

# Mobile Based Car Hiring System

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**Abstract:-** A Car Hiring Management System (CHMS) is a mobile application system that oversees car leasing and rental for short periods of time, ranging from a few hours to a few weeks. The conventional system is facilitated to operate with different locations as to permit clients access, made possible with the existence of numerous local offices which allow a user to return a vehicle to a different location and primarily located near busy city areas. In this paper we considered the audit of significant articles which helped us to design a system which facilitates online bookings for “car rentals” which will primarily serve people who require a temporary vehicle and desire to book such ahead of time from far and near. Tourists who are out of town, owners of damaged vehicles awaiting repairs or indemnity compensation can as well take advantage of this service. In order to implement the car hiring management system, the technologies adopted for the development of the system and are of XML, JAVA, KOTLIN, C++. It has in-built text-editor, code completion, graphic user interface (GUI) builder, compiler, and debugger. These technologies were chosen because they are well suited for mobile-based applications.

**Keywords:** Mobile app, Car Rental, online booking, Tracking device.

## I. INTRODUCTION

The world has become a place where there is a lot of innovative turn of events; where each and every thing did physically have been transformed into computerized form. These days, individuals' exercises have been transformed into work done via mechanized frameworks. One of which is the essential objective of this project, which is about Car Hiring Management System (CHMS). The strategy for leasing vehicles exists back in earlier years, where individuals lease vehicles for their reasons. Vehicle renting is essential to numerous people groups' arrangement to travel or move starting with one spot then onto the next for business purposes, visit, and visit or occasions, in light of these reasons, vehicle leasing is useful. Vehicle recruiting administrations are discovered everywhere throughout the world, particularly in created and creating nations. For this reasons, vehicle employ business is developing, most vehicle rental organizations presently have different outlets in different urban communities, and consequently the need to have a very much planned and instinctive framework that vehicle recruit organizations can use to oversee staff, vehicles, drivers, and clients [1]. To make this administration progressively famous and available to general society, it must

be changed into a versatile based framework and associated with the Internet where everybody can approach it.

## II. THEORETICAL BACKGROUND

Car hiring management system (CHMS) is built using web but this project targets on building a mobile-based system using android technologies which are XML, JAVA, and FIREBASE for the database technology. The XML and JAVA codes are rendered visible through the android studio to the users to the target device known as an Android smartphone. FIREBASE has several services which are Firebase Analytics, Firebase Cloud Messaging, Firebase Auth, Real-time Database, Firebase Storage, etc. This paper will make use of Firebase Auth, and authentication, Real-time database for storing all require information, Firebase storage for storing data like images, etc.

### *Review of Related Literature*

This section is to review the related literature, an existing system that relates to car hiring service.

According to [3] the author wrote on car rental, which connects several ways of function, operation and technical requirement of a dedicated web application for online car rental system. He stated that the system is focused on facilitating the functioning of the web-based Rental Car store. He also stated that cars have their particular price per day, which depends on the number of days, brand, and how fast the car runs. This work is related to my work base on different cars having an actual price, which is also applicable to the brand and features of the car. I learned from this work that different cars should have a separate price due to the feature of the car and its model.

In [4], He wrote on the work which is developing a prototype of a web-based rental system using data matching techniques. He stated that online renting system has a considerable benefit to its user's, but on the other hand, implementing data matching into the rental system will meet user's need in such a way that the system matches the data which the user entered to a recommended/related material he or she is looking for. Furthermore, the user may decide to accept the recommendation, or they may view the product catalog, which is being provided by the system. The system can as well generate vital records such as payment receipt, renting

information and statistics of materials, which is sorted by year, month or week. This work is related to my work from the angle of addition, removal and query of data into/from the database. I learned from this work that every hiring system has to be reported either daily, weekly, monthly or yearly. The limitation of this study is that there was no room for online payment. This study is different from my own, from the angle of using firebase as the database management and also using android development platform to implement the mobile aspect of the application.

According to [5] the author wrote on renting management system. A rental Store management System permits a home office to supervise a number of Stores. The home office and Stores are connected by a virtual private network. Each Store number of processing devices that provide user interfaces for Store personnel. Each processing device includes Software to exchange data with the home office. This work is related to my work based on the area of computation and avoidance of error during calculations. This work is different from my work because it focuses on the return tracking system as a whole, which does not concentrate solely on car rental. I learned from this work that increase of companies involved in renting business can help employ more workers, thereby reducing unemployment.

[6] Studies automated vehicle return system wherein status information of a rented vehicle is automatically tracked during the rental period and is transmitted to a selected destination computer upon driving the vehicle into a return area. Electronic vehicle monitoring circuitry is tied to existing components within the vehicle to keep track of the status of the vehicle during the rental period. The status information includes, miles driven, fuel level, pick up time, drop off time, wear and tear on the vehicle, etc. The status information is used by the destination computer to generate a bill for the rented vehicle's the automated car hiring system improved the manual way of renting cars, which he achieved it by making the system computerized.

[7], Proposed a vehicle tracking application. The data collected from GPS receiver is sent to the web server via GPRS cellular network. When the users need to monitor their vehicles, a request is sent from an application to the web server, that will process these request and responds back to the requesting application. Since the application is server dependent, therefore server failure will cause serious problems. In vehicle tracking device (VTD).

[8], a user must send a message to a sim-card installed on VTD hardware. The user will get a reply from the VTD in terms of coordinates i.e., latitude and longitudes. The user

clicks on received coordinates in order to view the location of a vehicle on google maps. In VTD, the absence of user friendly application makes it inappropriate for many users.

