MySQL is a very flexible Database Management System and multi-threaded for the multi user Relational Database Management System.

MySQL become popular because this database is 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. Most of the developer prefers MySQL compare to others such as ORACLE. Based on mysql.com it is the fastest-growing database in the industry, with more than 10 million active installations and 50,000 daily downloads. These are the reason why MySQL is being chosen to be used in this project.

Table 2.3 shows the comparison between MySQL and ORACLE. Based on the table, there are many advantages compare to the ORACLE. In order to build this MyBanjir Alert system, MySQL is much more suitable and reliable to use in this project compare to ORACLE.

Table 2.3: Comparison MySQL and ORACLE

MYSQL	ORACLE
For non-mission-critical environments	Rock solid dependability, reliability, and features
Attractive price point	Designed with the enterprise in mind
Characterized as a free, fast, reliable open source relational database.	Expensive although they came out with Oracle Free Edition to attract MySQL users but limited features**.**
Many free GUI management tools like PHPMyAdmin	Oracle chooses the most efficient way to execute a SQL statement
Available on virtually all hosting companies.	Limited to large corporations due to licensing costs and not all hosting companies have Oracle

2.7 Conclusion

As a conclusion, the comparison of existing system and development tools used has been discussed in this chapter. Research has been made to compare which are the best tools and software that suitable to use in developing this MyBanjir Update system. The MyBanjir Alert system must be developed following the given criteria.

CHAPTER 3

PROPOSED WORK

3.1 Overview

In this chapter, it will discuss on six subtopics that will cover the context diagram of MyBanjir Update, system interface, data dictionary and also the details on software and hardware requirements to develop this mobile application.

Subtopics 3.2 will explain about the overall context diagram of MyBanjir Alert. Subtopic 3.3 will discuss on logical design of the client side of the system with the data flow diagram. Subtopic 3.4 will cover the data dictionary to be used in this system. Subtopic 3.5 will explain the interface design of the MyBanjir Alert and subtopic 3.6 will explain the database structured in the system. The last two subtopics 3.7 and 3.8 will explain the hardware and software requirements for developing the system.

Overall contents in this chapter will provide the detailed information of implementation that will carried out in this project.

3.2 Context Diagram of MyBanjir Update System

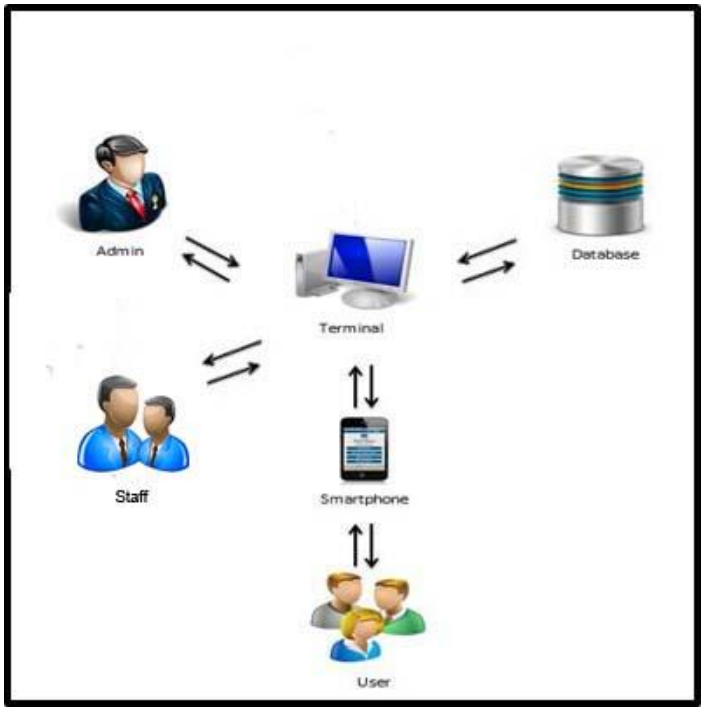


Figure 3.1 Complete context diagram of MyBanjir Update

Figure 3.1 shows the overall process of MyBanjir Update in general. The process begins when staff entering an update about the flood in certain area through the terminal and it will be stored in the database. After the information has been saved in the database, it will directly pass through in the smartphones by installing MyBanjir Update application. The user will get the updates immediately right after the installation of MyBanjir Update in the smartphones.

Throughout the recent studies that have been made, this system are most likely contribute a lot of benefits for user from the area that always being destroy by flood. First and foremost,

there are two type of client that takes part in this system. The first one is the staff from Jabatan Meteorologi Pahang. The staff will key in the update about the water level rising in

certain area that are affected and the information that guides victim to the safe house. For the staff, there are different interface that are specifically handle only by the Jabatan Meteorologi Pahang.

For the second client that is the user of MyBanjir Updat, the first thing to do is download and install the application from Android Market. Then, the user will be display a few menu button on the application. The first button is where user chooses the specific district in Pahang. Then it will lead to the update of the flood information from the Jabatan Meteorologi Pahang. User also can view the overall flood incident happened in Pahang area by clicking the geographical map that give red sign if the area is flooded.

3.3 Logical design (Client Side)

The system requirement for the MyBanjir Update (client side) has been transformed into the context diagram and data flow diagram (DFD) for easy to understand about the system flow. The DFD picture show the movement of the external entities, process of the system and the data stores in the database. Figure 3.3.1 shows the context diagram for the user view.

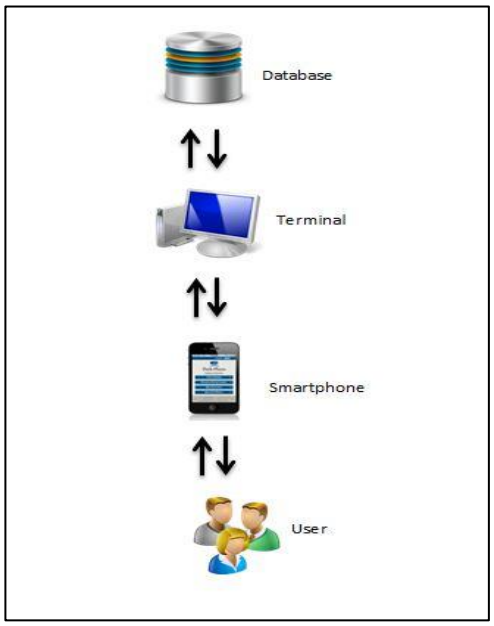


Figure 3.2 Context diagram

The process shows the system flow process, first things is that user need to download the MyBanjir Update from Android Market. After that user needs to install into their smartphone. The important things that user need to have is the internet connections. This is because the application needs to connect with the server to get the update and alert via internet. After that the server will pass the information in different district depends on user selection. When users select certain district, it only shows the updates on that area.

Besides that, user also gets the information from the server about the nearest safe house or shelters that give victims a place to stay for a while. There are additional functions where users also can report the flood information on certain area. The report from the user will be stored in the database for the staff to be view.

Figure 3.3 shows the level 0 data flow diagram of the user view. User will be given a list of district in Pahang. Then, user needs to select the district depends on where the user wants to get update. Next it will view the flood warning information including the date that been issued. The most latest issued flood alert will be right on top of the list. The next phase is user will be given information on the nearest shelter that can be used for the victims to stay for a while. The information shows the name of the place and also the person in charge.

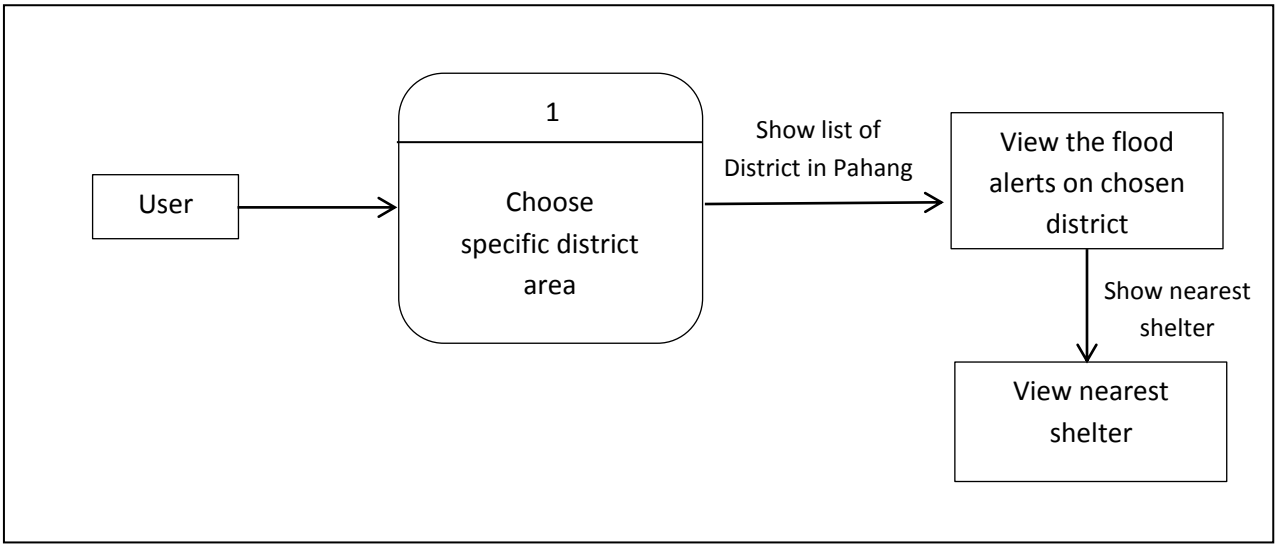


Figure 3.3: DFD of user choosing the district

Figure 3.4 shows the data flow diagram level 0 for selecting the geographical map. The user will be display a geographical map that shows the warning sign of flood overall in Pahang area. User also will be given information about the closing road that cause by the flood. In this matter user can know which road that can and cannot be used. It will benefit to the user from outside of the Pahang area to come to Pahang. Besides, this will save the time and avoid the traffic jams on the road.

