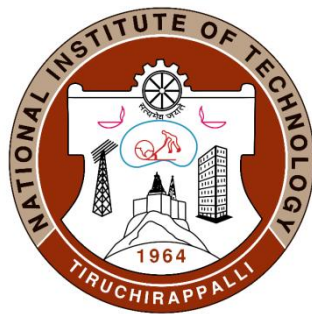


A
Project Report
on
“ONLINE CAR RENTAL SYSTEM”

By
RAHUL RAI
Roll No: 205119073



Submitted to
Dr. U. Vignesh
Department of Computer Application

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The study has indeed helped us to explore more knowledgeable avenues related to my topic and we are sure it will help us in our future.

Thank you

RAHUL RAI

MCA (II SEM)

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CHAPTER 1

INTRODUCTION

INTRODUCTION

1.1 Introduction

This Car Rental System project is designed to aid the car rental company to enable renting of cars through an online system. It helps the users to search for available cars view profile and book the cars for the time period. It has a user-friendly interface which helps the user to check for cars and rent them for the period specified. The rental cars shall be categorized into economy, premium etc. Based on the type of car required by the customer, the user shall be able to make bookings. The use of internet technology has made it easy for the customers to rent a car any time. This Car Rental System makes the bookings easy. It saves time and labor. The tool shall ask the user for information such as the date and time of journey, type of car etc. Also, it will need an identification number. Using these details, the tool shall help the customer to book a car for the journey.

1.2 Problem Statement

A car rental is a vehicle that can be used temporarily for a fee during a specified period. Getting a rental car helps people get around despite the fact they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who needs a car must contact a rental car company and contract out for a vehicle. This system increases customer retention and simplify vehicle and staff management.

1.3 Aims & Objectives

- To produce a web-based system that allow customer to register and reserve car online and for the company to effectively manage their car rental business.
- To ease customer's task whenever they need to rent a car.

1.4 Scope

This project traverses a lot of areas ranging from business concept to computing field, and required to perform several researches to be able to achieve the project objectives.

The area covers include:

- Car rental industry: This includes study on how the car rental business is being done, process involved and opportunity that exist for improvement.
- JAVA Technology used for the development of the application.
- General customers as well as the company's staff will be able to use the system effectively.
- Web-platform means that the system will be available for access 24/7 except when there is a temporary server issue which is expected to be minimal.

CHAPTER 2

SYSTEM DEVELOPMENT

LIFE CYCLE

SYSTEM DEVELOPMENT LIFE CYCLE

2.1 SYSTEM DEVELOPMENT LIFE CYCLE

SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process.

2.1.1 Phases of SDLC

System Analysis

System Design

Coding

System Testing

System Implementation

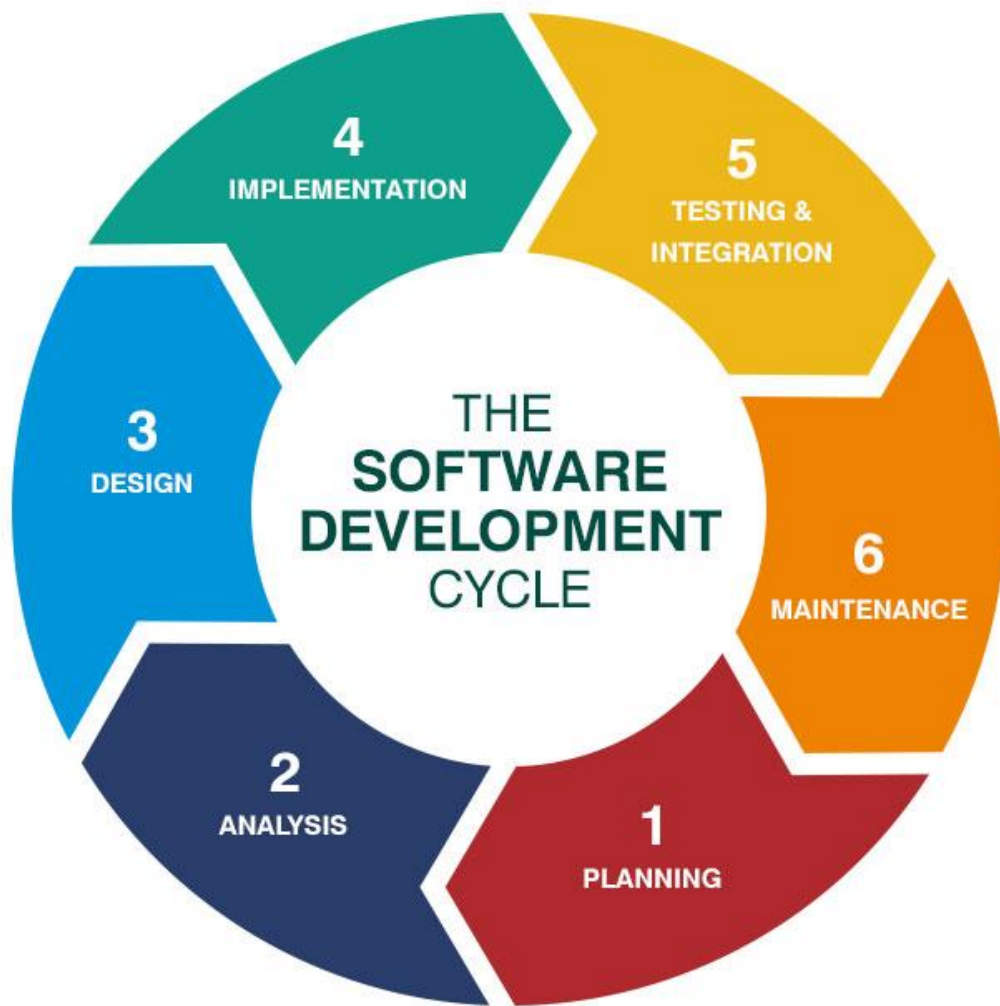
System Maintenance.

