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CAR RENTAL AND TRACKING WEB-BASED SYSTEM USING GPS

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Abstract
A car rental is a process to allow use car temporarily for a period with a fee renting, with technology customers need to reduce the time and effort in obtaining their needs, and we find that some customers who stay for temporary periods in places other than where they live have a desire to get a car for rent. Through this research will develop an electronic web-based system to provide a service Car rental for customers as well as the possibility of managing car rental agencies for the owner. This system will present a excellent tools tool for fast and accurate development of car rental service. Agile methodology and WebML methodology relied upon to carry out the search. The electronic web-based system application will allow improvement and quality of services provided to clients who have the desire to get a car for rent, and the car rental agencies that offer car rental services, and also the electronic system provides monitoring of cars that will be rented through the GPS service, which facilitates the process of controlling rental cars, Also some electronic system components will be added and reused.

1.0 INTRODUCTION

1.1. Background

The proliferation of information technology and electronic services has led to the building of effective systems to connect customers with businesses by using devices to communicate with the required service provider to the customer. In the business, it has entered many online bookings, whether it is for hotels, airline tickets or other services that need to be booked.

Due to the marketing need and the reasons for competition between companies in various fields. including the areas of electronic booking, it was necessary for car rental companies to make systems based on the idea of electronic transactions, to suit the needs of the labour market and customers from the availability of service on 24 hours within 7 days and this confidentiality Transactions and the provision of resources are easier and faster.

Bayu Waspodo. Qurrotul Aini. Syamsuri Nur. [1] propose an online car rental system that enables employees and customers managing the basic system services such as bookings, payment, vehicle status, etc. The proposed system offers a web solution with the support of SMS notification to the customers. The effectiveness of the system is conducted through an evaluating questionnaire including user interface design, usefulness and usability. However, the system does not propose any tracking car solution.

T Prince. M Jenifer. Axumawit H. [2] propose a car rental management system. The proposed system is designed to provide management solution for either car rental companies or car owners. This system acts as an intermediary between customer, car rental company and car owners. The proposed solution focuses mainly on the payment management service instead other car rental services such as tracking, vehicle status.

U. Rehan, W. Raza and A. Mehmood [3] offer a framework for an online rent a car system. The proposed system offers various functionality especially for client management. The framework can deal with client appointments and update their profile highlights. The system provides also data recovering solution for the manager. However, the framework does not provide a tracking service.

N. Singh1, V. G. Pandey and N.Thillaiarasu [4] propose a web based online car rental system. This solution offers assistance and organization to find and spare transportation medium like a vehicle when it is required. the system is composed by a customer and administrator parts. The administration service of the proposed framework is useful for stock, leasing, records, and to lead a report document. Nevertheless, the proposed framework does not offer a fully automated solution.

N. N. A. P Siwa, I. M Pitrama and G. S Santyadiputra [5] provide a web-based car rental system. The proposed solution is based on a decision support system with Analytical Hierarchy Process (AHP) and simple Additive Weighting Method (SAW). The system was tested using black box, white box and user response test. However, the proposed solution focuses on analytic mechanisms rather than the proposal of car rental basic services.

The model works to locate the vehicle through the vehicle's tracking device, which works according to the global positioning system via GPS satellites, and then send the location data with other data related to the vehicle's status to the server for the tracking and monitoring system through the service of sending data via the mobile network GPRS using a mobile chip installed in the tracking device, and this process is done with a small time frequency (can be set) so that the vehicle monitoring process is almost instantaneous [6].

Determining the vehicle's current location is done in one of two ways:

- By sending a text message containing a specific code to the mobile line used in the tracking device, and the response will be received in less than a minute as a text message containing the coordinates of the vehicle's location.- By entering the online tracking and monitoring system, which enables to locate the current vehicle on a digital map. E. D.

Fig. 1 Model Tracking and Monitoring

1.2. Problem Formulation

The Customers are vital stakeholders, the customers need to minimize cost and time to get car for rental and with the mobile/ web car rental service, and any customers can find

comfort in getting a car with conditions ranging from the disruption of his current car to the need for a holiday transportation. IN ADDITION, the car rental companies need to know some information about the car after rental such as location, range, and other information can available.

