

**A WEB BASED APPLICATION ON PARKING SPOT FINDER**

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This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering

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**APRIL 2018**

## APPROVAL

This project titled “**Study, Analysis, Design and Develop a Higher Education Guideline**” submitted by Md. Kamrul Hasan , Autoshi Bintay Islam and Md. Anamul Hasan Inran to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 6<sup>th</sup> May 2018.

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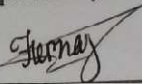
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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Dr. Fernaz Narin Nur**, Assistant Professor, Department of CSE, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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## ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project successfully.

We really grateful and wish our profound our indebtedness to **Farhana Irin, Lecturer,** Department of CSE, Daffodil International University. Deep Knowledge & keen interest of our supervisor in this field to carry out this project. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Dr. Syed Akhter Hossain, Professor and Head,** Department of CSE, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

## ABSTRACT

In our city, parking problems are majorly caused by combination of recent increasing number of motor vehicles with limited amounts of physical parking spots. Parking problems promote unsatisfied motor vehicle drivers communities and residents. Despite multiple mobile applications designed for locating parking spots, it is still an open problem, and the available solutions cannot solve it to the satisfactory level. Our main goal is to finding parking spot (availability) and design a web application for finding parking spots. In order to achieve our goal, we developed and conducted an application which help users to find the nearest parking spot in the least time & to reach their destination through the shortest way possible. Based on the current parking scenario of our city, we developed an innovative parking system that features a web application including mobile application that will save time and reduce traffic jam on the roads, give security, accuracy and reliability to the users and future proposals to support and relieve parking conflicts in our city.

## TABLE OF CONTENT

<b>CONTENS</b>	<b>PAGE</b>
Board of examiners	i
Declaration	ii
Acknowledgements	iii
Abstract	iv

<b>CHAPTER</b>	<b>PAGE</b>
<b>CHAPTER 1: INTRODUCTION</b>	<b>1-2</b>
1.1 Introduction	1
1.2 Motivation	1
1.3 Objectives	2
1.4 Expected Outcome	2
1.5 Report Layout	2
<b>CHAPTER 2: BACKGROUND</b>	<b>3-5</b>
2.1 Introduction	3
2.2 Related Works	3
2.3 Comparative Studies	4
2.4 Scope of the Problem	4
2.5 Challenges	5

<b>CHAPTER 3: REQUIREMENT SPECIFICATION</b>	<b>6-10</b>
3.1 Business Process Modeling	6
3.2 Requirement Collection and Analysis	7
3.3 Use Case Modeling and Description	8
3.4 Logical Data Model	9
3.5 Design Requirements	10
<b>CHAPTER 4: DESIGN SPECIFICATION</b>	<b>11-12</b>
4.1 Front-end Design	11
4.2 Back-end Design	12
4.3 Implementation Requirements	12
<b>CHAPTER 5: IMPLEMENTATION AND TESTING</b>	<b>13-27</b>
5.1 Implementation of Database	13
5.2 Implementation of Front-end Design	14
5.3 Implementation of Interactions	27
<b>CHAPTER 6: CONCLUSION AND FUTURE SCOPE</b>	<b>28-29</b>
6.1 Discussion and Conclusion	28
6.2 Limitations	28
6.3 Scope for Further Developments	28
<b>REFERENCES</b>	<b>30-31</b>

## LIST OF FIGURES

<b>FIGURES</b>	<b>PAGE NO</b>
Figure 3.1: Business process model	6
Figure 3.3: Use Case	8
Figure 3.4: DFD	9
Figure 5.1: Database Implementation	13
Figure 5.2: Implementation tree	14
Figure 5.2.1: Home Page	17
Figure 5.2.2: House Owner Profile	18
Figure 5.2.3: Find Location	19
Figure 5.2.4: Car Owner Profile	20
Figure 5.2.5: Car info	21
Figure 5.2.6: Driver Info	22
Figure 5.2.7: Current Location	23
Figure 5.2.8: Add Location	24
Figure 5.2.9: About	25
Figure 5.2.10: Expertise	26



# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Nowadays parking is one of the difficult and dysfunctional parts of modern life and which is not surprising at all, as it's barely changed for decades or more. Parking Spot Finder is something like a parking reservation service. We partner with garages throughout the country to provide you with a guaranteed parking spot at a low price. We make parking easy for drivers, whilst helping garage or parking owners and operators manage their assets more effectively and efficiently.

To use Parking Spot Finder, you just need to search for parking on our app or website before you arrive, choose the space that works the best for your ride, and book the space. You'll know that there's a certain spot in the garage waiting for you, taking all the stress out of parking so that you can concentrate on the things that matters most. There is no need to drive around looking for your parking spot, just tap or click on the search button and you will get the nearest parking spots based on their distance from your current location.

### 1.2 Motivation

With the advancement in the technology, the number of electronic devices in our day-to-day lives has rapidly increased to make life simpler. So a necessity to construct a Parking Spot Finder that will help drivers to find a parking spot easily, reduce the complexity of the garage owners. It will not only save time but also reduce traffic jam. This project presents a successfully developed website of a Parking Spot Finder application.

Due to the increasing number of vehicles on the roads, traffic problems always exist. The current car parks and transportation facilities are unable to cope with the increasing number of vehicles so it is necessary to have a digital parking management system in big cities. This project is aimed at analyzing a car parking system in big cities. This project will be user-friendly. This system can easily upgraded to an actual parking facility. It will reduce parking vehicles anywhere in road. It helps driver to immediately locate the best parking spot available. It can eliminate the hassle of

circling a garage in search of a parking spot. We think it will reduce traffic jam for parking vehicles anywhere. It will save human resources and time.

### **1.3 Objectives**

The parking spot finder is compatible mainly with concept of smart cities.

The main objectives of our proposed project are as follows:

- To save time
- To get parking spots easily
- To get a source to earn for garage owners
- To reduce unexpected traffic jam on the road
- Safe & reliable option for both driver & garage owner

### **1.4 Expected Outcome**

The expected outcome of this project is to let users find the nearest parking spot in the least time & to reach their destination through the shortest way possible, which will save human resource and time.

### **1.5 Layout of the Report**

- i. Chapter one have demonstrates an introduction to the project with its motivation, objectives and expected outcome.
- ii. Chapter two will have “Background” demonstrates project management phases and project management challenges.
- iii. Chapter three will have requirement specification
- iv. Chapter four will have design specification
- v. Chapter five will have system details and implementation and testing.
- vi. Chapter six will have conclusion, limitation and discuss about future work.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

At first the user needs to get registered as a car owner or garage owner. User have to input his/her name, email, contact number & valid image for registration. The car owner needs to add his car model, license plate number etc. The garage owner has to provide his exact address.

If the user is a car owner, he/she needs to set his current location. Then search for a parking spot & after getting search result he/she needs to choose the nearest parking spot. If the parking spot is available for parking then he/she will confirm it & if the parking spot is not available he/she will have to check for the next one.

On the other side the garage owner has to add his location. It will be visible on the map if the garage is available for parking. For availability green signal will be shown & red for offline. By default there will be a fixed rate per hour for parking. The parking capacity of the garage will also be mentioned by the garage owner.

#### **2.2 Related Works**

There are many applications or system that may have proposed to solve the parking problem or solving the traffic jam issue. In our country, we are getting something similar facilities from apps like ‘Uber’, ‘Pathao’ etc. These apps are mainly used for easy and fast transport with lower cost & better safety purpose. But till now we could not find any suitable app which helps us to find a parking spot easily in our country.[3][4]

Today is the time of technology where people don’t want to go outside without any reason. Time is very precious for us & we don’t want to waste it at all. Instead we love to do our work in online very easily in order to save our time & assets. Thus we came up to this idea to make a web based parking spot finder which is user friendly and it helps us in many ways in our daily life. It is secured, time consuming, accurate, reliable and easy to operate for the users.

## 2.3 Comparative Studies

What makes us think about this project is mainly traffic jam & inappropriate parking in wrong places. The increasing number of vehicles in our city is causing a huge jam in our daily life which is very annoying. Only by following the traffic rules can't solve this problem alone. Therefore we desired to develop this kind of online based parking spot finder app to solve this issue by reducing jam & cost. It saves our time alongside it help owners of the garages to get an extra source to earn. Eventually both the drivers and garage owners are benefited.[6]

This parking spot finder app helps us to find the easiest route to get to the nearest parking spot easily. So if a driver is new to an unknown place & doesn't know the routes properly, this app will be a game changer for him/her. If we utilize the parking spots properly and use them often then it will surely reduce unexpected cause of traffic jam on the roads. Comparative to other apps we'll try to upgrade this with new features to make it more user friendly and detailed. So that it will be easy going to procedure for any type of users. [21]

## 2.4 Scope of the Problem

Few scopes of the problem are given below:

- Social and economic benefit
- Time consuming
- Anytime Anywhere & Any device
- Well protected data
- Break the current chain
- Reduce manpower
- Better life time value
- Security issue for users
- Accuracy
- Reliability
- Easy to operate
- Sufficient information

## 2.5 Challenges

In order to complete this project, we have to face few major challenges. The more challenge we can face successfully, the more precise & accurate outcome our project will provide.