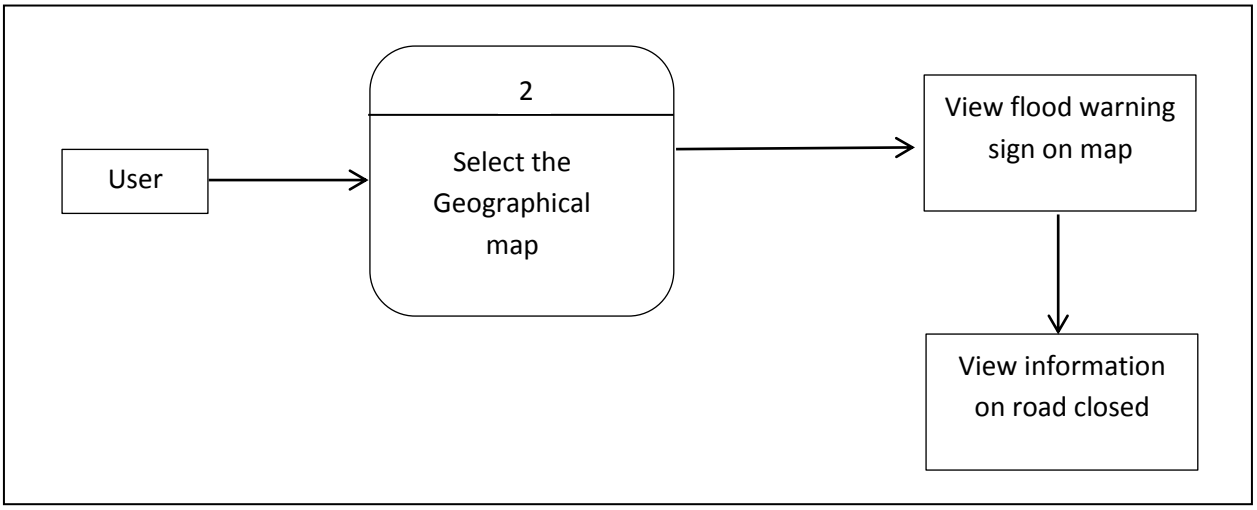


Figure 3.4: DFD user viewing the geographical map

Figure 3.5 shows the data flow diagram level 0 for sending a report. The user will be display a simple form to enter user name, contact number and the flood report that they want to do. After the report has done, it will be saved in the database for the staff of Jabatan Meteorologi Pahang to check. In this matter user can know which road that can and cannot be used.

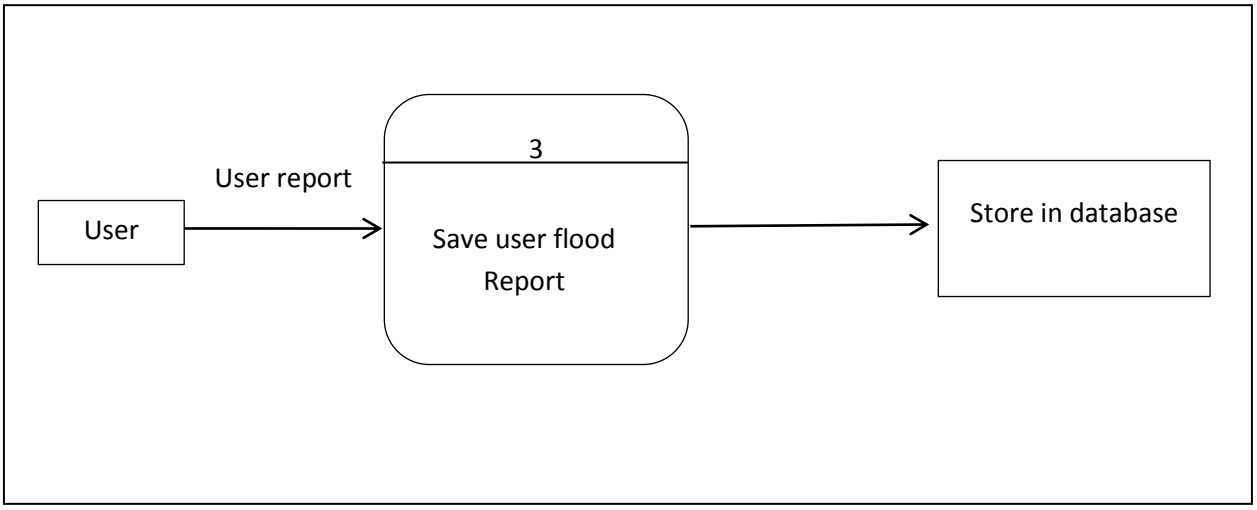


Figure 3.5: DFD user sending a report

3.4 Data dictionary

Data dictionary is a medium to store the whole of data about the MyBanjir Update. It defines and describe the element that have in data. Table 3.1 shows about all the data that have been use in MyBanjir Update. Technically, the database are comes from the staff of Jabatan Meteorologi Pahang that have the authority to give direct update and warning regarding the flood information.

Table 3.1: Data Dictionary for Jabatan Meteorologi Pahang staff

No.	Field	Type	Length	Description
1.	id	AUTO_INCREMENT	-	number
2.	district	varchar	50	District in Pahang
3.	flood_info	varchar	50	Flood update information
4.	shelter	varchar	50	Information about the nearest shelter
5.	username	varchar	50	username from the user
6.	password	varchar	50	Password of the user

