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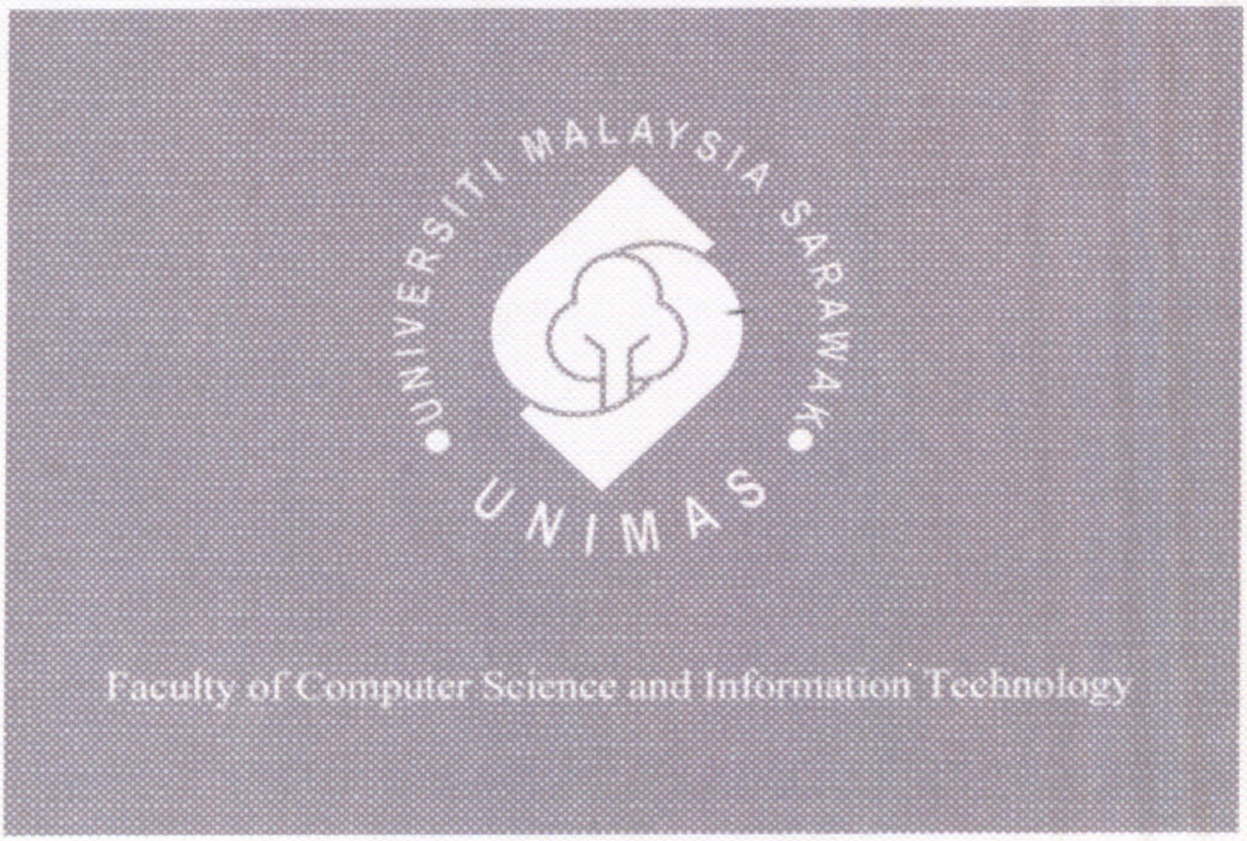

ANDROID-BASED *HAND-FOOT-MOUTH DISEASE* (HFMD) MONITORING

Chang Yei Ling

Bachelor of Computer Science with Honours
(Computational Science)
2015

Pusat Khidmat Maklumat Akademik
UNIVERSITI MALAYSIA SARAWAK

ANDROID-BASED HAND-FOO[illegible] (HFMD) MONITORING

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This project is submitted in partial fulfilment of the
requirements for the degree of
Bachelor of Computer Science with Honours
(Computational Science)

Faculty of Computer Science and Information Technology

UNIVERSITI MALAYSIA SARAWAK

2015

DECLARATION

I hereby declare that this project is my original work. I have not copied from any other student's work or from any other sources except where due reference or acknowledgement is not made explicitly in the text, nor has any part had been written for me by another person.

