



Multiplatform Mobile Application Development for Vehicle Renting and Sharing System

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Abstract: Many people who have private vehicles do not use their vehicles at all times so that over time the vehicles become poorly maintained and eventually damaged. Online Rental Application is here to help private vehicle owners to maximize the use of their personal vehicles while helping private vehicle owners to earn extra income. The purpose of writing is to develop applications that allow users to choose the vehicle according to their needs and to process the rental of vehicles both motorbikes and cars. The development method used is the waterfall method which consists of communication, planning, modelling, construction, deployment. The results are evaluated with 8 golden rules of interface design and the results of the questionnaire show that the application can be used by users and providers to make the process of renting and renting a vehicle. It was concluded that this application can be used well and can carry out the process of renting and renting vehicles for cars and motorbikes.

Keywords: Marketplace, Mobile Application, Private Vehicle, Rental Online.

I. INTRODUCTION

The development of technology from time to time increasingly rapidly both in developed countries and in developing countries including Indonesia. Information technology, especially in the field of mobile applications is also increasingly looked at by the public because of the many smartphone users at this time [1].

Economic growth in Indonesia which is getting better from year to year also increases the purchasing power of the community, especially for secondary needs such as motorcycles or cars. But motorized vehicle owners cannot use their vehicles continuously all the time. This can be caused by several factors such as traffic jams that make owners lazy to use private vehicles and prefer to use public transportation or online transportation, especially in the crowded and always congested city of Jakarta. Other factors can also be caused by the absence of a schedule or activities that need to be carried out in other places so that it does not require the use of a vehicle.

In addition, according to [2] motor vehicles that are rarely used can cause various problems, such as car batteries or motorcycles that will lose energy so the car or motorcycle cannot be started and in the end the car or motorcycle battery must be filled returned or replaced with a new one. The solution to these problems is to create a mobile application that is used to rent vehicles that are not being used [3]. This application is able to make private vehicles more useful and at the same time provide additional income for vehicle owners.

II. MOTIVATION

Vehicle Renting and Sharing System

Nowadays, everyone cannot afford the vehicle because of the high pricing. So there are many rental systems are present in the world. Our Vehicle Renting and Sharing System is being developed to override the problems or to reduce the hardship faced by these existing systems. Moreover, this system is designed to rent out personal vehicles for example bicycles, two-wheelers, four-wheelers at one platform with the cheapest costing.

This system is based on two main approaches, first is the customer/user who wants to rent a vehicle and second is vehicle owners who rent out their vehicle to customers. No formal knowledge is needed for the user to use this system. Thus, by this, it proves user-friendly. The system facilitates customers and provides them to register and reserve a vehicle on rent immediately as per their needs. The system will make it easy for the customer's task with time-saving, whenever they need to rent a particular vehicle. We will develop a system that allows customers to register and reserve a vehicle on rent immediately as per their needs. We maintain the availability of all types of vehicles to give on rent. It makes easy customer's tasks with time-saving. This system provides an easy and secure service. It gives the service to the customer



concerning their suitable area. The customers can share the vehicle with other customers who have the same route of travel. This system saves money instead of purchasing a vehicle at a high cost.

III. LITERATURE REVIEW

1. S Durai, C Shyamalakumari, S Florence, in Sep 2018, "Online High-Priced Motor Vehicle Rental System". This project purely based upon two factors, first the vehicle type and second the duration of the vehicle going to use in days or hours.: This paper describes the high-priced motor vehicle rental system which is purely based on two factors that are, vehicle type and duration of the vehicle going to use within days or hours. So in this mechanism, it will help the user to communicate with the owner through mobile phones. There is no any kind of paperwork. The main goal of this project is to avoid the third party that reduces the cost-effectively. Any user can access this website without registration but to hire the car, the user must have to enter the required detail.