1.3. Objectives and Benefits of Research

The proposed system aims to build a database of a web-based electronic car rental system that serves customers and car rental companies, so that the customer can open an account as well as rent the car and pay. Enable car rental companies as well as manage the rental operations of the cars available to them, also enable car rental companies' ability to track cars rented from customers based on GPS.

2.0 METHODOLOGY

We use Agile because is incremental and it is easier and fast to modify the process to reflect updating stakeholders requirements. In addition, an agile environment, the steps occur parallel instead of following each other.[7-8].

This way, design, development, and testing all Implemented in parallel, as the system is separated into smaller and independent units, called Sprints. These Sprints can be individually released, according to the continuously evolving requirements and solutions [9-10]

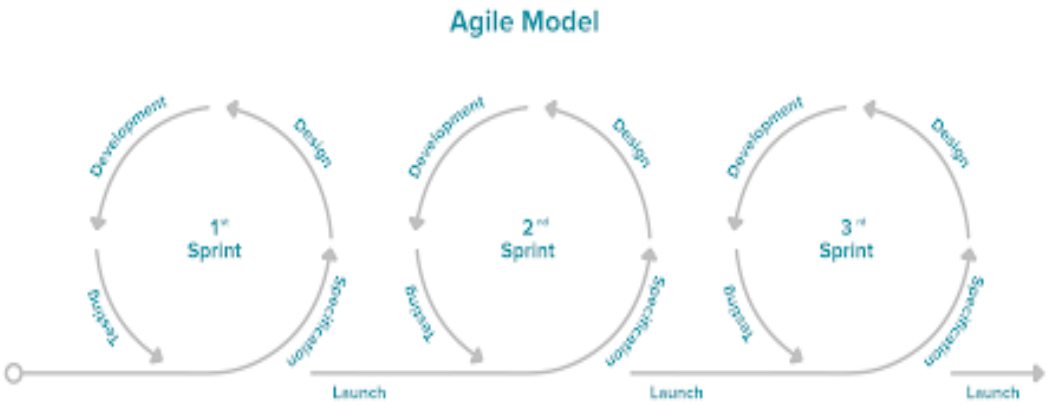

Fig. 2 The Web Design Process in Agile Methodologies

3.0 RESULANTS AND DISCUSSION

3.1 Analysis

3.1.1 Analysis Process Diagrams

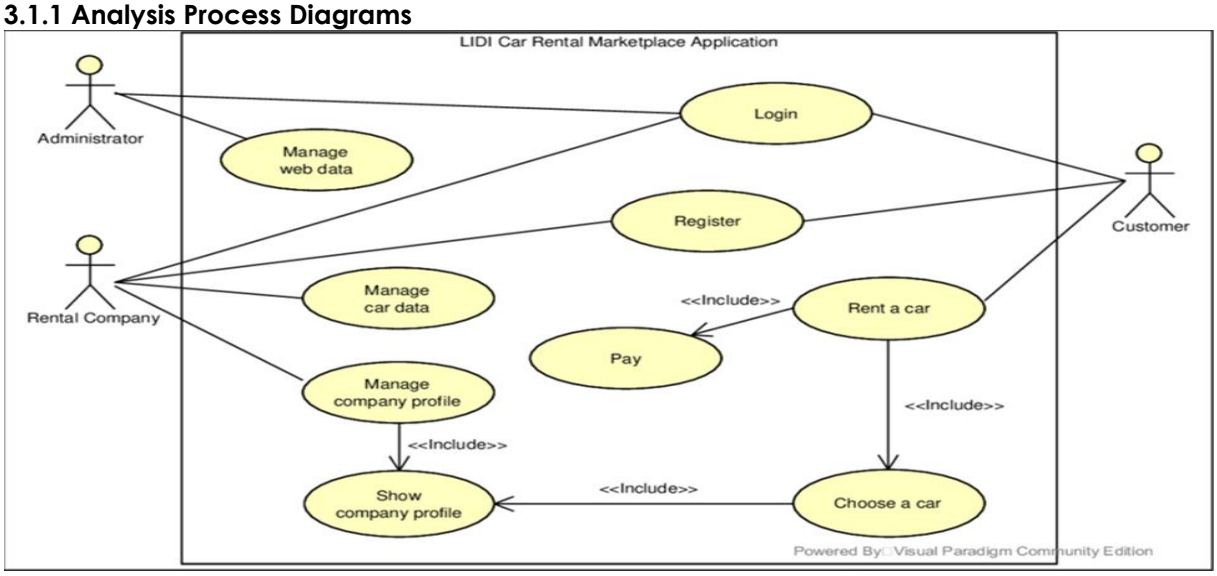

Fig. 3 Use Case Diagram

Use case diagram show the main functionalities for system by using actors and use cases, actors term denoted all People interacting with the system, use cases term denoted all possible functionalities to be accomplished through the system [11]. This system contain three actors (administrator, customer, rental company) and many use case (mange car, choose car, rent car)

