Faculty of Computer Science and Information Technology

Mobile Application of Dengue Information System

NUR AMANI NAJWA BINTI MOHD NAZHIR

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NUR AMANI NAJWA BINTI MOHD NAZHIR

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ABSTRACT

This project aims to describe the proposed system of Mobile Application of Dengue Information System. Development of the proposed system is to improve the previous system. Furthermore, dengue information is hard to be obtained since the government only developed a website as platform in sharing the current dengue information with the community. This proposed system will help the community to earn privilege in their health care and also reduce the number of dengue cases by letting them be more alert with their surroundings. The method used in the proposed system is the Waterfall model which includes five phases where each phase will be described in report chapters.

ABSTRAK

Projek ini bertujuan untuk menggambarkan sistem yang dicadangkan Aplikasi Mudah Alih Sistem Maklumat Denggi. Pembangunan sistem yang dicadangkan adalah untuk memperbaiki sistem terdahulu. Tambahan pula, maklumat denggi sukar diperolehi kerana kerajaan hanya membangunkan laman web sebagai platform untuk berkongsi maklumat denggi semasa dengan komuniti. Sistem yang dicadangkan ini akan membantu komuniti mendapat keistimewaan dalam penjagaan kesihatan mereka dan juga mengurangkan bilangan kes demam denggi dengan membiarkan mereka lebih peka dengan persekitaran mereka. Kaedah yang digunakan dalam sistem yang dicadangkan ialah model Waterfall yang merangkumi lima fasa di mana setiap fasa akan diterangkan dalam bab laporan.

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Chapter 1: Introduction

1.1 Project Title

Mobile Application of Dengue Information System

1.2 Introduction/Background

There are a lot of diseases that have been spreading around Malaysia. Dengue fever is one of the most critical diseases within Malaysia caused by the Dengue virus. The Dengue virus comes from the bite of an infected female Aedes mosquito. According to the Health Minister of Malaysia, Datuk Seri Dr.Dzulkefly Ahmad, the cases for Dengue Fever in Malaysia are quite common. A total of 72,356 cases had been reported from January until July and it surges 89.5% from last year within the same period. The number of the death toll caused by Dengue had increased from 61 to 108 from the past year. Most people in Malaysia aren't aware of this disease in their community. Apart from that, they don't even know the symptoms of the Dengue fever and the fatality rate of this disease. This apps are build based on the community's need where it helps the community to gain privilege in aspect of health care. It will help them to be more aware of places especially the one with the highest number of dengue's cases and they can prepare themselves before going there. There's a self-diagnosis test within the app to ensure whether that person is having a symptom of the Dengue Fever and the result of the test will show the probability of the user is having the disease or not. As the result of the test only shows the probability, the user is advised to get a more thorough checkup with the doctor and this application can guide them to go to the nearest hospital/clinics. Figure 1 is a map that shows the affected area with Dengue cases in Malaysia.

Figure 1.1 The Affected Area with Dengue Cases in Malaysia

1.3 Problem Statement/Research Problem

The problem with Malaysia's current system is within the aspect of sharing the information. The information is being disclosed in the current system that the government currently used which is eDengue. This platform isn't available for anyone except those who works under the government for Ministry of Health. There is another website that appeal with the current information regarding dengue's cases. It is called as iDengue. It was built for the community, but it was out of reach for them and unknown since it is not been introduced properly. Nowadays, people are more attracted to mobile apps rather than surfing the website. The website doesn't have a mobile application features so it's hard to attract younger generations to take this matter seriously. There are also no features that allow them to check their symptoms based on locality of the Dengue's hotspots. If an outbreak occurs in a local place, not all of the local people will be noticed about it. As they're not aware of it, they will not take any precaution and end up infected by the disease. Apart from that, finding the nearest hospitals/clinics can be a problem since you need to open Google and search for it.

1.4 Scope

The targeted user for this project is the Malaysian citizen. This project is focused solely in raising the awareness of Malaysians regarding of Dengue Fever. This mobile application serves as a platform that shares the latest information of Dengue within the Malaysia region only.