2.1.2 System Development Life Cycle

System development life cycle is a process of developing software on the basis of the requirement of the end user to develop efficient and good quality software. It is necessary to follow a particular procedure. The sequence of phases that must be followed to develop good quality software is known as SDLC

The software is said to have a life cycle composed of several phases. Each of these phases results in the development of either a part of the system or something associated with the system, such as a test plan or a user manual. In the life cycle model, called the “spiral model,” each phase has well-defined starting and ending points, with clearly identifiable deliverables to the next phase. In practice, it is rarely so simple.

As with most undertakings, planning is an important factor in determining the success or failure of any software project. Essentially, good project planning will eliminate many of the mistakes that would otherwise be made, and reduce the overall time required to complete the project. As a rule of thumb, the more complex the problem is, and the more thorough the planning process must be. Most professional software developers plan a software project using a series of steps generally referred to as the software development life cycle. A number of models exist that differ in the number of stages defined, and in the specific activities that take place within each stage



A GENERIC SOFTWARE DEVELOPMENT LIFE CYCLE

2.1.2.1 Analysis of user requirements

The feasibility study, Tentative planning, Technology selection, Requirement Analysis are part of the analysis phase.

People who work in this field are: System Analyst (SA), Project Manager (PM), Team Manager (TM)

How Analysis phase work?

(I) Feasibility study: It is a detailed study of the requirements in order to check whether all the requirements are possible or not.

(II) Tentative planning: The resource planning and time planning is temporarily done in this section.

(III) Technology selection: The lists of all the technologies that are to be used to accomplish the project successfully will be analysed and listed out here.

(IV) Requirement analysis: The list of all the requirements like human resources, hardware, software required to accomplish this project successfully will be clearly analysed and listed out here.

2.1.2.2 Program design

Design phase has two major tasks to follow:

HLD (High-Level Designing), LLD (Low-Level Designing)

How Design phase works?

The chief architect will divide the whole project into modules by drawing some diagrams and technical lead will divide each module into submodules by drawing some diagrams using UML (Unified Modelling Language).

The technical lead will also prepare the PSEUDO Code. The Pseudo Code is defined as “A set of English instructions used for guiding the developer to develop the actual code easily”.

2.1.2.3 Program coding

- Coder has now task to do Programming / Coding.
- Developers will develop the actual source code by using the PSEUDO Code and following the coding standards like proper indentation, color-coding, proper commenting and etc. The proof of this phase is SCD (Source Code Document)

2.1.2.4 Documentation and testing

- First of all the Test Engineer will receive the requirement documents and review it for understudying the requirements.
- If they have any doubts while understanding the requirements they will prepare the Review Report (RR) with all the list of doubts.
- Once the clarifications are given and after understanding the requirements clearly they will take the test case template and write the test cases. Once the build is released they will execute the test cases.
- After executions, if they find any defects then they will list out them in a defect profile document.
- Post that they will send defect profile to the developers and wait for the next build.
- Once the next build is released they will once again execute the test cases. If they find any defects they will follow the above procedure again and again till the product is defect free. Once they feel the product is defect free they will stop the process.

2.1.2.5 Operating and maintaining the system

After the delivery if any problem occurs then that will become a task based problem and the corresponding rolls will be appointed for each problem. Based on the problem, roles will be defined and the process and thus the there solutions.