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ABSTRACT

Public may have a problem to prevent the Hand-Foot-Mouth Disease (HFMD) early because they do not receive important information in time. This result may cause the disease to spread quickly. This problem can be tackled if there exists a computer system to monitor the spread of the disease. Therefore, the main purpose of this project is to develop a mobile application that can notify the public about the HFMD that is reported by medical personnel. By notifying the disease, it also reduces the number of susceptible people and to prevent the outbreak of the disease. By utilizing this application, public may attain information about the disease immediately at the same time to prevent their children from going to the location of highly infected with the disease.

ABSTRAK

Setiap orang mempunyai masalah untuk mencegah Penyakit Tangan-Kaki-Mulut (HFMD) kerana mereka tidak dapat menerima maklumat itu pada masa yang tepat. Hal ini menyebabkan penyakit itu merebak dengan cepat. Namun, masalah ini boleh ditangani jika wujudnya salah satu sistem komputer yang memantau penularan HFMD. Oleh itu, tujuan utama projek ini adalah untuk mencipta satu aplikasi mudah alih yang boleh memberitahu orang ramai tentang HFMD yang dilaporkan oleh kakitangan perubatan. Dengan memberitahu penyakit itu, ia juga mengurangkan bilangan orang yang terdedah dan mencegah wabak penyakit tersebut. Dengan menggunakan aplikasi ini, orang ramai juga boleh mencapai maklumat mengenai penyakit ini dengan serta-merta mengelakkan anak-anak mereka jauhi dari lokasi yang mempunyai banyak penyakit.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Hand-Foot-Mouth Disease (HFMD) is a disease that mostly affects young children under the age of five (Leslie & Nancy, 2013) but it may probably affect adults too. It produces sores or ulcers on hands, feet and mouth. Sarawak State Health Department confirmed that HFMD is a contagious disease and the direct contact from an infected person will cause spread of virus rapidly (Nandita & Nilimesh, 2010). The direct contact includes direct contact with nose and throat discharges, the infected stool, unhygienic objects and surfaces. Generally, the period of infection to onset symptoms (incubation period) is three to seven days. Meanwhile, the virus might continue to be transmitted from the infected stool up till one month (Nandita & Nilimesh, 2010). The symptoms of HFMD are fever, sore throat, ulcers in mouth, and blisters on the hand, feet, or even buttocks. Seriously infected patients may cause the person to die seen in the dreaded year 1997 that had killed 31 children after an outbreak of HFMD (Parochial, 2012b). As studied by Parochial (2012a), the State Health Department also suggested that it can reduce the risk of infection by avoiding close contact with another person. As a result, parents must have greater awareness of HFMD in order to reduce the number of susceptible population and to avoid the occurrence so that it would not happen again.

1.2 Problem Statement

HFMD is very harmful and can spread easily among the children. Unfortunately, there is no existing computer system platform that alerts the susceptible population in hopes of reducing the spread of the virus. The disease information only can be obtained through the mass media such as newspapers, televisions, radios and magazines. At the same time, the news slowly filtered through to public and caused public have a problem to prevent HFMD

early since they do not receive that information in time. Subsequently, the disease spreads quickly and the number of susceptible people increases. If there is a computer system that can monitor the spread of that disease, then it may cause the number of susceptible people decrease and to prevent the outbreak of the disease. Thus, there is a need to create a user-friendly interface of computer system to monitor HFMD easily.

