CAR RENTAL MOBILE APPLICATION IN UNIVERSITI TEKNOLOGI MALAYSIA

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Abstract

Nowadays, car rental services become one of the needs for students at Universiti Teknologi Malaysia (UTM) Skudai because most of the students do not have their own vehicle to easily travel from one location to another. The inconvenient of public transport and cost have contributed to the popularity of car rental services in UTM. In addition, the rental cost specified by most of the car rental company is affordable. However, both parties (customer and car rental company) faced several problems due to inefficient car rental system. Therefore, this project proposed a Car Rental Mobile Application in UTM that was developed using the Android-based platform. This application can be benefitted the customer and the car rental company. As a customer, they can view the profile and services provided by any car rental companies and, give feedback in terms of how good or bad the service provide by the particular car rental company. For the car rental company, they can share or promote their services in systematic ways. Also, they could consider a feedback from the customer to improve their services if appropriate. Moreover, this application can push information to social media application for advertisement purposes. To develop this application, the JavaScript, Hyper Text Markup Language (HTML) and Cascading Style Sheets (CSS), were used as main programming language, while Backend as the database. Finally, we hope this application will benefit to anybody that require a good system for car rental application.

Keywords: Car Rental, Mobile Application, Android, JavaScript, Backend.

2.0 INTRODUCTION

Usually, the car rental company will spread out their services to student or others by using a flyer or a poster. This method seem not very effective as they have to compete with other services who are using the same approach. Furthermore, mostly the size of the poster they used is A4 size, which make the information regarding their services that can be added is limited.

A survey has been conducted and we found that the car rental company such as Klezcar, Sheqins, and Aremis are popular among the UTM students. They promote their services through Facebook page known as "*Kereta Sewa UTM Skudai*". Besides they offer car rental services, they also invite those students that having a car to join their business in order to get an extra money. The student can rent his or her car to the company and as a car

rental company, they will advertise it to public. Once the business was successful, the company will share the profit to the student as owner of the car.

Promoting a car rental services through Facebook is economical approach because it easy and free of charged. According to SocialTimes (June. 21, 2015), "The more you post, the better your chances are of being seen". Compared to other approach such as poster or brochure, they have to pay the advertising cost (printing, distributing, etc.). As a customer, to search an available car for rent will be easier when using the social network such as Facebook page. He or she can review the group's timeline to obtain information from the advertisements made by various companies. There are many companies that advertise their services. Since, they doing the same business, they have to compete with each other. As in the Facebook page, the latest post will be on the top of timeline. Therefore, company need to keep posting to ensure their advertisement always on the top of timeline.

2.0   RELATED WORK

This part will describe about the similar application available on the market. We have chosen two applications for comparison purposes, i.e., Car Rental Market and RentalCarGroup applications. The main goal of Car Rental Market application is to help travelers find the best car for rent in the US, Canada and Europe. Nowadays, they already have partnership with over 25 car rental companies worldwide. While, RentalCarGroup is independent car brokers, which offer online booking at the most major cities around the world. The car rental system eases the customer to find major car rental companies around the world. Moreover, the application was developed that support in 32 different languages.

3.0   METHODOLOGY

Methodology is a system of broad principles or rules, which specify methods or procedures, may be derived to interpret or solve different problem. In other word, methodology is a guideline to ensure the selected problem can be solved. There are several components in methodology such as phases, tasks, methods, techniques and tools (Charvet, 2003). In this project, we applied prototype method in developing the car rental mobile application system. This method could improve the communication between developer and customer, reduce the risk inherent in the project and help in validating the requirement of specification (Coleman and Verbruggen, 1998). Figure 1 show the lifecycle of prototype methodology.