[9], vehicle tracking system is developed that receives GPS signals and transmit it to the web server. Additionally these signals are sent to the vehicle owner in the form of SMS. The system provides location, date and to track the stolen vehicle in the shortest possible time, speed information to the owner in case of vehicle's theft

According to [10], client software based android platform is developed. The whole system consists of four parts i.e. car terminal, monitoring server, smart phone application and a GPRS network. GPRS network is used to transmit data to the state information such as location and speed and then sends this information to the server via GPRS. The smart phone application is used to access the server and to show the location of the vehicle on a map. Most of the existing schemes for vehicle tracking rely on a central web server. The users send request message to the server in order to track the location of a vehicle. The server then replies with the required information to the user after receiving the GPS coordinates from the vehicle. The drawback of this scheme is a usage of central server which is a single point of failure. If the server stops working, the whole system will collapse. Moreover, if a single user is interested to track his vehicle, the usage of central server is termed as waste of resources.

### III. ANALYSIS OF THE PROPOSED SYSTEM

The proposed system can hire cars to the customers without them being physically present and thereby eliminating all manner of hardcopy records and documentation. A customer who wants to rent a car will first register to the database and log into the system which will grant the user access to view various cars available in the car categories and also could be able to rent a car. The admins can add/update the products information to the system so that the customer view change in prices and update in a new vehicle. The benefit of the proposed system is that it begets less time consumption, and clients can rent cars without being present and as well as reduce data redundancy.

#### 3.1 Use case diagram

The diagram above comprises of actors and event (activities). The actors are the admin, user, and the system. There are several events done by the staff, which includes login, add/delete a product, and manage users and logout. The users do registration, login, view product, payment, contact staff, and logout.

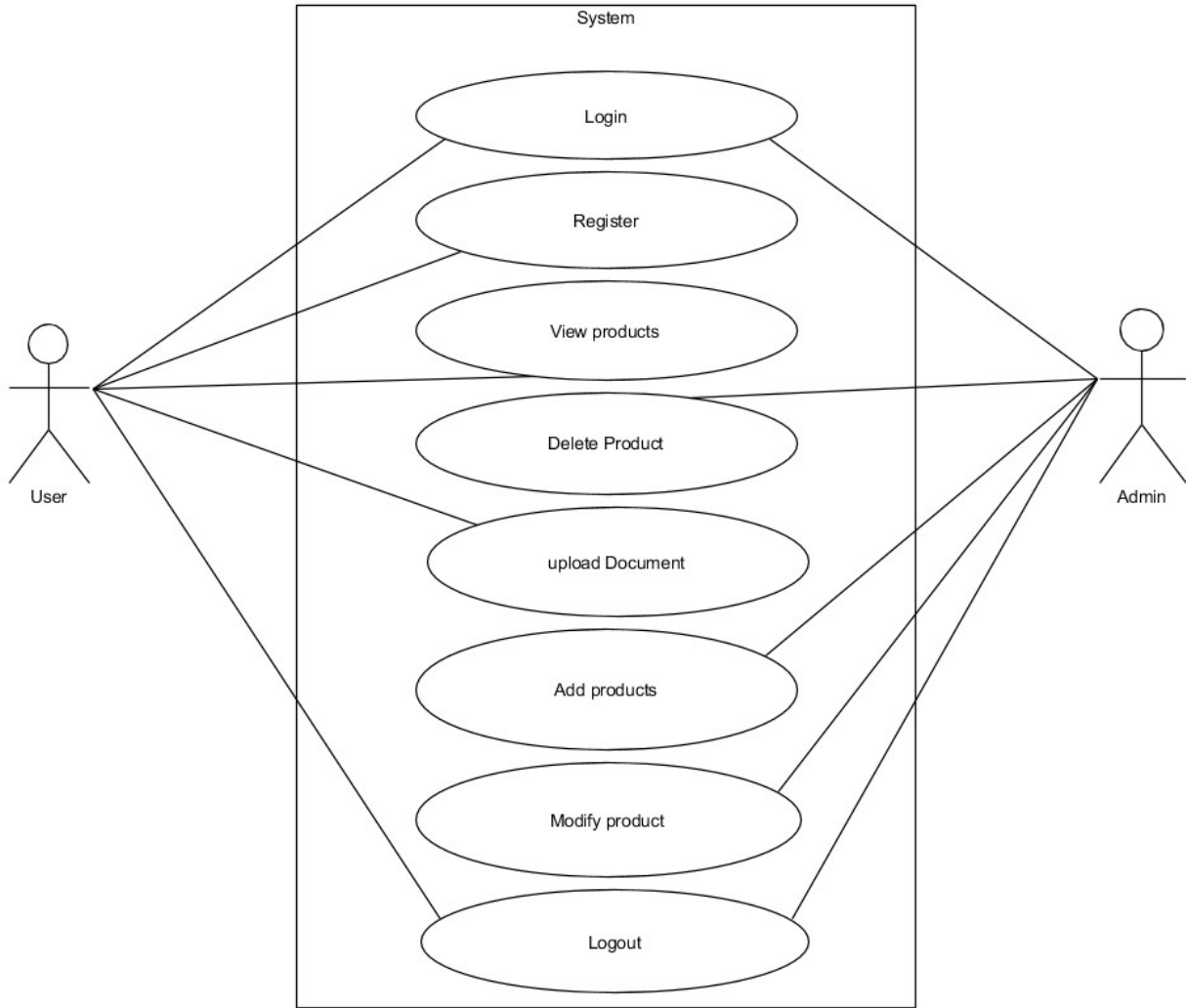


Figure 3.1: use case diagram

### 3.2 Design of the Proposed System

The system designed is the conceptual illustration that defines the structural behaviors and more views of system elements,

the externally noticeable properties of those components and the connection between them; it can present a plan from which products can be procured.

