TOURS BOOKING AND PLANNING APPLICATION

A project submitted in partial fulfilment of

therequirements for the award of the degree

of

Bachelor of Technology

In

COMPUTER SCIENCE AND ENGINEERING

Submitted by: Anupreet Singh
Roll number: 11911063
Group Number: - 15

Supervised by:

Dr. KUNAL GAGNEJA

Assistant professor

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, SONEPAT – 131201, HARYANA, INDIA

ACKNOWLEDGEMENTS

The success and the outcome of this project required ceaseless guidance and assistance, my team members and I are extremely privileged to have got this all along the project.

We would like to take this opportunity to acknowledge all the people who have helped us wholeheartedly in every stage of this project.

We are indebtedly grateful to Dr. Kunal Gagneja, Assistant professor, CSE, IIIT SONEPAT for providing this opportunity in the first place and giving us all the support and guidance possible, in spite of having a busy schedule.

We are indebtedly grateful for his help which played a very foremost part in the project and for providing us all the indispensable information for developing project.

Anupreet Singh

SELF DECLARATION

I hereby state that work contained in the project titled “Tours Planning and Booking web application” is original. I have followed the standards of the project ethics to the best of my abilities. I have acknowledged all the sources of knowledge which I have used in the project.

Name: Anupreet Singh

Roll no: 11911063

Department of Computer Science and

Engineering,Indian Institute of Information

technology, Sonepat-131201, Haryana, India

CERTIFICATE

This is to certify that Mr. Anupreet Singh has worked on the project entitled **"**Tours Booking and Planning Web Application**"** under my supervision and guidance.

The contents of the project, being submitted to the Department of Computer Science and Engineering, IIIT SONEPAT, HARYANA, for the award of the degree of B. Tech in Computer Science and Engineering, are original and carried out by candidate himself. This project has not been submitted in full or part for award of any other degree or diploma to this or any otheruniversity.

Dr. Kunal Gagneja

Supervisor

Department of Computer Science and

Engineering,Indian Institute of Information

technology, Sonepat-131201, Haryana, India

ABSTRACT

Name of the student: Anupreet Singh
Roll No: 11911063
Degree for which submitted: B. Tech

Department of Computer Science and Engineering

Indian Institute of Information Technology, Sonepat

Project Title**:** Tours Planning and Booking web Application

Name of the project supervisor**:** Dr. Kunal Gagneja

Month and year of the project submission**:** March, 2021

Our project is a Tours Planning and Booking web application in which we will be providing streamlined approach for economical packages for the tour. The project will be focusing on W/A and S/w related Development purposes rather than focusing on research point of view. We will be creating our own rest API giving us lot of technologies and offering flexibility. The prime objective behind this topic is that there is a lot of potential in the Indian Tourism since there aren't many W/A's that provide a user-friendly platform for browsing, viewing information about tourism spots across the country. Users waste quite a lot of their time in finding the blend of both economical pricing, extravagant tourism spot and transportation services all together, a problem that our web-app will solve. For chatting we will be creating chat rooms for the users. Also providing options of reviews and comments. The platforms and programming languages we will be using are SASS, Js, Weather Stack, React, React Router Dom, MongoDB, Node.js, Babel, Stripe, Socket.io, Atlas, Mongoase, Map box, Express etc.

The prime Results which wished to achieve are: -

Creating a user-friendly and a flexible platform for the users visiting different parts of the country so that they can browse the different packages offered by our platform. To provide a well laid out plan for the user so they don't have to worry about getting lost in any unknown place and providing all the necessary information about the trip in the limited time. Also, to provide a user-friendly interface for the above objectives and to establishing ourselves as a profound name.

LIST OF ABBREVIATIONS

S/W	Software
Js	JavaScript
HTML	Hyper Text Markup Language
CSS	Cascading Style Sheets
SASS	Syntactically Awesome Style Sheets
AUT	Application Under Test
W/A	Web Application
JSON	JavaScript Object Notation
PUW	Project Under Work
API	Application Programming Interface
SQL	Structure Query Language
RDBMS	Relational Database Management System
UI	User Interface
CDN	Content Delivery Network

LIST OF FIGURES

LIST OF TABLES

TABLE OF CONTENTS

Chapter 1
Introduction

1.1 INTRODUCTION

Brief Introduction to the Topic:

The project under work (PUW) is a Tours Booking and PLanning web Application for providing economical packages to travelers for exclusive tourist places across the country. The project is purely meant to focus on Web-Application and S/w related Development purposes rather than focusing on research point of the view. The basic reason for choosing this topic for our practicum project is that we will provide an easier way for the novice travelers and tourists by providing them range of discounted and reasonable travel packages for the tour. Thus, making the work a lot easier for the user which would be wastedin surfing the web in finding economical packages, transportation sources and information about exclusive tourist spots because there are not a lot of good websites, which would be providing the all services provided by us and still be rivaling our website.