- Assisting drivers to get parking spots for their car easily
- To save time
- To get an extra source to earn for the garage owners
- Reducing unexpected traffic jam on the road
- Safe & reliable option for both driver & garage owner
- Making user-friendly UI for all kind of users

# CHAPTER 3

## REQUIREMENT SPECIFICATION

### 3.1 Business Process Modeling

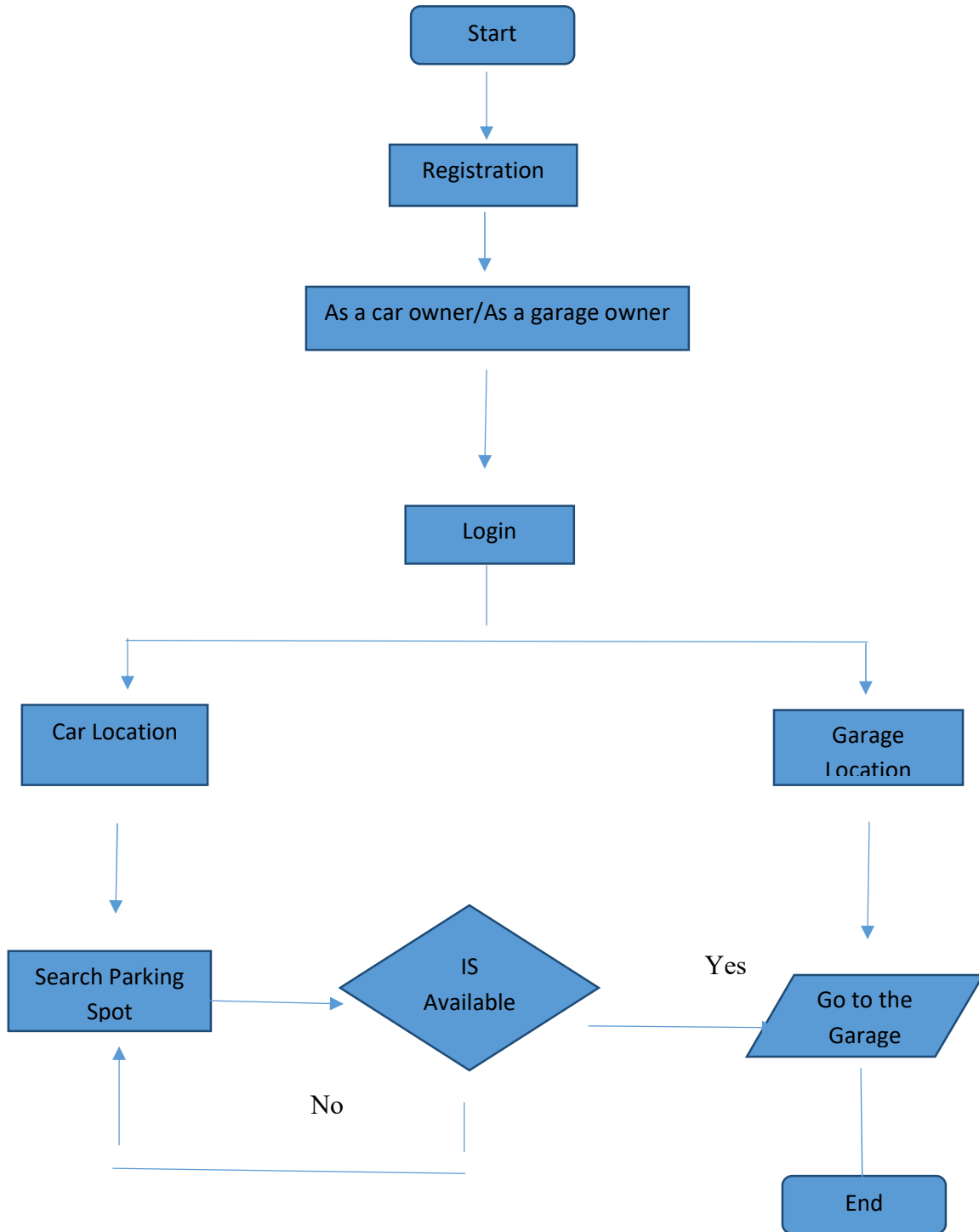


Figure 3.1: Business process model[7]

## 3.2 Requirement Collection and Analysis

### ➤ Software Requirements

To develop this application we used following Software Requirements:

- Operating System: Windows 7, Windows 8, Windows 10.
- System Design: CSS, Bootstrap
- Language: PHP, JavaScript
- Database: PHPMyAdmin, Xampp
- Tools: Sublime text
- Technologies used: Google api

### ➤ Functional Requirements

Graphical User interface (GUI) which gives the application user ease of understanding the application through Wi-Fi or cellular network

### ➤ Database Server:

Server: 127.0.0.1 via TCP/IP

Server type: MariaDB

Server version: 10.1.30-MariaDB - mariadb.org binary distribution

Protocol version: 10

User: root@localhost

Server charset: UTF-8 Unicode (utf8)

### ➤ Web Server:

Apache/2.4.29 (Win32) OpenSSL/1.0.2n PHP/7.1.13

Database client version: libmysql - mysqlnd 5.0.12-dev - 20150407 - \$Id:

b396954eeb2d1d9ed7902b8bae237b287f21ad9e \$ PHP extension:

mysqliDocumentation curlDocumentation mbstringDocumentation PHP version: 7.1.13[8]

### 3.3 Use Case Modeling and Description

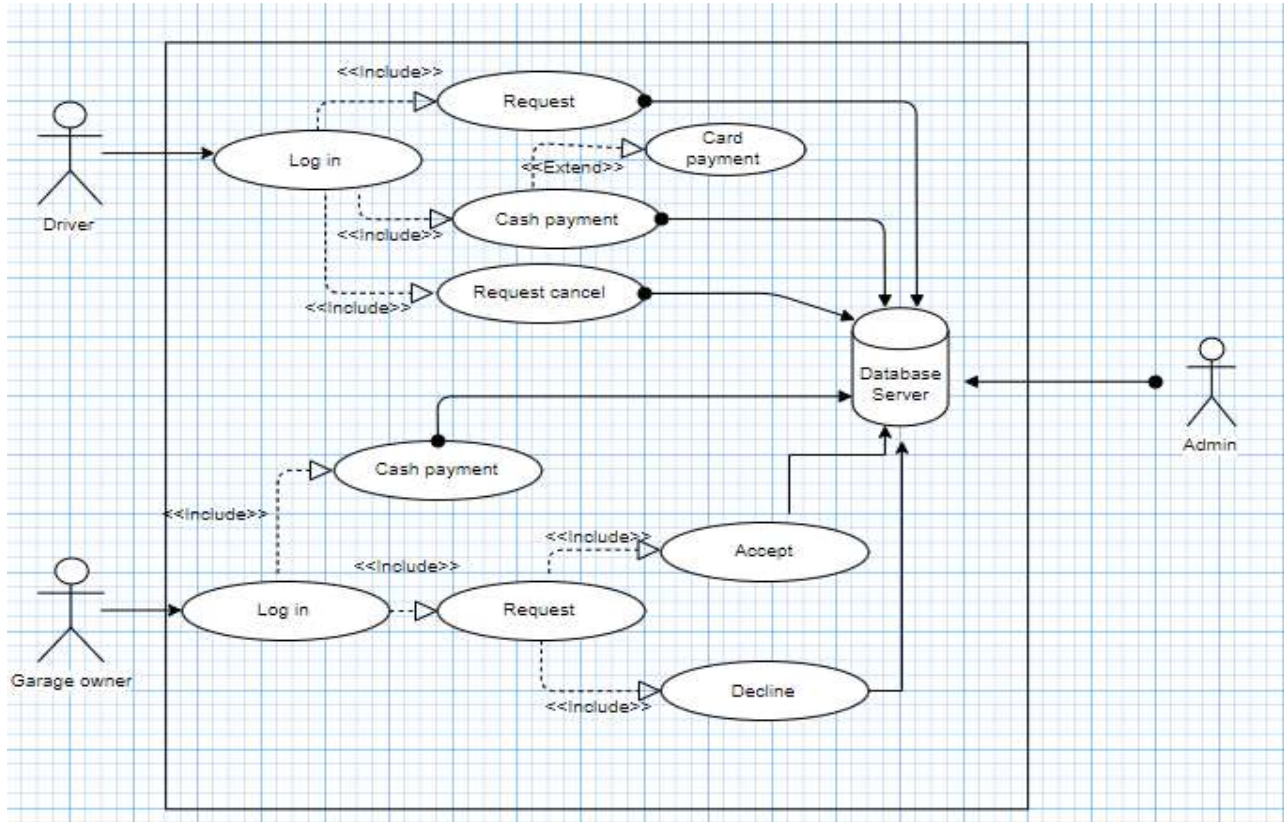


Figure 3.3: Use Case

#### Description:

#### Actors:

1. Driver
2. Garage Owner
3. Admin

**Workflow:** At first the drivers need to get registered and then he can log in to this website by his email and password. Then he can request for a parking spot from his current location or cancel it if needed. He can select payment method after confirming the parking spot for his ride. These info will be updated on the database which is under control of the admin panel.

