

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
**JNANA SANGAMA, Belagavi - 590018.**



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**DBMS**  
**Mini Project Report on**

**“CAR RENTAL MANAGEMENT SYSTEM”**

Submitted in partial fulfillment of the requirements for the award of the degree of

**BACHELOR OF ENGINEERING**

in

**INFORMATION SCIENCE & ENGINEERING**

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**CERTIFICATE**

Certified that the project work entitled **“CAR RENTAL MANAGEMENT SYSTEM”** carried out by **VISHWAS L (1AT20IS104)**, **SOHAN RAJ M (1AT20IS091)** and **SAI SHREYAS V(1AT20IS079)** are bonafide students of **ATRIA INSTITUTE OF TECHNOLOGY**, Bengaluru, in partial fulfillment for the award of Degree of **Bachelor of Engineering in Information Science & Engineering** of **Visvesvaraya Technological University, Belagavi**, during the academic year **2022-23**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

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## DECLARATION

We, **VISHWAS L (1AT20IS104)**, **SOHAN RAJ M (1AT20IS091)** and **SAI SHREYAS V(1AT20IS079)** students of **5th semester Bachelor of Engineering, Department of Information Science and Engineering, Atria Institute of Technology, Bengaluru**, would hereby declare that the project entitled “**Car Rental Management System**” has been carried out by us at **Atria Institute of Technology, Bengaluru**, and submitted in partial fulfillment of the course requirement for the award of degree of **Bachelor of Engineering in Information Science and Engineering** of **Visvesvaraya Technological University, Belagavi**, during the academic year **2022-23**.

We further declare that the work embodied in this report has not been submitted to any other university or institution for the award of any other degree.

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## **ABSTRACT**

The purpose of is to automate the existing Car Rental Management System manual system by the help of computerized equipments and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. The required software and hardware are easily available and work with.

Car Rental Management System, as described above, can lead to error free, secure, reliable and fast management system. The aim is to automate its existing manual system by the help of computerized equipments and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. Basically the project describes how to manage for good performance and better services for the clients.

## ACKNOWLEDGEMENT

We are grateful to our institution, **Atria Institute of Technology**, for having provided us with the facilities to successfully complete this mini project on CAR RENTAL MANAGEMENT SYSTEM.

We thank **Dr. T N Srinivasa, principal** and **Dr. Shanthi Mahesh, HOD, ISE** for providing us all the necessary facilities for the successful completion of our mini-project.

Deadlines play a very important role in the successful completion of the academic project on time, efficiently and effectively. We take this opportunity to express our deep sense of gratitude to our guide and coordinators **Dr.T N Anitha, Professor and Ms.Malini R, Assistant Professor, Department of ISE** for their valuable guidance and help throughout the course of the academic mini-project. They have always been patient with us and helped immensely in completing the task on hand. We also thank them for their immense support, guidance, specifications & ideas without which seminar would have been completed without full merit.

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## CHAPTER 1

# INTRODUCTION TO DATABASE

Database and database technology has a major impact on the growing use of computers. It is fair to say that databases play a critical role in almost all areas where computers are used, including business, electronic commerce, engineering, medicine, genetics, law, education, and library science. The word database is so commonly used that we must begin by defining what the database is.

Our initial definition is quite general. A database is a collection of related data. By data, we mean known facts that can be recorded and that have implicit meaning. For example, consider the names, telephone numbers, and addresses of the people you know. You may have recorded this data in an indexed address book or you may have stored it on a hard drive, using personal computers and software such as Microsoft excel. This collection of related data with an implicit meaning is a database.

The preceding definition of a database is quite general, for example, we may consider the collection of words that make up this page of text to be related data and hence to constitute a database. However, the common use of the term database is usually more restricted. A database has the following properties:

- A database represents some aspect of the real world, sometimes called the mini world or the universe of discourse. The changes to the mini world are reflected in the database.
- A database is a logically coherent collection of data with some inherent meaning. A random assortment of data cannot correctly be referred to as a database.
- A database is designed, built and populated with data for a specific purpose. It has an intended group of users and some preconceived applications in which these users are interested.

In other words, a database has some source from which data is derived, some degree of interaction with events in the real world, and an audience that is actively interested in its contents. The end-users of the database may perform business transactions (for example a customer buys a camera) or events may happen that may cause the information in the

database to change. In order for a database to be accurate and reliable at all times, it must be a true reflection of the mini world that it represents; therefore changes must be reflected in the database as soon as possible.

A database can be of any size and complexity. A database may be generated and maintained manually or computerized. For example, a library card catalog is a database that may be created and maintained manually. A computerized database may be created and maintained either by a group of application programs written specifically for that task or by a database management system.

A database is a collection of data, typically describing the activities of one or more related organizations. For example, a university database might contain information about the following:

- Entities such as students, faculty, courses, and classrooms.
- Relationships between entities, such as student's enrolment in courses, faculty teaching courses, and the use of rooms for courses.

A database management system, or DBMS, is software designed to assist in maintaining and utilizing a large collection of data. The need for such systems as well as their use is growing rapidly. The alternative to using a DBMS is to store the data in files and write application-specific code to manage it.

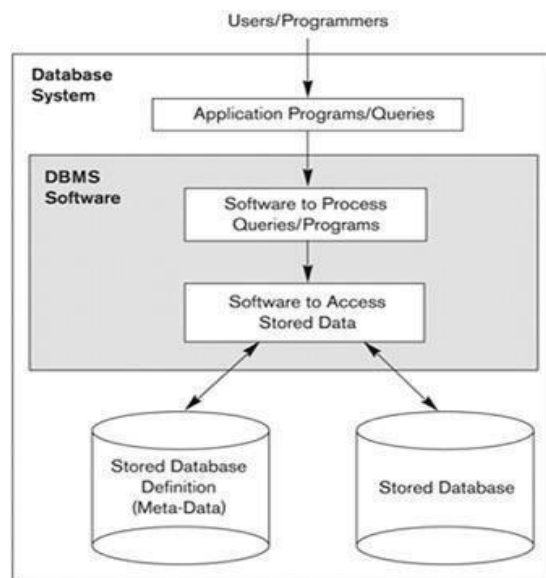
## **File system versus DBMS**

To understand the need for a DBMS, let us consider a motivating scenario: a company has a large collection (say 500 GB) of data on employees, departments, products, sales, and so on. This data is accessed concurrently by several employees. Questions about the data must be answered quickly, changes made to the data by different users must be applied consistently and access to certain parts of the data must be restricted. We can try to manage the data by storing it in operating system files.

This approach has many drawbacks, including the following-

- We probably do not have 500GB of main memory to hold all the data. We must, therefore, store data in a storage device such as a disk or tape and bring relevant parts into the main memory for processing as needed.
- Even if we have 500 GB of main memory, on computer systems with 32 bit addressing, we cannot refer directly to more than about 4 GB of data. We have to program some method of identifying all data items
- We have to write special programs to answer each question a user may want to ask about the data. These programs are likely to be complex because of the large volume of data to be searched.
- We must protect the data from the inconsistent changes made by different users accessing the data concurrently. If applications must address the details of such concurrent access, this adds greatly to their complexity.
- We must ensure that the data is restored to a consistent state if the system crashes while changes are being made.
- Operating systems provide only a password mechanism for security. This is not sufficiently flexible to enforce security policies in which different users have permission to access different subsets of the data.
- DBMS is a piece of software designed to make the preceding tasks easier. By storing data in DBMS rather than as a collection of operating system files, we can use the DBMS's features to manage the data in a robust and efficient manner. As the volume of data and the number of users grow hundreds of gigabytes of data and thousands of users are common in current corporate database DBMS support becomes indispensable.

## 1.1 DATABASE ENVIRONMENT SYSTEM



**Fig 1.1: Simplified database environment system**

A database management system (DBMS) is a collection of programs that enables users to create and maintain a database. The DBMS is a general-purpose software system that facilitates the processes of defining, constructing, manipulating and sharing databases among various users and applications. Defining a database involves specifying the data types, structures and constraints of the data to be stored in the database.

The database definition or description information is also stored by the DBMS in the form of a database catalog or dictionary, it is called Metadata. Constructing the database is the process of storing the data on some storage medium that is controlled by the DBMS. Manipulating a database includes functions such as querying the database to retrieve specific data, updating the database to reflect changes in the mini world and generating reports from the data. Sharing a database allows multiple users and programs to access the database simultaneously.