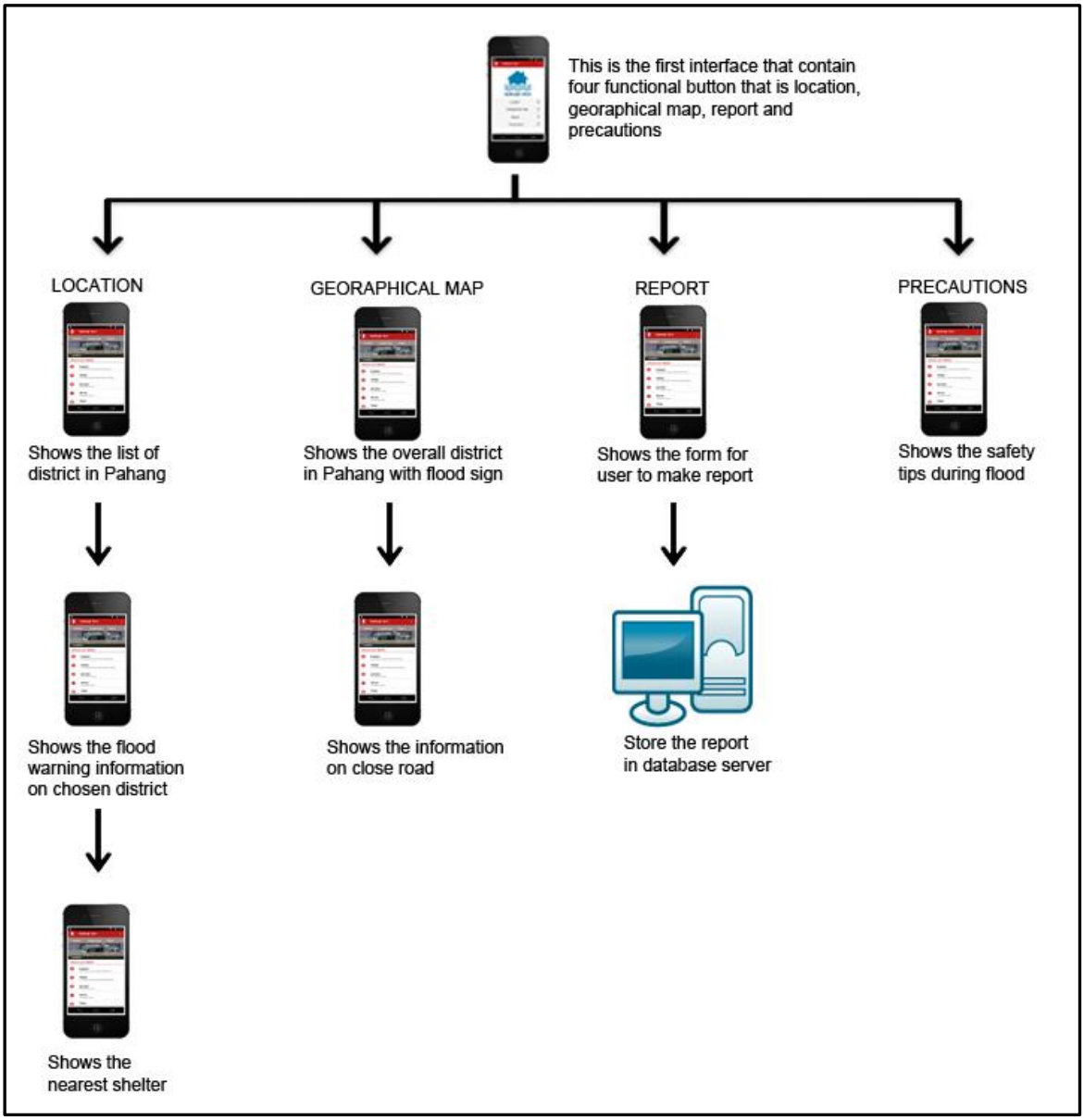
Table 3.2 shows the data dictionary of user giving reports if there is flood happened around Pahang area. User that use this MyBanjir Alert need to include their name and contact number so that it is easy for the staff to make a confirmation about the reports that have been made.

Table 3.2: Data dictionary of MyBanjir Update

No.	Field	Type	Length	Description
1.	id	AUTO_INCREMENT	-	number
2.	district	varchar	50	Username of the staff
3.	flood_report	varchar	50	Password of the staff
4.	name	varchar	50	Name of the user
5.	contact_no	int	50	Contact number of user

3.5 Interface Design

System design is important stage to this system. There are several criteria need to be follow in order to make the user understand well and easy to use this system. Figure 3.6 shows the overall interface of the system. It shows the flow on each functional button goes



to.

Figure 3.6: Overall flow of MyBanjir Update interface

3.5.1 Detail Interface Design

Figure 3.7 shows the main page of MyBanjir Update system. The page basically provides four main buttons that gives different functionality. User can choose which update they want to get the information.

Figure 3.7: Main page of MyBanjir Update

Figure 3.8 shows the interface of location page. The page consists of several districts in Pahang area. User can choose which area that they want to get the update regarding the flood. The page will lead to the flood information alert when users click in each of the area around Pahang. The flood update information display three level of flood warning that is danger, precautions and normal stage. User will be able to know where the level of flood and start to secure all the things.

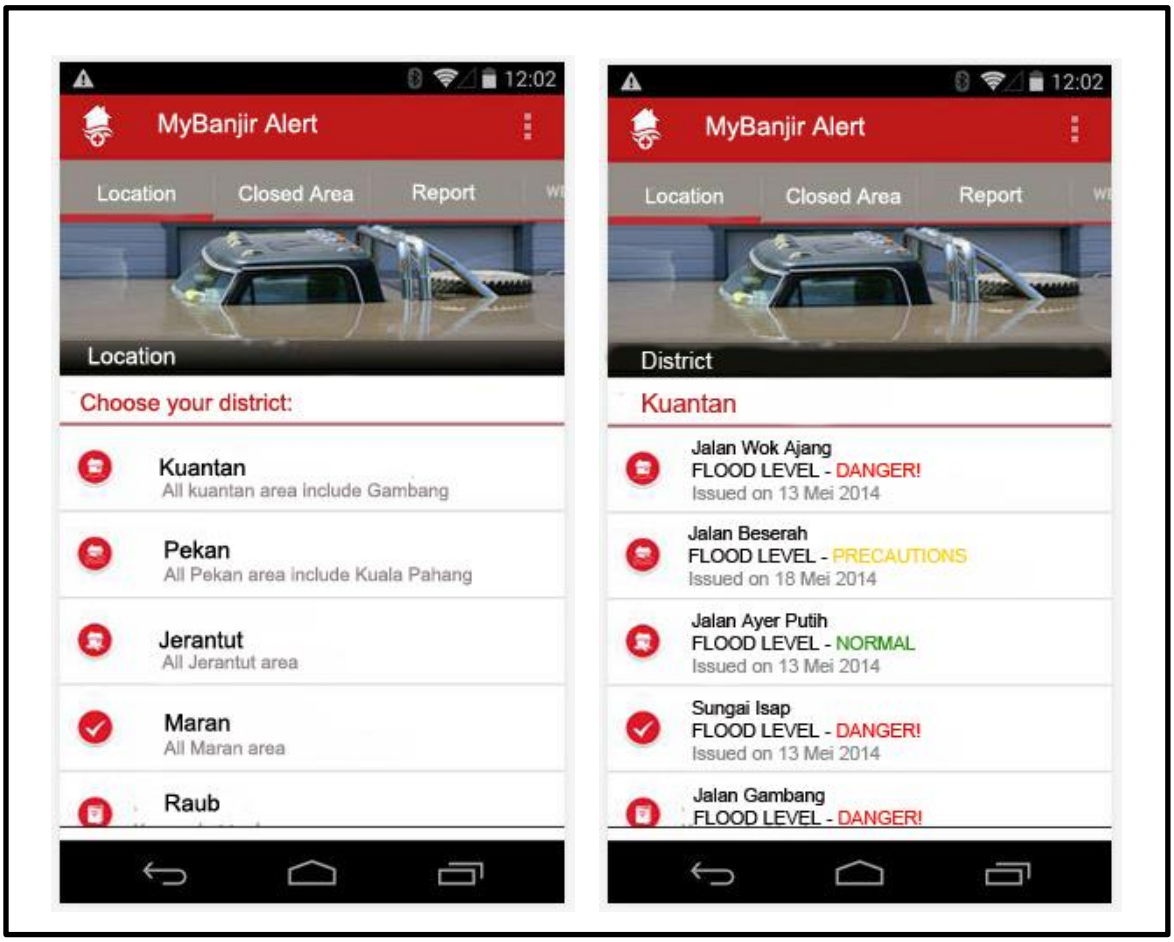


Figure 3.8: Interface of location and flood information page.

Figure 3.9 shows the geographical map view of the flood .It shows the overall places in Pahang that affected by flood. Besides that it also gives information about the road closed and cannot be used for a certain time. This function will avoid the traffic jams on the road by viewing this geographical map. Users will save a lot of time to go somewhere with the help of this application.

Figure 3.9: Interface of Geographical map

Technically, the designs are created to make ease the user. The designs are following the principle and rules of designing an interface. The criteria such as usability, learnability, consistency and flexibility must include in designing the interface. This is because, the user will be satisfy and easily to use this mobile application without having any errors.

3.6 Database Design

In MyBanjir Update system, there are two table and database used to develop the system. The first table is flood update table while the second table is user report table. Figure 3.10 shows the overall database design of MyBanjir Update.

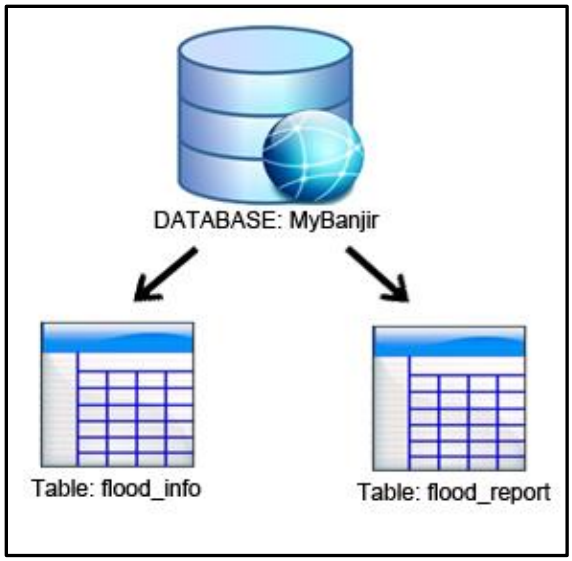


Figure 3.10: Overall database design

Figure 3.11 shows the database design table for client-side of MyBanjir Update System. This is where the staff of Jabatan Meteorologi Pahang stores the update of the flood in each district. The staffs have their own username and password that only they can access to give an update about the flood. This is to prevent the security of the system so that only authorize person can give alert about the flood.