On the other hand the garage owner has to follow the same principle to use this app. After login he will receive parking request & he can either accept it or reject it. After parking session he'll receive the payment from the driver. [9]



### 3.4 Logical Data Model

Given below the DFD of our parking spot finder project:[10]

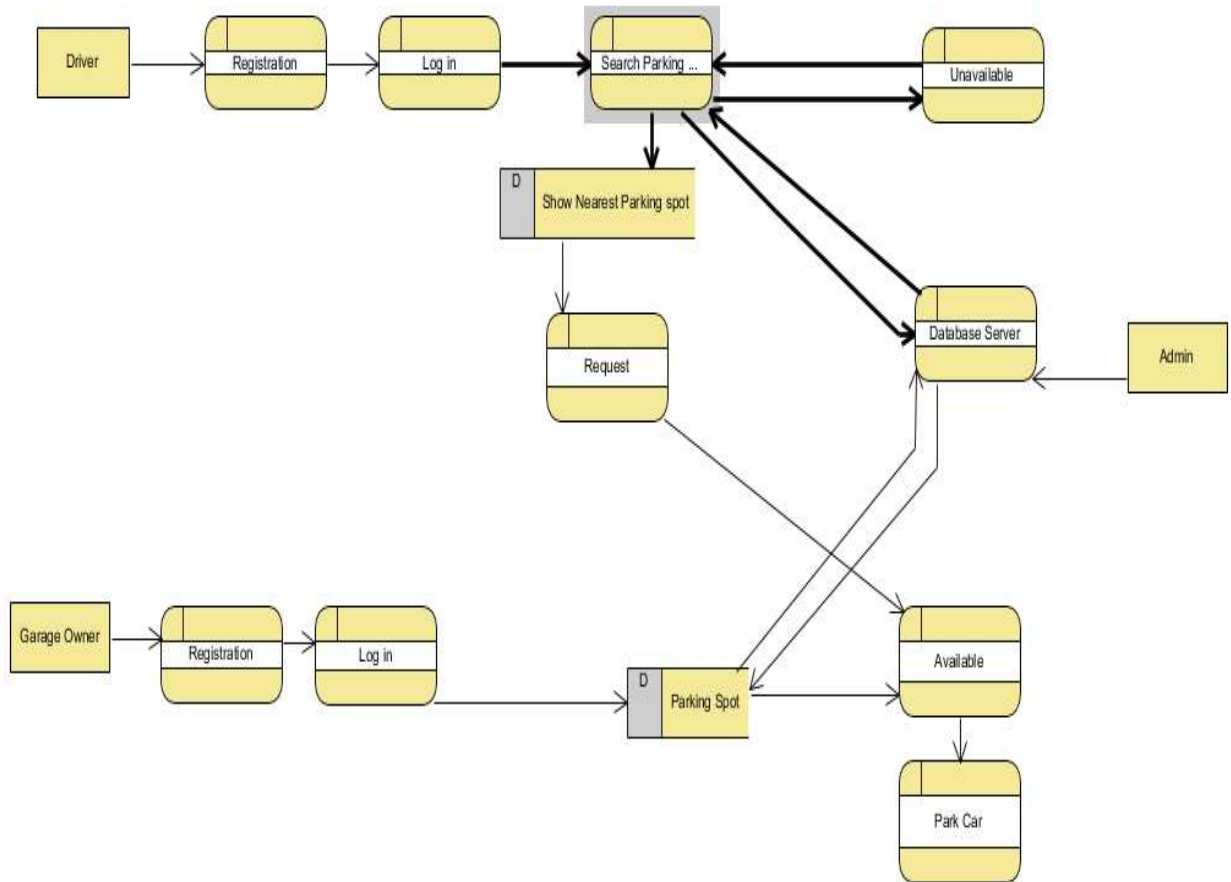


Figure 3.4: DFD

## 3.5 Design Requirements

Design requirements for the Driver:

- Login
- Name
- Address
- District
- City
- Postal code
- Country
- Profile image

Design Requirements for the Garage Owner:

- name
- house address
- district
- city
- postal code
- country
- max car space
- profile image
- parking time

These are the basic design requirements for this project. [11]

## CHAPTER 4

### DESIGN SPECIFICATION

#### 4.1 Front-end Design

The front-end design of our project is mainly done with CSS and Bootstrap.[5] [12]

##### CSS

CSS is a language which describes the style of HTML document. It describes how HTML elements should be displayed.[19]

##### Bootstrap

Bootstrap is one of the most popular HTML, CSS, and JavaScript framework for developing responsive, mobile-first web sites.

- Bootstrap is a free front-end framework for easier and faster web development.
- Bootstrap includes HTML and CSS based design templates for typography, buttons, forms, tables, modals, navigation, image carousels and many other, as well as optional JavaScript plugins.
- Bootstrap also gives you the ability to create responsive design easily.[18]

##### Advantages of Bootstrap:

**Easy to use:** Anyone with just basic knowledge of HTML and CSS can start using Bootstrap.

**Responsive features:** Bootstrap's responsive CSS adjusts to desktops, phones and tablets.

**Mobile-first approach:** In Bootstrap 3, mobile-first styles are part of core framework.

**Browser compatibility:** Bootstrap is compatible with almost all modern browsers (Chrome, Firefox, Internet Explorer, Opera and Safari)

## 4.2 Back-end Design

We have used HTML, PHP and JavaScript for back-end design. [13]

### HTML

With HTML you can create your own Website. HTML is the standard markup language for creating Web pages. HTML stands for Hyper Text Markup Language. HTML describes the structure of Web pages using markup. HTML elements are the building blocks of HTML pages. HTML tags label pieces of content such as "heading", "paragraph", "table", and so on. Browsers do not display the HTML tags, but use them to render the content of the page. [16]

### PHP

PHP is a server scripting language, and a powerful tool for making dynamic and interactive Web pages. PHP is a widely-used, free, and efficient alternative to competitors such as Microsoft's ASP.[15]

### JavaScript

JavaScript is the programming language of HTML and the Web. JavaScript is easy to learn.[17]

## 4.3 Implementation Requirements

To implement this project we need Xampp for PhP and mysql and XML coding. We need Photoshop or Illustrator to design UI/UX. To implement other thing we need is Sublime text or Notepad++ to do html, css, php, javaScript. We need all the tool to work with this project already we have discussed previously.

Minimum Software Requirements for this application are given below:

- Operating System Windows 7, Windows 8, Windows 10
- Sublime text3 or Notepad++ or any advance editor
- XAMPP or WAMP Server

# CHAPTER 5

## IMPLEMENTATION AND TESTING

### 5.1 Implementation of Database

Central database will maintain all the parking spot information. The database will have couple of tables for basic info, car info, car owner, driver info, house owner, and couple other information.