An application program accesses the database by sending queries or requests for data to DBMS. A query typically causes some data to be retrieved; a transaction may cause some data to be read and some data to be written into the database.



Other important functions provided by DBMS include protecting the database and maintaining it over a long period of time, protection includes system protection against hardware or software malfunction and security protection against unauthorized or malicious access. A typical large database may have a life cycle of many years, so the DBMS must be able to maintain the database system by allowing the system to evolve as requirements change over time.

It is not absolutely necessary to use general-purpose DBMS software to implement a computerized database. We could write our own set of programs to create and maintain the database, in effect creating our own special purpose DBMS software. In either case, whether we use a general-purpose DBMS or not we usually have deployed a considerable amount of complex software. In fact, most DBMSs are very complex software systems. Fig 1.1 shows a simplified database environment system.

## 1.2 ADVANTAGES OF USING DBMS APPROACH

**Using a DBMS to manage data has many advantages:**

- **Data Independence:** application program should not, ideally, be expected to details of data representation and storage, the DBMS provides an abstract view of the data that hides such details.
- **Efficient Data Access:** A DBMS utilizes a variety of sophisticated techniques to store and retrieve data efficiently. This feature is especially important if the data is to be stored on an external device.
- **Data Integrity and Security:** if data is always accessed through DBMS, the DBMS can enforce integrity constraints. For example, before inserting salary information for an employee, the DBMS can check that the department budget is not exceeded. Also, it can enforce access controls that govern what data is visible to different classes of users.
- **Data Administration:** when several users share data, centralizing the administration of data can offer significant improvements. Experienced professionals who understand the

nature of the data being managed, and how different groups of users use it, it can be responsible for organizing the data representation to minimize redundancy and for finetuning the storage of the data to make retrieval efficient.

- **Concurrent Access and Crash Recovery:** A DBMS schedules concurrent accesses to the data in such a manner that users can think of the data as being accessed by only one user at a time. Further, the DBMS protects users from the effects of system failures
- **Reduced Application Development Time:** clearly, the DBMS supports important functions that are common to many applications accessing data in the DBMS. This, in conjunction with the high-level interface to data, facilitates quick application development. DBMS applications are also likely to be more robust than a similar standalone application because many important tasks are handled by the DBMS.

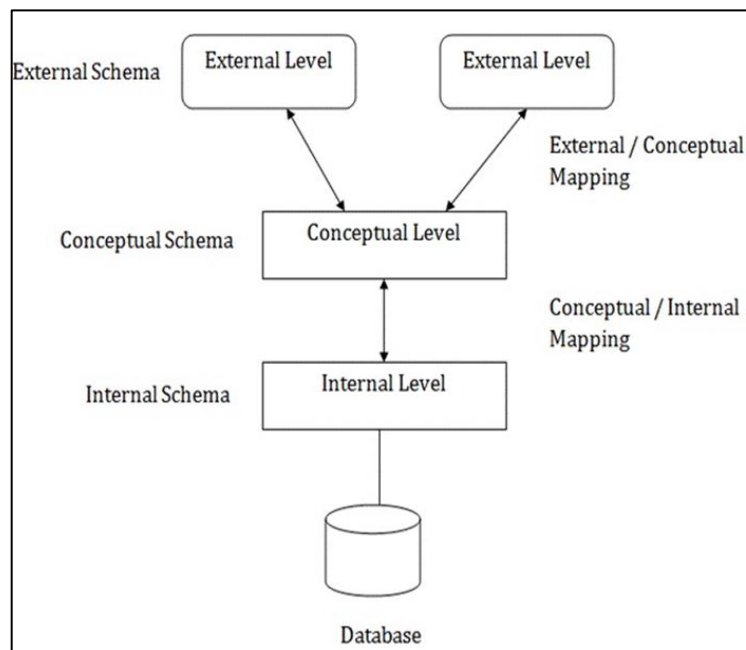
## 1.3 ARCHITECTURE OF DATABASE

### The Three-Schema Architecture

The goal of the three-schema architecture illustrated in the figure is to separate the user application from the physical database. In this architecture, schemas can be defined at the following three levels:

- The internal level has an internal schema, which describes the physical storage structure of the database. The internal schema uses a physical data model and describes the complete details of data storage and access paths for the database.
- The conceptual level has a conceptual schema, which describes the structure of the whole database for a community of users. The conceptual schema hides the details of physical storage structures and concentrates on describing entities, data types, relationships, user operations, and constraints. Usually, a representational data model is used to describe the conceptual schema when a database system is implemented. This implementation conceptual schema is often based on a conceptual schema design in a high-level data model.

- The external or view level includes a number of external schemas or user views. Each external schema describes the part of a database that a particular user group is interested in and hides the rest of the database from that user group. As in the previous level, each external schema is typically implemented using a representational data model, possibly based on external schema design in a high-level data model.



**Fig 1.2: Architecture of DBMS**

## CHAPTER 2

# INTRODUCTION TO PROJECT

### 2.1 Overview of the project

#### 2.1.1 Introduction

This project is designed so as to be used by Car Rental Company specializing in renting cars to customers. It is an online system through which customers can view available cars, register, view profile and book car.

#### 2.1.2 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.

#### 2.1.3 Reason for the Project

The advancement in Information Technology and internet penetration has greatly enhanced various business processes and communication between companies (services provider) and their customers of which car rental industry is not left out. This E-Car Rental System is developed to provide the following services:

- Enhance Business Processes: To be able to use internet technology to project the rental company to the global world instead of limiting their services to their local domain alone, thus increase their return on investment (ROI).
- Online Vehicle Reservation: A tools through which customers can reserve available cars online prior to their expected pick-up date or time.
- Customer's registration: A registration portal to hold customer's details, monitor their transaction and used same to offer better and improve services to them.
- Group bookings: Allows the customer to book space for a group in the case of weddings or corporate meetings (Event management).

### **2.1.4 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.
- PHP 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.

## **2.2 Car rental Services**

### **2.2.1 How Car Rental Services Work:**

A car rental is a vehicle that can be used temporarily for a period of time with a fee. Renting a car assists people to get around even when they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who want to rent a car must first contact the car rental company for the desire vehicle. This can be done online. At this point, this person has to supply some information such as; dates of rental, and type of car. After these details are worked out, the individual renting the car must present a valid Identification Card.

Most companies throughout the industry make a profit based of the type of cars that are rented. The rental cars are categorized into economy, compact, compact premium, premium and luxury. And customers are free to choose any car of their choice based on their purse and availability of such car at the time of reservation.

### **2.2.2 Benefits of Online Car Rental Services:**

- This online car rental solution is fully functional and flexible.
- It is very easy to use.

- This online car rental system helps in back office administration by streamlining and standardizing the procedures.
- It saves a lot of time, money and labour.
- Eco-friendly: The monitoring of the vehicle activity and the overall business becomes easy and includes the least of paper work.
- The software acts as an office that is open 24/7.
- It increases the efficiency of the management at offering quality services to the customers.
- It provides custom features development and support with the software.

## 2.3 TABLE DESCRIPTION

### 2.3.1 ADMIN

ADMIN table has the details of Admins and it has attributes id, password, updation date.

**Table 2.3.1 Structure of Admin**

The screenshot shows a database management tool interface. At the top, there is a SQL query editor with the text `SELECT * FROM `admin``. Below the editor are several action buttons: ☐ Profiling, [ Edit inline ], [ Edit ], [ Explain SQL ], [ Create PHP code ], and [ Refresh ].

Below these buttons is a table control section with ☐ Show all, Number of rows: 25 (with a dropdown arrow), and Filter rows: Search this table (with a text input field).

Under the 'Options' section, there is a table with the following columns: id, UserName, Password, and updationDate. The table contains two rows of data:












				id	UserName	Password	updationDate
<input type="checkbox"/>				1	shradha	ShreShra	2021-12-01 17:52:38
<input type="checkbox"/>				2	shri	Shrii	2021-12-01 17:52:38

At the bottom of the interface, there are additional controls: an up arrow, ☐ Check all, With selected: Edit, Copy, Delete, and Export.

### 2.3.2 TABLE BOOKING

BOOKING table has the attributes id, Booking number, user Email, Vehicle id, from date, to date, message, status, posting date, last updation date.