1.5 Aim and Objectives

- To analyse and design a mobile platform that can raise the awareness of dengue to the public
- To develop a system that have a self-diagnosis test and can share the current Dengue info
- To find the Dengue spots and the nearest clinics/hospitals based on locality

1.6 Brief Methodology

The method that will be used in this project are quantitative research method. A quantitative research is a data-oriented method which used in emphasizing the objective measurement and gathering all the requirements to achieve the project's objective. In other way, this method that will be used includes:

- **Online survey**

For this method, we will use Google Form as our online survey. This online survey will be given to a part of the community divided by the age structure. This is to analyse on how well the community's understanding toward Dengue based on their age.

- **Face to face interview**

An interview is one of the basic methods to gather the information. This interview will be conducted toward two people, the health officer that's in charge of the Dengue cases and the person in charge of the hospital inquiry counter. For the health officer, I want to see how they record the Dengue data from the beginning process until the end. As for the hospital, I would like to interview them on how the current Dengue info disseminated to the community and the documentation of it.

- **Waterfall Methodology**

Waterfall methodology is one of the models used in system development life cycle (SDLC). It defined as waterfall as it uses a sequential approach and this model developed systematically from one phase to another in a downward structure (Business News, 2019). Each phase must be completed before it enters the new phase. There should be no overlapping phases in this model.

1. **Requirements**

   In this stage, the detailed requirement of the system is analysed and gathered in a specification document which serves as an inference for the future development.

2. Design

The design of interface, system and database are explained in this phase. The interface of the system will be design using Justinmind and as for the database, the data will be illustrated using Data Flow Diagram (DFD). A detailed explanation for this phase will be covered on chapter 3.

3. Implementation

The phase for Implementation is by describing tool that is used to develop the system. The programming language that will be used for coding is Java. The hardware that is in use is Asus X455L with Intel(R) Core(TM) i3-5005U CPU @ 2.00GHz.

After the system is implemented, it will run into several tests according to each feature of it. This test is conducted in order to maintain its functionality, efficiency and usability. The application should show all the data of Dengue based on the locality. A detailed explanation for this phase will be covered in chapter 5.

4. Verification

For this phase, running a software testing is a way to ensure whether the system is running smoothly with all the functions working as well.

5. Maintenance

If the system caught any error or malfunction, it will be handled within this phase. A detailed explanation will be covered in chapter 5.