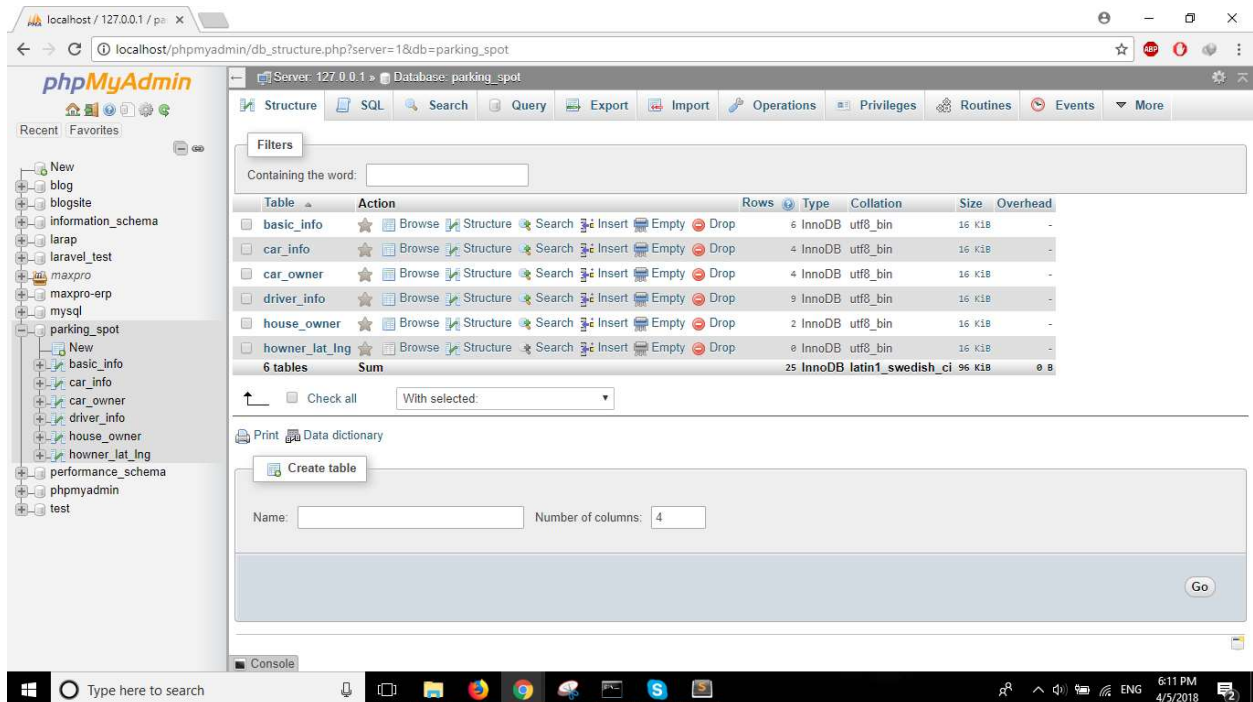


Figure 5.1: Database Implementation

Once a mobile application user opens up the mobile application, the user's current approximated location will be determined and a request is sent to the central database for nearby traffic and parking information. Once the central database receives the location data from the user, the database sends back nearby parking information with owner info as well as parking data back to the mobile device. Once the user receives those data, the mobile device renders those data nicely on a map for the user so that the user can find an appropriate parking spot.

## 5.2 Implementation of Front-end Design

Given below the implementation tree of front-end design for our parking spot finder projet:

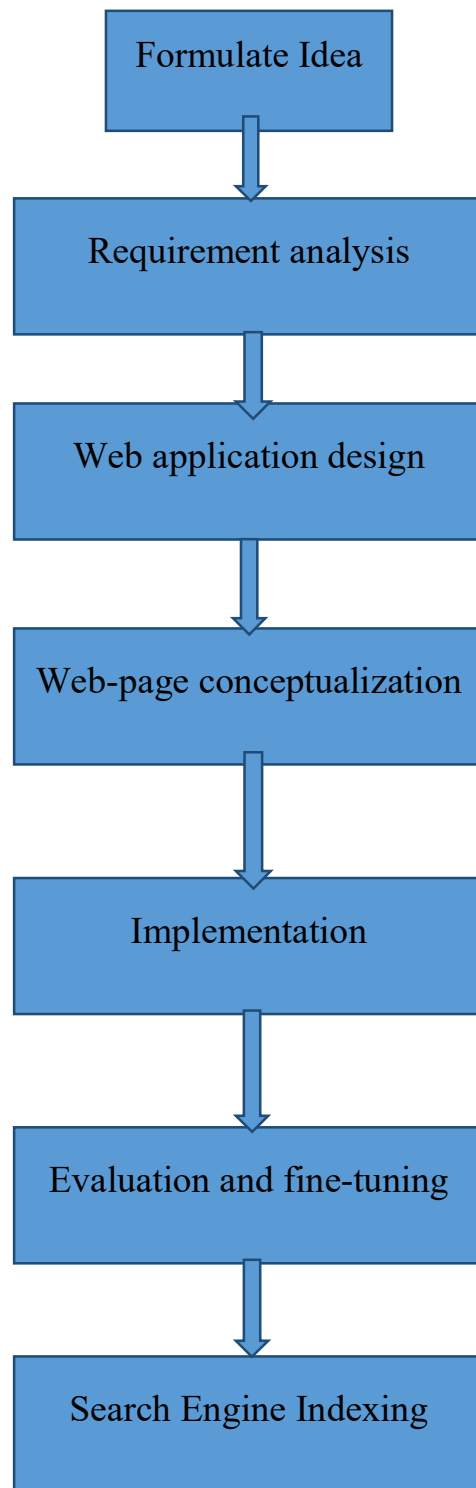


Figure 5.2: Implementation tree[20]

## **Formulate Idea**

Based on the needs analysis, we determined the factors that will best serve the website. We looked at the trends in the market to ensure that you have the latest technology, components and elements. We took time to think out of the box and gave consideration to more than your present day needs so that your website can sustain any upcoming future needs. So finally we've decided to make a website of parking spot finder.

## **Requirement analysis**

The first step for us is to analyze your and your target market's requirements. Who will be visiting our website, what will be the purpose of their visit, what is the primary goal of our website, how can our application draw the best attention to their needs etc. Many such questions are analyzed for the needs analysis stage. To reduce traffic jam & make parking easier for drivers & garage owners we've decided to build this website to make things easier.

## **Web application design**

This work stage represents the point in the project where most of the project team members will be working together to produce design concepts and construct the website. Deliverable for this stage is baseline design.

## **Web page conceptualization**

We consider this stage to be one of the most crucial factors in any project. We justify every single aspect of the design to ensure that each element is serving a specific need and the website is truly designed to attract, retain and enhance the end user-experience. Two type user will be able to use this website by getting registered through few mandatory steps.

## **Implementation**

After getting registered the owner will set availability of the garage & the driver will confirm after searching parking spot from his current location. Owner will set a valid fare for the parking according to time spent.

## **Evaluation and fine-tuning**

Upon receiving User Acceptance Testing signoff from you and based on your feedback, we will do the necessary changes to the website. For user's satisfaction we'll try to make our site faster, smoother & more user friendly.

## **Search Engine Indexing**

Once our website is live, we will submit our website to various search engines and directories for them to index our new website on their servers. We intent do submit our website on the trendy search engines and directories.[1][2]



## Home Page

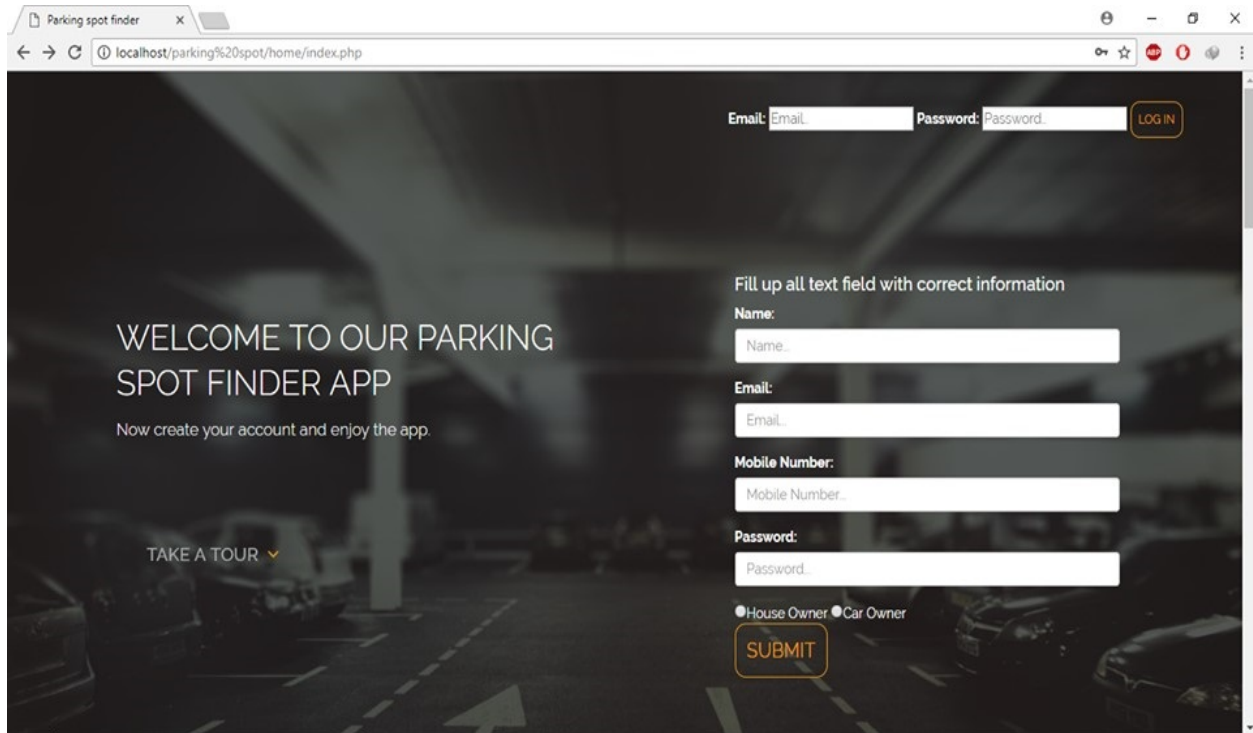


Figure 5.2.1: Home Page

This following picture shows how the homepage of our app actually looks like. It has a log in option for existing users. Simply by inputting his/her Email & password, the user can log in at ease.