2. Mohd Nizam Osman, Nurzaid Mohd. Zain, in October 2017, "Online Car Rental System using Web-Based and SMS Technology". This paper described a notification-based content alert and web-based system using SMS technology: This paper describes the online car rental system using web based and SMS technology, where it specifies a notification-based content alert. It was specifically developed for the alert notification to the customers about car rental information, and availability of the car reserved. The main purpose of developing SMS based technology is to reduce the cost and time consumed. The system developed using SDLC methodology.

PROBLEM DEFINITION

Vehicle sharing is part of a larger trend of shared mobility. Vehicle sharing enables the occasional use of a vehicle or access to different brands of vehicles. The renting organization may be a commercial business. Users can also organize a company, public agency, cooperative, or ad hoc grouping. Nowadays everyone cannot afford vehicles because of high pricing. One cannot bear the loan because of their financial condition or if he gets the vehicle on finance, it's difficult to pay the installments. Then the owner of the vehicle can get some profit from this web-based application. When the vehicle is not in use he can rent on the application and this could be a source of income for him. For traveling purposes, he or she wants to hire the vehicle. The customers can get a variety of vehicles then one can board the vehicle of their choice. The customers get collectively choices of vehicles such as bicycles, two-wheeler, four-wheelers, etc. at the cheapest price of cost. When customers on the same route they can share the vehicle and get benefited from the fair of the vehicle.