1.2 PROBLEM OUTLINE

The sole purpose of choosing this problem is that the number of tourists in India is sky rocketing and putting tourism very suitable for career purposes and proving to be an enormous business and revenue generator and contributing largely to the GDP.

People are now accepting Tourism as a passion and a suitable career choice as well. Since, the number is increasing day by day so our W/A which will not only provide user with economical packages but also full-fledged plan including services like transportation also options like chat rooms and reviews and commenting and saving their time in: -

- Firstly, searching in some of the travel packages which are both streamlined and economical
- Then, finding a web site which provide these both the above and transportation services along with it.

There is a tendency to feel out of control and more fearful when we are unfamiliar with or we don't understand something. Traveling, getting to know the world and connecting with people helps reduce the risk that areas of conflict will spread. People who travel a lot,display a greater knowledge of how things work and tend to be more practical than others.

Since, tourism is slowly turning into a million-dollar business. Our website is making it easy for the users by providing a user-friendly platform which covers all the basic necessities required for travelling such transportation services, cottage and other useful information without which it is very difficult to enjoy to the fullest.

1.3 PROJECT OBJECTIVES

The main project objective is to deliver the application as a platform which will offer a streamlined and well laid out plan for the user about the trip. Saving the user all the trouble and worry about the tour in an unknown place.
We will be creating chat rooms for the users with which they can communicate with other users and also, we will be enabling reviews and comments features for the basic outline of the services about the tour.
We will also be providing the user with all the information about tourist spots and exploration needed in the limited time period that they have on the trip.
Other objectives are providing discounted price in an economical plan that would be difficult to find elsewhere generation are an easy to use or user-friendly interface with only and Another major problem faced by travelers is transportation and to overcome this transportation sources would be included in the given package.

1.4 PROJECT METHODOLOGY

The methodology used to achieve the upcoming objectives are as follows: -

The PUW will be a user-friendly interface and it would be achieved by making interface bit modern and different than the existing interfaces and it will be achieved by using Js, Babel, SASS, Weather Stack and MongoDB, Express, Atlas etc. These are relatively new technologies which would transform the speed of our web application from mediocre levels to a rather high-speed web application.
We will be providing features like chat rooms, reviews, commenting. Also, if any user has any major queries about the project then he/she can email to the provided email and resolve it.
Predominantly travelers face problems details about the location, transport, price and we will be overcoming these obstacles by providing economical packages for extensive locations throughout the country directly through the application.
Our platform would be handling every minuscule detail about the tour thus overcoming any and every problem faced by the tourists such as time management, information about location, high-end and extravagant cottage prices.

1.5 SCOPE OF PROJECT WORK

The Tourism Sector has been widely and positively accepted by the Indians allover the country. The country has been showing staggering numbers in the field of tourism mentioned in tabular form below.

These are some stats concerning tourism across country:

Table - 1.1 The Table shows tourist visiting India in the past years

YEAR	TOURIST VISITING INDIA
2011	6.31 MILLION
2015	8.03 MILLION
2019	10.93 MILLION

Table 1.2 This Table shows the revenue generated in the past years

YEAR	REVENUE GENERATED BY TOURISM IN TERMS OF (%) GPD
2011	4.5% OF TOTAL GDP
2018	9.2 % OF TOTAL GPD
2024 (Expected)	10% OF TOTAL GDP

From the figures, it is quite clear that tourism industry is sky rocketing year by year, the scope of tourism as a career choice is escalating and a startup business for the same would be an asset rather thana liability.

Our project will be providing streamlined packages for the same and other top facilities and features mentioned above.

1.5.1 LIMITATIONS: -

But every project has some Limitations and here are some for our project:

There are already some giants in the tour and travels business as well such as Trivago and go-ibibo and it is very difficult for a new player to quickly overthrow these giants and establish itself. Limited travel options are also a disadvantage of the application.
There is not very proficient investment in the Indian Tourism market. Many customers still do not believe in the upcoming businesses based on tour and travels and still there are people who do not want to book traveling through online apps.
Also, there are a lot of changes in prices regarding expenses related to traveling which if not updated day to day can lead negative impact among the users.

1.6 ORGANISATION OF PROJECT

The organization of the project mentioned is being done by dividing the work into several phases or chapters to make the project work more organized. The chapters havebeen as follows: -

- Chapter-1 Introduction: This is the initial phase of the project. This briefly explains theproject, the objectives of the project, methodology, scope of project.
- Chapter-2 UI: In this chapter, the complete front-end work will be done, and practice will be carried out to enhance the UI and to make it interactive.
- Chapter-3 API: In this chapter, the part of the backend along with the API will be developed, and the initial phase testing will be done.
- Chapter-4 Finishing Touch: This would be the Last phase, in this the remaining part of the backend will be completed, and the system flaws will be identified and will be fixedand the project will be deployed.