	Field	Type	Collation	Attributes	Null	Default	Extra	Action
☐	Id	int(20)			No		auto_increment	
☐	district	varchar(50)	latin1_swedish_ci		No			
☐	flood_info	varchar(50)	latin1_swedish_ci		No			
☐	shelter	varchar(50)	latin1_swedish_ci		No			
☐	report	varchar(50)	latin1_swedish_ci		No			
☐	username	varchar(50)	latin1_swedish_ci		No			
☐	password	varchar(50)	latin1_swedish_ci		No			

Figure 3.11: Database design for flood update

Figure 3.12 shows the database design table for user-side of MyBanjir Update System. This is where user of MyBanjir Update application gives report if there is a flood around Pahang area. User will need to give their full name and contact no and then the flood report that they saw happened around Pahang.

	Field	Type	Collation	Attributes	Null	Default	Extra	Action
☐	Id	int(20)			No		auto_increment	
☐	district	varchar(50)	latin1_swedish_ci		No			
☐	flood_report	varchar(50)	latin1_swedish_ci		No			
☐	name	varchar(50)	latin1_swedish_ci		No			
☐	contact_no	varchar(50)	latin1_swedish_ci		No			

Figure 3.12: Database design for user report

3.7 Hardware Requirement

Table 3.3 below shows the hardware requirements and functions included in developing the MyBanjir Update. There are two type of hardware that need to be used in developing this MyBanjir Update application.

Table 3.3: Hardware requirement

Hardware	Functions
• Acer Laptop • 4GB Ram • 32-bit Operating System • Intel Core i3 2.20 GHz	To develop the application and run software such as MySQL and ECLIPSE.
• Samsung smartphone or tablet • Android operating system • Minimum Android version 2.3.4 froyo	Act as Android mobile device to run the application and record the report

3.8 Software Requirement

Table 3.4 below shows the software requirements and functions included in developing the MyBanjir Update. There are two software that contributes in developing this MyBanjir Update application.

Table 3.4: Software requirement

Software	Functions
• MySQL	To store and create database in the system.
• ECLIPSE	To develop, test and maintaining the MyBanjir Update applcation

CHAPTER 4

IMPLEMENTATION

4.1 Overview

In this chapter, it will discuss on two subtopics that will cover the technologies used of MyBanjir Update and system interface between two client sides.

Subtopics 4.2 will explain about the overall technologies used of MyBanjir Update. Subtopic 4.3 will discuss on the interface of two clients that is from Jabatan Meterologi Staff and mobile application user.

Overall contents in this chapter will provide the detailed information of implementation that will carried out in this project.

4.2 Technologies used

To create the system between two clients, it will need a web server and also the mobile application side for user. The staff of Jabatan Meteorologi Pahang is responsible in handling the web server side. They have the rights to pass through the flood information and also the safe house. The information of flood are receive from the headquarters as in formal report. Then the staff will review and check with the flood live camera to compare whether it is still flooding or not.

4.3 Interface and coding of the system

Interface and coding is one of the important things in developing the system. Coding is useful to make sure the system can run successfully. All the function and coding can be accept and having no errors during the testing. Interface is to make easier for staff and customer to interact with this system and create a user friendly environment. This system has two kind of interface that is for staff in Jabatan Meteorologi Pahang and citizens in Pahang. The interface for Jabatan Meterologi Pahang are web based interface and for the user is in mobile application interface.

4.3.1 Login Interface for Jabatan Meteorologi Pahang Staff

MyBanjir Update System for staff side is login as their private ID that already registered in their database. They might not need to undergo any registration stage for using this system. There is only several staff that is responsible in accessing the system and gives update on flood happened. Figure 4.1 shows the interface of login page containing the staff ID and the password. Figure 4.2 shows the coding and the MySQL for login session.

Figure 4.1: Staff Login Interface

```php
<?php
  error_reporting(0);
  ob_start();
  session_start();
  include "config/koneksi.php";
?>
<link rel="stylesheet" href="css/login2.css" type="text/css" />
<?php
function anti_injection($data){
    $filter = mysql_real_escape_string(stripslashes(strip_tags(htmlspecialchars($data,ENT_QUOTES))));
    return $filter;
}
$username    = anti_injection($_POST['username']);
$pass        = anti_injection(md5($_POST['password']));

$sql=mysql_query("SELECT * FROM users WHERE username='$username' AND password='$pass'");
$cek=mysql_num_rows($sql);
$r=mysql_fetch_array($sql);
```

Figure 4.2: Coding for login session

4.3.2 Homepage Interface for Jabatan Meteorologi Pahang Staff

Figure 4.3 below shows the interface for the homepage of MyBanjir Update System. The page displays the latest info from the National Whether Forecast and latest news directed into this page. There are 4 buttons in left hand side that is Direct Flood Update, Georaphical Map, MBUS Mobile and flood statistics.

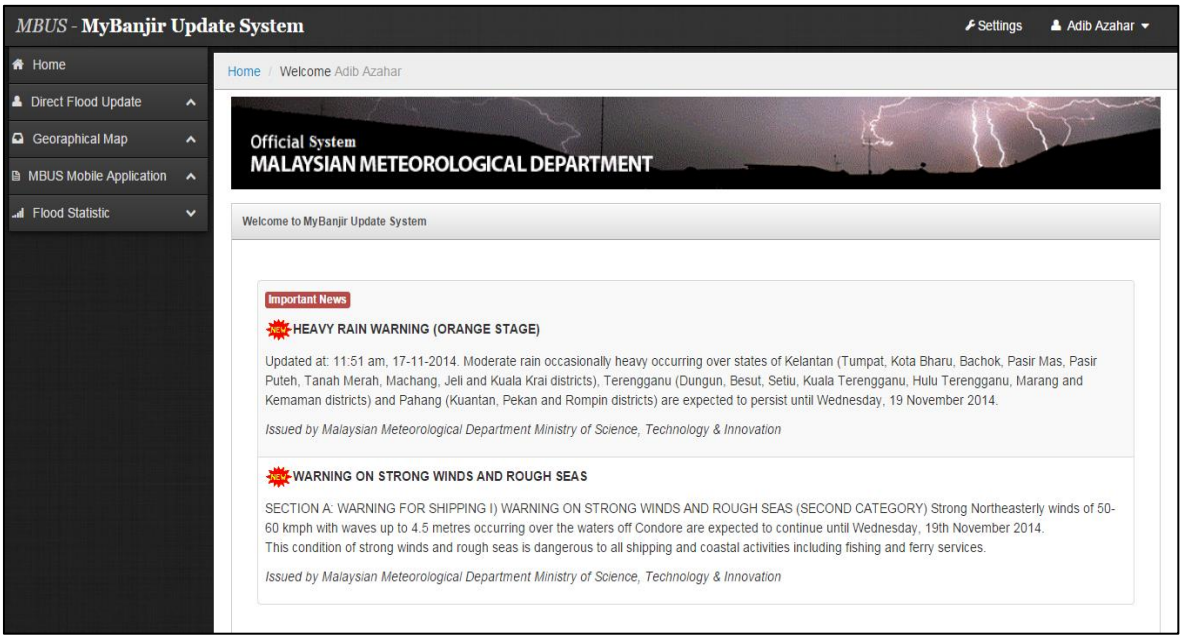


Figure 4.3: Homepage interface

4.3.3 Adding Flood Update Interface for Jabatan Meteorologi Pahang Staff

Figure 4.4 below shows the interface for adding new flood update of. The page displays the latest updates that have been made by the previous staff. The staff can add another update by clicking the add button and it will display the update forms for staff to fill in. The information includes an image of formal report from the headquarters of Jabatan Meterologi Pahang. It is to make as a reference for the staff. Figure 4.5 shows the interface of the form and also the code to add into the database. The important data is store in the table and can be view in this section.