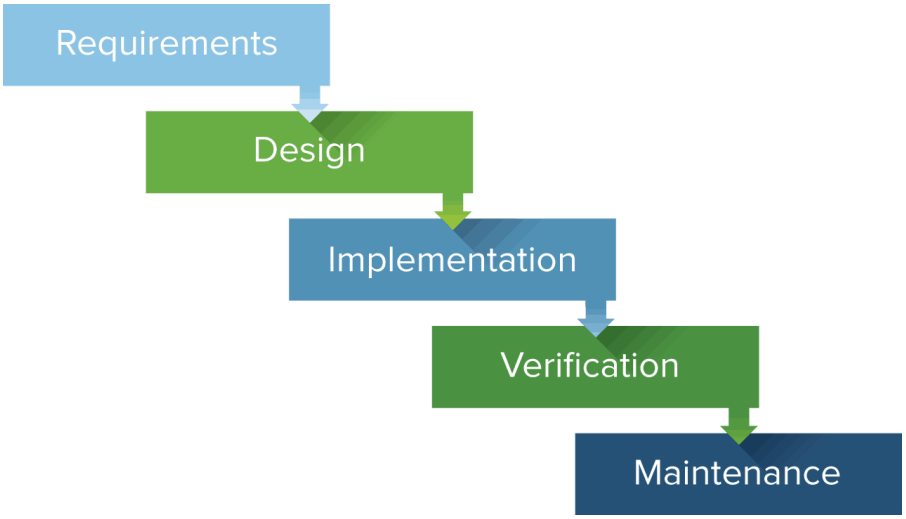

Figure 1.2 Waterfall Model

1.7 Significance of Project

This spotlight for this project is currently directed to the mobile apps. It develops for the purpose of community's need in increasing the awareness for Dengue. A mobile apps is one of the best platforms to share the information as it is also helped the users to receive any news or notification much faster. At the end of this project, the community should be able to spread their awareness and be more particular to their surroundings in case their place is one of the affected places. If they're worried about being infected by the Dengue Virus, they can do the self-diagnosis test to see if there's any symptoms that they're being infected or not. An early diagnosis is better than a late on since it can alert them to get their treatment as fast as possible. As the app also shows the nearest hospitals/clinics, they should find it easier to reach for the treatment.

1.8 Project Schedule

The duration for Final Year Project 1 to complete is about 90 days. There are 15 tasks to be completed. This Final Year Project 1 is expected to finish on 12 December 2019 right after Final Report (Amendment) have been submitted through the FYP Management System. Figure 1.3 is the Gantt chart of this project for FYP 1.

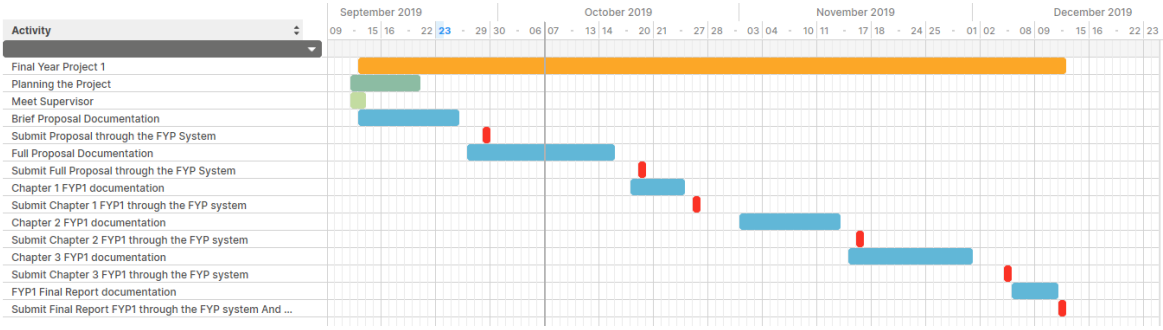

Figure 1.3 The Gantt Chart for Mobile Application of Dengue Information System for Final Year Project 1

The duration for Final Year Project 2 to complete is about 88 days. There are 16 tasks to be completed. This Final Year Project 2 is expected to finish on 25 May 2020 right after Final Report (Amendment) have been submitted through the FYP Management System. Figure 1.4 is the Gantt chart of this project for FYP 2.

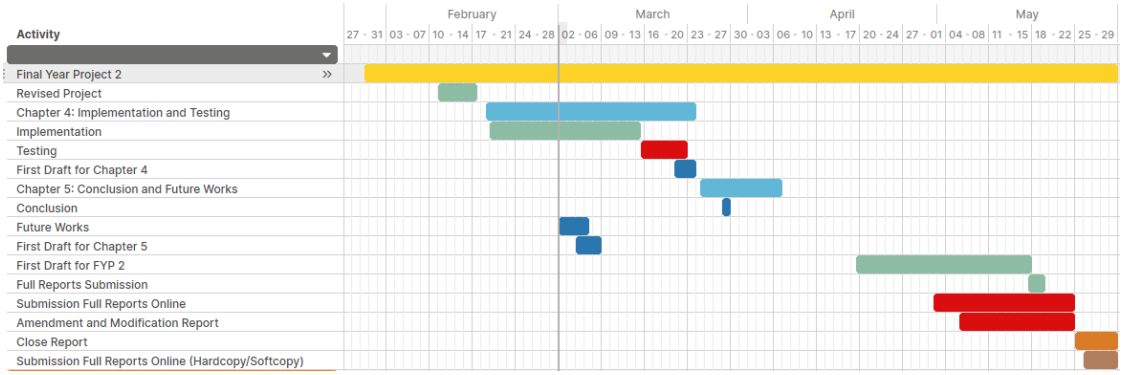

Figure 1.4 The Gantt Chart for Mobile Application of Dengue Information System for Final Year Project 2

1.9 Expected Outcome

The dengue information system apps should be able to raise the awareness within the community. Since most of them have their phone with them all the time, there should be no excuses to not be aware of their surroundings. If there's any new cases within the area, they can easily update it in the app. The app will also show the list of the Dengue's cases for each state. Apart from that, there is a self-diagnosis test to see whether they have the Dengue fever symptoms. In the event, if they are suspected to have Dengue, the mobile app could recommend the nearest hospitals/clinics.