1.3 Objectives

The aim of this project is developing an Android application for monitoring Hand-Foot-Mouth disease within Kota Samarahan. Specifically, the project aims:

- To identify the location for tracking Hand-Foot-Mouth disease
- To display the number of disease cases from the main database
- To create a user friendly interface design

1.4 Methodology

To complete this project efficiently, particular hardwares are needed. A computer and some physical mobile devices are needed to implement an Android development application and to test the application respectively. Moreover, software such as Android Studio is also used to write the full coding for Android development application.

Moreover, there are some techniques to be used to complete this project. Usually, the process of developing a mobile application is almost same as System Development Life Cycle (SDLC). There is an obvious difference of both SDLC and mobile development application process. The release phase is required by the mobile development application process but SDLC does not comprise any. Iconma (2013) stated that the release phase means that the

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process of the application is available in the market. In view of the fact that the project is not designed for a profit gain, the SDLC method is preferred.

There are seven SDLC phases as shown in Figure 1.1. The first phase is identifying problems, opportunities, and objectives. Secondly, it is possible to determine human information requirements. Subsequently, the process is analyzing system needs. In addition, designing the recommended system is also very important. Besides that, developing and documenting software. After that, testing and maintaining the system. Last but not least, to implement and evaluate the system.

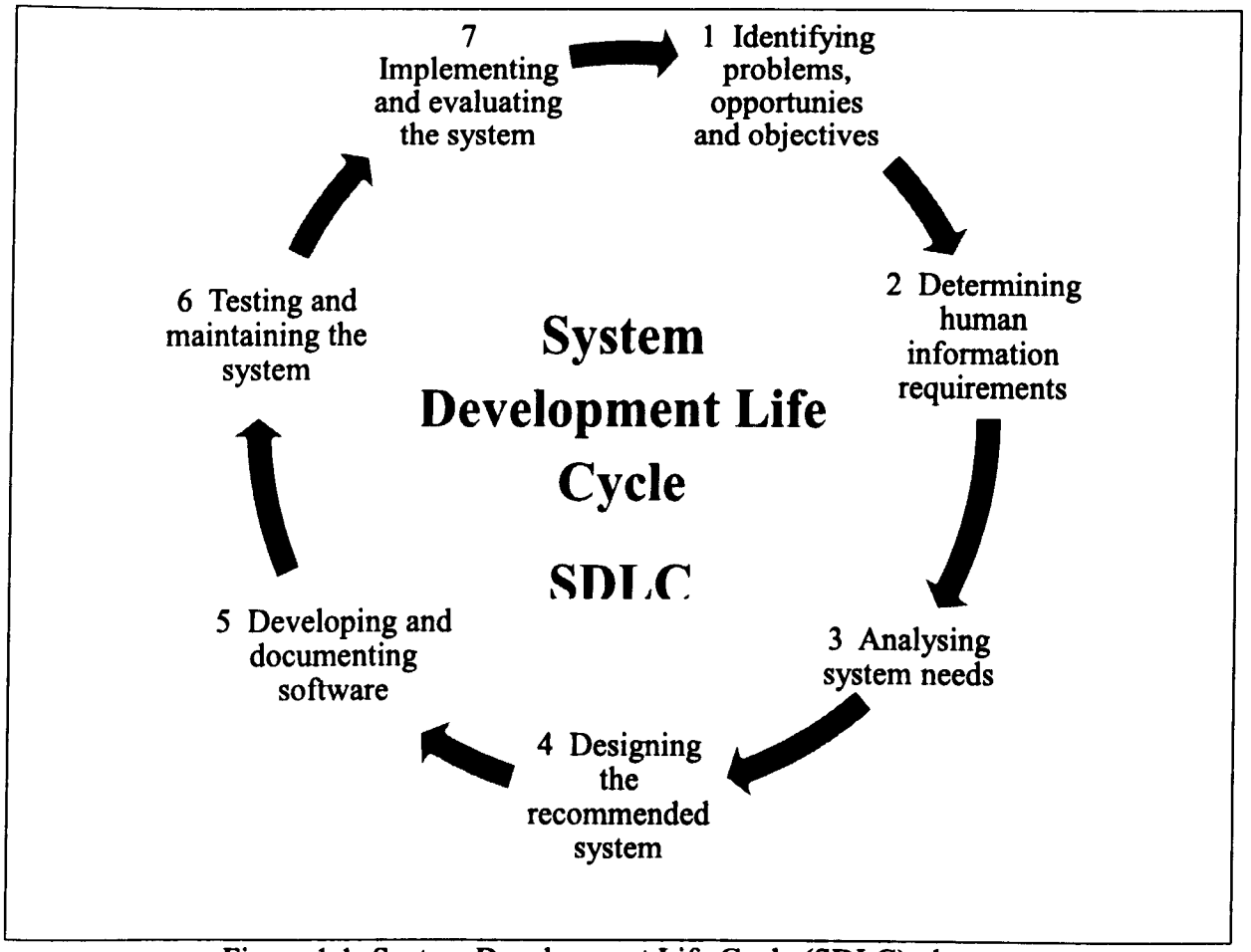

Figure 1.1: System Development Life Cycle (SDLC) phases.

During the application development, there are some other methods to be used as such prototyping, observation and interview. The method of prototyping is needed for designing a good user interface. At the mean time, observation and interview are also important for analyzing system need by users.

1.5 Scope

This project must be completed in a short period of time. As a result, there are some limitations on this project in order to make it as a small and precise project. This project mainly focuses in Kota Samarahan, Sarawak. At the same time, the targeted group will be the people that suspected at the age of 18 and above, namely parents and teachers. They are currently the most exposed group with smart phones. Besides that, the application is only available for Android smart phone with version 4.0 and above.