For the new users there is a simple way to create an account. They have to submit their name, email, mobile number & password.

After submitting these information the user will be able to use this app according to his/her needs.

## House Owner Profile

The screenshot shows a web application interface for editing a house owner profile. The main content area is titled "Edit Profile" and contains the following form fields:

- NAME: Tanveer
- HOUSE ADDRESS: Gabtoli
- DISTRICT: Dhaka
- CITY: Dhaka
- POSTAL CODE: 1234
- COUNTRY: Bangladesh
- CAR SPACE: 2
- UPLDDE PROFILE IMAGE: Choose File (No file chosen)

A blue "Update Profile" button is located at the bottom right of the form. To the right of the form is a profile card with a profile picture and the following text:

House Owner  
tanveer  
takla@gmail.com

The left sidebar contains navigation links: "INFORMATION", "DASHBOARD", and "HOUSE OWNER PROFILE". The top right of the page shows "User", "Account", and "Log out (tanveer)".

Figure 5.2.2: House Owner Profile

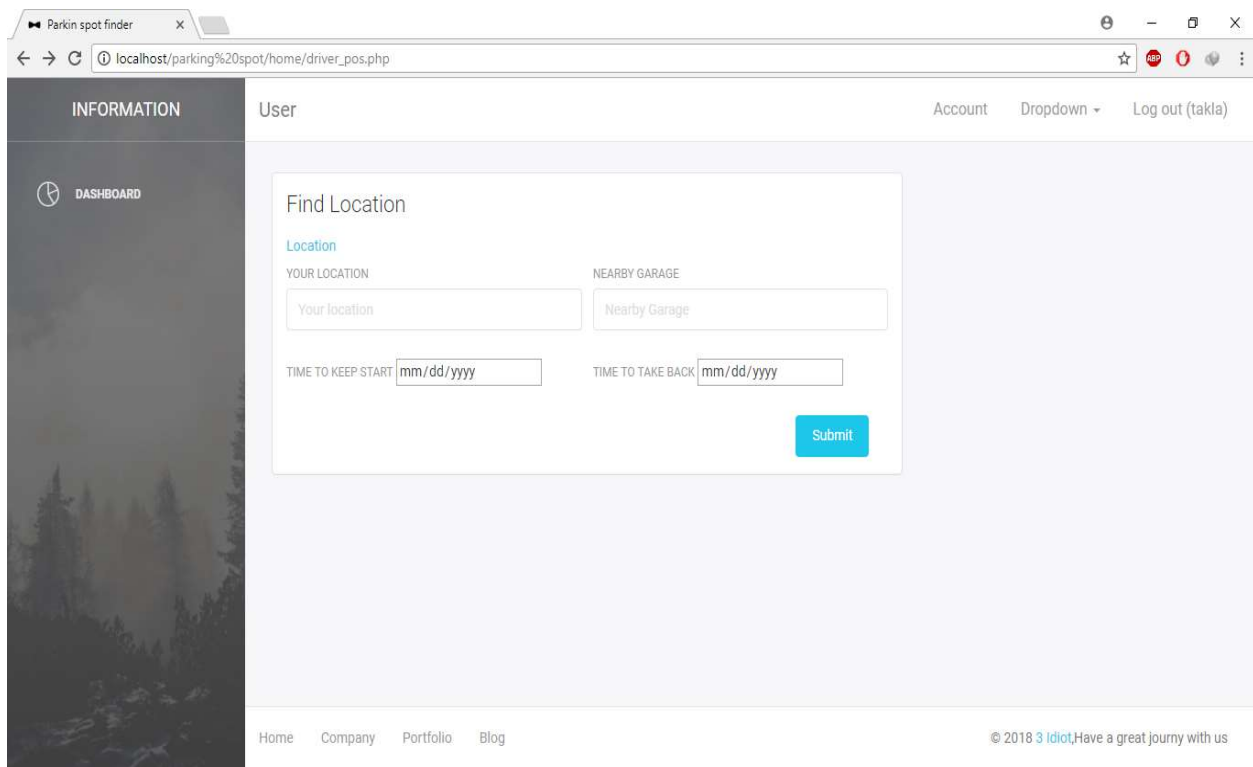
After creating an account, the user can either choose to be an owner of the house or driver of his/her car. For the house owner profile, user needs to fill up a form for his/her profile.

And to do so he/she needs to provide few information like-

- name
- house address
- district
- city
- postal code
- country
- max car space
- profile image
- parking time

After submitting these info the user is ready to use his/her profile as an owner of the house.

## Find Location



The screenshot shows a web browser window with the address bar displaying 'localhost/parking%20spot/home/driver\_pos.php'. The page has a dark sidebar on the left with 'INFORMATION' and 'DASHBOARD' links. The main content area is titled 'Find Location' and contains a form with the following fields:

- YOUR LOCATION:** A text input field labeled 'Your location'.
- NEARBY GARAGE:** A text input field labeled 'Nearby Garage'.
- TIME TO KEEP START:** A date input field with a placeholder 'mm/dd/yyyy'.
- TIME TO TAKE BACK:** A date input field with a placeholder 'mm/dd/yyyy'.

A blue 'Submit' button is located at the bottom right of the form. The page footer includes navigation links for 'Home', 'Company', 'Portfolio', and 'Blog', along with a copyright notice: '© 2018 3 idiot, Have a great journey with us'.

Figure 5.2.3: Find Location

To find a parking spot for the vehicle, the driver needs to log in to this app, then he/she needs to input current location & search for the nearest garage. After getting the result of nearby garages the user needs to pick up a garage by his choice & provide his starting time for parking & also provide the probable departure time from the garage. By providing these conditions, app will check if the garage has available spot for parking. If yes, the driver may proceed to park his car on the selected garage.

## Car Owner Profile

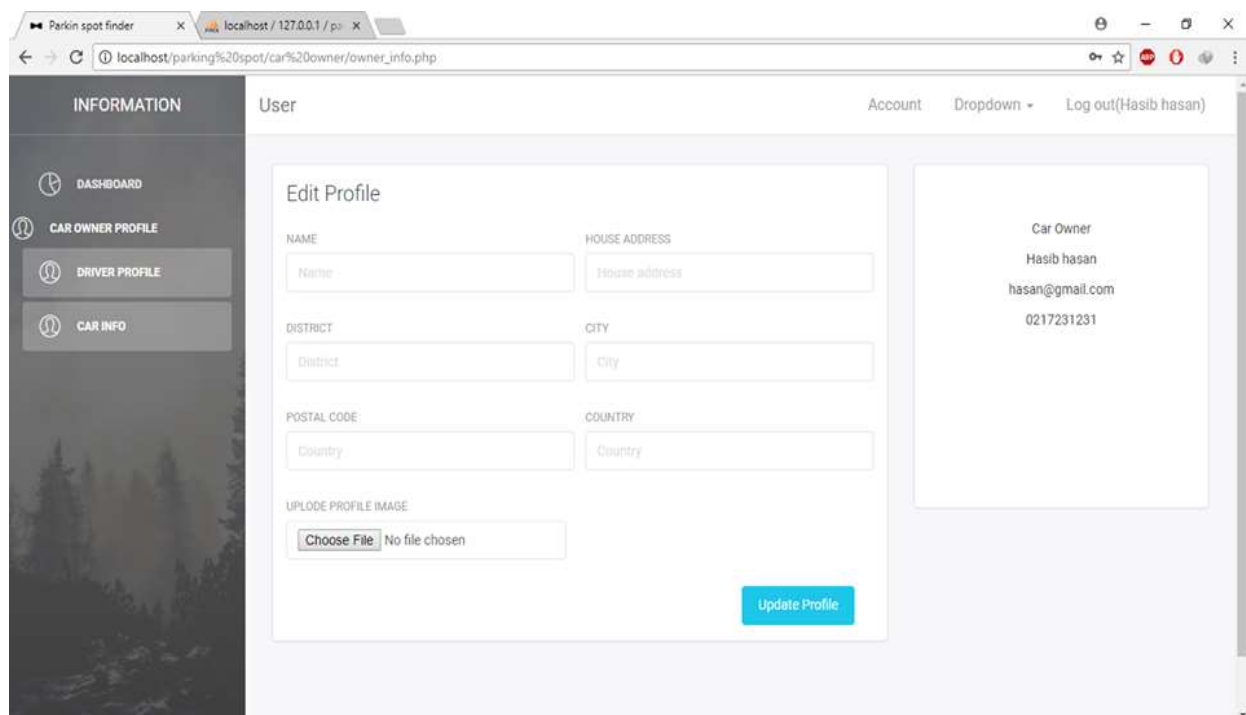


Figure 5.2.4: Car Owner Profile

The 2<sup>nd</sup> category user is the drive. As a result user needs to fill up another form for a driver profile. In this section, user needs to provide information like-

- Name
- Address
- District
- City
- Postal code
- Country
- Profile image

By providing these information, the user is available to use this app through a driver profile & enjoy its facilities.