**Table 2.3.2 Structure of Tablebooking**

▼ id BookingNumber userEmail VehicleId FromDate ToDate message Status PostingDate LastUpdateDate													
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	123456789	test@gmail.com	1	2022-01-07	2022-01-09	What is the cost?	1	2022-01-07 19:33:09	NULL
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	987456321	test@gmail.com	4	2022-01-19	2022-01-24	hfhgh	1	2022-01-09 23:19:21	2022-01-11 17:50:57
<div> <input type="checkbox"/> Check all    With selected:  Edit     Copy     Delete     Export</div>													

## 2.3.3 TABLE BRAND

BRAND table has the attributes id, brand name, creation date, updation date.

**Table 2.3.3 Structure of Tablebrands**

				id	BrandName	CreationDate	UpdationDate
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	Maruti	2021-12-18 21:54:34	2021-12-19 12:12:23
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	BMW	2021-12-18 21:54:50	NULL
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	Audi	2021-12-18 21:55:03	NULL
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	Nissan	2021-12-18 21:55:13	NULL
<input type="checkbox"/>	 Edit	 Copy	 Delete	5	Toyota	2021-12-18 21:55:24	NULL
<input type="checkbox"/>	 Edit	 Copy	 Delete	7	Volkswagon	2021-12-19 11:52:13	2021-12-07 19:44:09

## 2.3.4 CONTACT INFO

CONTACT INFO table has the attributes id, address, emailid, contactno.

**Table 2.3.4 Structure of Contact info**

<div><div><div>↔</div><div>T</div><div>↔</div></div><div>▼</div></div>				id	Address	EmailId	ContactNo
<div><div><div><div></div></div><div><div></div></div></div><div><div>Edit</div><div>Copy</div><div>Delete</div></div></div>	1	1st Block, RT Nagar	info@gmail.com	9148631084			

## 2.3.5 CONTACT US QUERY

Contact us table has the attributes id, name, emailid, contact number, message, posting date, status.

**Table 2.3.5 Structure of Contact us query**

	id	name	EmailId	ContactNumber	Message	PostingDate	status
<input type="checkbox"/> Edit Copy Delete	1	Kunal	kunal@gmail.com	7977779798	I want to know you brach in Chandigarh?	2022-01-07 15:04:51	1

## 2.3.6 SUBSCRIBERS

SUBSCRIBERS table has the attributes id, subscriber email, posting date.

**Table 2.3.6 Structure of Subscribers**

	id	SubscriberEmail	PostingDate
<input type="checkbox"/> Edit Copy Delete	4	harish@gmail.com	2022-01-07 14:56:21
<input type="checkbox"/> Edit Copy Delete	5	kunal@gmail.com	2022-01-07 15:05:07

## 2.3.7 TESTMIMONIAL

TESTIMONIAL table has the attributes id, user email, testimonial, postingdate, status.

**Table 2.3.7 Structure of Testimonial**

	id	UserEmail	Testimonial	PostingDate	status
<input type="checkbox"/> Edit Copy Delete	1	test@gmail.com	I am satisfied with their service great job	2022-01-07 20:00:12	1

## 2.3.8 USERS

USERS table has the attributes id, full name, emailid, password, contactno, dob, address, city, country, regdate, updationdate.

**Table 2.3.8 Structure of Users**




	id	FullName	EmailId	Password	ContactNo	dob	Address	City	Country	RegDate	UpdationDate
<input type="checkbox"/> Edit Copy Delete	1	Test	test@gmail.com	f925916e2754e5e03f75dd58a5733251	6465465465		159 1st Phase Bhanashankari Bangalore	Bangalore	India	2022-01-07 19:30:49	2022-01-12 11:14:29



## 2.3.9 VEHICLES

VEHICLES table has the attributes all the details about the vehicles.

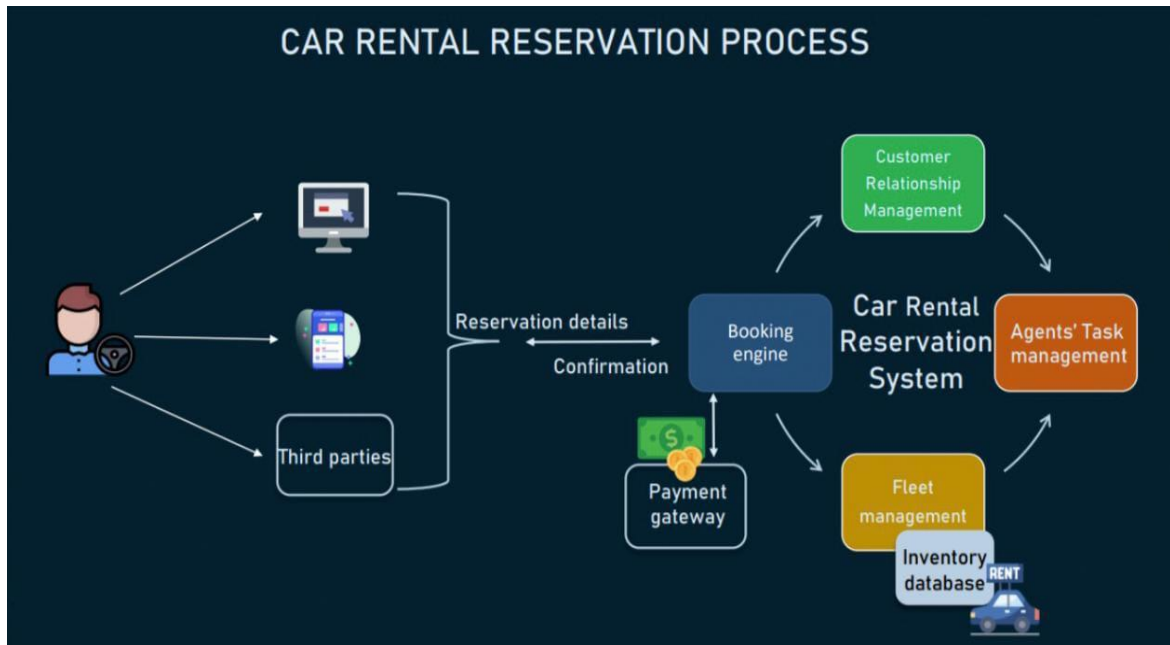
**Table 2.3.9 Structure of Vehicles**

		id	VehiclesTitle	VehiclesBrand	VehiclesOverview	PricePerDay	FuelType	ModelYear	SeatingCapacity	Vimage1	Vimage2	Vimage3
<input type="checkbox"/>	  	1	Maruti Suzuki Wagon R	1	Maruti Wagon R Latest Updates	500	Petrol	2019	5	rear-3-4-left-589823254_930x620.jpg	tail-lamp-1666712219_930x620.jpg	rear-3-4-right-520328200_930x620.jpg
<input type="checkbox"/>	  	2	BMW 5 Series	2	Maruti Suzuki has... BMW 5 Series price starts at ₹ 55.4 Lakh and goes ...	1000	Petrol	2018	5	BMW-5-Series-Exterior-102005.jpg	BMW-5-Series-New-Exterior-89729.jpg	BMW-5-Series-Exterior-102006.jpg
<input type="checkbox"/>	  	3	Audi Q8	3	As per ARAI, the mileage of Q8 is 0 kmpl. Real mil...	3000	Petrol	2017	5	audi-q8-front-view4.jpg	1920x1080_MTC_XL_framed_Audi-Odesa-Armaturen_Sple...	audi1.jpg
<input type="checkbox"/>	  	4	Nissan Kicks	4	Latest Update: Nissan has launched the Kicks 2020 ...	800	Petrol	2020	5	front-left-side-47.jpg	kicksmodelimage.jpg	download.jpg
<input type="checkbox"/>	  	5	Nissan GT-R	4	The GT-R packs a 3.8-litre V6 twin-turbocharged p...	2000	Petrol	2019	5	Nissan-GTR-Right-Front-Three-Quarter-84895.jpg	Best-Nissan-Cars-in-India-New-and-Used-1.jpg	2bb3bc938e734f462e45e83be05165d.jpg
<input type="checkbox"/>	  	6	Nissan Sunny 2020	4	Value for money product and it was so good it is m...	400	CNG	2018	5	Nissan-Sunny-Right-Front-Three-Quarter-48975_of.jp...	images (1).jpg	Nissan-Sunny-Interior-114977.jpg
<input type="checkbox"/>	  	7	Toyota Fortuner	5	Toyota Fortuner Features. It is a premium seven-se...	3000	Petrol	2020	5	2015_Toyota_Fortuner_(New_Zealand).jpg	toyota-fortuner-legendre-rear-quarters-6e57.jpg	zw-toyota-fortuner-2020-2.jpg
<input type="checkbox"/>	  	8	Maruti Suzuki Vitara Brezza	1	The new Vitara Brezza is a well-rounded package th...	600	Petrol	2018	5	marutisuzuki-vitara-brezza-right-front-three-quart...	marutisuzuki-vitara-brezza-rear-view37.jpg	marutisuzuki-vitara-brezza-dashboard10.jpg

## CHAPTER 3

# DESIGN

### 3.1 System architecture



#### 3.1 System Architecture of Car Rental Management System

The above figure describes the system architecture of Car Rental Management System. It describes how a user uses a system to accomplish a particular goal. System Architecture help ensure that the correct system is developed by capturing the requirements from the user's point of view.