1.7 SUMMARY

In the summary of chapter 1 i.e., Introduction, we have talked about the Problem Outline in subchapter 1.2 which explains why we chose this topic over others, Project Objectives which is explained in the subchapter 1.3 which briefly mentions the main objectives of the project andthe methodology used to follow these objectives in subchapter 1.4.
The Scope and Limitations of the project have been discussed in subchapter 1.5 and followed by Organization of the complete project in subchapter 1.6 which mentions all the chapters in which the report work is categorized.

Chapter 2

Study and Review of Literature

2.1 INTRODUCTION

The project under work (PUW) is a Tours Booking and Planning web Application for providing economical packages to travelers for exclusive tourist places across the country. The project is purely meant to focus on Web-Application and S/w related Development purposes rather than focusing on research point of the view.

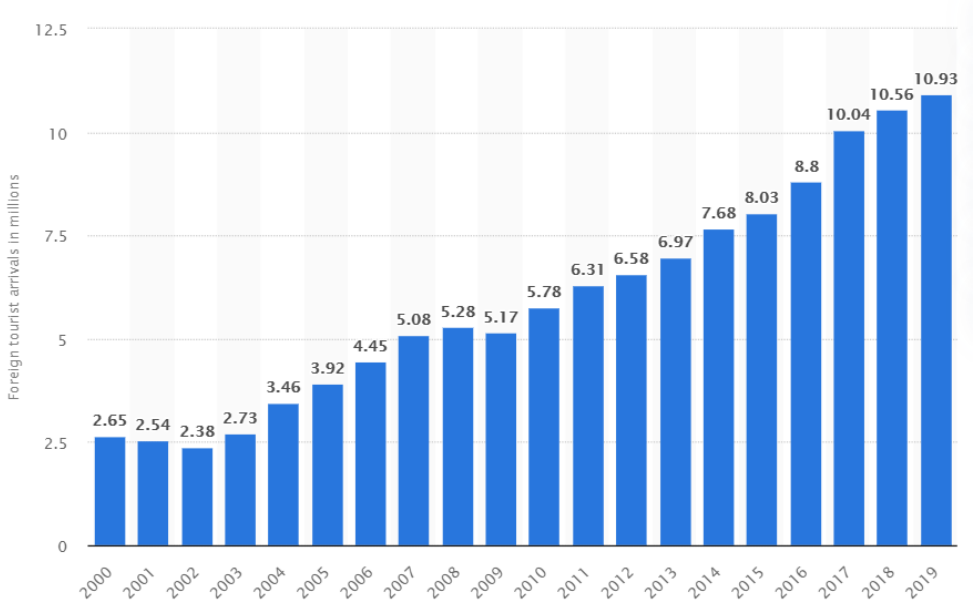


Fig. 2.1 Foreign Tourist arrivals in India

This above figure shows the pictorial representation of Foreign Tourist arrival in India per year data from the past 20 years. Now with a single website, anything and everything can be facilitated online with a single click over any required web application. But the technologies to be used should be up to the mark.

This chapter presents some discussions about the relevant tools and technologies used in the project to develop the Tours Booking and Planning web application.

Some of the tools and technologies or the Pre-requisite which are used in development of front- end, UI and back-end are JavaScript, React, HTML, CSS, SASS, JSX technology, Node.js, Mongo DB, Socket.IO. Others are Babel and, Map Box, Weather Stack, React-Router-Dom, Atlas, Express, Mongoose and Stripe Payment Processor.

2.2 FRONT-END

Front-end web development, also known as client-side development is the practice of producing HTML, CSS and JavaScript for a website or Web Application so that a user can see and interact with them directly. The front end of a website is the part that users interact with. Everything that user see when user navigating around the Internet, from fonts and

colors to dropdown menus and sliders, is a combo of HTML, CSS, and JavaScript being controlled by user's computer's browser. The challenge associated with front end development is that the tools and techniques used to create the front end of a website change constantly and so the developer needs to constantly be aware of how the field is developing.

HTML AND CSS

HTML and CSS HTML stands for Hyper Text Markup Language. It is used as the standard markup language for building web applications and web pages. It was originally developed byTim Berners-Lee in 1991. HTML5 is the latest version of HTML.

CSS stands for Cascading Style Sheet. It is used to style web pages for different kinds of devices and screen sizes. It also saves a lot of time and stress since it can be used to style multiple webpages simultaneously. Its latest version is CSS3.