1.6 Significance of the Project

This mobile application plays a significant role to notify parents and teachers about the HFMD that appears in the clinic and school that is reported by medical personnel. Parents and teachers can utilize this application to attain information about the disease immediately. Moreover, it is to update the location which is tracked with the infected cases. Simultaneously, parents can avoid their children going to the particular location of highly infected with disease. Since the school has had this information, they can take appropriate action immediately to avoid this disease to march into the school. Consequently, the mobile application may reduce the number of susceptible people and also to prevent the outbreak of the disease.

1.7 Project Outline

A general plan to show the main features for a few chapters but not detail as described below:

Chapter 1 is the introduction, which includes some preliminary sections to state clearly what the project is going to be, why it is important to be carried out, how to complete it, who are the expected people to be involved in this project, where is the area for specific use, and why the outcome of project is needed.

Chapter 2 describes the literature reviews. It is a process of retrospective written works and existing computer systems. Then, this chapter makes a comparison of aspects between a few existing computer systems and constructs a proposal solution to enhance the existing computer systems as well as to innovate.

Chapter 3 represents the requirement analysis and design, which explains the methodology in the process of analyzing and designing. After analyzing the user requirements, there are some solutions are required to solve the problem. Subsequently, a proposed system may need to design.

Chapter 4 explains the implementation of the proposed system. The output of the implementation may display for every function and the method of implementing is also showing simultaneously.

Chapter 5 shows the testing of the proposed system and the user satisfaction towards the proposed system. The proposed system must be tested in term of performance such as animation, transition, multi-screen resolution supported and service. The interface testing and usability testing are also needed for satisfying user's the requirements.

Chapter 6 concludes the conclusion and future works. The project limitation and future works may identify in this chapter.