## Car Info

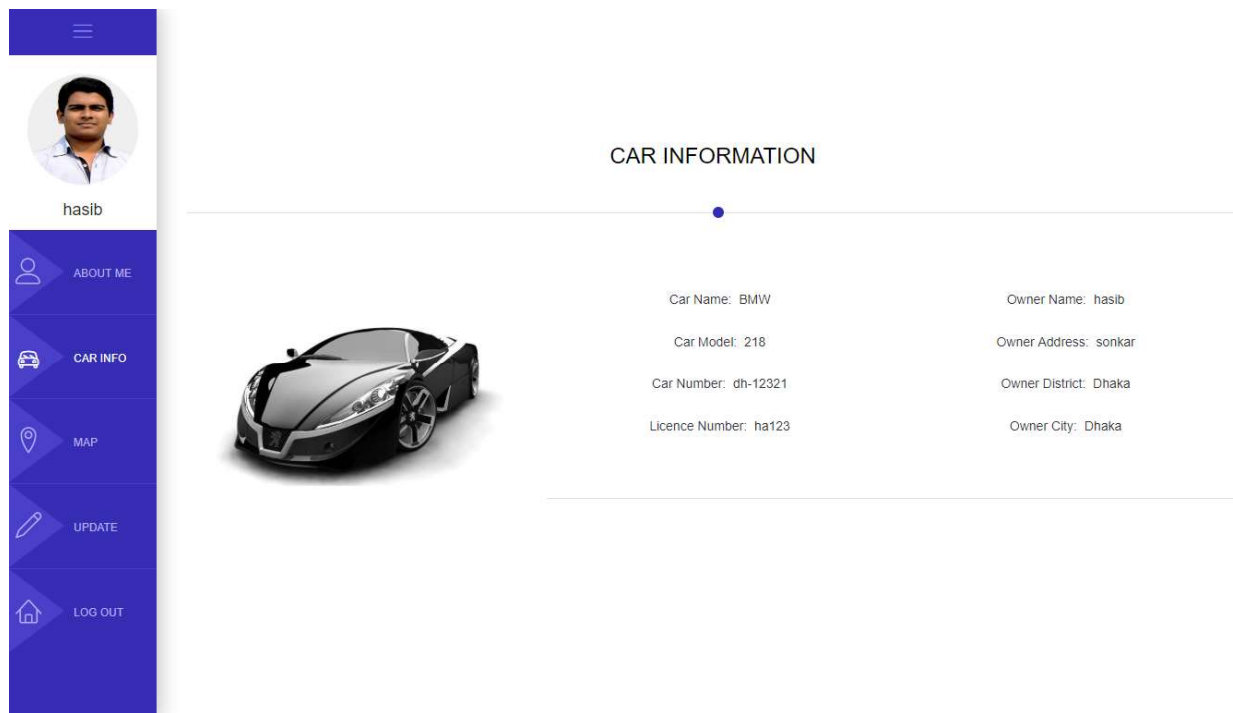


Figure 5.2.5: Car info

One of the most important section is car info. It's mandatory to provide valid information of the car by the driver. In order to do so the driver needs to provide information like:

- Car name
- Car model
- Car number
- License number
- Car image

By submitting these information the user will be able to activate his/her profile as a drive & use the app to find nearby parking spot for his/her car.

## Driver Info

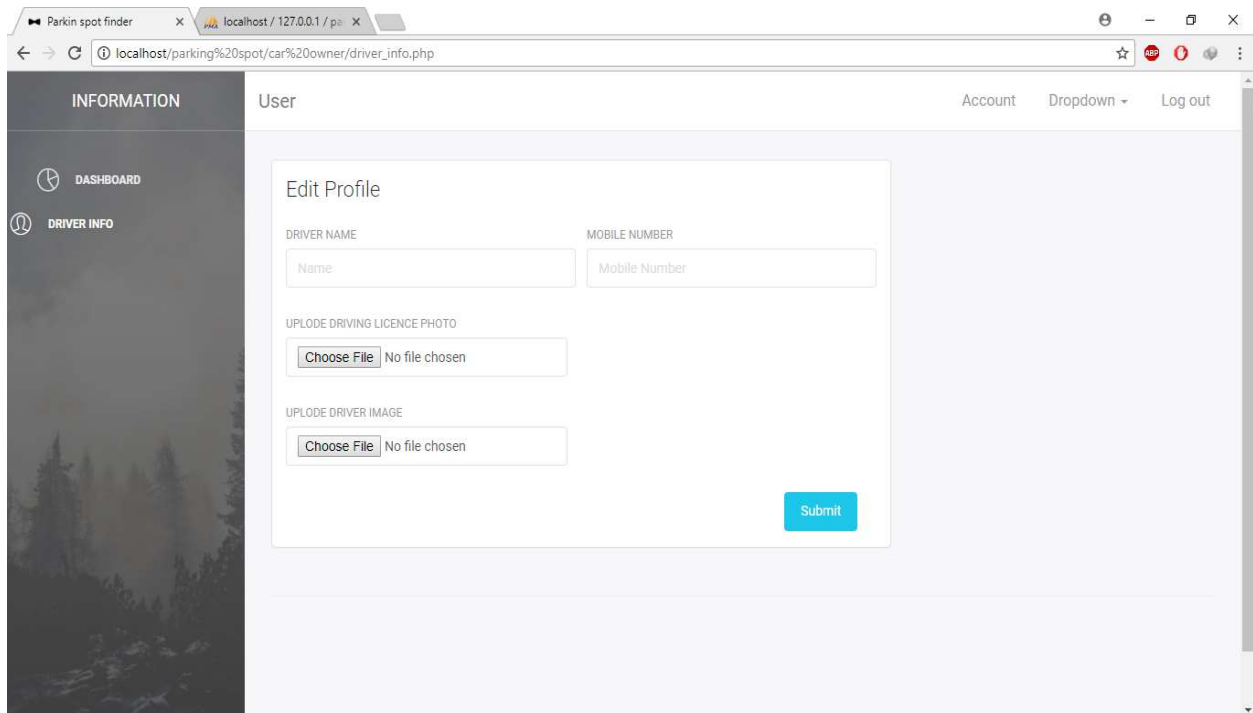


Figure 5.2.6: Driver Info

Driver profile is incomplete without these additional information. These driver info will provide extra security & validity to his/her profile. For this user needs to provide information like:

- Name
- Mobile number
- License image
- Profile image

It is mandatory to upload recent photo of the driver. After submitting these, the driver will get full access to this app.