The Car Rental Management System has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardship faced by this exiting system. Moreover this system is designed for the particular need of the company to carry out operations in a smooth and effective manner.

The application is reduced as much as possible to avoid errors while entering the data. It also provides error message while entering invalid data. No formal knowledge is needed for the user to use this system. Thus by this all it proves it is user-friendly.

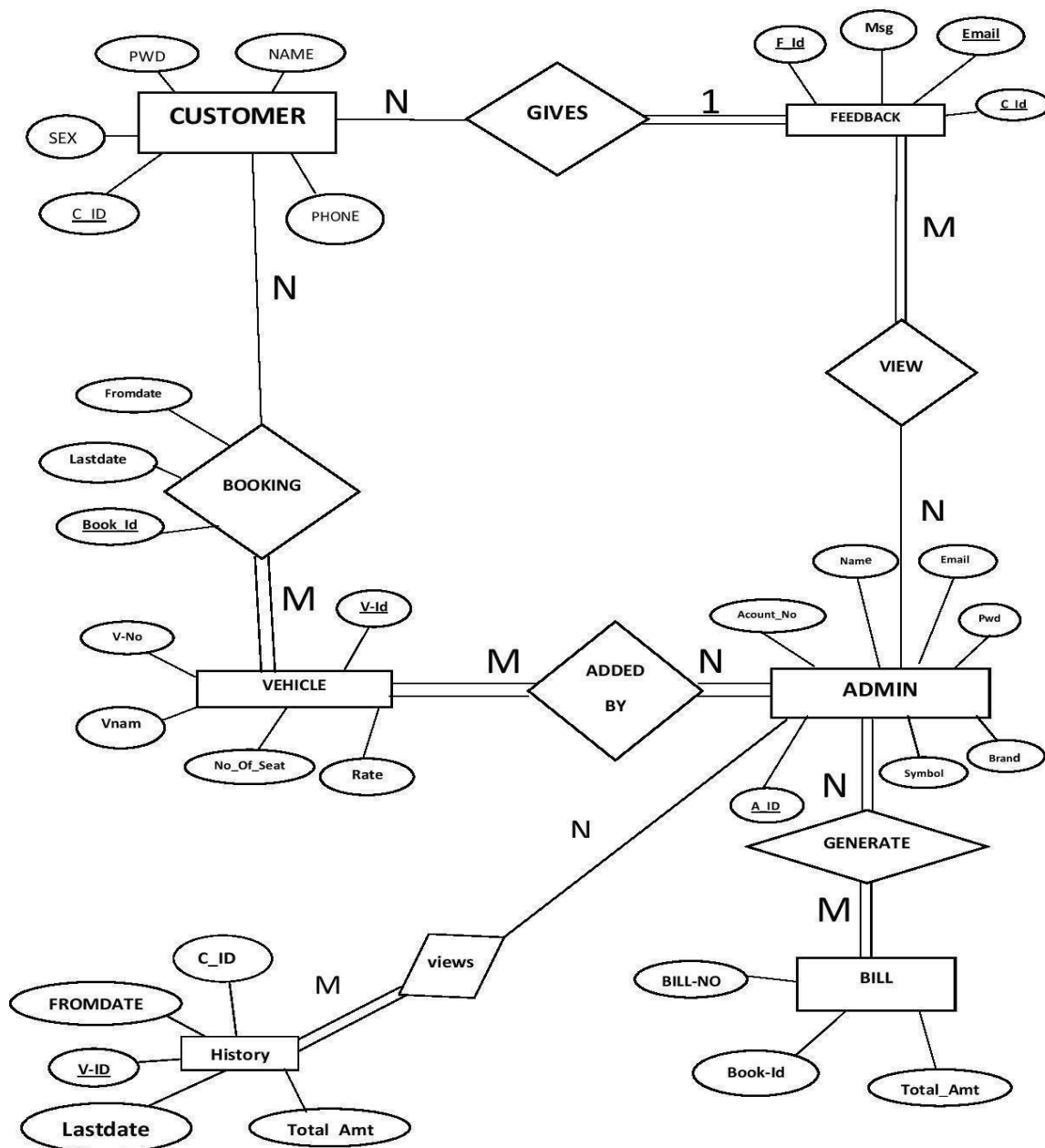
Car Rental management system is developed to produce a web-based system that allow customer to register and reserve car online and for the company to effectively manage their car rental business and to ease customer's task whenever they need to rent a car.

A System Architecture is a standardized set of concepts, practices, and criteria for dealing with a common type of problem, which can be used as a reference to help us approach and resolve new problems of a similar nature.

The aim of System Architecture is to provide a common structure so that developers don't have to redo it from scratch and can reuse the code provided. In this way, frameworks allows us to cut out much of the work and save a lot of time.

### **3.2 ENTITY RELATIONSHIP DIAGRAM**

An entity-relationship model describes inter-related things of interest in specific domain of knowledge. An ER module is composed of entity types and specifies relationships that can exist between instances of those entity types. It is a data modeling technique that graphically illustrates an information systems entities and the relationship between those entities.



**Fig 3.2 ER DIAGRAM-CAR RENTAL MANAGEMENT SYSTEM**

### 3.3 SCHEMA DIAGRAM

A database schema is a skeleton structure that represents the logical view of the entire database. It defines tables, views and integrity constraints.

Car Rental Management System:

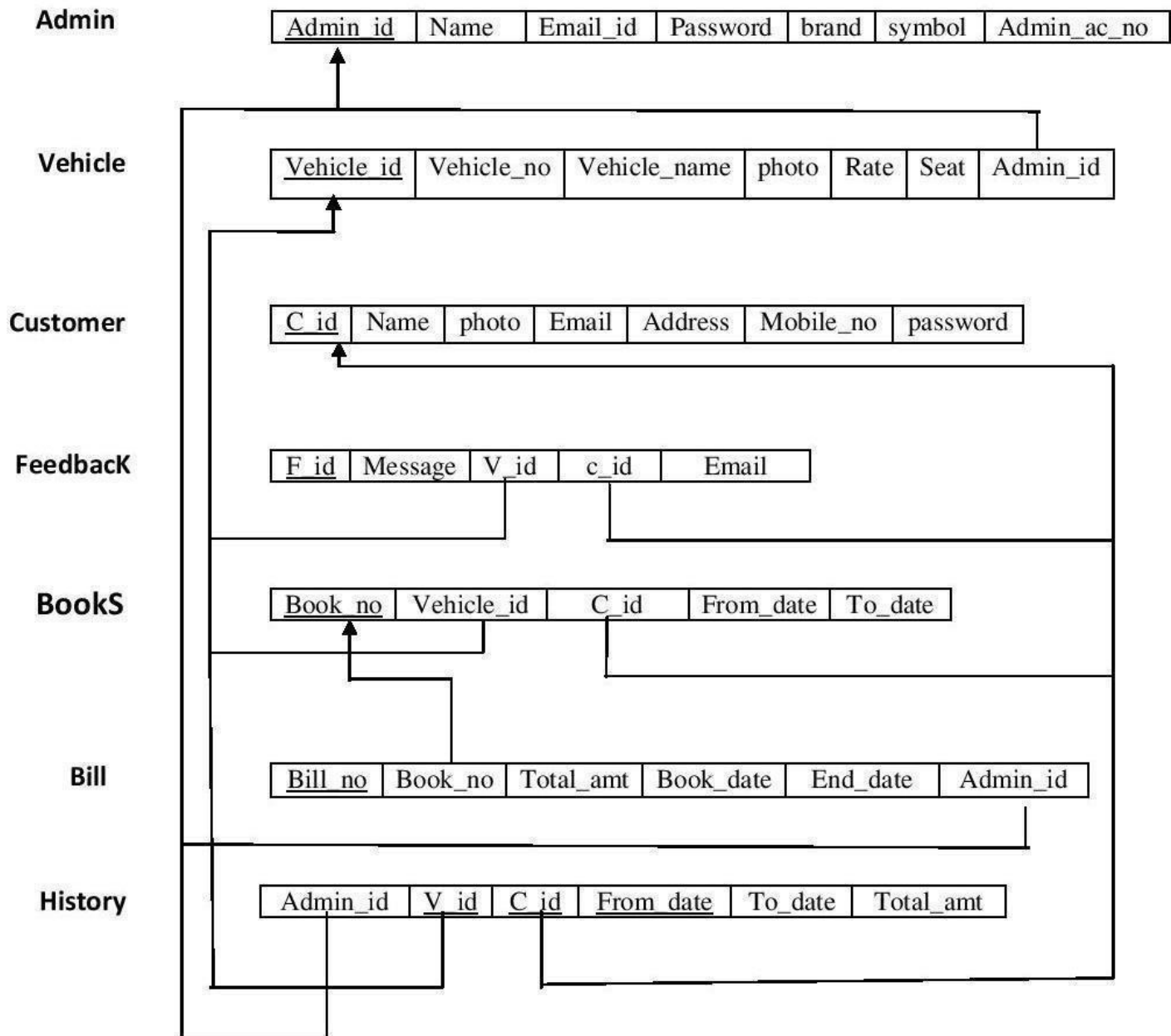


Fig 3.3 Schema diagram of car rental management system

## CHAPTER 4

# HARDWARE AND SOFTWARE REQUIREMENTS

### 4.1 FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

#### 4.1.1 Functional Requirements Requirement

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:

- Customer's registration: The system should allow new users to register online and generate membership card.
- Online reservation of cars: Customers should be able to use the system to make booking and online reservation.
- 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.
- Feedbacks to customers: It should provide means for customers to leave feedback.

#### 4.1.2 Non-Functional Requirements

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

They are:

- **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.
- **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.
- **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.
- **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.
- **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.

#### **4.1.1.1 SECURITY REQUIREMENTS**

Some of the factors that are identified to protect the software from accidental or malicious access, use, modification, destruction, or disclosure are described below.

- Ascertain functions to different modules
- Restrict communication between areas of the program
- Check data integrity for critical variables
- A later version of the software will incorporate encryption techniques in the user/license authentication process

- Communication needs to be restricted when the application is validating the user or license.

## **4.2 HARDWARE REQUIREMENTS**

- A desktop or laptop with a proper internet connection.
- 2 50GB or 60GB of the hard disk
- 3.4GB 8GB of the RAM
- 4 Windows 7 or 8 or 10 Operating system.

## **4.3 SOFTWARE REQUIREMENTS**

### **4.3.1 SERVER SIDE**

1. Programming language: PHP 5.6.31
2. Web Server: Apache 2.4.27
3. Database: SQL 5.7.19

### **4.3.2 CLIENT SIDE**

1. Programming language: JAVASCRIPT, HTML, CSS
2. OS: windows7/8/10
3. MYSQL server

#### **4.3.1.1 PHP**

PHP is a server-side scripting language designed primarily for web development but also used as a general programming language PHP code may be embedded into HTML or HTML5 markup or it can be used in combination with various web template systems, web content management systems, and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server. The web server software combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated webpage.[1]



#### **4.3.1.2 WEB SERVER:**

APACHE Apache is the most widely used web server software. Developed and maintained by Apache Software Foundation, Apache is open-source software available for free. It runs on 67% of all web servers in the world. It is fast, reliable, and secure. It can be highly customized to meet the needs of many different environments by using extensions and modules. Most WordPress hosting providers use Apache as their web server software. However, WordPress can run on other web server software as well.[2]

#### **4.3.1.3 HTML**

HTML is an acronym that stands for HyperText Markup Language.

HyperText: HyperText simply means "Text within Text". A text has a link within it, is a hypertext. Every time you click on a word that brings you to a new webpage, you have clicked on a hypertext.

Markup language: A markup language is a programming language that is used to make text more interactive and dynamic. It can turn a text into images, tables, links, etc. An HTML document is made of many HTML tags and each HTML tag contains different content.[3]

#### **4.3.1.4 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 objectoriented capabilities.[4]

## CONCLUSION

Car rental business has emerged with a new goodies compared to the past experience where every activity concerning car rental business is limited to a physical location only. Even though the physical location has not been totally eradicated; the nature of functions and how these functions are achieved has been reshaped by the power of internet. Nowadays, customers can reserve cars online, rent car online, and have the car brought to their door step once the customer is a registered member or go to the office to pick the car.

The web based car rental system has offered an advantage to both customers as well as Car Rental Company to efficiently and effectively manage the business and satisfies customers' need at the click of a button

## REFERENCES

### Books:

- Software Engineering - R.S. Pressman
- PHP For Dummies
- PHP Beginners Guide By McGrawhill Publication
- Javascript By McGrawhill Publication

### Links:

- <http://www.carrentingsolutions.com/>
- <http://www.flashvortex.com/>
- [http://www.imscart.com/car\\_rental\\_software.html](http://www.imscart.com/car_rental_software.html)
- Wikipedia.org
- [www.w3schools.com](http://www.w3schools.com)

## APPENDIX 'A'- CODE SNIPPETS

### A.1 DATABASE CONNECTION

This is for database connection.

```
SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
SET AUTOCOMMIT = 0;
START TRANSACTION;
SET time_zone = "+00:00";

/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
/*!40101 SET NAMES utf8mb4 */;

--
-- Database: `carrental`
```

**Fig A.1 Database Connection**

### A.2 INSERT QUERY

This query is used to insert a new users.

```
INSERT INTO `tblusers` (`id`, `FullName`, `EmailId`, `Password`, `ContactNo`, `dob`, `Address`, `City`, `Country`,  
`RegDate`, `UpdationDate`) VALUES  
(1, 'Test', 'test@gmail.com', 'f925916e2754e5e03f75dd58a5733251', '6465465465', '', '159 1st Phase Bhanashankari  
Bangalore', 'Bangalore', 'India', '2022-01-07 14:00:49',  
'2022-01-12 05:44:29');
```

**Fig A.2 Insert Query**

### A.3 DELETE QUERY

This query is to delete the vehicles.

```
1 <?php
2 session_start();
3 error_reporting(0);
4 include('includes/config.php');
5 if(strlen($_SESSION['alogin'])==0)
6 {
7 header('location:index.php');
8 }
9 else{
10
11 if(isset($_REQUEST['del']))
12 {
13 $delid=intval($_GET['del']);
14 $sql = "delete from tblvehicles WHERE id=:delid";
15 $query = $dbh->prepare($sql);
16 $query -> bindParam(':delid',$delid, PDO::PARAM_STR);
17 $query -> execute();
18 $msg="Vehicle record deleted successfully";
19 }
20 }
```

Fig A.3 Delete Query

### A.4 UPDATE QUERY

This query is to update the contact info.

```
1 <?php
2 session_start();
3 error_reporting(0);
4 include('includes/config.php');
5 if(strlen($_SESSION['alogin'])==0)
6 {
7 header('location:index.php');
8 }
9 else{
10 // Code for change password
11 if(isset($_POST['submit']))
12 {
13 $address=$_POST['address'];
14 $email=$_POST['email'];
15 $contactno=$_POST['contactno'];
16 $sql="update tblcontactusinfo set Address=:address,EmailId=:email,ContactNo=:contactno";
17 $query = $dbh->prepare($sql);
18 $query->bindParam(':address',$address,PDO::PARAM_STR);
19 $query->bindParam(':email',$email,PDO::PARAM_STR);
20 $query->bindParam(':contactno',$contactno,PDO::PARAM_STR);
21 $query->execute();
22 $msg="Info Updated successfully";
23 }
24 ?>
```

Fig A.4 Update Query

## APPENDIX ‘B’– SCREENSHOTS

### B.1 Home Window

This is the first window when application is executed.