1.8 Summary

To sum up, a mobile application will be developed at the end of this project on the purpose of enhancing the existing computer system to monitor HFMD. The proposed application also can detect the location of people infected by HFMD and notify the number of infected case to the users, especially the parents and teachers. The most important is a user friendly interface in order to make the application simple to be learned, used and is resourceful. To complete the useful application, the procedures are the most important element for accomplishing the project systematically. The methods such as SDLC, prototyping, observation, and interview, are the extraordinary ways of carrying out the whole tasks in this project.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter is a part of this project that represents a retrospective survey on the existing works of papers or systems that have been published. The action of looking back on the several of existing projects and computer systems for Hand-Foot-Mouth Disease (HFMD) is liable to summarize the advantages and disadvantages for each feature. Then, a proposed solution may be carried out to solve the problems of the existing works and to help the users to protect themselves from HFMD easily.

2.2 Awareness and Monitoring HFMD

Awareness of HFMD is very important for our healthy life. Awareness of HFMD means that a feeling of concern and having knowledge as well as informing about HFMD. With the help of the knowledge and information, public, especially parents and teachers may have the responsibility to monitor HFMD in order to avoid HFMD to spread rapidly.

2.3 Existing Projects Review

There are some existing papers and computer system that have been published. The existing works are related to how the parents are concerned and well informed about HFMD. There are three existing systems that needed to be reviewed, which are Outbreak Near Me, Hand Foot And Mouth Disease, and Sickweather.

2.3.1 Outbreak Near Me (Health Map)

This mobile application was created by Clark Freifeld and John Brownstein, which had started in the year 2007. It was responsible to alert users to the occurring of the sickness outbreak in real-time. Users could set it to alert with a notification automatically when an outbreak occurs in the area and see the current disease outbreak in their neighborhood (HealthMap, 2012). Moreover, the application showed a map with the pinpoint, which was representing the outbreak that happened in the certain location. Furthermore, it also displayed the news about the swine flu. The sources were reported by disease experts, public health professionals, and the general public. Outbreak Near Me could be downloaded from the app store and play store.

App store:

https://itunes.apple.com/us/app/healthmap-outbreaks-near-me/id328358693?mt=8.

Play store:

https://play.google.com/store/apps/details?id=com.duethealth.healthmap&hl=en.

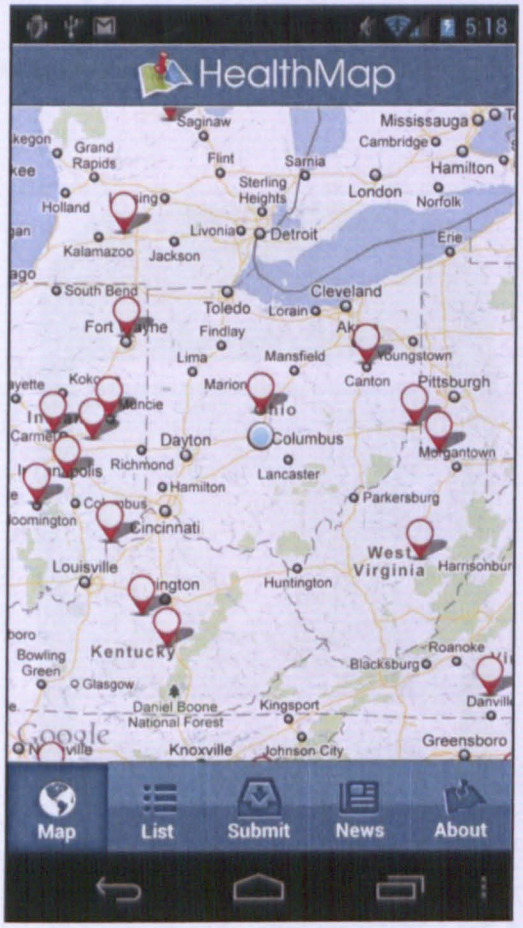

Figure 2.1: Map with the pinpoints (reported outbreaks).