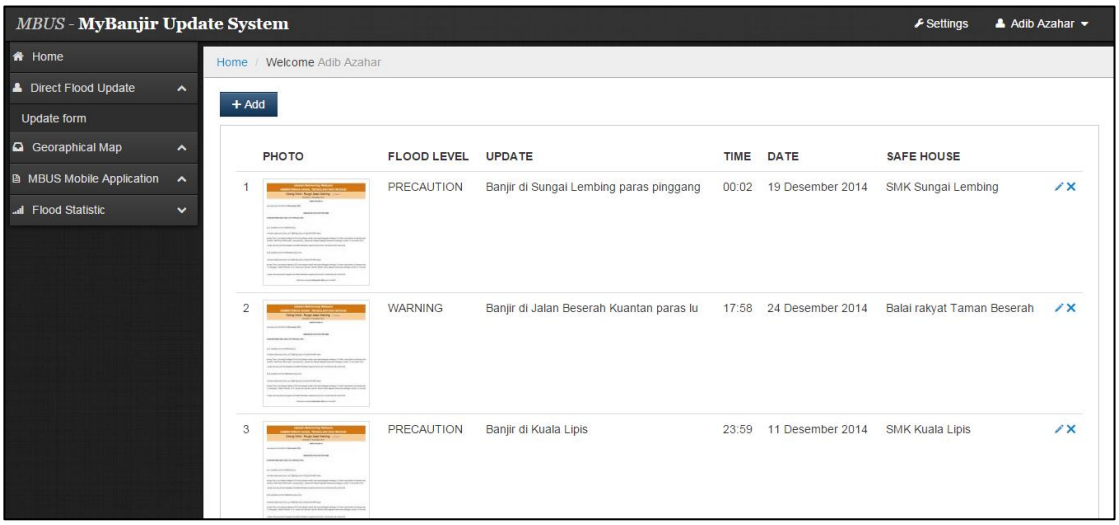


Figure 4.4: Display flood report interface

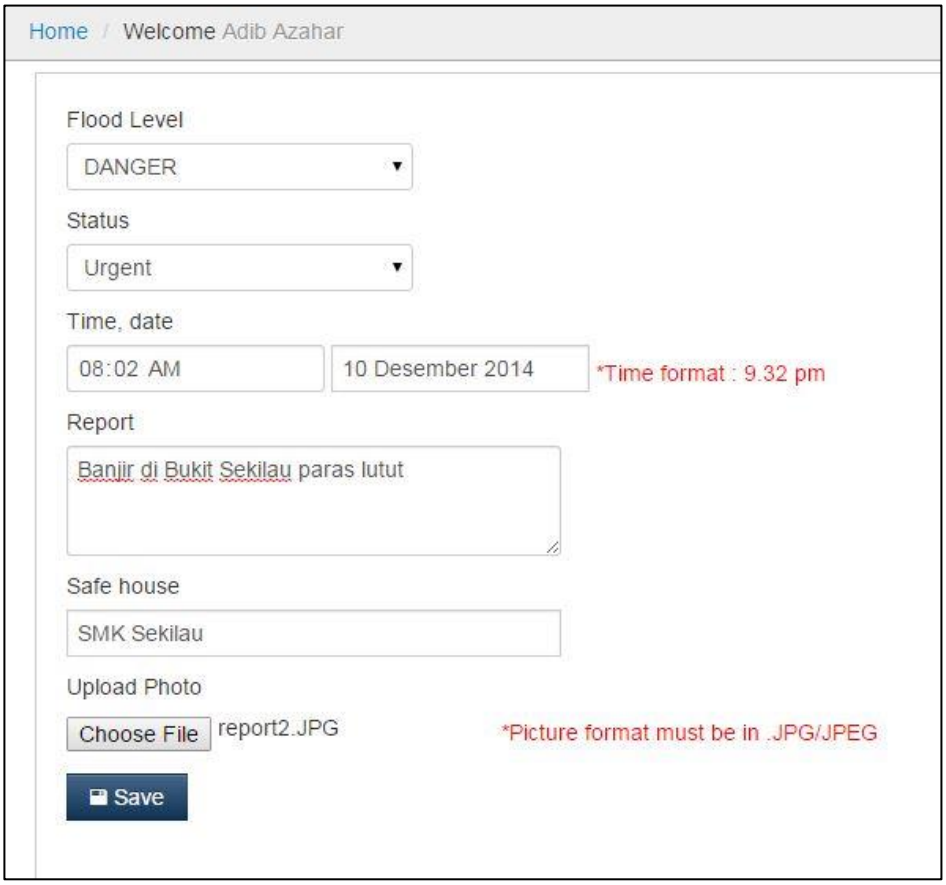


Figure 4.5: Adding flood update interface

4.3.4 Geographical View Interface for Jabatan Meteorologi Pahang Staff

In this section, staff of Jabatan Meteorologi Pahang can view live satellite report, live flood cameras on certain place that has been installed and latest radar image. This will give the staff direct info and pass to the user of MyBanjir Update Application. When the report from the Headquarters receives, the staff will compare with the live flood cameras in certain area. If the report from headquarters same and still valid with the live flood cameras, the staff will proceed to the MyBanjir Update System and insert the flood information to the user. Figure 4.6 shows the interface of the Geographical view section.

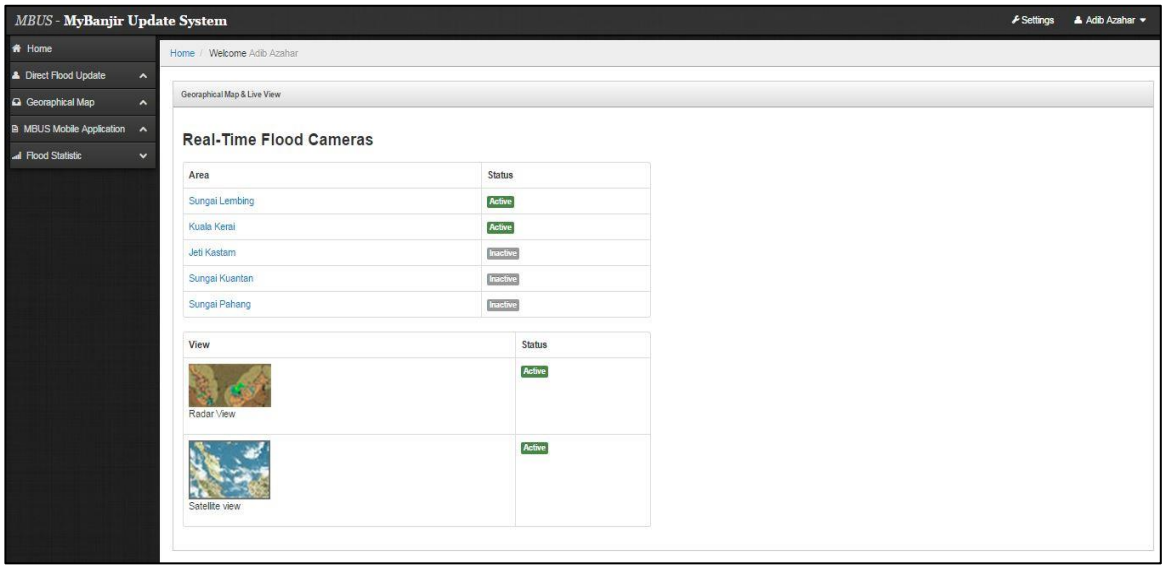


Figure 4.6: Geographical View interface

4.3.5 Flood statistic Interface for Jabatan Meteorologi Pahang Staff

In this section, there are statistics on report that have been post in the database. It shows the amount of flood level such as precaution, danger and warning. Staff can know by viewing the bar chart graph automatically increasing depends on how many flood report that have be post. Figure 4.6 is the interface of the flood statistics.

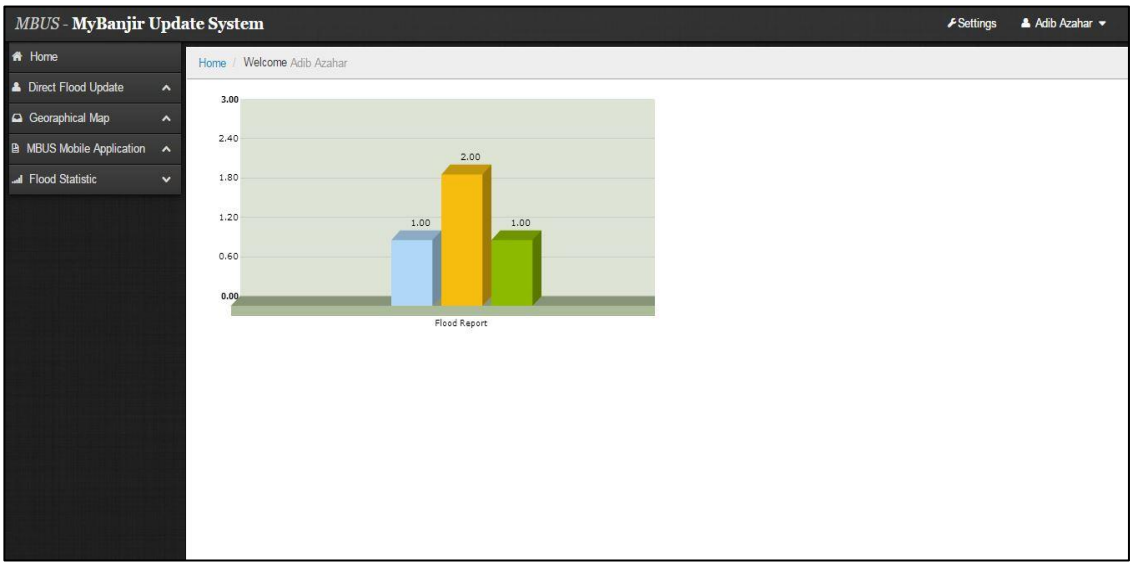


Figure 4.7: Flood statistic interface

4.3.6 Login interface for MyBanjir Update Mobile Application

For the first time user, they must be register their personal information such as usernames, email and password. All the information will be stored in the database. Figure 4.8 shows the Login page for user to log on.