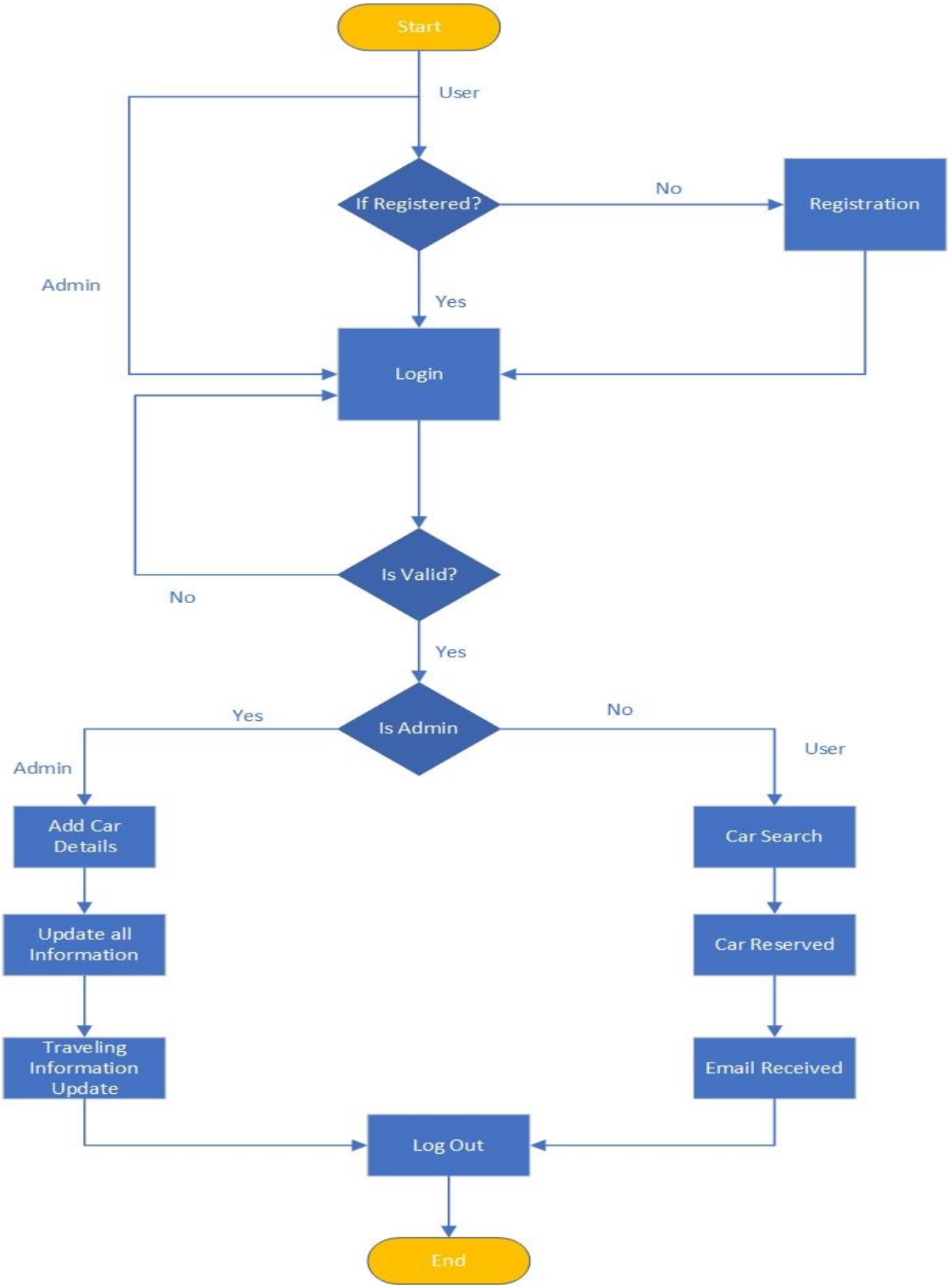

Fig. 4 Flow Chart

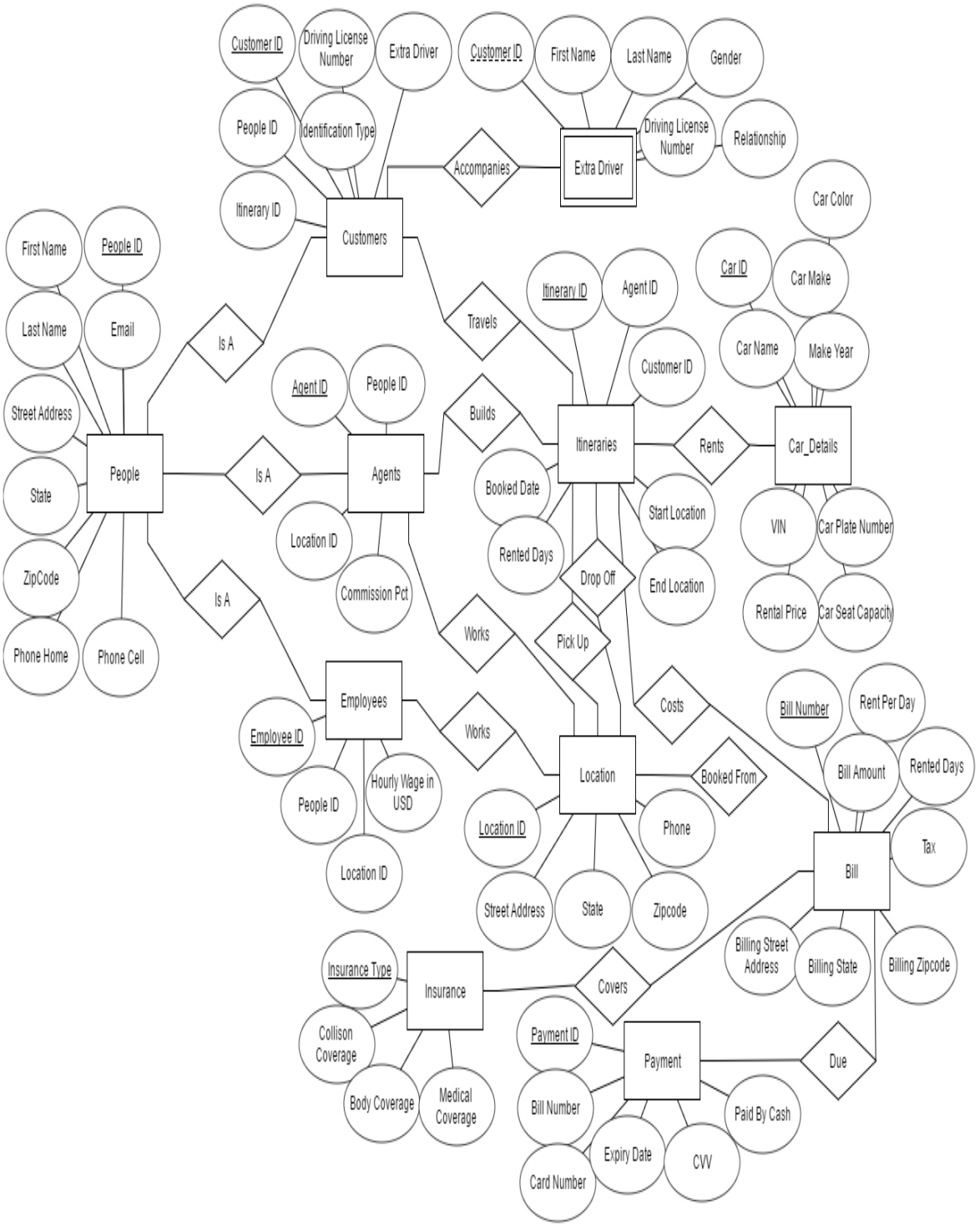

Fig. 5 Entity Relationship Diagram

An entity relationship diagram represent the relationship among the system's entities in a