1.10 Thesis Outline

1.10.1 Chapter 2

In Chapter 2, the literature review will be explained in detail thoroughly by comparing related system with the proposed system.

1.10.2 Chapter 3

In Chapter 3, the requirement analysis and design of the Mobile Application of Dengue Information System. Thus, a survey will be conducted to the public. Along with that, a DFD diagram and sketches of the interfaces will be presented.

1.11 Summary

In this chapter, we will describe the details of the system's background along with the explanation of the system. Apart from that, the methodology that's in used for this project, Waterfall Model will be explained and applied in Chapter 3. The scope of the proposed system, significance and the expected outcome are also be described within this chapter.

Chapter 2: Literature Review

2.1 Introduction

In this chapter, there will be discussion on concepts that are relevant with the proposed system. Next, there will be a presentation that consist of the existing system and its functions. After that, the reviewed system will be compared with the proposed system. Finally, in this chapter, a brief overview of the proposed system will be presented.

2.2 Dengue

Dengue fever is a mosquito-borne tropical disease caused by the dengue virus (Wikipedia, 2019). It is a fast-emerging pandemic-prone viral disease that occurred in many parts of the world. Dengue virus (DEN) is the cause of Dengue fever and the mosquito that transmitted the virus is called Aedes aegypti. The viruses are passed on to humans through the bites of an infective female Aedes mosquito, which mainly acquired the virus while feeding on the blood of an infected person (World Health Organization, 2019).

This disease thrives places such as countryside, the urban poor areas and they are more active around neighborhoods in tropical and subtropical countries. It was initially recognized during dengue epidemics in the Thailand and Philippines in the 1950s. The most affected countries in the present are Asian and Latin American where it become major cause of hospitalization as well as death among the children and adults.

The signs and symptoms that occur to people that're infected with Dengue fever are sudden high-fever, headache, vomiting, muscle and joint pains ("Dengue Fever", 2019). These symptoms usually begin three to fourteen days after been infected. Skin rash will appear from two to five days after fever arise.

Each patient must endure complications such as bleeding, low levels of blood platelets and dangerously low blood pressure due to these infections. A vaccine has been approved and available in many countries, but the vaccine is only recommended for those that've been infected before. People can prevent themselves from this disease by always prepared mosquito repellents, even indoors. Reducing mosquito habitat and limit the exposure in outdoors's activities.

2.3 Predict and Beat Dengue

Predict and Beat Dengue is an application built by AIME (Artificial Intelligence for Medical Epidemiology), a health analytic company and webe community, a crowd-backing platform. This application acts as a dengue dynamic surveillance system which relies on artificial intelligence (AI) that predicts geo-locations and timing for the next dengue outbreak (TRISHA, 2019).

This application contains features such as accessible map that shows marked spots for dengue in Malaysia. Apart from that, push notification of potential hotspots can be received based on your location. Dengue cases can be reported through this application in every location and date. Any encounter with the potential of breeding sites, larvae can be reported as well. Photos can be taken and upload from the application to be referred as an incident report. Users can receive update from health news portal from the Malaysian Integrated Medical Gazette. An algorithm is implemented within this application where user can use it check if they're having dengue or not.