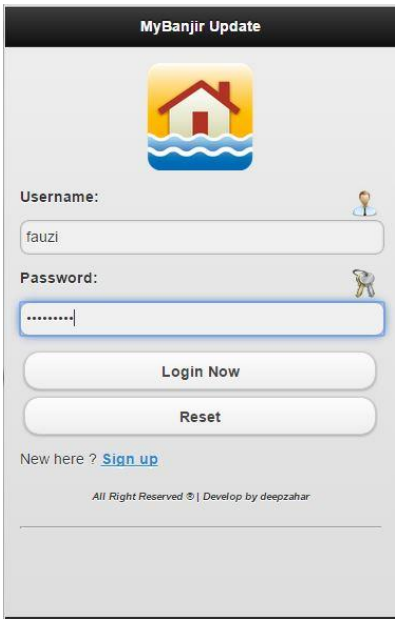


Figure 4.8: Login user interface

Figure 4.9 shows the coding to connect the database. It is connected with the database to read the username, password from the table user. If the username and password is correct, it will direct to the successful pages and preview all the flood updates that have been stored in database.

```
91  if (isset($_POST['user'])) {
92    $loginUsername=$_POST['user'];
93    $password=$_POST['password'];
94    $MM_fldUserAuthorization = "";
95    $MM_redirectLoginSuccess = "success.php";
96    $MM_redirectLoginFailed = "index.php#page3";
97    $MM_redirecttoReferrer = false;
98    mysql_select_db($database_connect, $connect);
99
100   $LoginRS__query=sprintf("SELECT username, password FROM `user` WHERE username=%s AND password=%s",
101     GetSQLValueString($loginUsername, "text"), GetSQLValueString($password, "text"));
102
103   $LoginRS = mysql_query($LoginRS__query, $connect) or die(mysql_error());
104   $loginFoundUser = mysql_num_rows($LoginRS);
105   if ($loginFoundUser) {
106     $loginStrGroup = "";
```

Figure 4.9: Database login coding

CHAPTER 5

RESULT & DISCUSSION

5.1 Introduction

In this chapter, it will discuss on three subtopics that will cover the result of MyBanjir Update System, advantages and disadvantages of system, constraints and discussion.

Subtopics 5.2 will explain about the result of the overall system during the testing process. It includes between two clients. Subtopic 5.3 will discuss on advantages and disadvantages of the system. Subtopic 5.4 will be discussing the project constraints for the system. Subtopic 5.5 will be the discussion of the overall results.

Overall contents in this chapter will provide the detailed information of implementation that will carried out in this project.

5.2 Result of the system

MyBanjir Update System is systems that have two medium that is web based application and mobile application. The staffs of Jabatan Meteorologi Pahang are using the web based application. The other user for the citizens in Pahang is using the mobile application to retrieve the updates regarding flood information. The systems are run smoothly in local host and smartphones and give the outputs that were expected.

Three type of testing have been done to test the output functionality of this system, which are functionality test, integration testing and system testing. All three tests are proven to be run accurately and smoothly. The results are shown in the next sub topic.

5.2.1 User Registration

User of MyBanjir Update System needs register for the first time so that they will receive the information regarding the floods and also they can make their own report if there is flood happened around their area. Figure 5.1 shows the registration page for user to fill in.

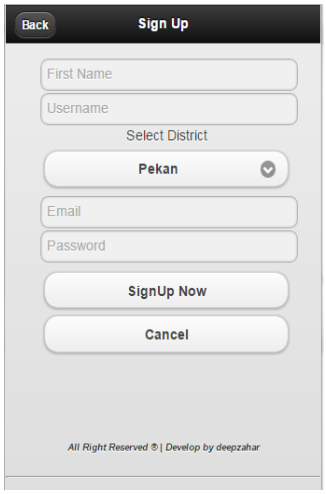


Figure 5.1: User registration page

5.2.2 Flood update recieve

After the registrations have been done, user will sign in and the flood information page will review. There are sign showing the updates that need to be read by the user. Besides, there is guidance and indication for user to understand what is precaution, warning and danger stages. Figure 5.2 shows the receive flood information page and the indication.

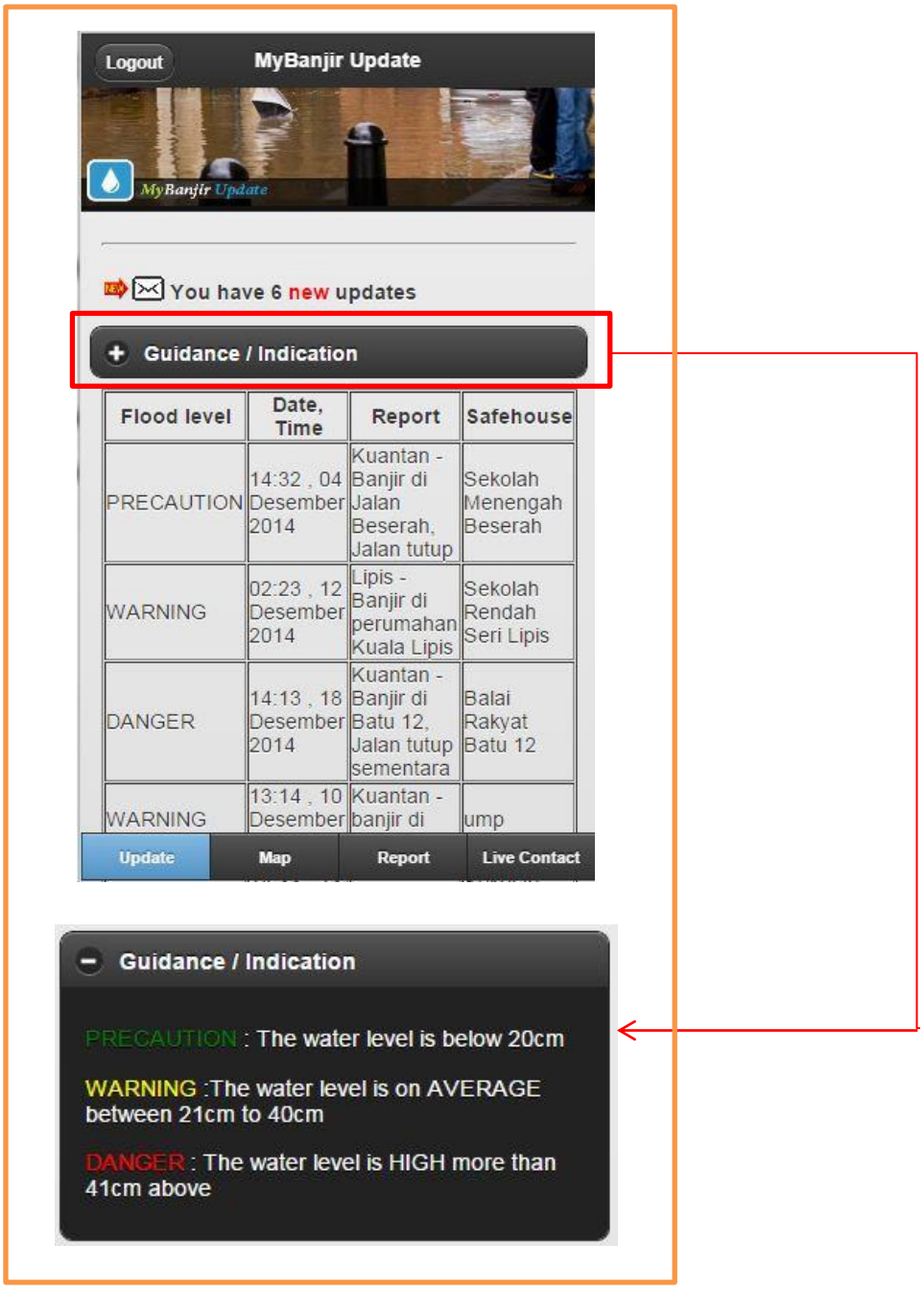


Figure 5.2: Flood information and indication interface

5.2.3 User report submission

Another option for user is to send reports if there is any flood occur in their area. This function will need them to insert some personal details such as their phone numbers so that the staff of Jabatan Meterologi Pahang can contact the person who makes the flood report. It is to make the confirmation and to know whether it is a valid report. Figure 5.3 shows the report section for user to fill in. After the user has submitted, the info will be stored in the database and can be view in web server side.