particular domain of knowledge[12]. The above ER diagram describes all entities (car details, agent, customer, location, bill, insurance, employee) in the system and the relationships between entities.

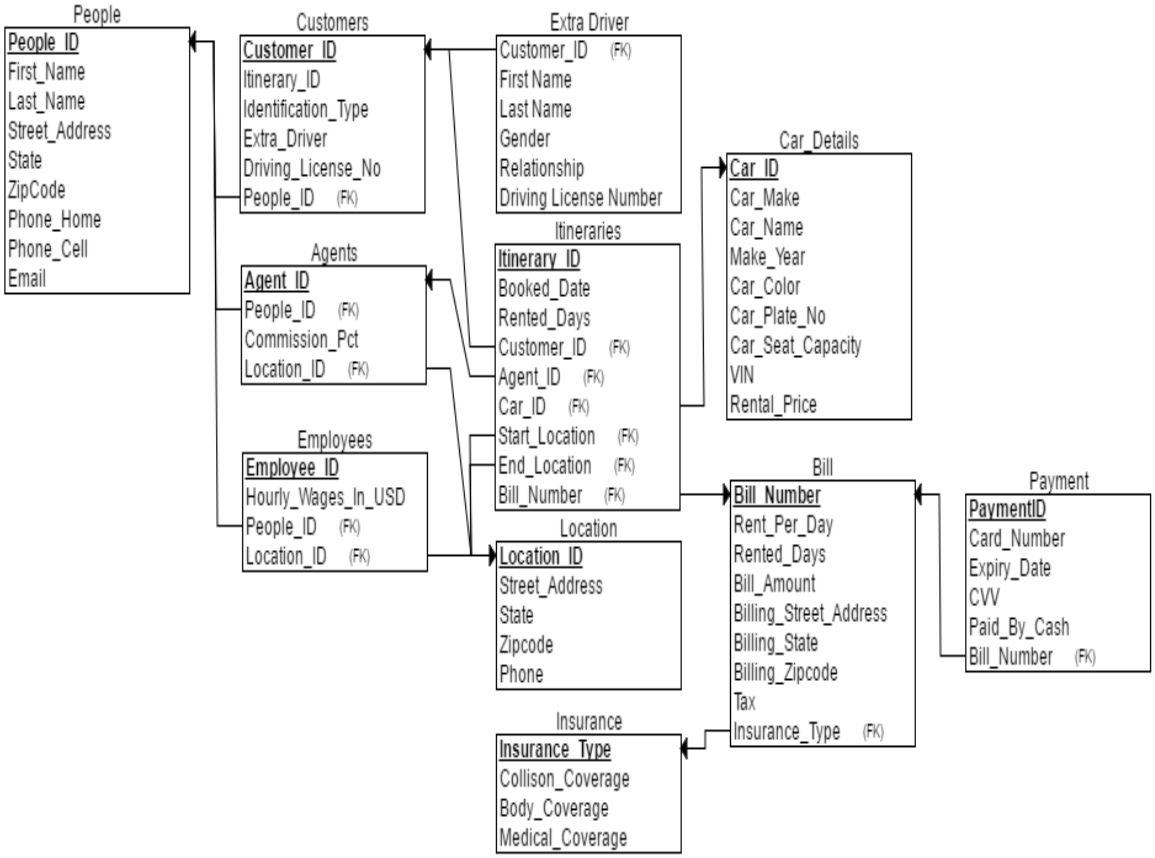

Fig. 6 Relational Database Schema

The relational model is an approach to data management using a Symbols consistent with first-order predicate logic, where all data is represented in terms of rows, grouped into relations[13].

