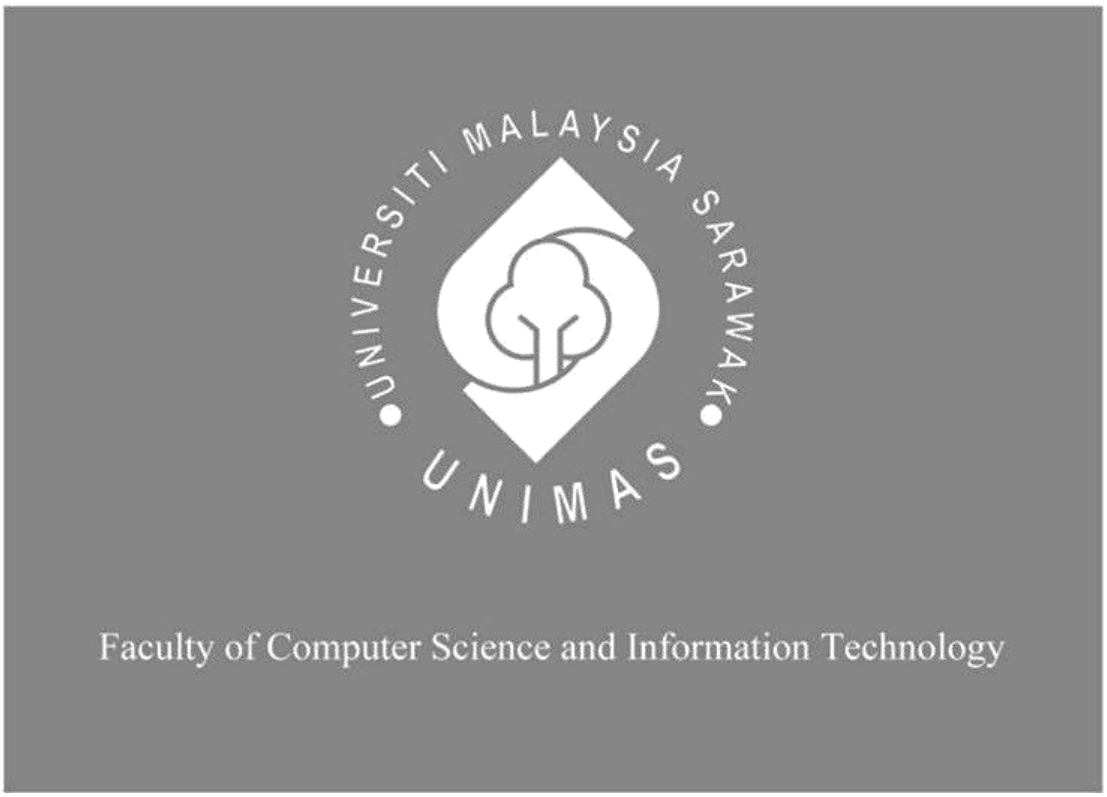

My Crime View: Web Application Dashboard for Malaysia Crime Statistics

WONG CHEE XIAN

Bachelor of Computer Science with Honors (Software Engineering)

2019

UNIVERSITI MALAYSIA SARAWAK

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My Crime View: Web Application Dashboard for Malaysia Crime Statistics

WONG CHEE XIAN

This project is submitted in partial fulfillment of

the requirements for the degree of

Bachelor of Computer Science with Honors

Faculty of Computer Science and Information Technology

UNIVERSITI MALAYSIA SARAWAK

2019

DECLARATION OF ORIGINALITY

I hereby declare that the project with the title "MY CRIME VIEW: WEB APPLICATION DASHBOARD FOR MALAYSIA CRIME STATISTICS" submitted by me to the Faculty of Computer Science and Information Technology, University Malaysia Sarawak (UNIMAS) is a record of an original work done by me under the guidance of Dr Stephanie Chua Hui Li.

Signed,

…….

WONG CHEE XIAN

Faculty of Computer Science and Information Technology

UNIVERSITI MALAYSIA SARAWAK.