CHAPTER 3

ANALYSIS



ANALYSIS

3.1 REQUIREMENT ANALYSIS

System analyst in an IT organization is a person, who analyzes the requirement of proposed system and ensures that requirements are conceived and documented properly & correctly. Role of an analyst starts during Software Analysis Phase of SDLC. It is the responsibility of analyst to make sure that the developed software meets the requirements of the client.

System Analysts have the following responsibilities:

- Analyzing and understanding requirements of intended software
- Understanding how the project will contribute in the organization objectives
- Identify sources of requirement
- Validation of requirement
- Develop and implement requirement management plan
- Documentation of business, technical, process and product requirements
- Coordination with clients to prioritize requirements and remove and ambiguity
- Finalizing acceptance criteria with client and other stakeholders

3.2 REQUIREMENT SPECIFICATION

SRS is a document created by system analyst after the requirements are collected from various stakeholders.

SRS defines how the intended software will interact with hardware, external interfaces, speed of operation, response time of system, portability of software across various platforms, maintainability, speed of recovery after crashing, Security, Quality, Limitations etc.

The requirements received from client are written in natural language. It is the responsibility of system analyst to document the requirements in technical language so that they can be comprehended and useful by the software development team.

SRS should come up with following features:

- User Requirements are expressed in natural language.
- Technical requirements are expressed in structured language, which is used inside the organization.
- Design description should be written in Pseudo code.
- Format of Forms and GUI screen prints.
- Conditional and mathematical notations for DFDs etc.

3.2.1 Functional Requirements

Requirement analysis is a software engineering technique that is composed of the various tasks that determine the needs or conditions that are to be met for a new or altered product, taking into consideration the possible conflicting requirements of the various users. Functional requirements are those requirements that are used to illustrate the internal working nature of the system, the description of the system, and explanation of each subsystem. It consists of what task the system should perform, the processes involved, which data should the system holds and the interfaces with the user. The functional requirements identified are:

- a. Customer's registration: The system should allow new users to register online and generate membership card.
- b. Online reservation of cars: Customers should be able to use the system to make booking and online reservation.
- c. Automatic update to database once reservation is made or new customer registered: Whenever there's new reservation or new registration, the system should be able update the database without any additional efforts from the admin.
- d. Feedbacks to customers: It should provide means for customers to leave feedback

3.2.2 Non Functional Requirements

It describes aspects of the system that are concerned with how the system provides the functional requirements. They are:

- a. Security: The subsystem should provide a high level of security and integrity of the data held by the system, only authorized personnel of the company can gain access to the company's secured page on the system; and only users with valid password and username can login to view user's page.
- b. Performance and Response time: The system should have high performance rate when executing user's input and should be able to provide feedback or response within a short time span usually 50 seconds for highly complicated task and 20 to 25 seconds for less complicated task.
- c. Error handling: Error should be considerably minimized and an appropriate error message that guides the user to recover from an error should be provided. Validation of user's input is highly essential. Also the standard time taken to recover from an error should be 15 to 20 seconds.
- d. Availability: This system should always be available for access at 24 hours, 7 days a week. Also in the occurrence of any major system malfunctioning, the system should be available in 1 to 2 working days, so that the business process is not severely affected.
- e. Ease of use: Considered the level of knowledge possessed by the users of this system, a simple but quality user interface should be developed to make it easy to understand and required less training.

CHAPTER 4

DESIGN



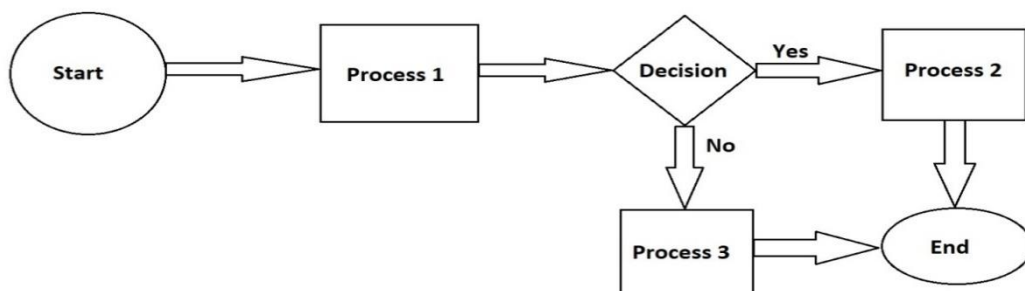
Design

4.1 System Flow Diagram

A System Flow Diagram (SFD) shows the relationships between the major components in the system. It is a systematic representation of an algorithm or a process. The steps in a process are shown with symbolic shapes, and the flow of the process is indicated with arrows connecting the symbols.