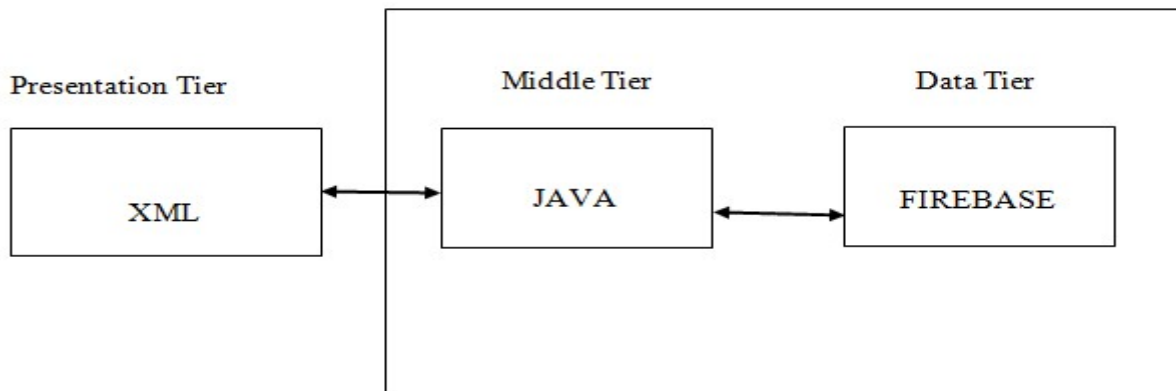


Figure 3.2: Proposed Systems architecture

The above diagram, the architecture of the system design is 3-tier. They are presentation tier, middle tier, and data tier. The presentation tier is the user interface, and it is designed using XML. The middle tier connects the presentation tier and the data tier together. The middle tier is also known as business logic. It was designed using Java with runs using Gradle files.

The data tier is the part of the system which is responsible for the storage of data (the database).

3.3 Algorithm Design of the Proposed System

This shows the algorithm design of the following: login, register, add Product of Car hiring management system.

