CHAPTER 1

INTRODUCTION

1.1   Background

Transportation is very important in our life. People can shorten distance and time because of it. People in Indonesia, especially in Jakarta, have a very high mobility. They need to save time in order to fulfill their needs and to do their everyday activities.

Nowadays, population in Jakarta has already exceeded the normal density and it is estimated to grow even larger. Since the technology has developed very much, most people in Jakarta have their own vehicles. One family at least has one vehicle, whether it is a car or motorcycle. Every year, the street growth is only 0.01 percent, while the motor vehicles growth is up to 9 percent [1]. This leads to the traffic jam problem which has been a major problem in Jakarta.

As mentioned by Sutanto Soehodo, Jakarta Capital City Governor Deputy for Industry, Trade, and Transportation, the key in completing the transportation issue was consisted of three main things: developing infrastructure, developing public transportation, and implementing traffic control. In addition, Soehodo advised that if there was no traffic management, the first two core things could not be optimally successful. [1]

Many solutions has been attempted to solve this traffic jam problem in Jakarta, such as 3 in 1 system and Transjakarta Busway. However, it is still not succeeded to suppress the traffic jam in Jakarta. For example, the 3 in 1 system has directed to a new problem,

which is the growth of 'jockeys' that are used by people in Jakarta to avoid 3 in 1. Because of these 'jockeys', the 3 in 1 system is not effective at all and it also has disadvantage of inviting criminal actions by those 'jockeys' since they are unknown people. Furthermore, the 3 in 1 system has hardened some people to travel and save their time since they have to reroute to other way which is more crowded in order to avoid the 3 in 1. Some other solutions might give a positive result such as the new policy about school hours and private working hours that could reduce traffic jam to 26% [1]. However, it is also give a drawback to students and employees who have to wake up earlier than usual.

If people can avoid traffic jam by knowing the road condition, then they can alter and control the road traffic to suppress traffic jam in Jakarta. However, since traffic jam is unpredictable and unknown, people often choose the wrong way which results in traffic jam trapped.

1.2   Scope

This thesis basically implements a web based community system to help people in Jakarta to acquire information about traffic jam in order to be aware of it or avoid it. The main feature of the web based system is the map system in which people can view information about traffic jam. This web based system will enable community to share information and thoughts regarding the traffic in Jakarta.

There is a supplementary system to this web based system which is the SMS based system built by the author's partner, Alfred.
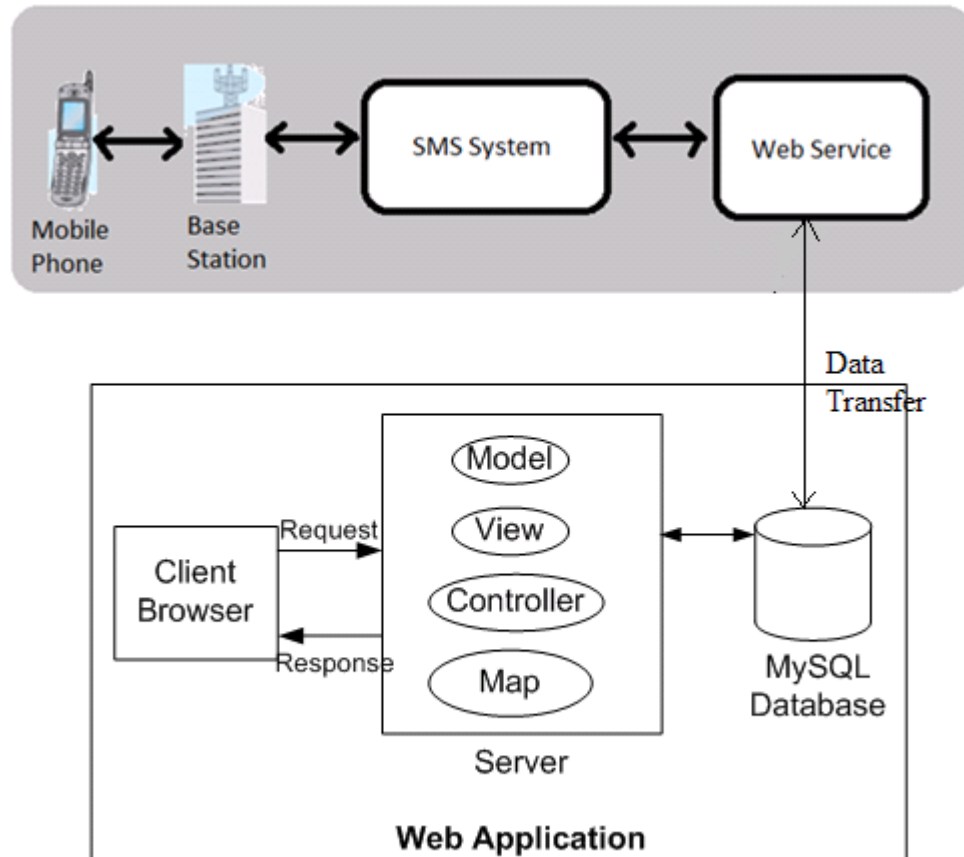
Figure 1.1 The architecture of this thesis (This thesis scope is the web application part)