In order to improve a process, it is first necessary to understand its operation in detail. Describing this in text lacks the clarity of a pictorial diagram, where individual steps are more easily seen. The flowchart is a simple mapping tool that shows the sequence of actions within a process, in a form that is easy to read and communicate. The mapping of 'what follows what' is shown with arrows between sequential action boxes, as in the illustration. This also shows the boxes for process start and end points of which there are normally one each.

Processes become more complex when decisions must be made on which, out of an alternative set of actions, must be taken. The decision is shown in a flowchart as a diamond shaped box containing a simple question to which the answer is yes or no.



SYSTEM FLOW DIAGRAM

4.2 Data Flow Diagram (DFD):-

A data flow diagram (DFD) illustrates how data is processed by a system in terms of inputs and outputs. As its name indicates its focus is on the flow of information, where data comes from, where it goes and how it gets stored.

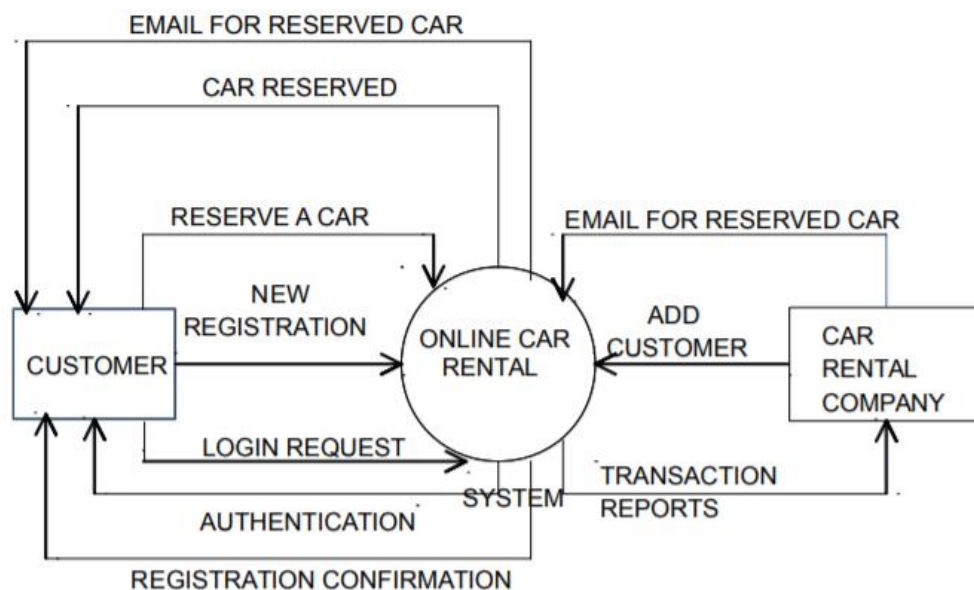
A DFD is a graphical representation of flow of data through information system. DFD can be used to visualize a data processing.

The result is a series of diagrams that represent the business activities in a way that is clear and easy to communicate. A business model comprises one or more data flow diagrams (also known as business process diagrams). Initially a context diagram is drawn, which is a simple representation of the entire system under investigation.