The objective of this project is to analyze the problem related to the management of car rental in UTM. A questionnaire has been distributed in order to collect the requirement and analyze the data. Next, suitable application was designed to solve the problem of car rental services in UTM. This mobile application was developed using Ionic Framework and Backend (backendles.com, 2016; waracle.net, 2016).
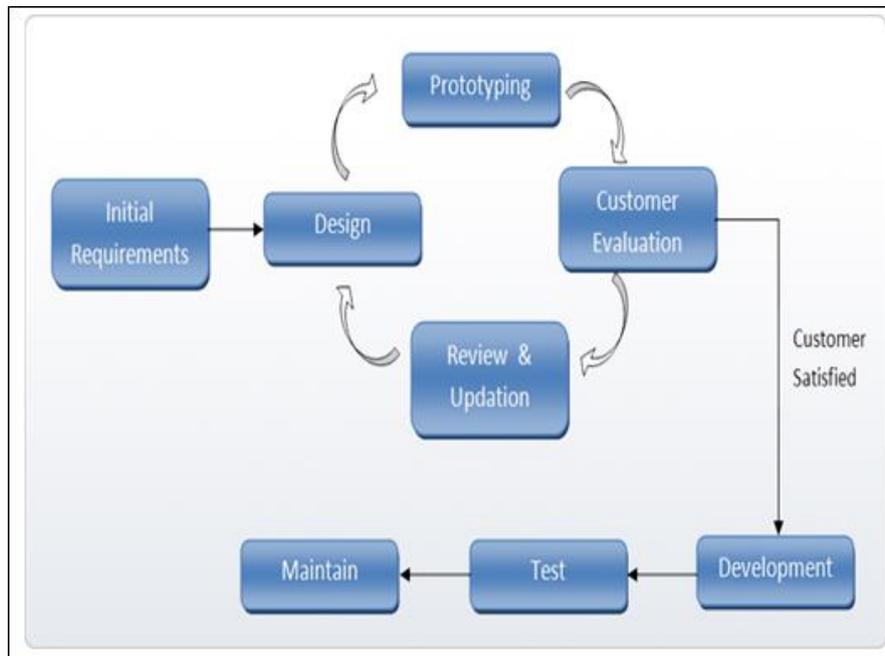
Figure 1: Main phases in prototype method

3.1   Initial Requirement

Use case diagram is used to show the relationship between the actor and the use case. Figure 2 show the use case diagram for Car Rental Application in UTM.
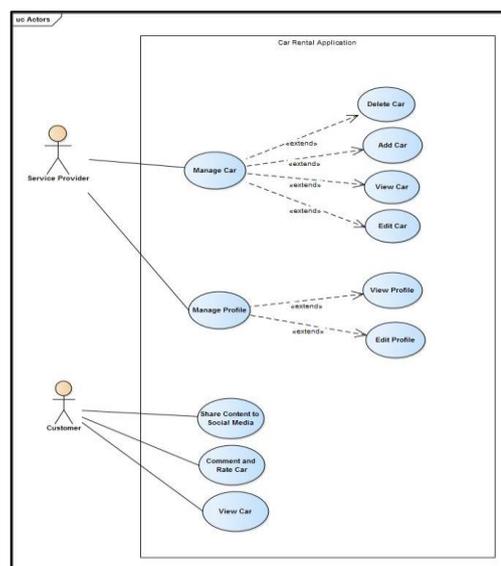

Figure 2: Use Case diagram

Table 1: Description of component in Use Case diagram

Use Case	Actor	Description
Share content	• Customer • Service provider	This use case allow user to share information from the application through social media
Manage profile	• Service provider	Service provider can view and update their profile.
Login	• Customer • Service provider	Users must login to application.
Logout	• Customer • Service provider	Users can logout from application.
Manage car	• Service provider	This use case allow service provider to view, add, edit and delete car information.
Comment and rate	• Customer	Customer can comment and rate car based on the performance of car and quality of the service.
View car information	• Customer	This use case allow customer to view car or services provided by car rental company.

Each component in the use case diagram has its own function as summarized in Table 1.