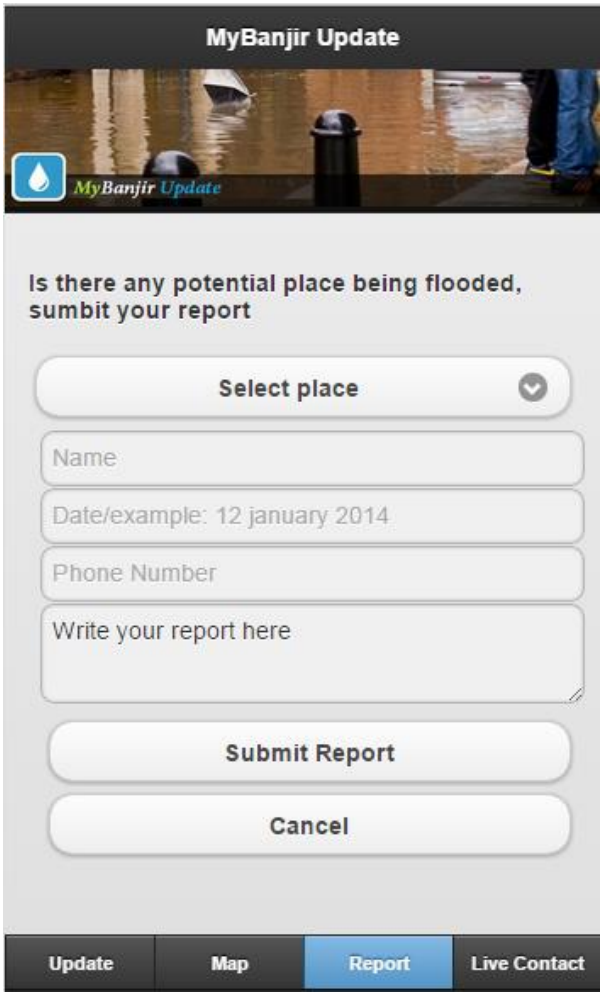


Figure 5.2: Flood reports interface by user

5.2.4 Live Contact

There is another option where user can contact to the admin by using live chat. This option can easily get answer from the admin when both of the users are online. Users can ask any related question regarding the flood might be happen or any kind of question regarding the flood. This is more quickly rather than contacting through Facebook or Twitter that sometimes need sometimes to approve the friends' request. Figure 5.3 shows how the live chat process occurs. The red circular column is where user key in the message or questions.

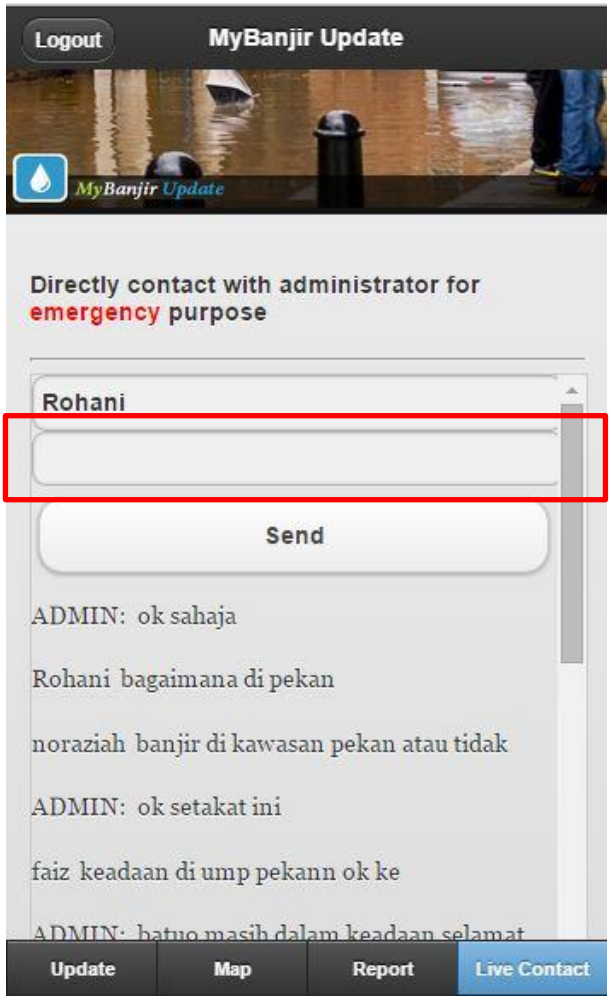


Figure 5.3: Live Contact interface by user

5.3 Advantages and Disadvantages.

The advantages of MyBanjir Update System are:

i. Allow user to get direct flood information anytime and anywhere as long as there is an internet connection
ii. Easily to contact the admin of Jabatan Meteorologi Pahang instead of using Facebook or Twitter
iii. Make ease the staff of Jabatan Meteorologi Pahang to pass the flood information and also the safe house to the citizens.
iv. Systematically add and updates flood report by staff of Jabatan Meteorologi Pahang.

The disadvantages of MyBanjir Update System are:

i. This system has limited functions and be done if there is an internet connection and smartphones
ii. If user forgets the password, they must contact the admin to reset back their password.
iii. The application cannot be support using IOS or Windows Phone.

5.4 Project Constraint

Project constraint is the problem and constraints in developing the project. This includes development constraint, software constraint, and hardware constraint.

Software Constraint:

i. The Eclipse sometimes is hard to render and run from the simulator and it takes a lot of time.
ii. The software need a high graphics performance to avoid the error to open
iii. The Eclipse emulator software is slow in performance thus force developer to use Android device to debug application in development.

Hardware Constraint:

i. Low specifications of laptops and mobile phones sometimes effect the performance to build and run the project
ii. Limited hardware used to view only using android phones but not in iPhone or Windows Phone

5.5 Discussion

By developing the prototype of the application, it shows that the objective and goals are successfully achieved which is to send the flood information together with the safe house for the ease of citizens in Pahang area. This prototype application has proven great feedbacks and direct information from the Jabatan Meterologi Pahang. A lot of improvements by using this system including fast direct updates, data stored efficiently, quick respond from admin, interaction between user and admin which are improved in this system.

All the improvement has been analyzed and recorded to be including into future work. The improvements are made to make the system more efficient and realistic for the user. With improvement through future work that will be started after this project development, the MyBanjir Update System might become an application that meets professional standard and it might be used in all state around Malaysia.

5.6 Future Works

There are several recommendations in order to enhance and improve the system. The recommendations are:-

i. Email function
   The system can be enhanced by adding an email trigger function. Every new updates regarding the flood can be post through email.

ii. Wide the area
   The system can be integrated into the whole state in Malaysia regarding the flood updates.

5.7 Project Contribute

The MyBanjir Update System Using Mobile Application has been successfully developed without any errors. The system was running smoothly and capable of generating an optimize function. Below are some contributions by using this system:-

i. Helps in flood situation and get to know the nearest safe house
ii. Make ease the staff of Jabatan Meterologi Pahang to send flood updates
iii. Easy to communicate with the staff of Jabatan Meterologi Pahang and user instead of using Facebook or Twitter.

CHAPTER 6

CONCLUSION

6.1 Conclusion

As a conclusion, the MyBanjir Update System Using Mobile Application has been developed in giving direct information through the flood incident happened. Although there are certain constraints arise while developing the system, the development of the system able to manage and complete it in the given time of period. The objectives are fully achieved with following all the phases. The main idea of this overall system is to make ease of two target user that is the staff of Jabatan Meteorology Pahang that happen to be a problem on delivering the flood information. For the second user of this system are the citizens in Pahang. They just need a smartphones and install the MyBanjir Update Application and get the latest flood update in just by viewing their own smartphones.