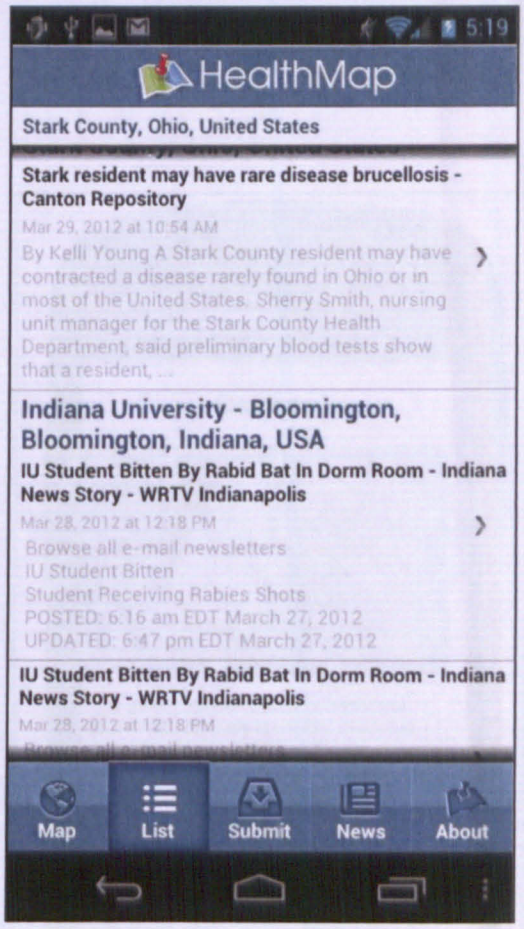

Figure 2.2: The list of the outbreaks with the details.

2.3.2 Hand Foot And Mouth Disease

This mobile application was published by Naster Solomon in the year 2014. It gave full information about HFMD that involved the definition of HFMD, symptoms, causes, risk factors, complications, preparing for your doctor, tests diagnosis, treatment, lifestyle home remedies, and preventions (Naster, 2014). At the end, it provides the HFMD knowledge to the public users. Hand Foot And Mouth Disease could be accessed from the Google play store, where the address is

https://play.google.com/store/apps/details?id=hand.foot.and.mouth.causes.diseases.symptoms.prevention.medicine&hl=fr.

Figure 2.3: The main page with the list of the categories.

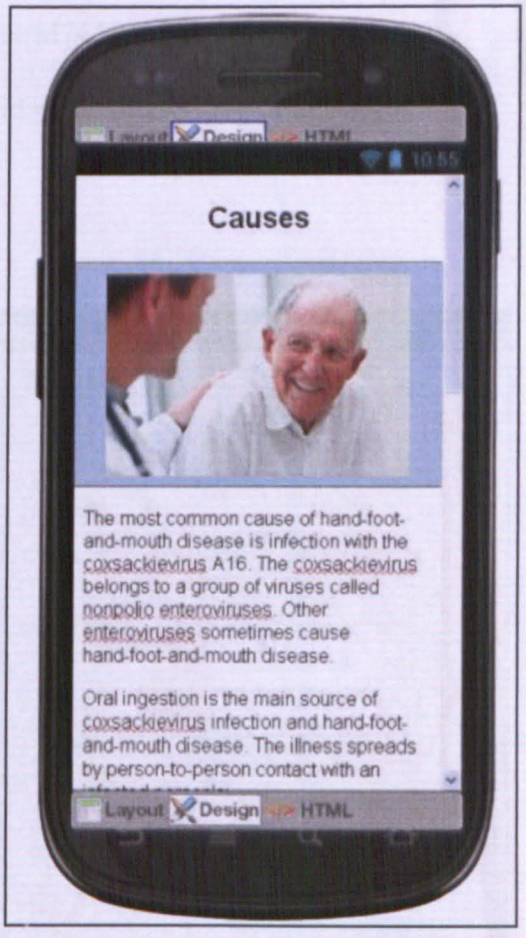

Figure 2.4: The page of *Causes* is the one of the categories.

2.3.3 Sickweather

This mobile application was developed by John Erck, Michael Belt, Graham Dodge, James Sajor, and Zephrin Lasker. It was activated in the year 2014. It provided real-time alerts and showed the map for users. When users were located in the area