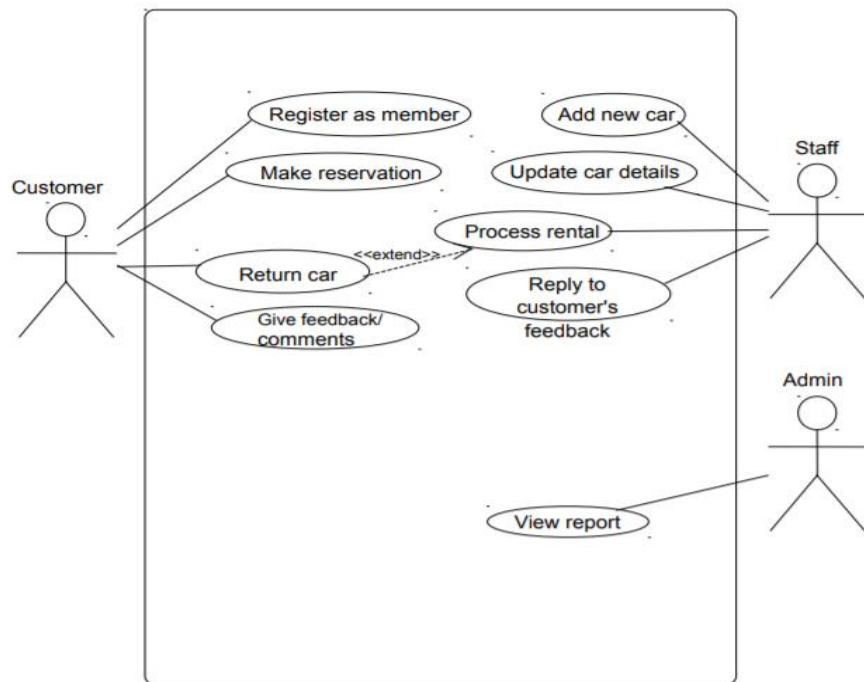
➤ **DFD Components:**

- **Entities:** -Entities are source and destination of information data. Entities are represented by rectangles with their respective names.
- **Process:** -Activities and action takes on the data are represented by circle or Round- edge rectangles.
- **Data Storage:-** It can either be represented as a rectangle with absence of both smaller sides or as an open-sided rectangle with only one side missing
- **Data Flow:** -Movement of data is shown by pointed arrows. Data movement is shown from the base of arrow as its source towards head of the arrow as destination.

