CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

In Malaysia, the usage of mobile application inside the vehicle is still not widely implemented compared to the foreign automotive industries. With the implementation of VDI inside a vehicle can reduce time, saving cost and provide better vehicle experience. An important factor for the success of automotive interfaces for drivers and passengers is the system’s ability to take the high contextual nature of traveling by car into account. In the tradition of contextual interfaces, successful in-car interfaces should react to what is going on in and around the car. Thus, in-car systems need to have access to data about the car, its interior and its surrounding. This contextual data can be used in different ways, two of which are most prominent: Applying car context data has the potential to support the creation of new user interfaces that make traveling by car safer and result in an overall better user experience.

1.2 PROJECT MOTIVATION

The capability of mobile phones to act as central part of such toolkits or context measuring platforms has already been exploited by before smartphones entered the market. Since then, these devices gained even more value for such a purpose. Modern smartphones are platforms with increasing computing capabilities, power supply and a great potential for connectivity, e.g., through Bluetooth. A wide range of smartphone apps is available on market places that use the ability of a smartphone to display car data. Torque for example, is an application that provides temperature information, RPM gauges
and speed timings. These apps nevertheless focus on displaying data and on limited functionality such as timing, but not on providing car data for interactive prototypes. So based on the mobile application inventions used in the vehicle nowadays, the VDI is developed to improve the driver preferences and the conventional mobile application in vehicle.

1.3 PROBLEM STATEMENT

There are only few applications which provide data monitoring for the vehicle. Receiving the data from the OBD-II from the vehicle requires a detail researched as it is one of the most difficult task in this project. The communication and the speed of the data transfer between the Android devices must be synchronise with the OBD-II to avoid data loss.

Most of local cars still using uncomplicated circuit system which can be used throughout this project. The modelled circuit must have the same characteristic as the actual one to achieve the goal which is to simulate the real car system for the central locking and power window. The software interface between the controller and the Android device have to communicate in transferring and receiving the data in the same manner.

The communication system is one of the issue where each of the system have their own communication make it hard to combine into a single application. As the Bluetooth only can connect to a single device at a time, this is one of the challenge in this project.

1.4 PROJECT OBJECTIVES

The aim of this project to develop a user-vehicle interface using Android technology which focusing on local vehicle. The VDI consist of two main features which are the OBD-II reader and car interior control (door lock and power window). The OBD-II Reader establishes a wireless Bluetooth communication link between an Android device and the automobile's On-Board Diagnostic system (OBD). The objectives for the OBD-II Reader are shown below:
1. To develop an application to communicate with vehicle on board diagnostic computer with Android device.

2. To design and develop an Android application with GUI which able to display these features:
   a) The real time vehicle engine information such as Power Supply Voltage, Engine RPM, Throttle Position, Air Intake Temperature, Speed and Engine Coolant Temperature.
   b) Extra features of the Android application such as Compass, GPS detection, Trip List and Diagnostic/Clear Troublecodes.

The second part of the VDI consist of controlling the central locking system and the power window using a microcontroller (Arduino). The objectives are as below:

3.1 To develop an Android application to be able to control the interior features of a vehicle which have:
   - Search and connect the paired Bluetooth device.
   - The digital buttons to control the lock and unlock of the central locking system and power window.

3.2 To develop a model circuit for the central locking and power window system based on the actual circuit of local cars.

1.5 LAYOUT OF THESIS

Chapter 1 is a brief introduction that explains the motivation and the main objectives of this project. Chapter 2 corresponds to the literature review which is the related researched based on the project and about the existing work on the field. It contains a brief explanation of the existing smartphone applications and an analysis of the existing research works on using smartphones for vehicular information and control system. Chapter 3 contains the methodology which is the work process until the completion of the project.

Chapter 4 explains the results and discussion obtained from the finalise application and circuit which has been tested according to the requirements. Chapter 5 concluded the whole project.