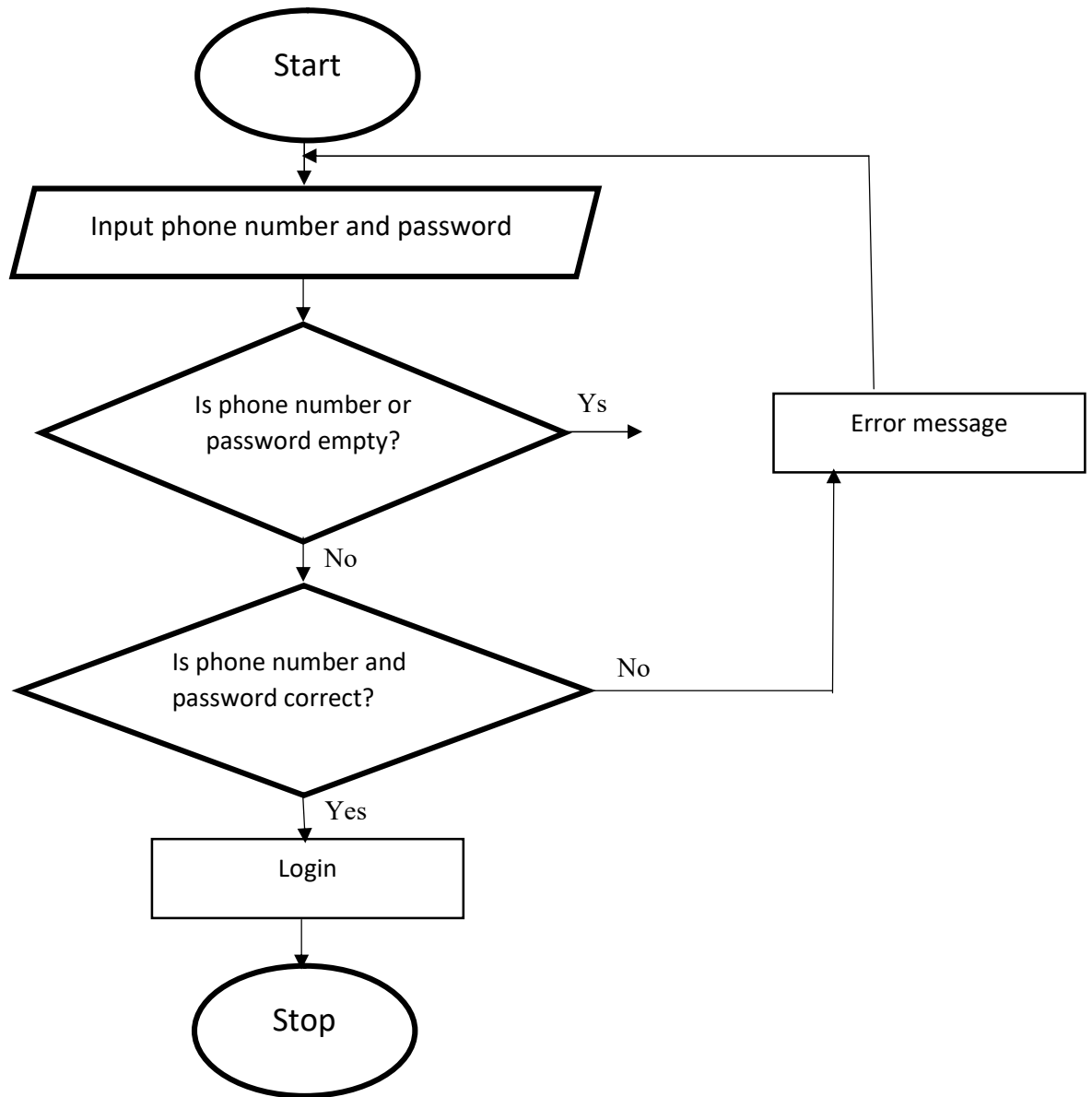


Fig 3.4: Login Algorithm

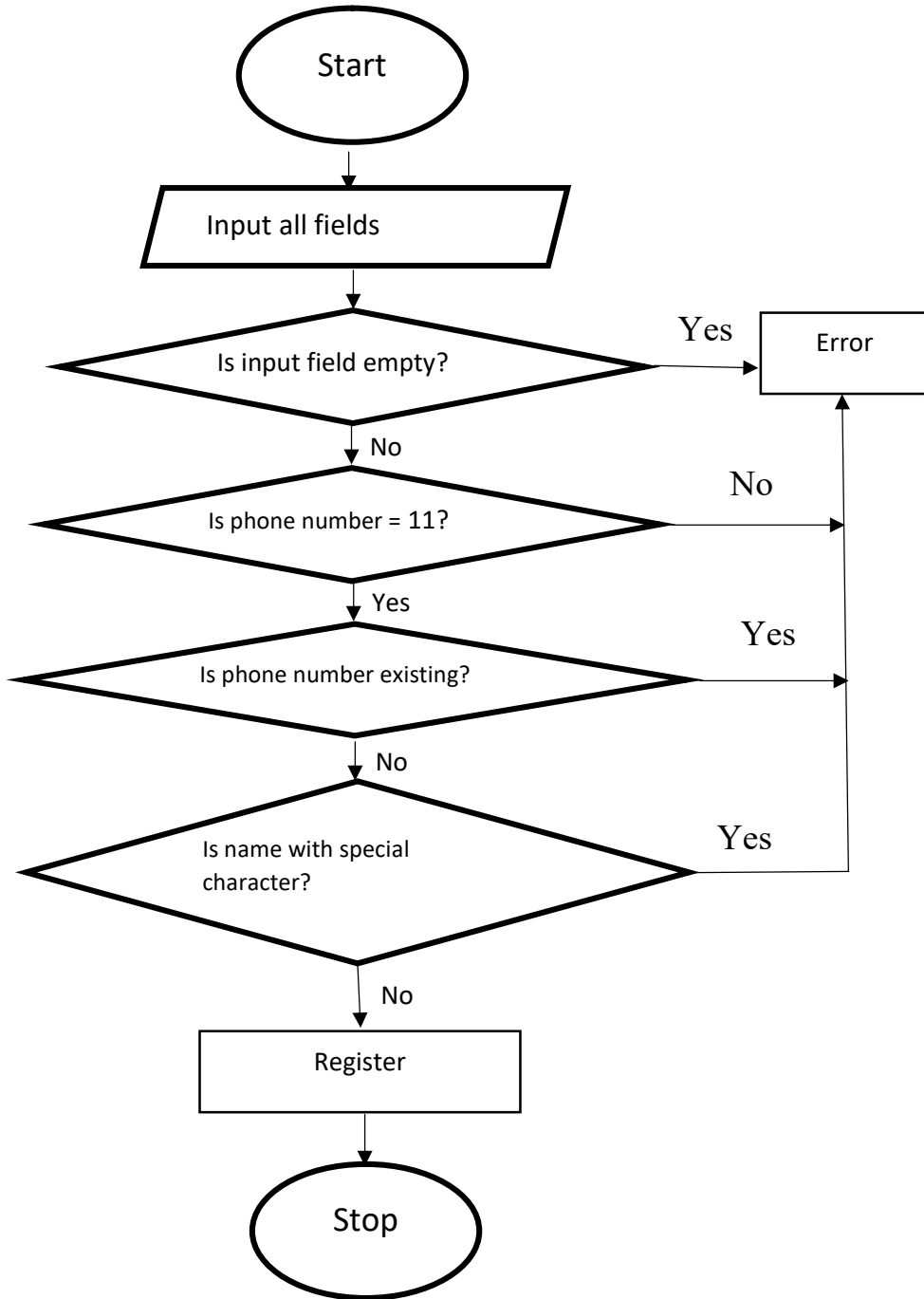


Fig 3.5: User Registration Algorithm

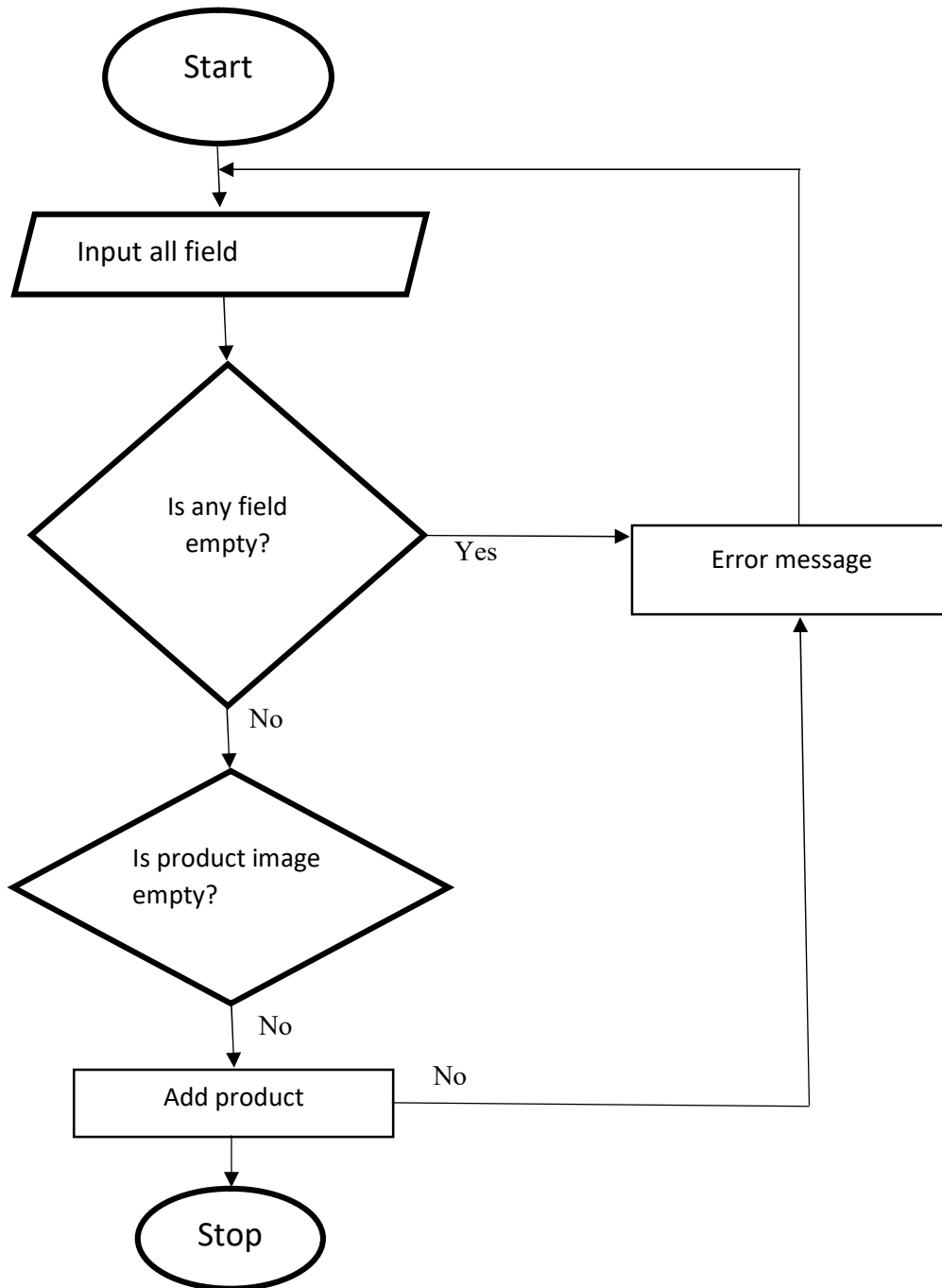


Fig 3.6: Product Registration Algorithm

### 3.4 Proposed Work

The system designed is target at developing an interactive mobile-based system for Car Hiring Management System (CHMS) that will enable customers to hire a vehicle of

choice online from any location. The significant goal includes:

- i. To develop a framework that manages car hiring system application using firebase database.

- ii. To create a system that will have an appropriated database for better storage of data/records.
- iii. To develop a system that the data can be queried from information on the activities in the car hiring business.

3.5 Implementation Architecture

Here, implementation architecture focuses on how the system was built. It cod the connection of the link and nodes; how one link leads to another