Zero Level DFD

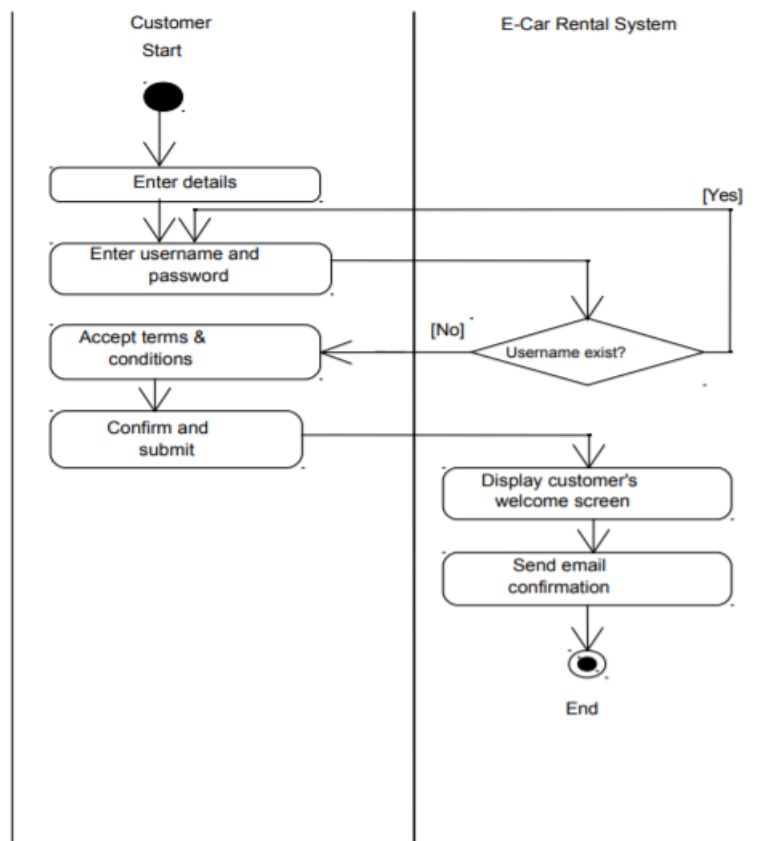


4.3 Use Case Diagram

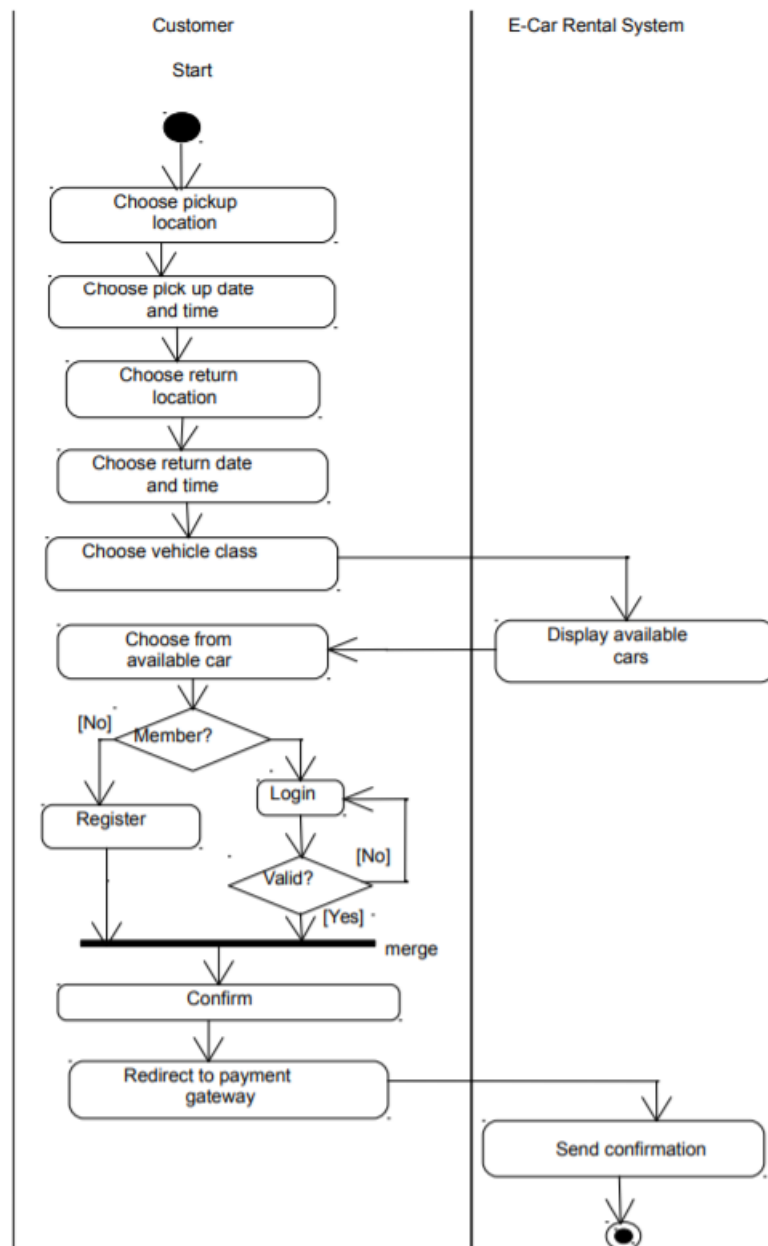


4.3 Activity Diagram

Member Registration

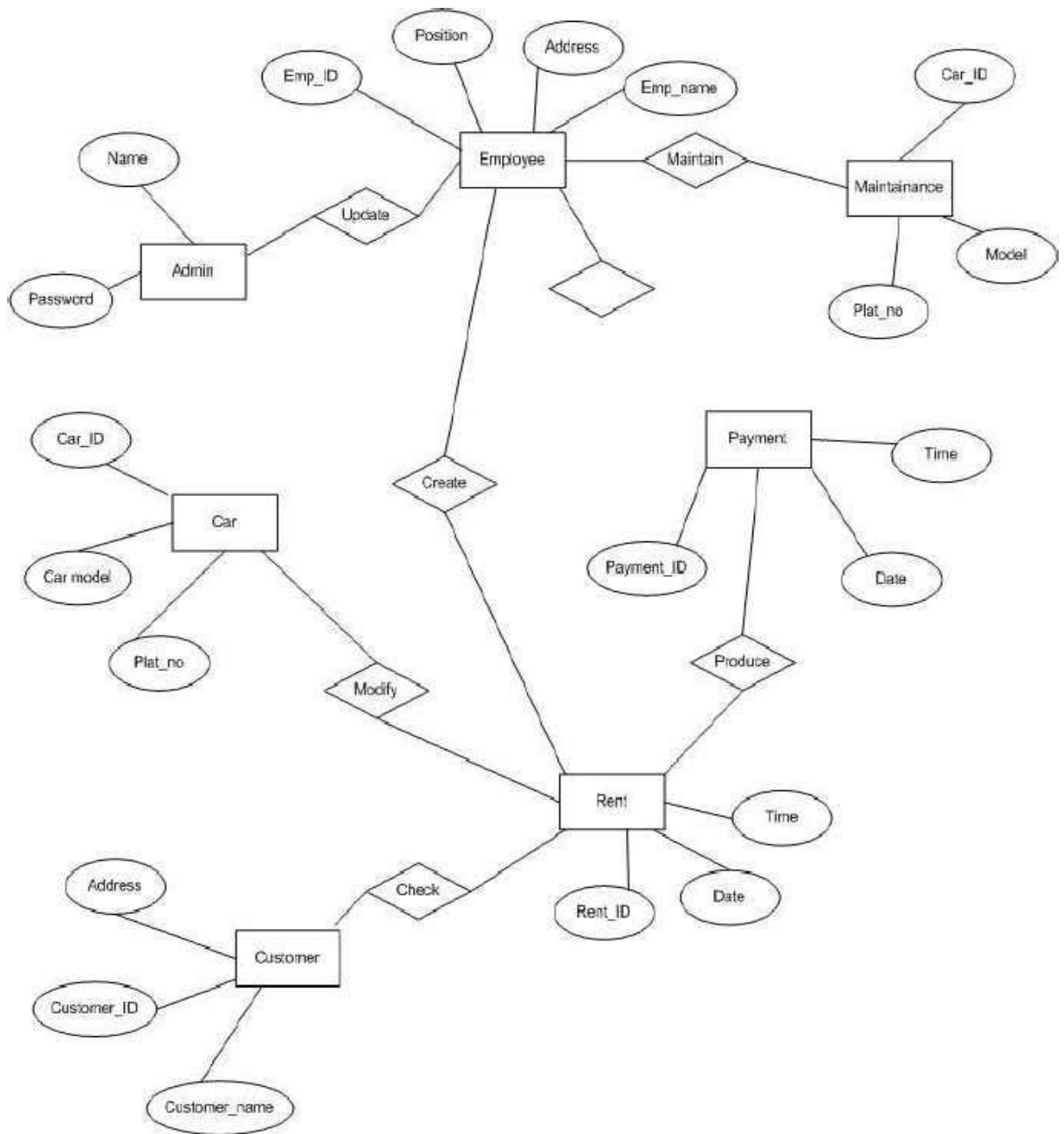


Reservation of Car



4.4 ER-Diagram

ER Model is represented by means of an ER diagram. Any object, for example, entities, attributes of an entity, relationship sets, and attributes of relationships sets, can be represented with the help of an ER diagram.



ER-Diagram

CHAPTER 5

IMPLEMENTATION

Implementation

A crucial phase in the system life cycle is the successful implementation of the new system design. Implementation simply means converting a new system design into operation. This involves creating computer compatible files, training the operating staff and installing hardware terminals, and telecommunication network before the system is up and running.

In system implementation, user training is crucial for minimizing resistance to change and giving the new system a chance to prove its worth. Training aids such as user-friendly manuals, a data dictionary and job performance aids that communicate information about the new system and help screens. Provide the user with a good start on the new system.

5.1 PLATFORM USED

5.1.1 Client Side:

Hardware Requirements:-

Processor : Pentium 4 or any other higher versions

Hard Disk : Minimum 2 GB Required

Ram : Minimum 256 MB Required

Monitor : Any

Software Requirements:-

Operating System : Windows 10.

Language : PHP

Front End : HTML, JavaScript, CSS

Browser : Any Browse

5.1.2Server Side:

Hardware Requirements:-

Processor : Dual core or any other higher versions

Hard Disk : Minimum 40 GB or higher

RAM : Minimum 256 MB Required

Monitor : Any

Software Requirements:-

Operating System	: Windows 10
Language	: PHP
Software	: My SQL (Back End)
Browser	: Any Browse
Web Server	: Apache

5.2 TECHNOLOGY USED:

JAVA:

Java is the high-level, object-oriented, robust, secure programming language, platform-independent, high performance, Multithreaded, and portable programming language. It was developed by James Gosling in June 1991. It can also be known as the platform as it provides its own JRE and API.