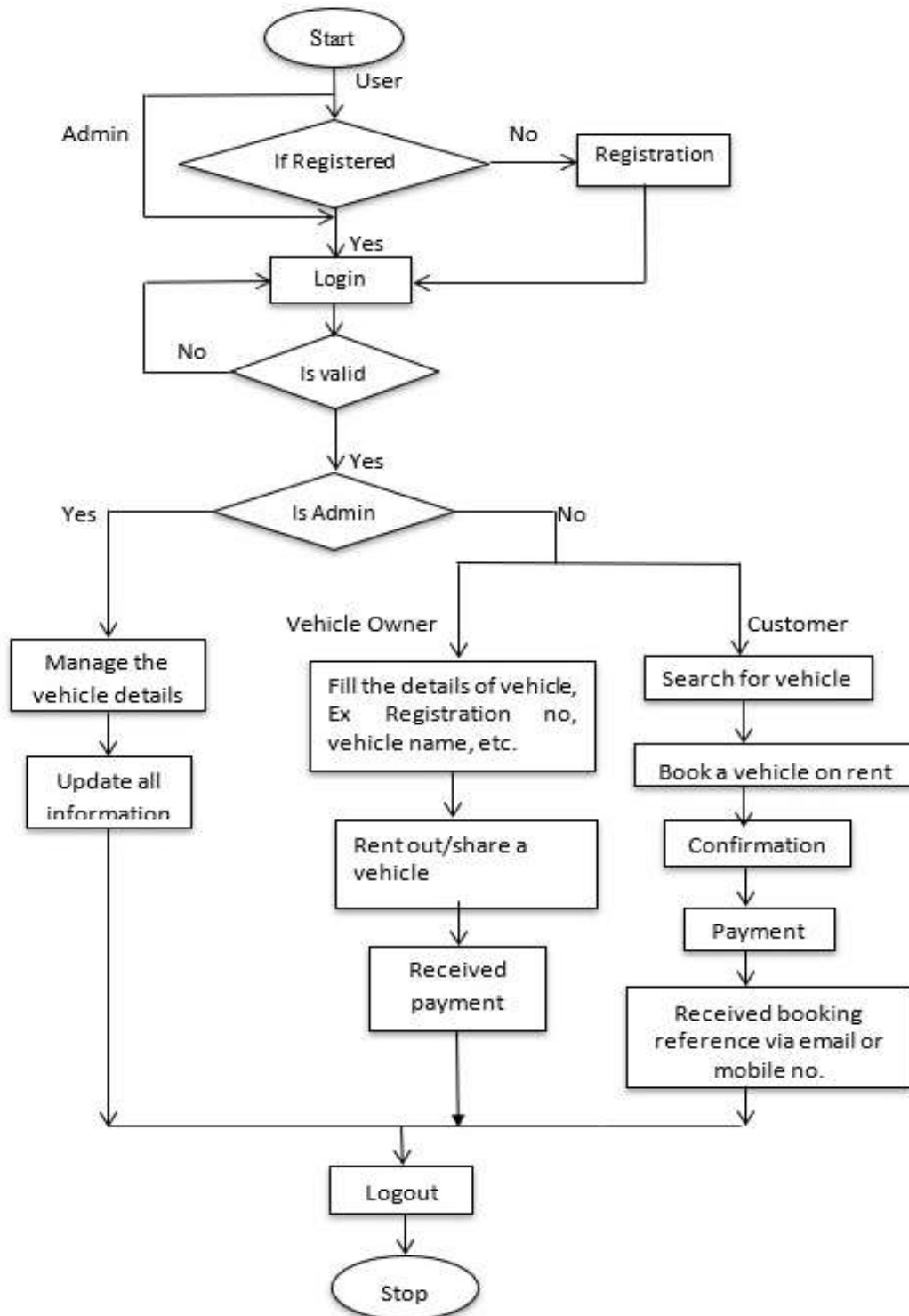
IV. PROPOSED WORK

The system being developed will provide three main parts:

- i) The system can be accessed by the users (owner of the vehicle) who want to rent out their vehicles to the registered customers.
- ii) The system is being provided with a portal where customers can login to the system and search for the desired vehicle and reserve them for booking. It is being collected renting details from the customers and provides them the basic cost of the transaction and confirmation of the request.
- ii) The users can update and renew details about vehicles and payments, etc.



V. PROJECT FLOW DIAGRAM



VI. METHODOLOGY

1. Login Module

The login module authenticates both the user and the admin. Once the authentication is done, the user and admin can perform their individual activities.

A. Admin Module:



Admin can add a vehicle, manage booking any vehicle and rent and also view feedback and enquiry. The Admin can add the vehicle so that the user can see thenavailable vehicles and book the vehicle. The Admin can manage the rent so that the user can see the rent and book the vehicle. The admin easily view the feedbacks and solve the query. The administration area allows to set up the system and control all the information related to vehicle rentals. Common sections of the admin system are: “Add New Element”, search box on each page to provide easy access to data, and a data editing page (on each section).After entering the system you’ll have access to control different areas of information.

B. User Module:

User are of two categories :

I. Vehicle owner :

Vehicle owner have to login/register into system.After that they can rent out their vehicle on the system in following way:

- Login/register as a vehicle owner.
- Fill the required details of own vehicle.for eg. vehicle no.,vehicle name, photograph of vehicle, upload required documents, Available area location etc.
- Rent Out the Vehicle
- After that they received payment.
- Update the details of vehicle on the basis of current information.

II. Customer:

Customer can view available vehicle and book it on rent as per their need.

- Login/register as a customer.
- Search for Vehicle as per their requirement.
- Book a vehicle on rent with respect to terms and conditions.
- Customer have to submit their document manually also for identity proof and security purpose.
- After payment, he/she will received reference via email and mobile number.
- Customer can share the vehicle with another customer who having same route for travelling.

Node.js (Node) is an open source development platform for executing JavaScript code server-side. Node is useful for developing applications that require a persistent connection from the browser to the server and is often used for real-time applications such as chat, news feeds and web push notifications.

Node.js is intended to run on a dedicated HTTP server and to employ a single thread with one process at a time. Node.js applications are event-based and run asynchronously. Code built on the Node platform does not follow the traditional model of receive, process, send, wait, receive. Instead, Node processes incoming requests in a constant event stack and sends small requests one after the other without waiting for responses.

React Native: React Native is an exciting framework that enables web developers to create robust mobile applications using their existing JavaScript knowledge. It offers faster mobile development, and more efficient code sharing across iOS, Android, and the Web, without sacrificing the end user's experience or application quality.