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http://www.redcross.org/prepare/mobile-apps/flood
(Mei 21, 2013)

Rapid Application Development
http://www.learn.geekinterview.com/it/sdlc/rapid-application-development.html
(January 10, 2008)

Methodology of project
http://www.my-project-management-expert.com/rad-software-development.html
(December, 12 2009)

The Post-PC Era Begins In Earnest Next Year
http://embedded-computing.com/articles/the-commercial-eclipse-based-solutions/
(Dan Rowinski December 10, 2013)

Wireless emergency alert capable

http://www.nws.noaa.gov/com/weatherreadynation/wea.html/

(Mei 13, 2012)

Richard Stew. Smartphones commandeer 70 percent of teen market http://www.cnet.com/news/smartphones-commandeer-70-percent-of-teen-market/

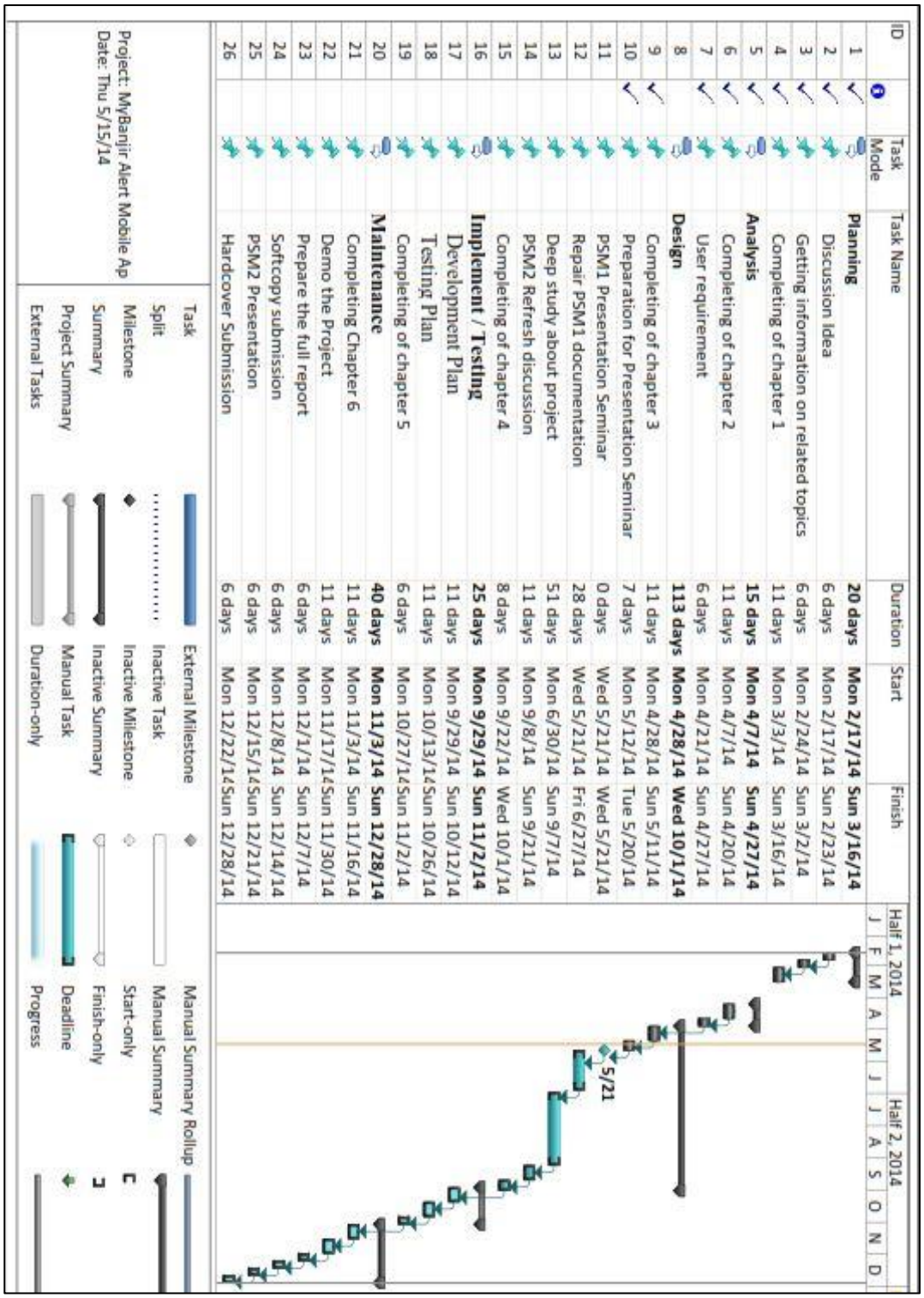
(October 29, 2013).

Marta Hurt, How will eclipse benefits your agency

http://www.recruitment-software.co.uk/benefits/benefits.aspx

(February 11, 2012)

Appendix A (Activity Gantt Chart)



Appendix B

(Sample Jquery Mobile code)

Header and javascript in jquery mobile

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
  <meta name="viewport" content="initial-scale=1.0">
  <meta name="apple-mobile-web-app-capable" content="yes">
  <meta name="apple-mobile-web-app-status-bar-style" content="black">
<title>MyBanjir Update Apps</title>
<link href="jquery-mobile/jquery.mobile-1.0.min.css" rel="stylesheet" type="text/css"/>
<script src="jquery-mobile/jquery-1.6.4.min.js" type="text/javascript"></script>
<script src="jquery-mobile/jquery.mobile-1.0.min.js" type="text/javascript"></script>
</head>
<body>

<div data-role="page" id="page">
    <div data-role="header">
        <h1>MyBanjir Update</h1>
    </div>
    <div data-role="content">

        <ul data-role="listview">
            <li><a href="#page2">Sign Up</a></li>
            <li><a href="#page3">Sign In</a></li>
            <li><a href="#page4">List User</a></li>
        </ul>
    </div>
    <div data-role="footer">
        <h4></h4>
    </div>
</div>
```

Successful page for jquery mobile

```
193     <div data-role="collapsible" data-theme="a" data-content-theme="a">
194    <h3>Guidance / Indication</h3>
195          <p> <font color='green'>PRECAUTION</font> : The water level is below 20cm</p>
196          <p> <font color='yellow'>WARNING</font> :The water level is on AVERAGE between 21cm to 40cm </p>
197    <p> <font color='red'>DANGER</font> : The water level is HIGH more than 41cm above</p>
198  </div>
199
200     <table border="1">
201         <tr>
202        <td width="144"><div align="center"><b>Flood level</b></div></td>
203
204                  <td width="144"><div align="center"><b>Date, Time</b></div></td>
205                        <td width="144"><div align="center"><b>Report</b></div></td>
206
207                              <td width="144"><div align="center"><b>Safehouse</b></div></td>
208         </tr>
209
210
211            <tr>
212          <?php do { ?>
213             <td><?php echo $row_listuser['nama_unit']; ?></td>
214          <td><?php echo $row_listuser['tempat']; ?> , <?php echo $row_listuser['tanggal']; ?></td>
215
216           <td><?php echo $row_listuser['gelar_depan']; ?> - <?php echo $row_listuser['alamat']; ?></td>
217
218           <td><?php echo $row_listuser['provinsi']; ?></td>
219
220         </tr>
221                  <?php } while ($row_listuser = mysql_fetch_assoc($listuser)); ?>
222
223           </tr>
224
```

Report form by user in Jquery Mobile

```
        <h1>MyBanjir Update</h1>
     <center><img src="images/b.jpg" alt="flood" width="100%" height="90"></center>
    </div>
    <div data-role="content">
      <h4>Is there any potential place being flooded, sumbit your report </h4>
      <form method="post" name="form1" action="<?php echo $editFormAction; ?>">
        <table align="center">
          <tr valign="baseline">
            <td nowrap align="right"></td>
            <td><input type="text" name="name" placeholder="Name" value="" size="32"></td>
          </tr>
            </td>
          </tr>


          <tr valign="baseline">
            <td nowrap align="right"></td>
            <td><input type="text" name="date" placeholder="Date/example: 12 january 2014" value="" size="32"></td>
          </tr>

            <tr valign="baseline">
            <td nowrap align="right"></td>
            <td><input type="text" name="phone" placeholder="Phone Number" value="" size="32"></td>
          </tr>




          <tr valign="baseline">
            <td nowrap align="right"></td>
            <td>    <textarea  rows="4" cols="50" type="text" name="report" placeholder="Write your report here" value="">
Write your report here
```

Alert function in jquery mobile

```
<script type="text/javascript">
$(document).ready(function(){
    var j = jQuery.noConflict();
     j(document).ready(function()
     {
         j(".refresh").everyTime(1000,function(i){
             j.ajax({
               url: "refresh.php",
               cache: false,
               success: function(html){
                 j(".refresh").html(html);
               }
             })
         })

     });
     j(document).ready(function() {
             j('#post_button').click(function() {
                 $text = $('#post_text').val();
                 j.ajax({
                     type: "POST",
                     cache: false,
                     url: "save.php",
                     data: "text="+$text,
                     success: function(data) {
                         alert('data has been stored to database');
                     }
                 });
             });
         });
    j('.refresh').css({color:"green"});
});
```