Java was developed by *Sun Microsystems* (which is now the subsidiary of Oracle) in the year 1995. *James Gosling* is known as the father of Java. Before Java, its name was *Oak*. Since Oak was already a registered company, so James Gosling and his team changed the Oak name to Java.

The primary objective of Java programming language creation was to make it portable, simple and secure programming language. Apart from this, there are also some excellent features which play an important role in the popularity of this language. The features of Java are also known as java *buzzwords*.

A list of most important features of Java language is given below.

1. Simple
2. Object-Oriented
3. Portable
4. Platform independent
5. Secured
6. Robust
7. Architecture neutral
8. Interpreted
9. High Performance
10. Multithreaded
11. Distributed
12. Dynamic

HTML:

Hypertext Markup Language (HTML) is the standard markup language for creating web pages and web applications. With Cascading Style Sheets (CSS) and JavaScript, it forms a triad of cornerstone technologies for the World Wide Web.

Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as `` and `<input />` directly introduce content into the page. Other tags such as `<p>` surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.

HTML can embed programs written in a scripting language such as JavaScript, which affects the behavior and content of web pages. Inclusion of CSS defines the look and layout of content. The World Wide Web Consortium (W3C), maintainer of both the HTML and the CSS standards, has encouraged the use of CSS over explicit presentational HTML since 1997.

CSS:

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language like HTML.^[1] CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, and reduce complexity and repetition in the structural content.

Separation of formatting and content also makes it feasible to present the same markup page in different styles for different rendering methods, such as on-screen, in print, by voice (via speech-based browser or screen reader), and on Braille-based tactile devices. CSS also has rules for alternate formatting if the content is accessed on a mobile device.