DATE:

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ABSTRACT

Crime occurrence is very common in Malaysia and is worrying to the community. People are lack of danger awareness towards crime which can lead to fatal incident. Crime is an act that cause harm to not just individuals but also the community. No proper tools are currently available in the market for the community to be able to monitor crime statistics in Malaysia. People can only discover crime occurrence through social media or news broadcasting. Hence, a web-based application is proposed to solve this issue by providing a dashboard to monitor and track crime statistics in Malaysia. Authorized police users are provided with the feature to manage the crime database using this proposed web application as well.

Keywords: *crime; dashboard; crime statistics; web application*

ABSTRAK

Jenayah merupakan kejadian yang kerap berlaku and biasa di Malaysia. Kejadian ini telah menimbulkan rasa kebimbangan di kalangan masyarakat. Masyarakat kini kurang kesedaran bahaya terhadap jenayah di mana akan membawa kemautan kepada mereka. Jenayah merupakan suatu tindakan yang akan mengakibatkan kebahayaan terhadap bukan sahaja individu tetapi juga terhadap seluruh masyarakat. Pada masa ini, tidak wujud satu alatan yang boleh didapati di pasaran yang membolehkan masyarakat untuk memantau statistic jenayah di Malaysia. Masyarakat hanya boleh mengetahui kejadian jenayah melalui media sosial dengan siaran berita. Oleh sebab itu, suatu aplikasi web yang mempunyai fungsi papan pemuka untuk tujuan pemantauan statistic jenayah di Malaysia telah dicadangkan untuk menyelesaikan masalah ini. Pengguna polis akan diberi kuasa untuk menggunakan fungsi pengurusan pangkalan data melalui aplikasi web ini.

Kata kunci: *jenayah; aplikasi web; dashboard; statistik jenayah*

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CHAPTER 1: INTRODUCTION

1.1 Background

Crime is defined as an action or omission which violates the law and is considered harmful to not only individuals but also the community. Such acts are forbidden, and the perpetrators are punishable by law. There is various type of crime which include murder, property theft, rape and many more. According to the crime index data compiled from over 117 countries by NUMBEO in mid of 2018, Malaysia ranks at top 20 in the world and ranks number one in South East Asia for highest crime rate (NUMBEO, 2018). Therefore, it is important that crime statistics can be monitored and presented to the community to create awareness of safety. One of the ways that these crime statistics can be disseminated to the community at large is through a web application using the dashboard presentation.

Dashboard is an information management tool that allows visual tracking, analysis and display of key performances and metrices to monitor businesses or other specific purposes. Dashboards are usually customizable to meet specific needs of the users. Dashboards connects to databases or files and the interface displays all the data in the form of tables, graphs or charts.

Currently, there are no proper dashboards available for the community to monitor and track crime statistics in Malaysia. Dashboards available online are only focused on major cities in the world and the community in Malaysia are unable to monitor the crime statistics in their own area. They can only get to know of crime occurrences through news broadcasting and are not well aware of the crime statistics in Malaysia. Hence, this project has the purpose of designing and implementing a web application dashboard for people to monitor and keep track of yearly crime statistics in Malaysia. The community will be able

to view crime statistics and be alerted of the hotspot area for crimes. The dashboard is accessible by everyone who has internet access. A database will also be designed and developed to ease the police department's data entry by providing a form interface for them to enter crime data. The data will be stored in database and dashboard will be updated accordingly.

1.2 Problem Statement

Currently, there is no proper dashboard available online that provide visualization of crime statistics in Malaysia. The community are unable to view crime statistics of their area. People can only get to know if a crime happens in their residential area through news broadcasting. Without proper statistical dashboard, people living in Malaysia are not able to monitor and view crime statistics that happen over the years. They are not being well informed and alerted on whether their area they are living is a hotspot for crime occurrence.

1.3 Objectives

The objectives of this project are to:

i. Design and implement a web application dashboard that will provide yearly statistics of crime by different states in Malaysia for the community.

ii. Create a database for storing and managing crime data for the authorized police.

1.4 Scope

This project aims to develop a web application dashboard for the public community and the police. The crime datasets used in this project are obtained from Malaysia's open data portal, data.gov.my which is developed by the Malaysian Administrative Modernization and Management Planning Unit (MAMPU). The crime covers violence crime such as murder, rape and robbery while property crime involves stealing of property and property trespassing. The proposed application will be used by two types of users, the police department and the community.