## Current Location

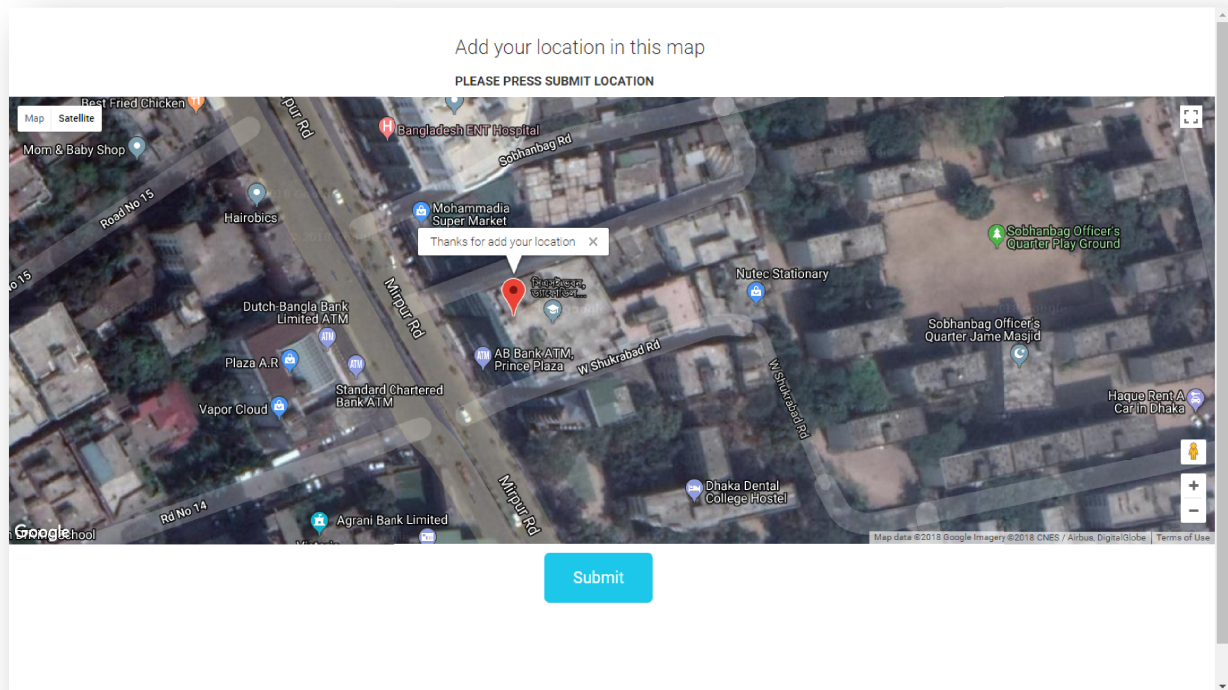


Figure 5.2.7: Current Location

In this figure, it shows the current location of the user.

Once a mobile application user opens up the mobile application, the user's current approximated location will be determined and a request is sent to the central database for nearby traffic and parking information. In Figure 5.2.7 we can see that user's current location is visible in the map.

## Add Location

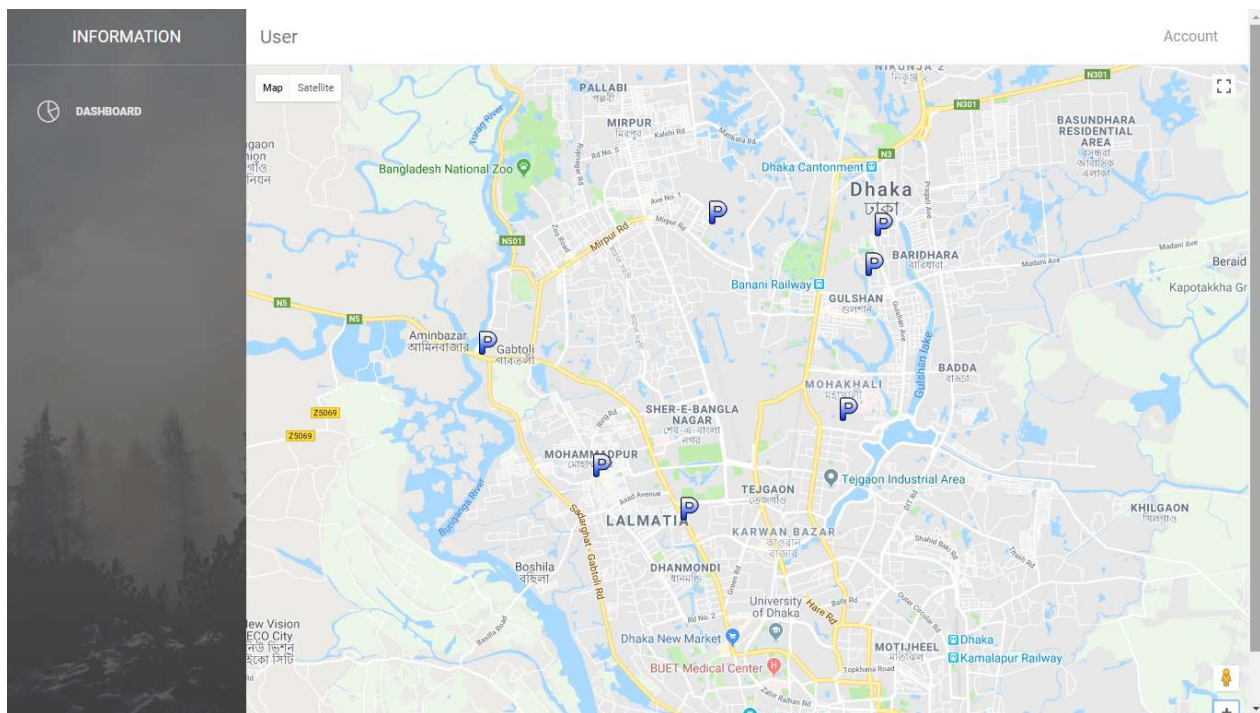


Figure 5.2.8: Add Location

Once the central database receives the location data from the user, the database sends back nearby parking information with real-time traffic data as well as parking type data back to the mobile device. Once the user receives those data, the mobile device renders those data nicely on the map for the user so that the user can find an appropriate parking spot.



## About

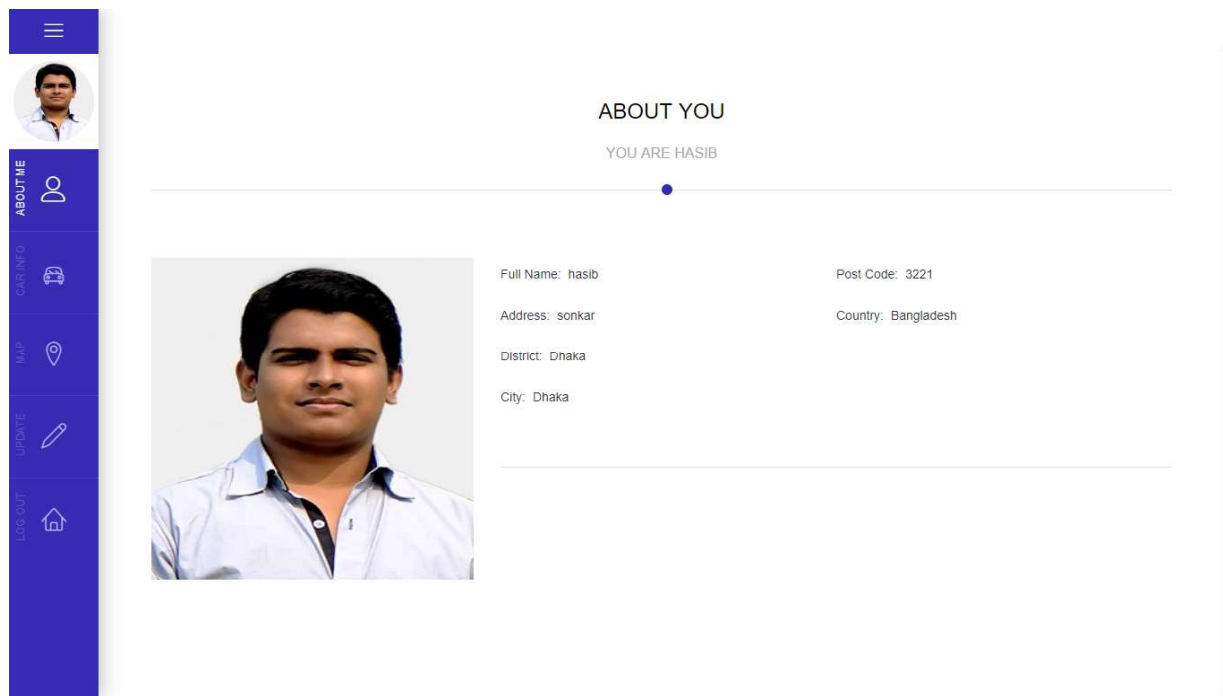


Figure 5.2.9: About

In this section we can see the driver profile and few information about him. These are:

- Full Name
- Address
- Phone Number
- Email
- Date of Birth
- Profession
- Skype
- Website