React Native has been a hot topic in the mobile development world. No wonder – it took the tech world by storm by offering a way to develop mobile apps for both iOS and Android simultaneously.

React Native – one framework to rule them all

React Native (also known as RN) is a popular JavaScript-based mobile app framework that allows you to build natively-rendered mobile apps for iOS and Android. The framework lets you create an application for various platforms by using the same codebase.

React Native was first released by Facebook as an open-source project in 2015. In just a couple of years, it became one of the top solutions used for mobile development. React Native development is used to power some of the world’s leading mobile apps, including Instagram, Facebook, and Skype. We discuss these and other examples of React Native-powered apps further in this post. There are several reasons behind React Native’s global success.

Firstly, by using React Native, companies can create code just once and use it to power both their iOS and Android apps. This translates to huge time and resource savings.

Secondly, React Native was built based on React – a JavaScript library, which was already hugely popular when the mobile framework was released. We discuss the differences between React and React Native in detail further in this section.



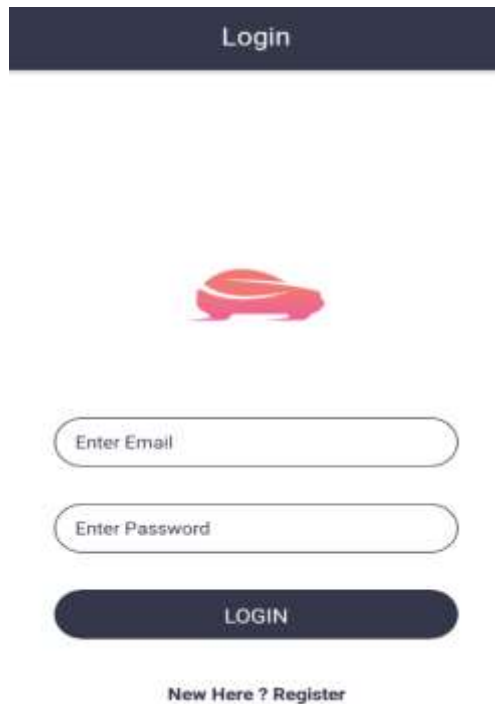
Thirdly, the framework empowered frontend developers, who could previously only work with web-based technologies, to create robust, production-ready apps for mobile platforms.

Interestingly, as with many revolutionary inventions, React Native was developed as a response to...a big technological mistake.

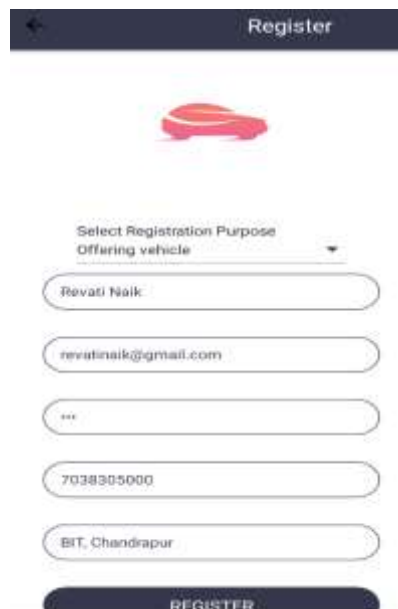
VII. RESULTS AND DISCUSSIONS

a. PROJECT SCREENSHOTS

i) Login



ii) New Register





The Project is open using Visual Studio Code, the details of project source code. Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE.

VIII. CONCLUSION

A mobile-based application development system for car and motorbike rental was built using Android Studio software that uses the Java programming language and uses firebase as the database. This application has been tested and is already running well. Based on the results of developing mobile-based applications for car and motorcycle rental, it can be concluded that:

1. This application can be used to choose vehicles according to the needs of the community.
2. Online Rental Application can be used to make the process of renting and renting vehicles in the form of cars and motorcycles.

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