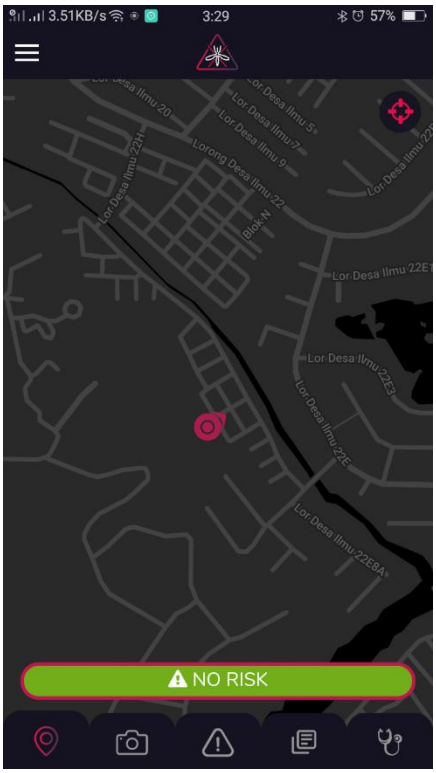

Figure 2.3.1 Main Menu

This is the main menu of the existing system. It shows our current location and inform us if there are any risk in our surroundings.

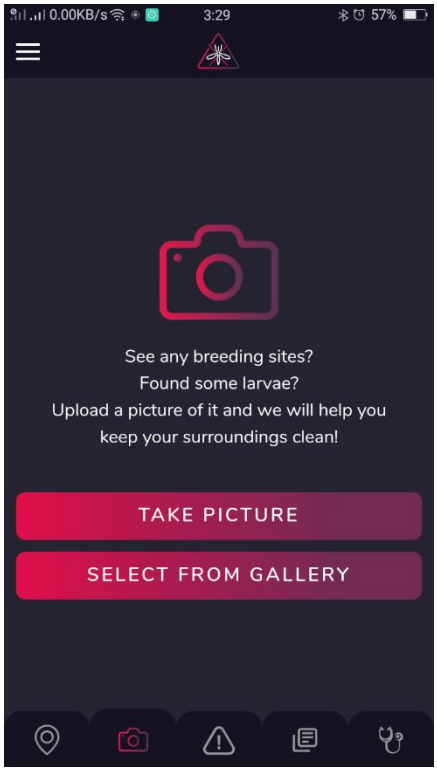

Figure 2.3.2 Share Breeding Sites

This is the page of the sharing the information on any breeding site or larvae and share it by uploading the picture to the system.

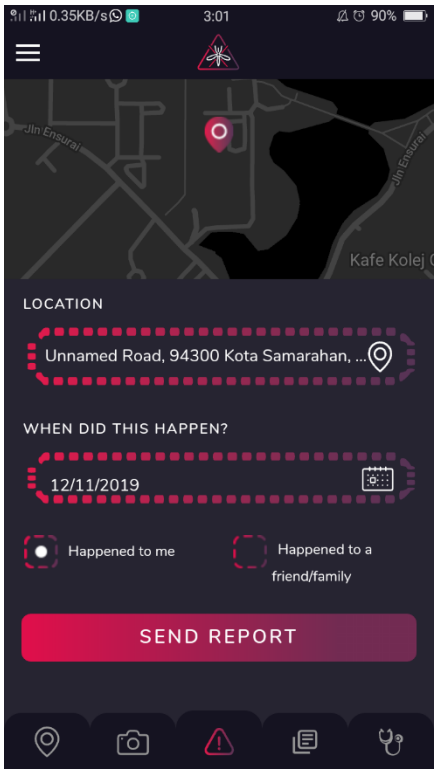

Figure 2.3.3 Report Activity

This is the page for reporting the activity. If the user see any breeding site or aedes near their surroundings, they can make a report by telling where it happens, the day of it happens and select whether it happen to themselves or to their family/friends.