# Expertise

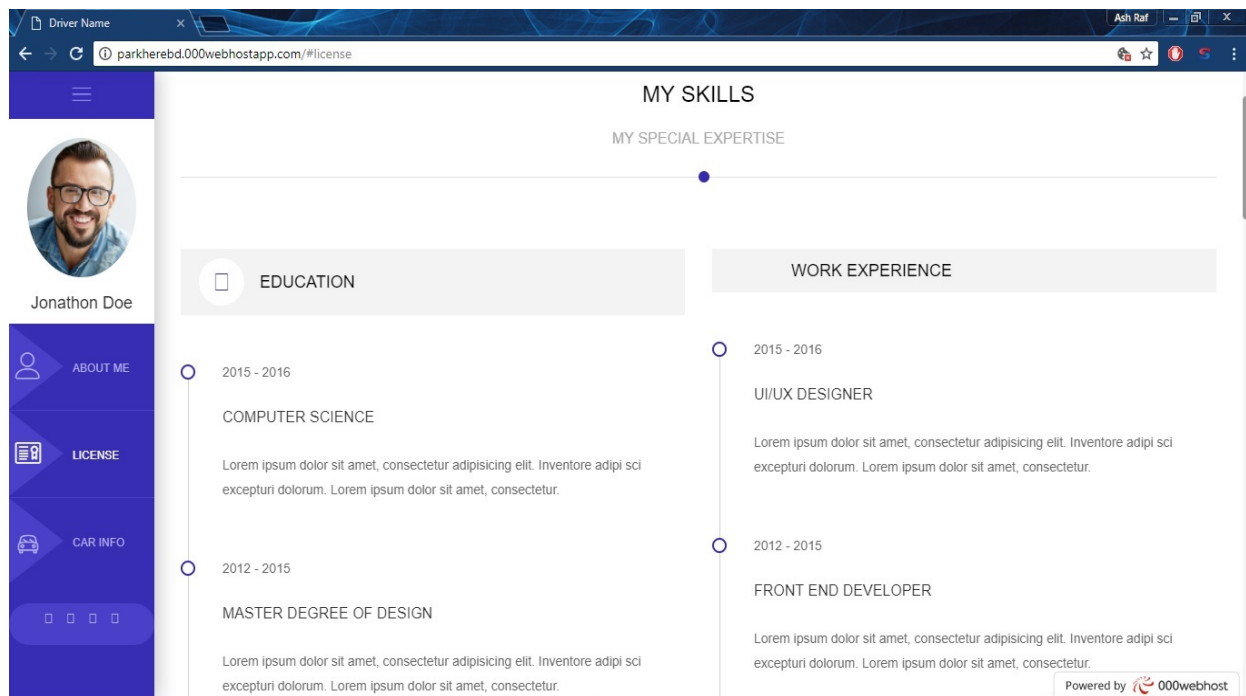


Figure 5.2.10: Expertise

This section represents the driver's skills & special expertise.

Among all the skills, some of the highlighted expertise are given below:

- Education
- Work Info
- Previous Work Experience
- Interest & Hobbies
- Extra skills

### 5.3 Implementation of Interactions

Implementation of interactions for this project is given below:

- Always on, always available: Anywhere any place with 24/7 availability, request a parking spot any time of day, any day of the year.
  
- Tap a button get a parking spot: Set your location, choose your nearest parking spot. You'll see garage owner's picture and garage details.
  
- Request for parking: When you are ready to go confirm your desired garage location and tap request. If you want know about the parking cost per hour.
  
- Check driver info: Before your driver arrives, you'll see their name, photo, car model and license plate number.
  
- Share your ETA: If you want friends and family to know your parking spot location & route, you can send a text message through the app with a link.

## CHAPTER 6

### CONCLUSION

#### 6.1 Discussion and Conclusion

This Parking Spot Finder project is to conceptualize a smart parking system, design a user interface for mobile application, and understand general user demand in mobile application features that would guide future smart parking mobile application. The project could provide statistical data of the current parking problems and will suggest and recommend potential solution to alleviate the parking problems. In order to achieve this goal, we finalized the initial research, utilized the tools readily available for us and designed the smart parking system as well as user interface for mobile application. Based on the research findings, the general population desired a mobile application that could assist them in busy areas, thus improving their lives in the future.

#### 6.2 Limitation

There are few limitations in this project too. These are given below:

- **Weather:** Sometimes the weather gets too bad & roads get unstable for riding vehicles & due to these unavoidable circumstances we won't be able to use this application in real time purpose.
- **Internet Connection:** To establish the project internet connection is must. So, if we face any internet connection issue then the whole process can be undone. Also, we won't get any notification without full speed internet connection

#### 6.3 Scope for Further Developments

We are looking forward to upgrade our project with some extra features in future. Other features are upcoming features for future releases. The initial mobile application will not have many

options such as turning on traffic status and finding a parking spot in specific time frame, but those features are definitely desirable in near future.

Therefore, settings page is extremely important. Once there are more than three filters and more features available, settings page will contain set of those filters and features as a group control format. This will improve user options and quality of service.

Some of the projected features for further developments are given below:

- Finding Public Parking Spots (Coin, Meter, Street)
- Finding Private Parking Spots (Garage, Lots)
- Improved Map features (Browse, Navigate, and Search)
- Real Time Traffic Data (Real time traffic)
- Showing Detailed Parking Spot Information

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# **PLAGIARISM**



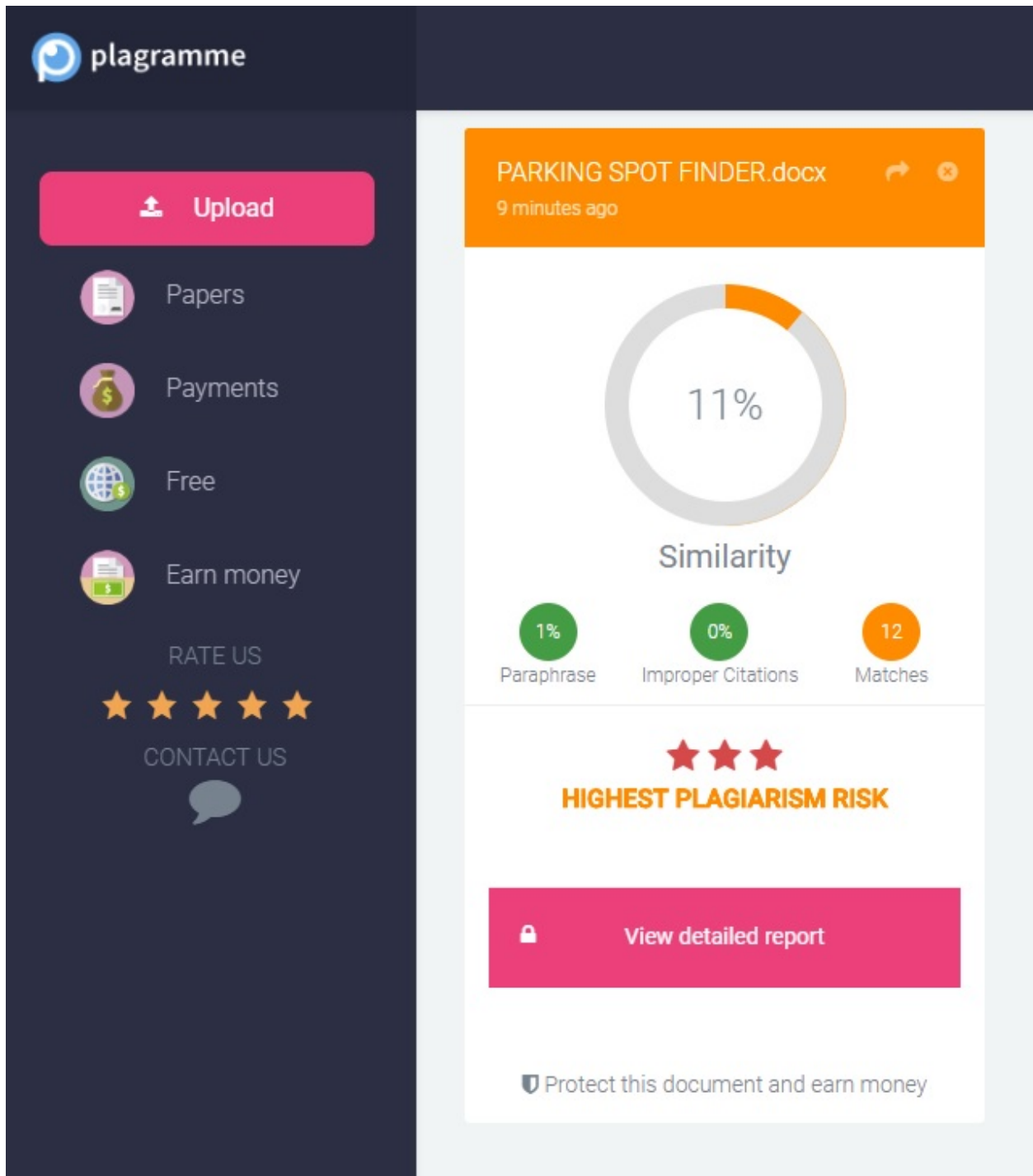


Figure : Plagiarism[21]