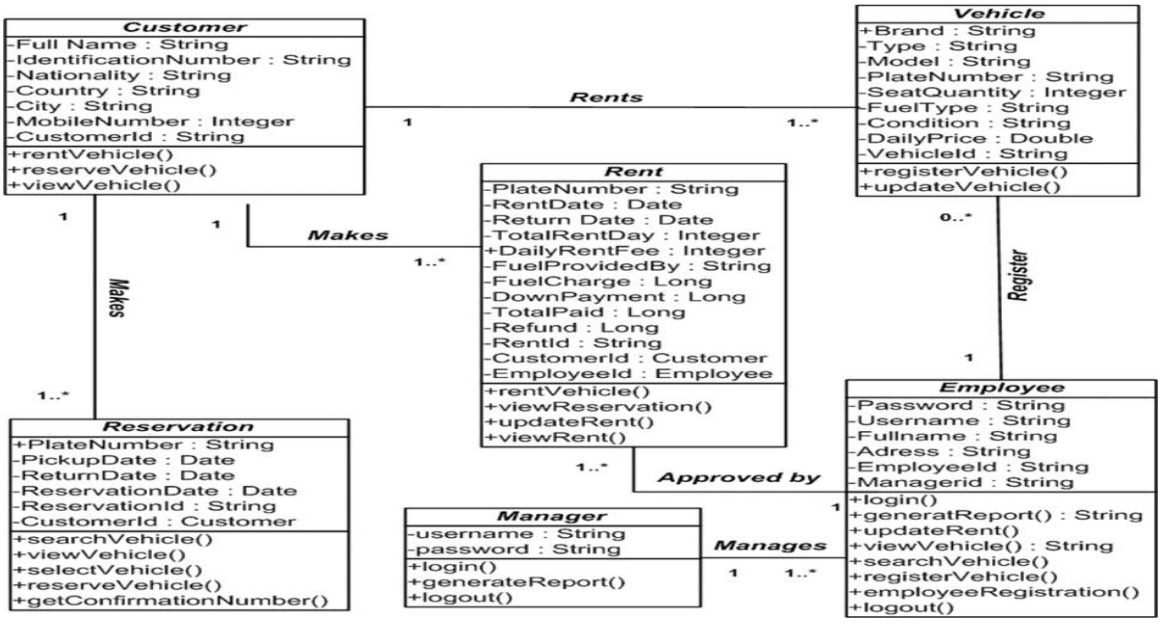

Fig. 7 Class Diagram

A class diagram identify the structure of a system. It includes the system components such as classes, related attributes, operations (or methods), and the relationships between objects. [14]

4.0 RESULTS

The research produced electronic web based system to manage car rental agencies and provide car rent service to customer online, also allows for car rental agencies to monitor cars and identify location of cars.

Table 1 depicts the implementation results for the proposed system. It has the list of cars available in car rental Agencies. to evaluate the effectiveness of the system are used two factors (User Interface Design, Usefulness 'ease of use and usability') and ask some questions to car rental agencies managers and customers about the proposed system according to factors identified.

Table- I: Implementation results of the proposed system

Type of the user	Total	factor	Strongly agree	Agree	Satisfied	Disagree	Strongly Disagree
Agencies	8	User Interface Design	-	5	3	-	-
		Usefulness	1	6	1	-	-
Customers	30	User Interface Design	10	8	9	2	1
		Usefulness	12	9	6	2	1

5.0 CONCLUSION

In conclusion, the car rental web-based system server the car rental agencies in the best way to take the advantages of today technology, in order to enhance the follow and tracking car after rent by customers. In reality, GPS add value to car rental web-based system by add follow and track the car at any time and any location.

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