The name *cascading* comes from the specified priority scheme to determine which style rule applies if more than one rule matches a particular element. This cascading priority scheme is predictable.

The CSS specifications are maintained by the World Wide Web Consortium (W3C). Internet media type (MIME type) `text/css` is registered for use with CSS by RFC 2318

JAVASCRIPT:

JavaScript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities.

JavaScript was first known as LiveScript, but Netscape changed its name to JavaScript, possibly because of the excitement being generated by Java. JavaScript made its first appearance in Netscape 2.0 in 1995 with the name LiveScript. The general-purpose core of the language has been embedded in Netscape, Internet Explorer, and other web browsers.

MY SQL:

MySQL is a fast, easy-to-use RDBMS being used for many small and big businesses. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company. MySQL is becoming so popular because of many good reasons –

- MySQL is released under an open-source license. So you have nothing to pay to use it.
- MySQL is a very powerful program in its own right. It handles a large subset of the functionality of the most expensive and powerful database packages.
- MySQL uses a standard form of the well-known SQL data language.
- MySQL works on many operating systems and with many languages including PHP, PERL, C, C++, JAVA, etc.
- MySQL works very quickly and works well even with large data sets.
- MySQL is very friendly to PHP, the most appreciated language for web development.
- MySQL supports large databases, up to 50 million rows or more in a table. The default file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB).
- MySQL is customizable. The open-source GPL license allows programmers to modify the MySQL software to fit their own specific environments.

CHAPTER 6

TESTING

Testing

Software testing is a critical phase of software quality assurance. It indicates the ultimate review of specification, design and code generation. Once source code has been generated, software must be tested to uncover and correct maximum possible errors, before being delivered. Testing emphasizes on a set of methods for the creation of test cases that fulfil overall testing objectives.

The primary objectives of software testing are as follows:

1. Testing is a process of executing a program to find an error in it.
2. A good test case should have a high probability of finding an as-yet-undiscovered error.
3. A test case will be considered successful if it uncovers an as-yet-undiscovered error.

6.1 TESTING TECHNIQUE

6.1.1 UNIT TESTING:-

Unit testing aims the verification effort on the smallest unit of software design i.e., a software component or module. It uses procedural design as a guide to test major control paths and uncover errors within the module boundary. It is white box oriented and the step can be conducted in parallel for multiple components.

Unit testing is a dynamic method for verification, where the program is actually compiled and executed. It is one of the most widely used methods, and the coding phase is sometimes called “coding and unit testing phase”. The goal of unit testing is to test modules or “units”, not the whole software system. Unit testing is most often done by the programmer himself/herself. The goal of unit testing is to isolate each part of the program and show that the individual parts are correct. A unit test provides a strict, written contract that the piece of code must satisfy. As a result, it affords several benefits.

6.1.2 INTEGRATION TESTING:

Integration testing is a phase of software testing in which individual software modules are combined and tested as a group. It follows unit testing and precedes system testing. The major

objective of integration testing is to tackle the problem of interfacing i.e. putting all the acceptable imprecision (view) may be magnified to unacceptable levels; global data structure can cause problems and to truncate this list of problems we use integration testing.

Integration testing is a systematic technique for constructing the program structure while at the same time conducting tests to uncover errors associated with interfacing. The objective is to take unit tested components and build a program structure that has been dictated by the design. Integration testing strategy used is Bottom-Up Integration Testing. In it all the bottom or low level modules, procedures or functions are integrated and then tested. After the integration testing of lower level integrated modules, the next level of modules will be formed and can be used for integration testing. This approach is helpful only when all or most of the modules of the same development level are ready

6.1.3 VALIDATION TESTING:

At the climax of integration testing, software is developed as a package having all the errors uncovered and corrected. At this time, a final series of software test may begin. It is called validation testing. Validation succeeds when software functions in a reasonably expectable manner. Validation attempts to uncover errors, but the emphasis is on the requirement level i.e. the things that will be immediately apparent to the customer.

A major element of the validation process is a configuration review, which is conducted to ensure that all software configuration elements have been well developed, well-catalogued, and have the essential detail to bolster the support phase of the software life cycle.

CHAPTER 7

CONCLUSION

CONCLUSION

Based on the research done, some car rental companies still use desktop application for their car rental services and thus making it to be limited to so many important feature that are not available unlike in the web based application where there are so many feature available. Also some upcoming companies do not only make use of these desktop applications, but also make use of phone call reservation, which is still lacking so many features that are needed for this type of system.