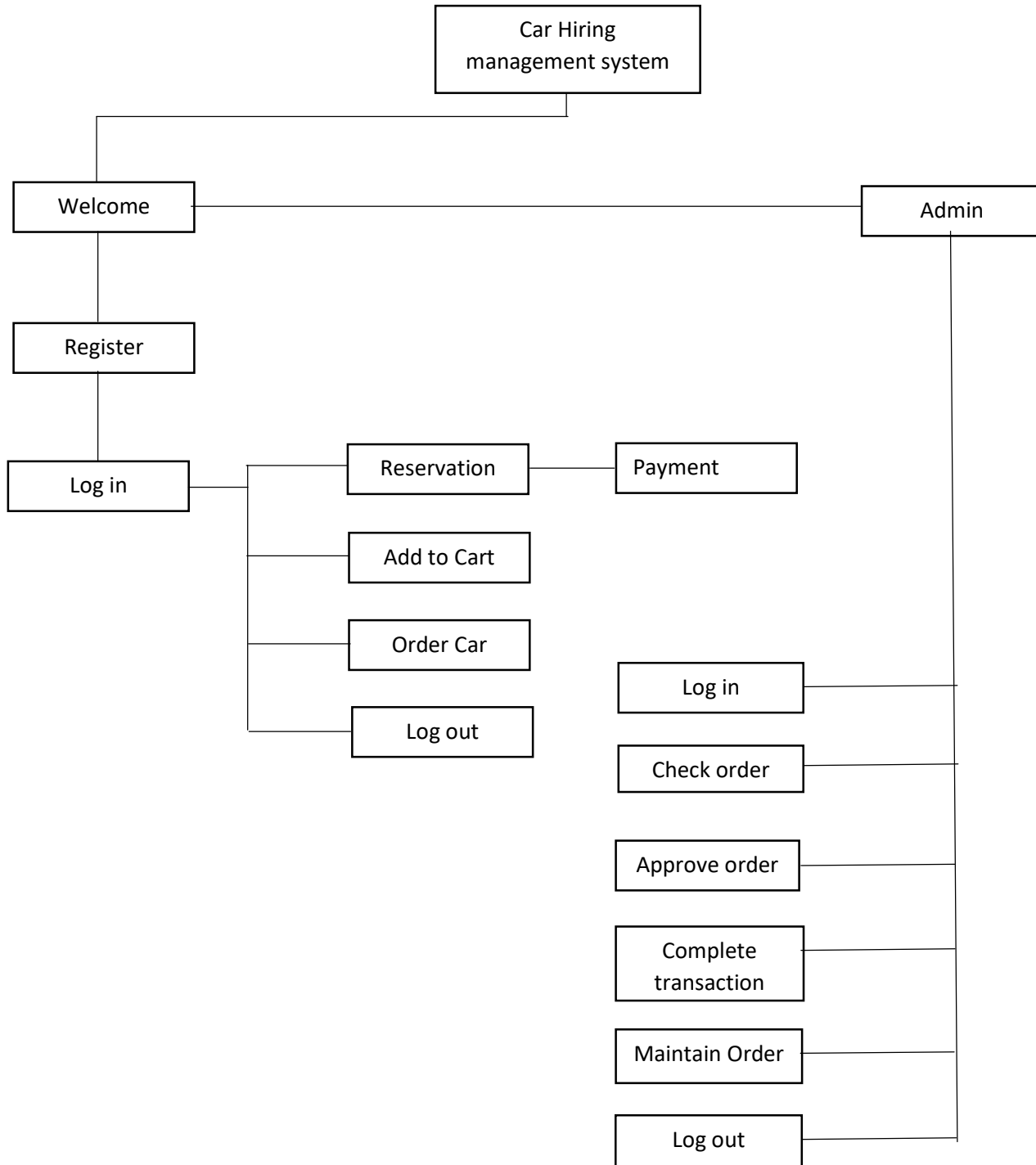


Fig 3.7: Implementation Architecture.

#### IV. RESULT AND DOCUMENTATION

This paper expects to build up an application that will improve the efficiency of online car hiring framework. This paper has been coordinated towards improving significant territories of vehicle rental frameworks which incorporates: keeping of records of clients' subtleties and their exchanges in

an efficient database, assist clients with sparing time and cost and furthermore give security to customer's data and records which must be gotten to by a solitary organization. In view of these premises, we have built up an online mobile application to mechanize these territories.

Screen shots of the proposed system is shown below:

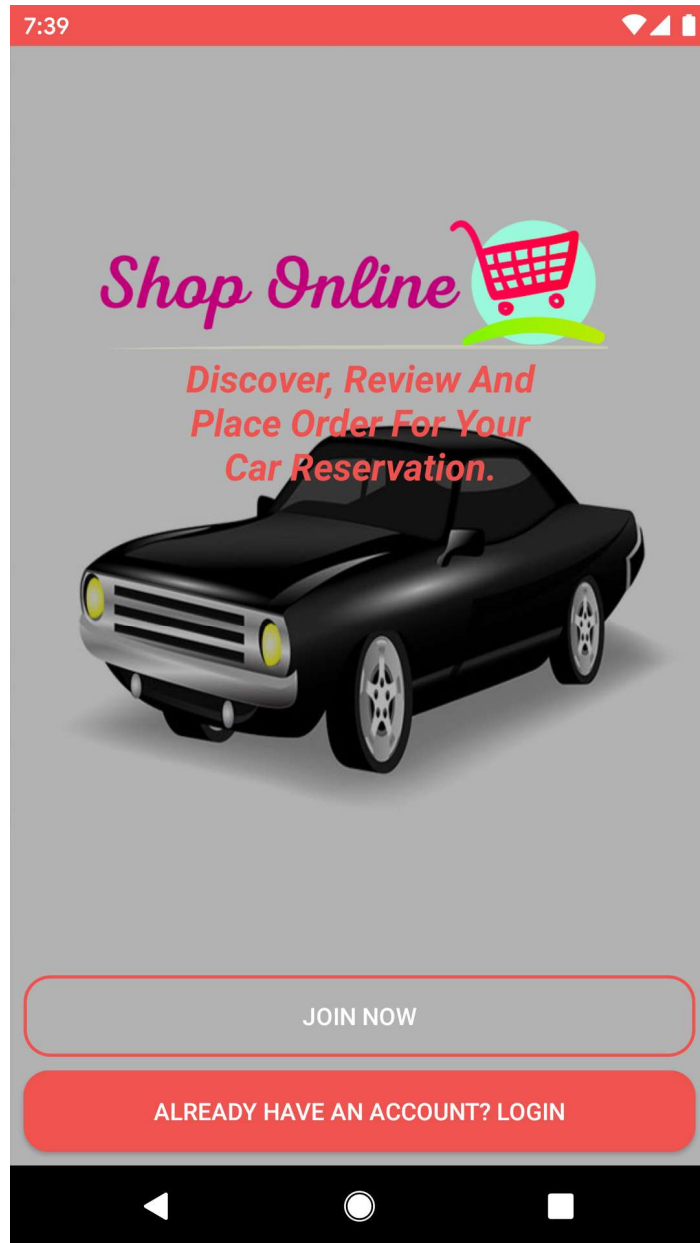


Fig 4.1: screen shot of Welcome screen



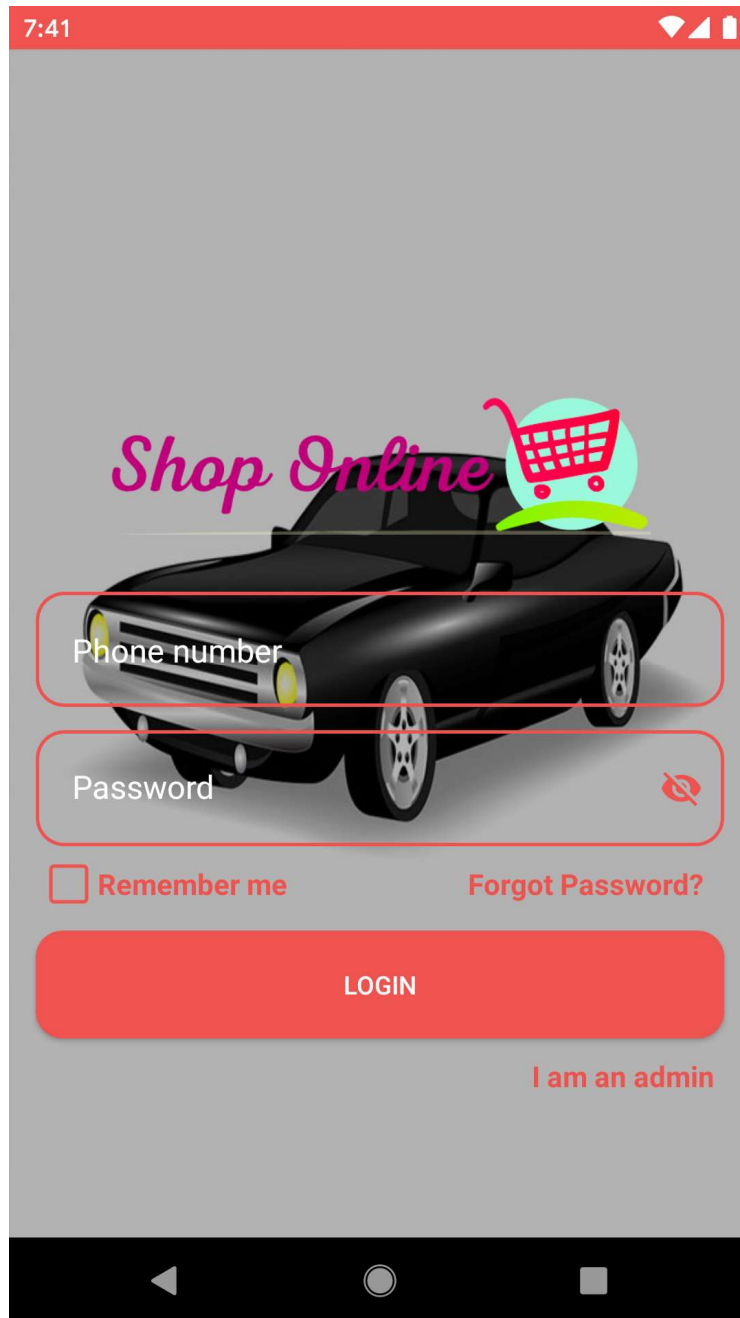


Fig 4.2: screen shot of Login Screen

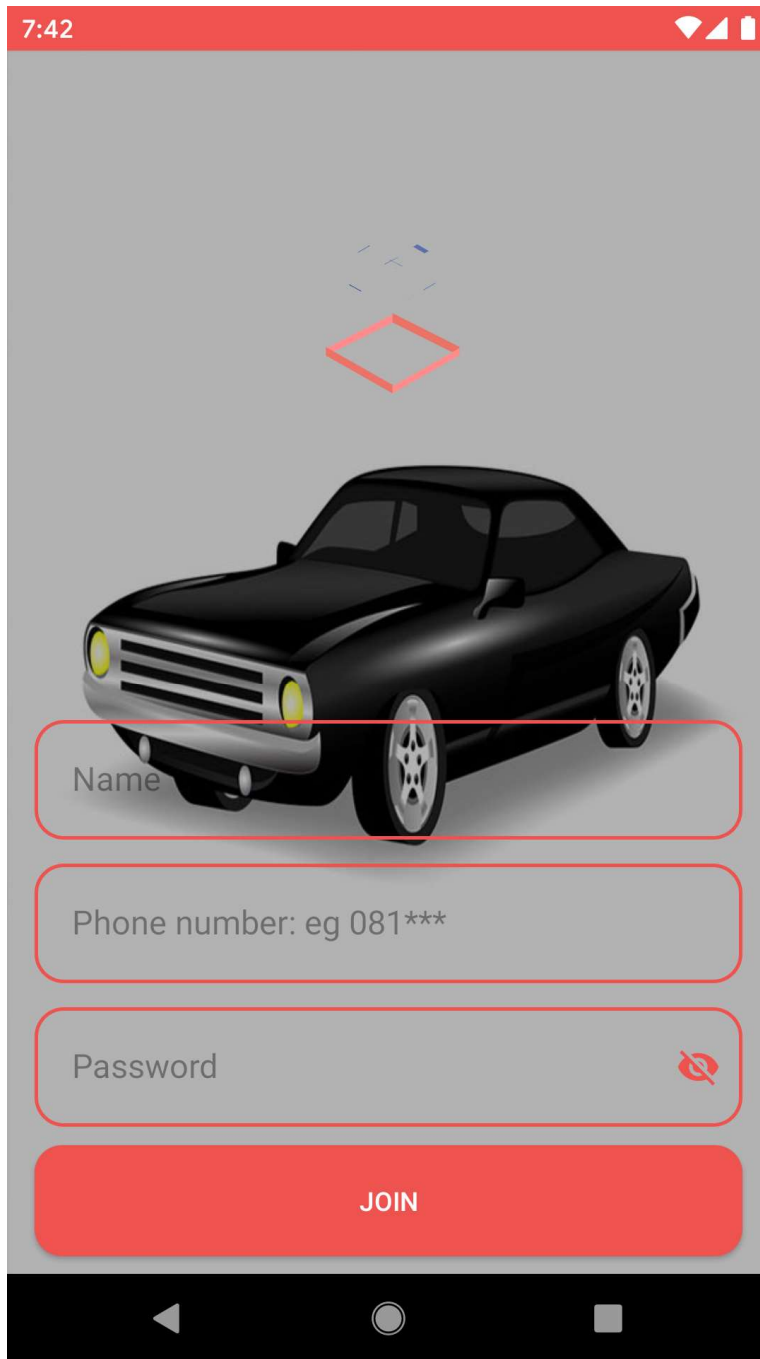


Fig 4.3: Screen shot of Register Screen

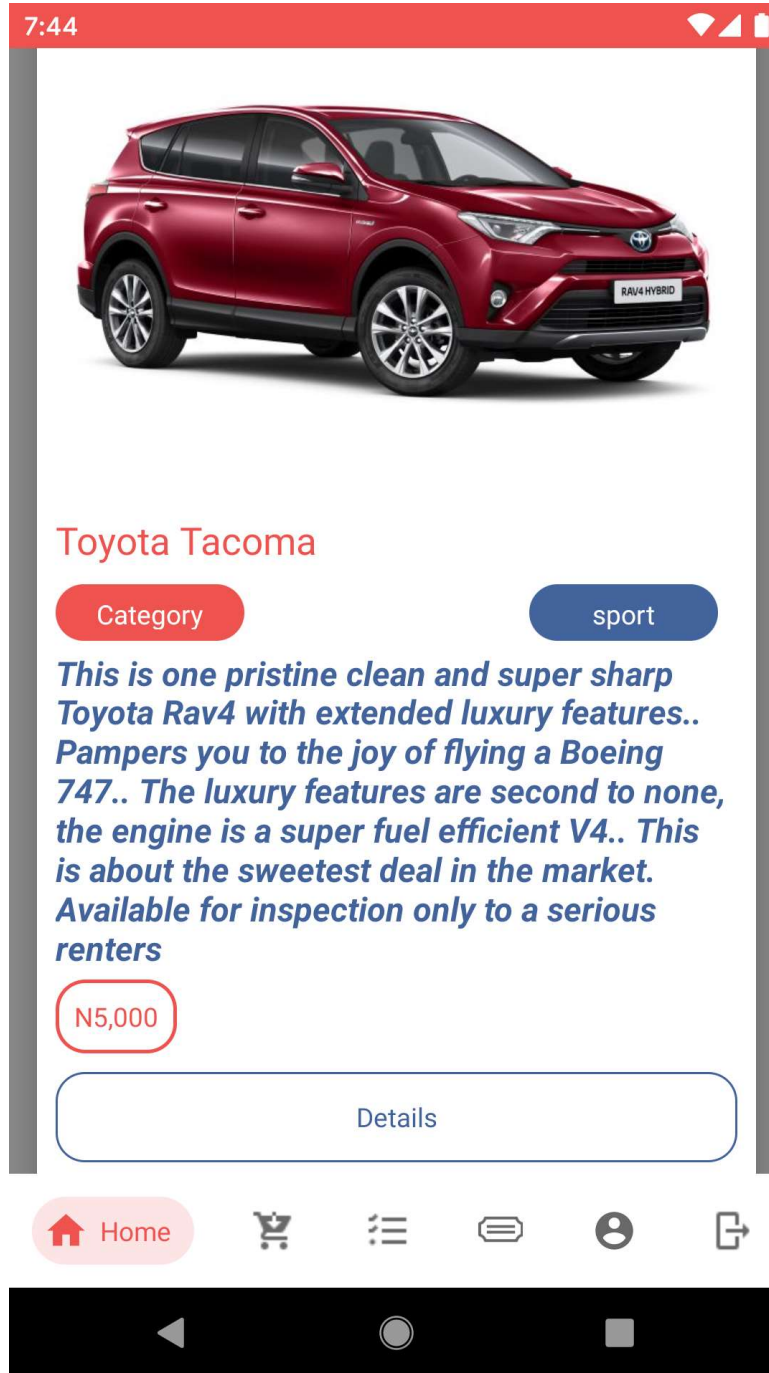


Fig 4.4: Screen shot of Home Screen

## V. CONCLUSION

This work has been able to improve the existing system by making most of the work automated thereby reducing heavy workload on the administrative staff of the car hiring company and has also reduced stress on customer, saving them from having a journey down to the company before renting products.

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