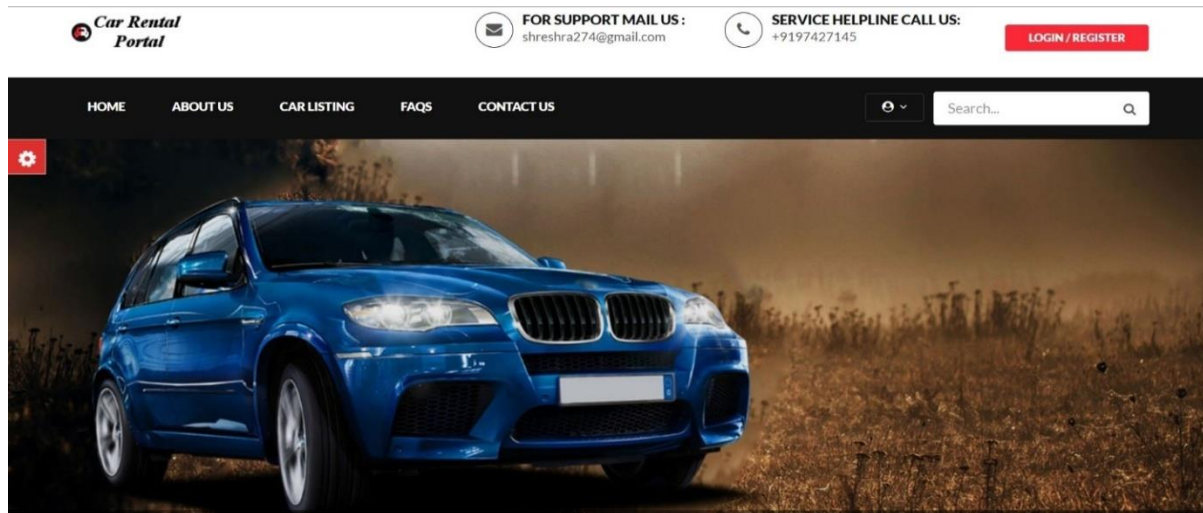


Fig B.1 Home page

### B.2 Registration Page

This page is to register.

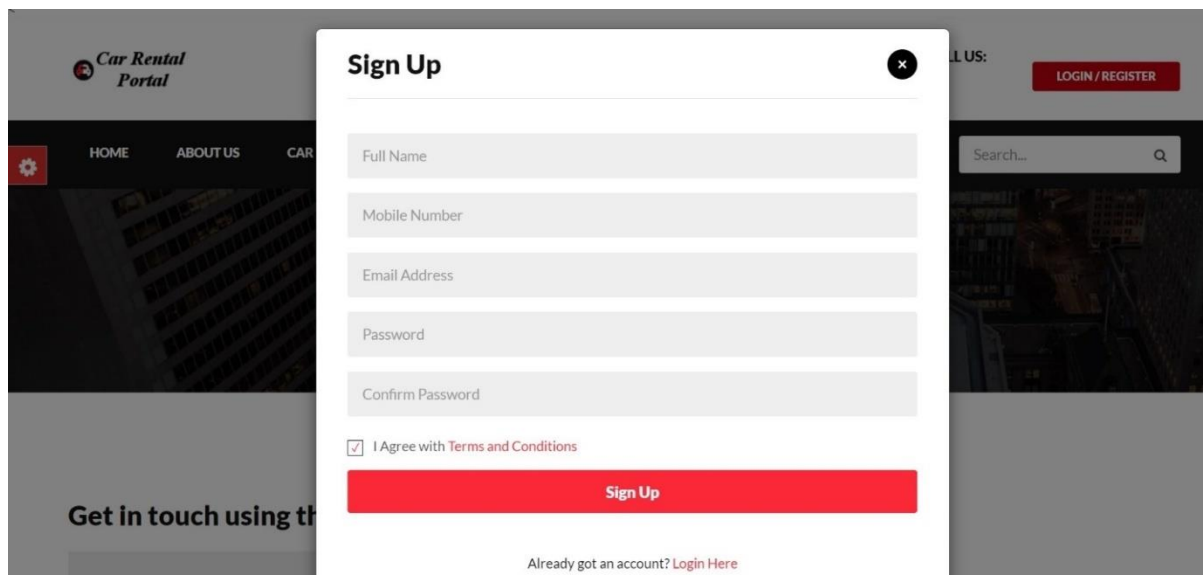


Fig B.2 Registration page

## B.3 Profile Settings

The user can edit his/her profile.

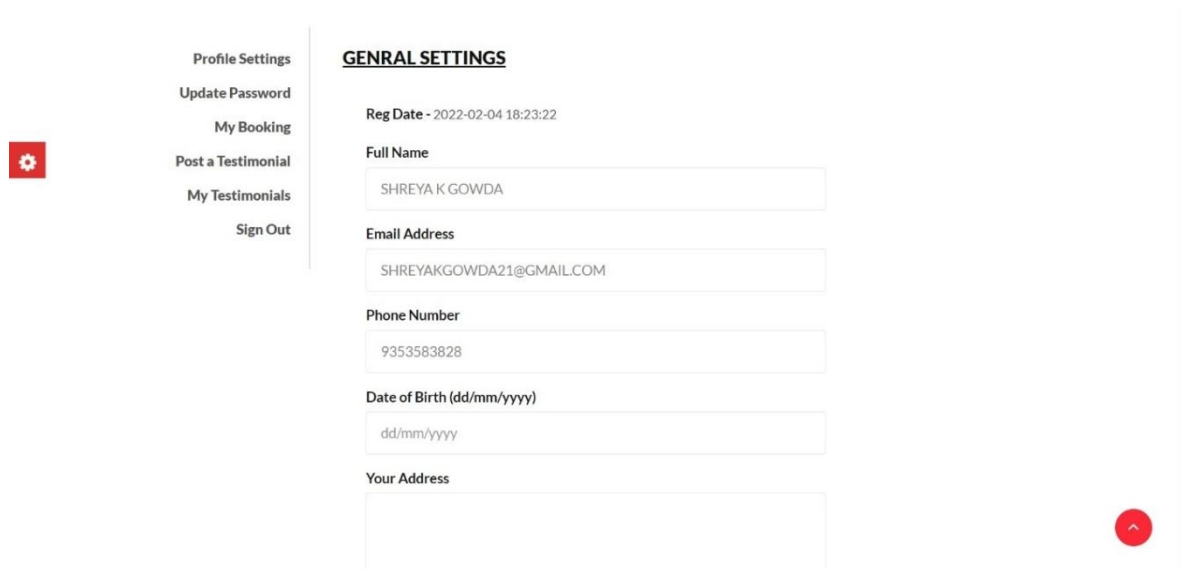


Fig B.3 profile settings

## B.4 Car Listing page

It shows the list of cars for booking.

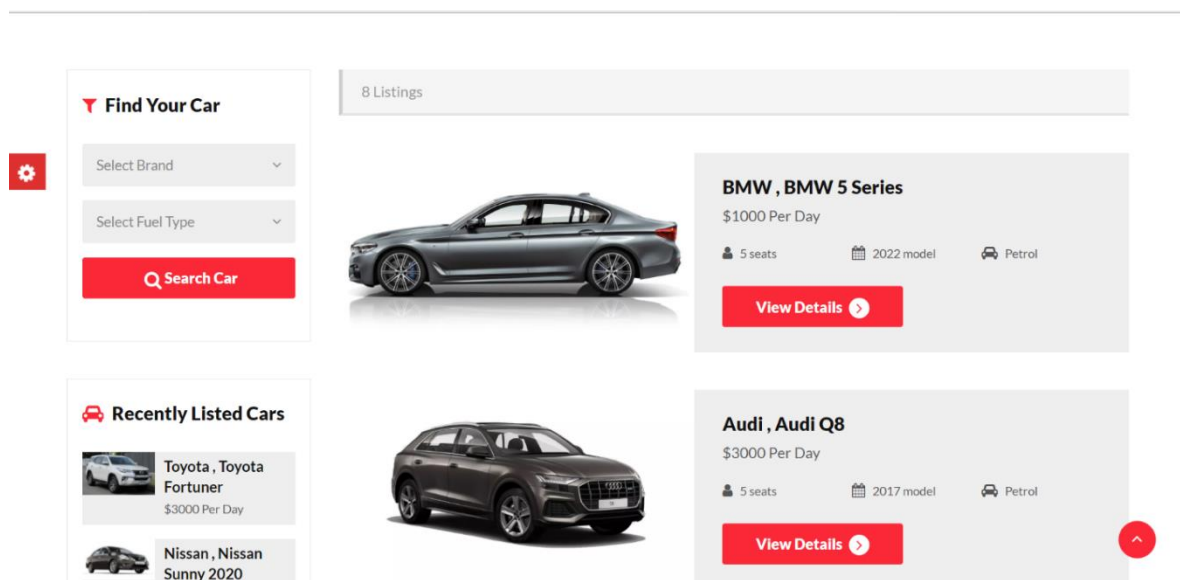


Fig B.4 car listing

## B.5 Booking

It take in the the entry of your booking details.