People can register to the website in order to join the community. All registered people can participate interactively in the system. They can check the website about the road situation in Jakarta (traffic jam condition). As a result, they can take a less traffic jam road to reach their destination faster.

The development of the web based system is separated to the SMS based system. The general functionalities of the web based system are:

- The user interface of the web based system.

- The database for the web based system.

- The registration and profile system.

- The map system (using the Google Maps):

  o The registered users can see and mark the crowded points on the map.

  o The registered users can find the shortest path on the map between two points while avoiding or not avoiding the traffic jam.

- The administrator system for administrator to monitor and manage the system, including:

  o Manage the users.

  o Manage the map.

    ▪ Add and delete the road markers on the map.

    ▪ Add and delete the connections among roads on the map.

    ▪ Edit information about the roads on the map.

  o Change log system where administrator can track the change of information on map.

- The comment system where registered users and administrators can share information about anything, especially about the traffic information.

The assumptions of the system are:

- People will to join the community to help each other. The marketing of this system has to be good enough to promote it to many people.

- The information that is given by the user is considered as valid information since the system does not validate how reliable the information is. In the future, the

information can be guaranteed as reliable if several parties are agreed to contribute to the system, such as: traffic police and the government.

- The website is considered to be secured since the system is not focused on the web security.

- The website is considered to be able to run well on the live web hosting since in the development and testing it runs on localhost.

- The interface of the website is considered as user friendly since the author did not focus on user interface development.

However, this thesis also has some limitation such as:

- It will be limited to provide solution only to general roads in Jakarta which have already stored into the database by the administrators.

- The map cannot be zoomed unless the roads will divide to more complicated roads and it could make the markers become ambiguous.

- The directions of the roads and road connections are not considered here.

- The information will also be limited by the community trust, not by satellite.

- The status of the road is limited only to:

  o UNKNOWN (gray color): to represent unknown status of a road.

  o LIGHT (green color): to represent less congestion.

  o CROWDED (red color): to represent high congestion.

For optimizing the validity of data, the color of the marker will fade along with the oldness of the data. The maximum is four hours and the color will automatically turn into gray color which is the UNKNOWN status.

- The system can run well in Mozilla Firefox 2.0+ and Google Chrome. However, it cannot work properly on Internet Explorer 7 since the author used Flex 3 to build the map and Internet Explorer 7 has a different Flex HTTP header handler for the cache which makes the map cannot run properly.

- For the shortest path, it can only be applied for certain road connections that already been stored in the database by the administrators.

- The shortest path line does not follow the shape of the road on the Google Maps image. It follows the saved connections from the database.

1.3   Aims and Benefits

This thesis is aimed to generate a web based application that can give information and alternatives to the community regarding the traffic jam. By using the system, people can help each other and share traffic information in Jakarta. In conclusion, people can be updated about the information, furthermore, they can also use shortest path finding feature to find direction between two places. The benefit of the system is the easiness in accessing the system, since it can be accessed anywhere and anytime by using computer and Internet. Moreover, the system is designed so that it can be updated easily to provide the information for the users.

1.4   Structure

Chapter 1   The background, scope, purpose of choosing thesis topic, and brief description about the thesis.

Chapter 2   The explanation of the theoretical foundation that will support the thesis construction. It includes the explanation of the web based programming and other technology that are used in this thesis.

Chapter 3   The explanation of the analysis conducted during the completion of the thesis, including the analysis and survey for the system.

Chapter 4   The design solution for the problem including the use case diagrams.

Chapter 5   The discussion of the implementation and testing of the solution.

Chapter 6   The evaluation of the results achieved and the explanation of the most important results.

Chapter 7   The conclusion of the thesis in implementing the solutions and the recommendations.