1.5 Methodology

The Agile methodology is chosen to be used in the process of developing this web application as it is the most suitable methodology because the datasets will be preprocessed to the suitable format for analytics and might need to constantly change accordingly so Agile methodology is required to adhere with the immediate changes. With the Agile methodology, the tasks are divided into different time boxes to deliver each feature. Iterative approach is taken in which the web application build is done in an incremental manner with each build delivered in iterations. Every iteration will involve planning, requirements analysis, design, coding, implementation and testing.

1.5.1 Planning

At the beginning of the project, the scope of the project is defined which is to develop a proper working web application dashboard that shows Malaysia crime statistics. The problem statement and the objectives of the project is clearly defined.

1.5.2 Requirement Analysis

Requirement analysis is done by searching and collecting Malaysia crime datasets from online sources which is from data.gov.my. The datasets are compared to get the most suitable statistics to be shown as charts on the dashboard. In addition, similar dashboard applications are reviewed to discover the general requirements of a dashboard application.

1.5.3 Design

The web application architecture is created at this stage. The functions of the web application are divided into different modules to ease the development of the web application structure. The modules design which include data input functions, drop-down menus and crime index calculations are carry out one by one to assure smooth development of the web application dashboard. Interface design is also done such as chart interfaces for viewing crime statistics and form interfaces for data input. A database architecture will also be designed for data storing purposes.

1.5.4 Implementation & Testing

The web application dashboard is implemented and tested on different platforms. Different testing methodologies are conducted:

i. Unit Testing

Each part of the web application is isolated into modules. Each module is tested when completed to show that each individual part is correct.

ii. Functional Testing

The various functions of the web application dashboards are tested to ensure the functions of the web application run successfully. Sample datasets are used to test on the output.

iii. Integration Testing

Integration testing will also be conducted as the functionality of the web application is divided into modules and will be tested each time the modules are integrated into the web application.

iv. System Testing

System testing will be conducted after the whole web application is completed before implemented.

1.6 Project Schedule

Table 1.1: Project Schedule

Task Name	Duration	Start	Finish	Predecessors	Resource Names
Project Proposal	**13 days**	**Mon 9/24/18**	**Wed 10/10/18**		
Brief Proposal	5 days	Mon 9/24/18	Fri 9/28/18		
Full Proposal	8 days	Mon 10/1/18	Wed 10/10/18		
Chapter 1: Introduction	**9 days**	**Thu 10/11/18**	**Tue 10/23/18**		
Introduction	2 days	Thu 10/11/18	Fri 10/12/18		
Problem Statement	1 day	Sat 10/13/18	Sat 10/13/18		
Objective	1 day	Sun 10/14/18	Sun 10/14/18		
Brief Methodology	5 days	Mon 10/15/18	Fri 10/19/18		
Scope	1 day	Sat 10/20/18	Sat 10/20/18		
Significant of the Project	1 day	Sun 10/21/18	Sun 10/21/18		
Project Schedule	1 day	Mon 10/22/18	Mon 10/22/18		
Expected Outcome	1 day	Tue 10/23/18	Tue 10/23/18		
Chapter 2: Literature Review	**15 days**	**Mon 10/29/18**	**Fri 11/16/18**		
Chapter 3: Methodology	**17 days**	**Sun 11/18/18**	**Mon 12/10/18**		
Submission of FYP 1 Final Report and Paper for Assessment	**25 days**	**Tue 12/11/18**	**Mon 1/14/19**		
Chapter 4: Implementation and Testing	**60 days**	**Mon 1/14/19**	**Fri 4/5/19**		
Chapter 5: Conclusion and Future Works	**14 days**	**Mon 4/8/19**	**Thu 4/25/19**		