The screenshot shows a web interface for booking a car. At the top, there are three cards: '2022 Reg Year', 'Petrol Fuel Type', and '5 Seats'. Below these is a 'Vehicle Overview' tab with text about BMW 5 Series prices. To the right is a 'Book Now' form with fields for 'From Date', 'To Date', and 'Message', and a 'LOGIN FOR BOOK' button. A share bar is at the top right.

Fig B.5 Booking

## B.6 Booking Details and conformation

Updates of the booking and weather the vehicle booking is confirmed or not is shown.

The screenshot shows the 'Booking Details' page in an admin panel. It includes a sidebar with navigation links like Dashboard, Brands, Vehicles, Bookings, etc. The main content area displays user details (Name, Email, Contact No., Address, City, Country) and booking details (Vehicle Name, Booking Date, From Date, To Date, Total Days, Rent Per Days, Grand Total). At the bottom, there are 'Confirm Booking' and 'Cancel Booking' buttons.

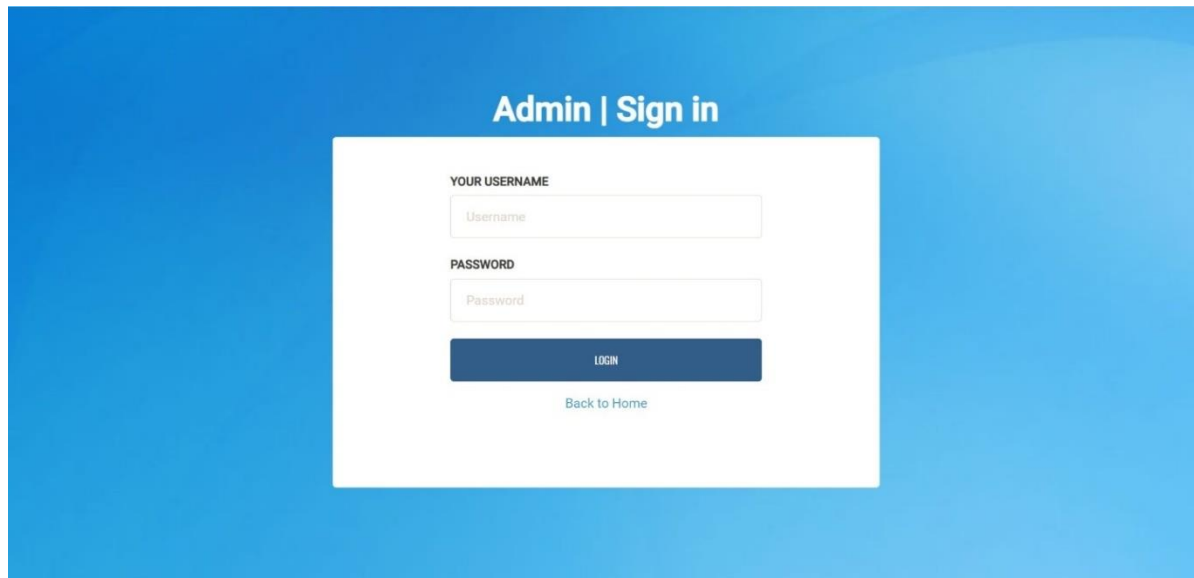
# Booking Details			
User Details			
Booking No.	#	Name	SHREYA K GOWDA
Email Id	SHREYAKGOWDA21@GMAIL.COM	Contact No	9353583828
Address		City	
Country			
Booking Details			
Vehicle Name	BMW , BMW 5 Series	Booking Date	2022-02-07 22:10:15
From Date	2022-02-08	To Date	2022-02-12
Total Days	4	Rent Per Days	1000
Grand Total			4000
Booking Status	Not Confirmed yet		Last pdation Date

Fig B.6 Booking details and conformation.



## B.7 Admin side login page

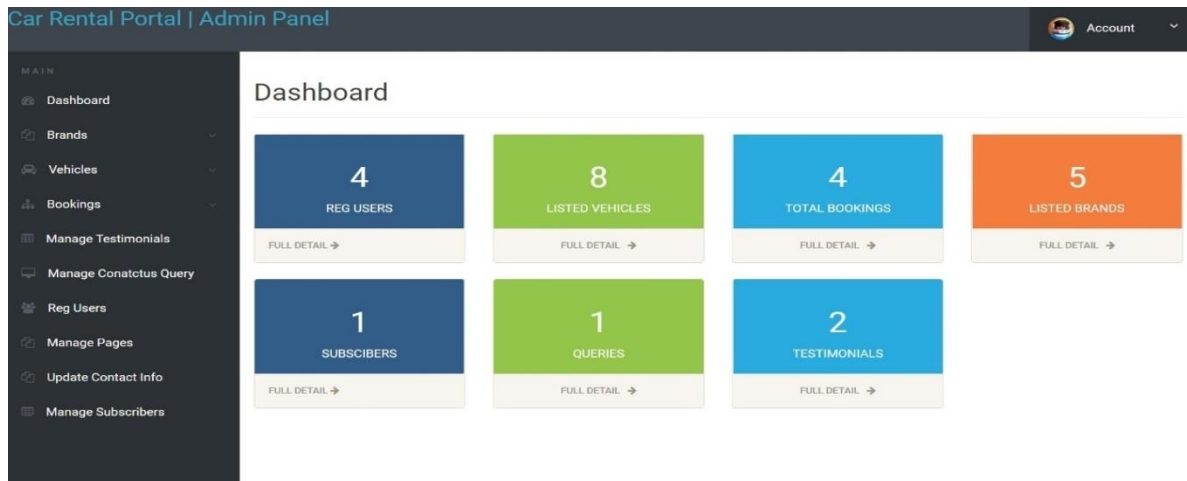
Admin side of the login page.



**Fig B.7 admin side login page**

## B.8 Admin pannel

Overall managing details of the entries and queries taking place in the system is given.



**Fig B.8 Admin pannel**

## B.9 Listed Cars

The total vehicles present for booking in given.

**Manage Vehicles**

VEHICLE DETAILS

Show 10 entries Search:

#	Vehicle Title	Brand	Price Per day	Fuel Type	Model Year	Action
1	BMW 5 Series	BMW	1000	Petrol	2022	<a href="#">Edit</a> <a href="#">Delete</a>
2	Audi Q8	Audi	3000	Petrol	2017	<a href="#">Edit</a> <a href="#">Delete</a>
3	Nissan Kicks	Nissan	800	Petrol	2020	<a href="#">Edit</a> <a href="#">Delete</a>
4	Nissan GT-R	Nissan	2000	Petrol	2019	<a href="#">Edit</a> <a href="#">Delete</a>
5	Nissan Sunny 2020	Nissan	400	CNG	2018	<a href="#">Edit</a> <a href="#">Delete</a>
6	Toyota Fortuner	Toyota	3000	Petrol	2021	<a href="#">Edit</a> <a href="#">Delete</a>
#	Vehicle Title	Brand	Price Per day	Fuel Type	Model Year	Action

Showing 1 to 6 of 6 entries

PREVIOUS 1 NEXT

**Fig B.9 Listed Cars**

## B.10 Car upload

New cars available of renting are uploaded in this website with there images features, and capacity ie overall details of the car.

**Car Upload Form**

Vehicle Title\*

Select Brand\*

Vehical Overview\*

Price Per Day(in USD)\*

Select Fuel Type\*

Model Year\*

Seating Capacity\*

**Upload Images**

Image 1\*  No file chosen

Image 2\*  No file chosen

Image 3\*  No file chosen

Image 4\*  No file chosen

Image 5  No file chosen

**Fig B.10 Car upload**

## B.11 Booking conformation

The conformation for the booking is given according the dates and availability checking.

The screenshot shows the 'Car Rental Portal | Admin Panel' interface. On the left is a sidebar menu with options: Dashboard, Brands, Vehicles, Bookings, Manage Testimonials, Manage Contactus Query, Reg Users, Manage Pages, Update Contact Info, and Manage Subscribers. The main content area is titled '# Booking Details' and contains a form with the following data:

User Details			
Booking No.	#	Name	SHREYA K GOWDA
Email Id	SHREYAKGOWDA21@GMAIL.COM		Contact No
Address			City
Country			
Booking Details			
Vehicle Name	BMW , BMW 5 Series	Booking Date	2022-02-07 22:10:15
From Date	2022-02-08	To Date	2022-02-12
Total Days	4	Rent Per Days	1000
Grand Total			4000
Booking Status	Not Confirmed yet		Last pdation Date

At the bottom of the form are two buttons: 'Confirm Booking' (blue) and 'Cancel Booking' (red).