3.2 System architecture and Design

A Model-View-Controller (MVC) architecture was used to design the Car Rental Application in UTM. This architecture consists of three main parts, which are model, view and controller. Model is responsible to managing the data of the application. It will respond the request from the view and controller. On the other hand, view is the user interface of the application. Lastly, controller is the heart of the application. It will respond to the input from user, manipulate the information structure in the view and responsible to the interaction between the models. Figure 3 illustrates the interface design of developed application.
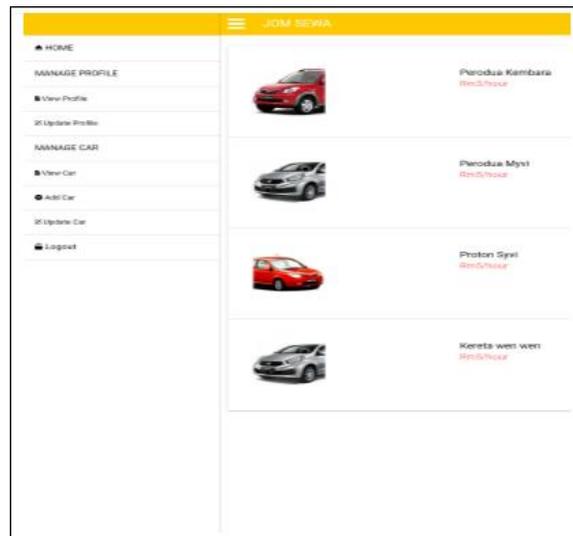
Figure 3: Home Interface of developed application

3.3   Database Design

This logical data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a data definition language, which can then be used to create a database. A fully attributed data model contains detailed attributes for each entity. Figure 4 depict the entity relationship diagram for the Car rental Mobile Application that we developed.
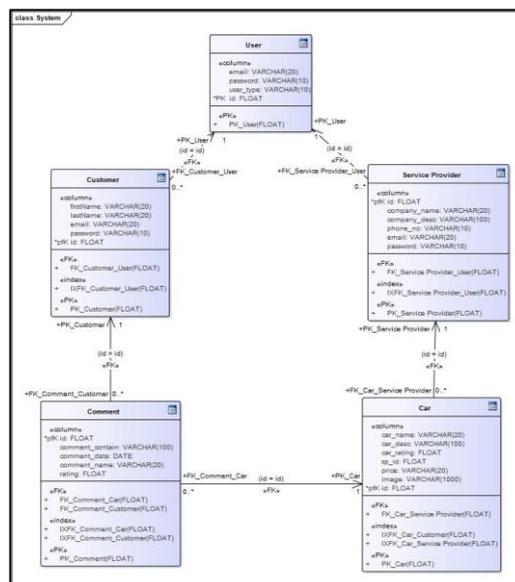

Figure 4: Entity relationship diagram

4.0   System Evaluation And Discussion

Car Rental Mobile Application for Android-based mobile is a cross-platform mobile application. This application involves two main actors that are customer and service provider who are mostly UTM student.

This application allow service provider to manage their car rental information more systematically. They can easily add, edit, delete or view any info regarding the car that they put on rental. On the other hand, customer can view the information on car rental including, any comments and rental rate per car. Besides, customer can select specific car to check the details information about the car, which he or she interested to rent. The displayed info including the average rating of the car by previous customers, car's specification and comments made by the customers on the service provided.

A software testing was conducted to make sure the developed mobile application manages to solve the related problem as discussed in the previous sub-topic. We do the testing using two methods, which are user acceptance testing and black box testing.

5.0   Conclusion

This application manages to achieve the entire objectives, which are stated in the first chapter. The first objective is to analyze the problem related to car rental management in UTM by distributing a questionnaire among the UTM students. The analysis of the problem can be referred in Software Requirement Specification (SRS) document. Then, designing a suitable application based on the collected requirement. The detail of the application design can be refer in Software Design Description (SDD). Next, implement the Car Rental Application for Android. The application has been developed based on the design in the fourth chapter. Lastly, conducting a test using two testing method which are user acceptance and black box testing. The detail of the testing is documented in Software Design Document (SDD).

References

Charvat, J. (2003). Project management methodologies: Selecting, implementing, and supporting methodologies, and processes for projects. New York: Wiley.

Coleman, G., & Verbruggen, R. (1998). A Quality Software Process for Rapid Application Development. Software Quality Management VI, 241-259. doi:10.1007/978-1-4471-1303-4_22

How To Choose The Right Backend as a Service Platform. (n.d.). Retrieved May 15, 2016, from waracle.net: http://waracle.net/how-to-choose-the-right-backend-as-a-service-baas-platform/

Study: How cost-efficient is Facebook advertising?|SocialTimes. (n.d). Retrieved June 21, 2015, from http://www.adweek.com./socialtimes/study-how-cost-efficient-is-facebook-advertising/300726

What-is-backend-as-a-service. (n.d.). Retrieved May 15, 2016, from backendless.com: https://backendless.com/what-is-backend-as-a-service/