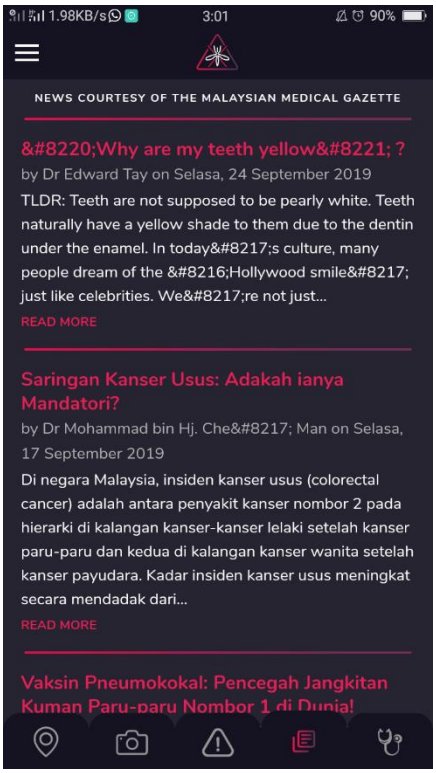

Figure 2.3.4 Latest Medical Info

This is the page for viewing the latest medical info within Malaysian Medical Gazette. It provides useful information for the user.

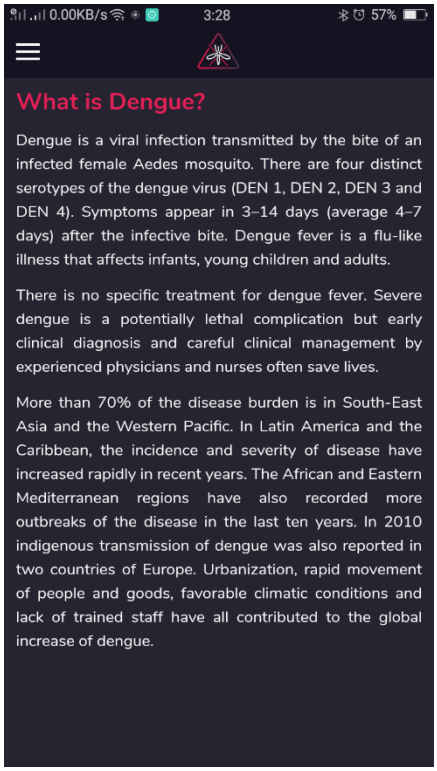

Figure 2.3.5 Dengue's Information

This is the page where it shows basic knowledge of dengue. It is easy to understand and can be helpful for the user of this system to know more about dengue's background.

2.4 Fight Dengue

This application is developed by Access Devices Asia Sdn.Bhd, a range of high-tech solutions and services and it was built on MosquitoBite Platform. This application currently available for Malaysia and Singapore. Fight Dengue is an application that assist in tracking the mosquito's activity and active cases of dengue in each area.

Users are allowed to submit report of the bite and mosquito's activity. Report for mosquito's activity can be made by adding marker to a certain location which is called POI(Point Of Interest). Cases for Dengue can be shared through online media social. Breeding grounds can be shared by uploading the picture of it.

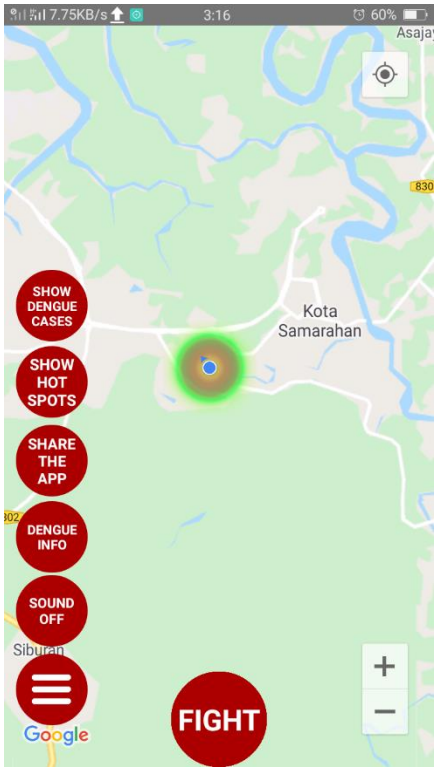

Figure 2.4.1 Main Menu

This is the main menu of this system where it shows a few buttons and it automatically detect the user location. It shows the colour range for each place which indicate the user whether they're staying in the green zone or red zone(danger).