Fig B.11 Booking conformation

## B.12 Testimonials

Customer opnion for the services is given here.

The screenshot shows a user profile page for SHREYA K GOWDA. On the left is a sidebar menu with options: Profile Settings, Update Password, My Booking, Post a Testimonial, My Testimonials, and Sign Out. The main content area is titled 'MY TESTIMONIALS' and displays a testimonial from SHREYA K GOWDA, who is associated with the 'Autospot' brand (indicated by a car icon). The testimonial text is 'the service is very good' and was posted on '2022-02-07 22:13:40'. A status box indicates 'Waiting for approval'.

Fig B.12 Testimonial

## B.13 Create Brands

New brand of cars can be uploaded here and left for filtering while renting the cars making it easy for the customers to search according to there needs.

Car Rental Portal | Admin Panel

Account

MAIN

- Dashboard
- Brands
- Create Brand
- Manage Brands
- Vehicles
- Bookings
- Manage Testimonials
- Manage Conatctus Query
- Reg Users
- Manage Pages
- Update Contact Info
- Manage Subscribers

### Create Brand

CREATE BRAND

Brand Name

Submit

Fig B.13 Brands

## B.14 Registered users

When products are bought transaction details are asked for the payment to be done.

Car Rental Portal | Admin Panel

Account

MAIN

- Dashboard
- Brands
- Vehicles
- Bookings
- Manage Testimonials
- Manage Conatctus Query
- Reg Users
- Manage Pages
- Update Contact Info
- Manage Subscribers

### Registered Users

REG USERS

Show 10 entries

Search:

#	Name	Email	Contact no	DOB	Address	City	Country	Reg Date
1	Test	test@gmail.com	6465465465		L-890, Gaur City Ghaziabad	Ghaziabad	India	2020-07-07 19:30:49
2	shradha k gowda	shreshra274@gmail.com	9742714522					2022-02-04 12:34:14
3	shrli	123@gmail.com	1234567890					2022-02-04 12:46:49
4	SHREYA K GOWDA	SHREYAKGOWDA21@GMAIL.COM	9353583828					2022-02-04 18:23:22

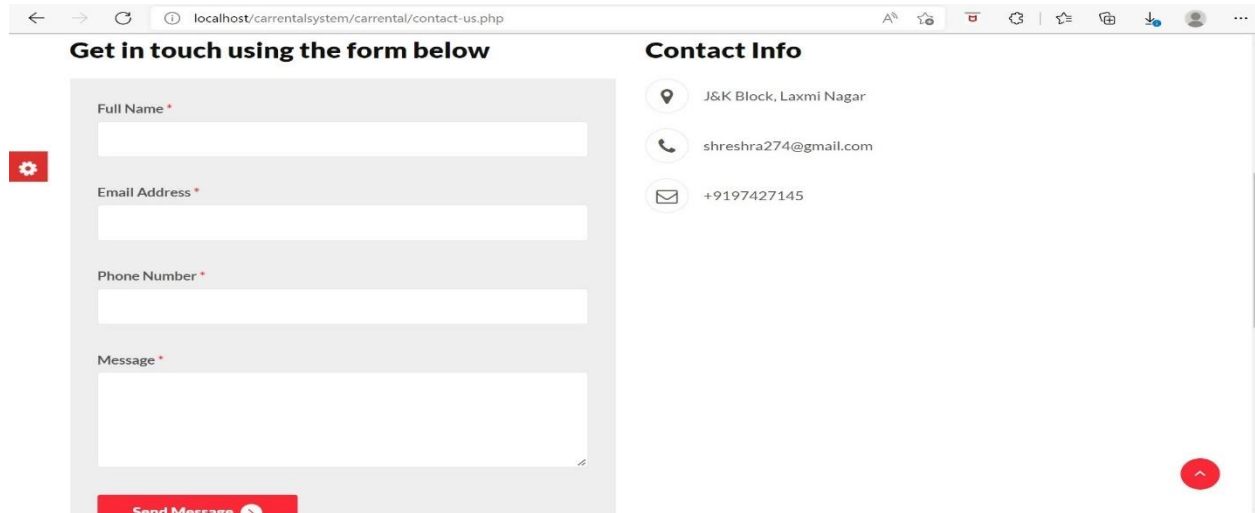
Showing 1 to 4 of 4 entries

PREVIOUS 1 NEXT

Fig B.14 Registered users

## B.15 Contact info

Any clarification personally during emergency or queries the customer can contact us.

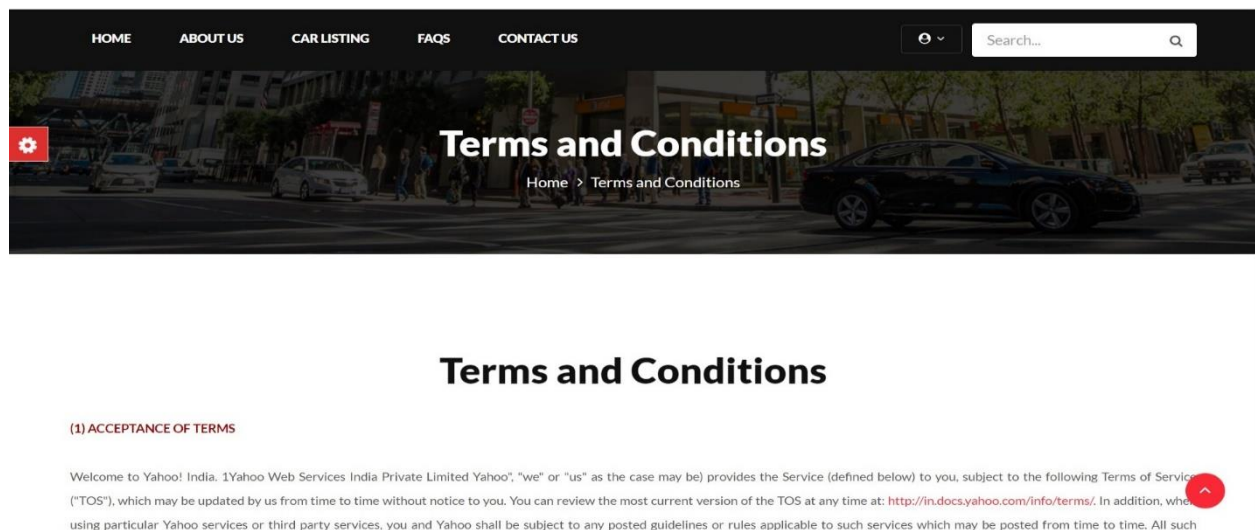


The screenshot shows a web browser window with the URL `localhost/carrentalsystem/carrental/contact-us.php`. The page is titled "Contact Info". On the left, under the heading "Get in touch using the form below", there is a form with four input fields: "Full Name", "Email Address", "Phone Number", and "Message". A red "Send Message" button is at the bottom of the form. On the right, under the heading "Contact Info", there are three contact details: "J&K Block, Laxmi Nagar", "shreshra274@gmail.com", and "+9197427145". A red "Up" arrow button is in the bottom right corner.

Fig B.15 Contact info

## B.16 Terms and conditions

The total policy terms and conditions are present here.



The screenshot shows a web browser window displaying the "Terms and Conditions" page. The header is dark with navigation links: HOME, ABOUT US, CAR LISTING, FAQs, CONTACT US. A search bar is on the right. The main content area features a large image of a car on a street with the title "Terms and Conditions" and a breadcrumb "Home > Terms and Conditions". Below this, the section "(1) ACCEPTANCE OF TERMS" is visible, followed by a paragraph of text: "Welcome to Yahoo! India. 1Yahoo Web Services India Private Limited Yahoo!, "we" or "us" as the case may be) provides the Service (defined below) to you, subject to the following Terms of Service ("TOS"), which may be updated by us from time to time without notice to you. You can review the most current version of the TOS at any time at: <http://in.docs.yahoo.com/info/terms/>. In addition, when using particular Yahoo services or third party services, you and Yahoo shall be subject to any posted guidelines or rules applicable to such services which may be posted from time to time. All such

Fig B.16 Terms and conditions