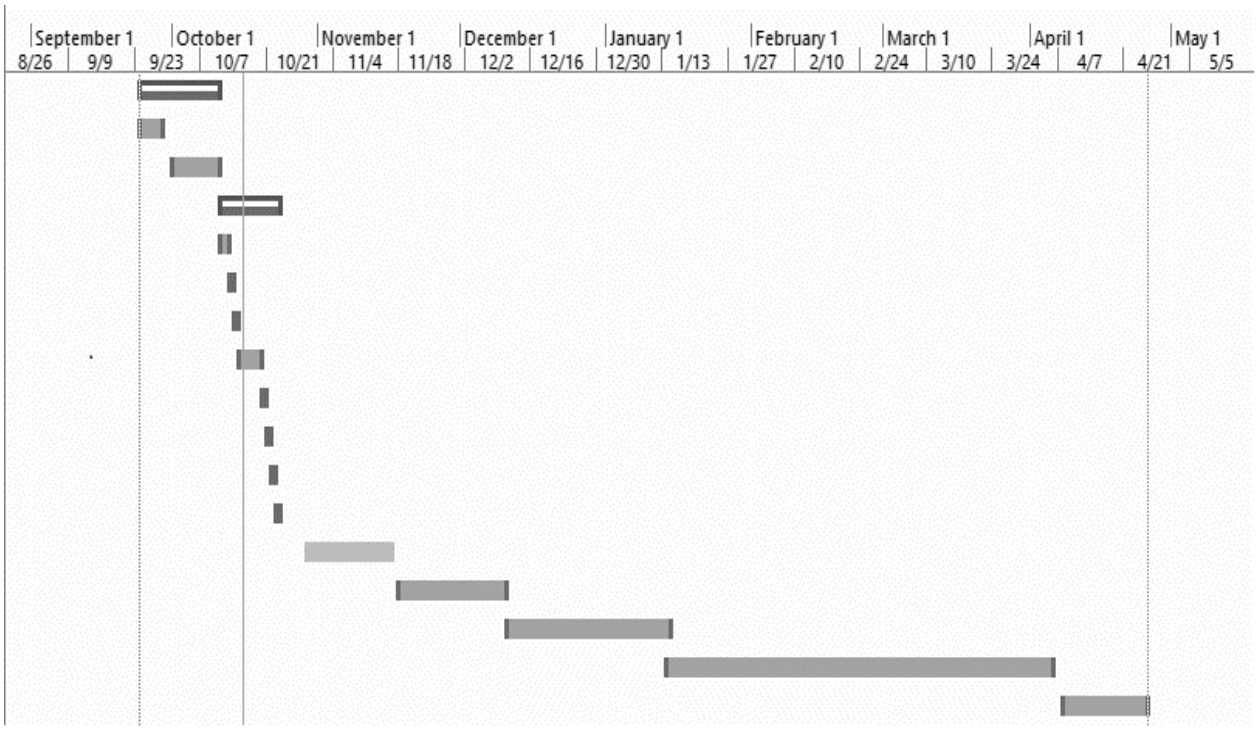

Figure 1.1: Gantt Chart

The project development is divided into five phases as shown in Figure 1.1. The project will start on 24 September 2018 and is expected to complete by 25 April 2019, it takes about seven months to complete this project.

1.7 Expected Outcome

The expected outcome of this project is a platform independent web application dashboard which provides visualization of Malaysia crime statistics with tabs and drop-down menus for users to view crime statistics by year or by different states in Malaysia. An interface is also provided for the Police Department to input crime data and the dashboard will be updated accordingly.

1.8 Significance of Project

The application can display visual output for crime statistics in Malaysia for the community. Police department can input crime data as the application provides an interface for them to enter crime details which will be stored in the database. The statistical output of the dashboard will be updated accordingly. The application will let the community keep track of and monitor crime statistics in Malaysia.

1.9 Project Outline

This thesis consists of five chapters with the content being summarized as below:

i. Chapter 1: Introduction

This chapter contains description of the background of the project. The problem statement is also defined clearly along with the scope and objectives of the project. The methodology employed in the project is also briefly presented in this chapter. The significance of the project is highlighted as well.

ii. Chapter 2: Literature Review

This chapter is about conducting research on current existing dashboard applications to visualize crime statistics. Review of literature on the functionalities of various similar applications are provided in this chapter. Comparisons between the applications are done and a combination of functionalities are proposed.

iii. Chapter 3: Methodology

Researching and analysis of various crime datasets are conducted and compared to get the most suitable statistics. General requirements for the web application are stated in