SASS

Sass stands for Syntactically awesome style sheets. It was designed by Hampton Catlin and SASS first appeared in November 2006 but its stable version was released was on March 23' 2018. Sass is a pre-processor scripting language that is interpreted or compiled into Cascading Style Sheets. Sass Script is the scripting language itself. Sass consists of two syntaxes. The original syntax, called "the indented syntax, "uses a syntax similar to Haml.

REACT JS

It is an open-source JavaScript library used in web development for building user interfaces and interactive elements and was first deployed in 2011. React makes it easier to create interactive UIs. React helps to create Declarative views which make the code more predictable and easier to debug. React is a front-end library and it runs on a browser like apache and rails.We used React to create the basic front-end framework of the project.

REACT-ROUTER-DOM

A router allows the application to navigate between different components, changing the browser URL, modifying the browser history, and keeping the UI state in sync. React is a popular library for building SPAs. However, as React focuses only on building user interfaces, it doesn't have a built-in solution for routing. React Router is the most popular routing library for React. In other words, React-router-dom is the router component for websites and webapp. For installing react-router-dom the system needs to have Nodejs version-6 or above installed.

2.3 UI DEVELOPMENT

A Web user interface or Web app allows the user to interact with content or software running on a remote server through a Web browser. The content or Web page is downloaded from the Web server and the user can interact with this content in a Web browser, which acts as a client. Simply put, a good User Interface is important because it can turn potential visitors to buyers asit facilitates interactions between the user and user website or web application. An interface is apoint where a user interacts with the website they're using. UI is a main part of building an engaging website.

- **Virtual design**
  Visual design improves a site's value by strategically implementing elements such as fonts, colors, and images among other things. When professionally done, visual designmakes a page elegant without compromising on its function or content.

- **Interactive design**

  The interactive design looks at how users interact with technology. It uses the understanding of such interactions to create an interface with behaviors that are well thought-out. Excellent interactive design not only anticipates how a person interacts with a system but also antedates and fixes problems in good time. It may also invent new ways through which a system interacts and responds to users.

- **Information Architecture**
  Information architecture is designed to help users find the info they need to complete various tasks. It, therefore, involves labelling, structuring, and organizing the web content in a manner that makes it easily accessible and sustainable. The services and technologies used in the building of the web user interface (UI) are mentioned below.

JAVASCRIPT

JavaScript is the world's most popular programming language. JavaScript is the most popular programming language in the world. JavaScript helps user in developing great front-end as well as back-end software's using different JavaScript based frameworks like jQuery, Node.JS, React etc.

JSX

JSX stands for JavaScript XML. JSX allows us to write HTML in React. JSX makes it easier to write and add HTML in React. JS is standard JavaScript while JSX is an HTML-like syntax that user can use with React to (theoretically) make it easier and more intuitive to create React components. Without JSX, creating large, nested HTML documents using JS syntax would bea difficult task. JSX simply makes that process easier.

BABEL

Babel is used to make sure that everyone will be able to run user code. Babel was stably released
on 27th February' 2020. Babel is a JavaScript transpiler that converts edge JavaScript into plain
old ES5 version of JavaScript that can run in any browser (even the old ones). It makes available all the options that were added to JavaScript with the new ES6 specification, including classes, fat arrows and multiline strings. Basically, Babel will convert +ES6 code into ES5 without waiting for browser support. We use babel to use the newest react and JavaScript syntax with old technologies and in old browsers.

WEBPACK

Webpack is an open-source JavaScript module bundler. It was released on 10th of march in 2012. It was primarily made for JavaScript but can also transform HTML, CSS and images etc. It is nowadays impossible for us to create web without module bundlers like webpack. Webpack is a JavaScript build tool and it basically groups the code of the program and other assets together. We use webpack in front end also because there are a number of assets in front-end like CSS, SASS, images, fonts. So, to bundle all these components we use module bundlers like webpack. As an example, Webpack can collect all user inline CSS styles in user JavaScriptfiles and bundle them into one.

2.4 BACK-END DEVELOPMENT

Backend website development consists of those tasks that allow user to optimize the website. The database, content, plugins, and other elements that make the website operate are all part ofits backend. The backend ensures that the website is fully functional and applies to business websites, blogs, ecommerce sites, and others. The needs of the backend development will depend on the nature of the website and the functionality it offers to its users. This is distinct from the website's frontend, which consists of the coding languages used to create the site's pages, navigation, and other parts that result in the visual display with which users interact whenengaging content. The backend and frontend of the website play different roles, but they worktogether to create the sum total experience of the website. Backend development utilizes the applications that access data and deliver it to the frontend for the audiences. The services and tools which were utilized to prepare the back end of the web application have been briefly mentioned below.

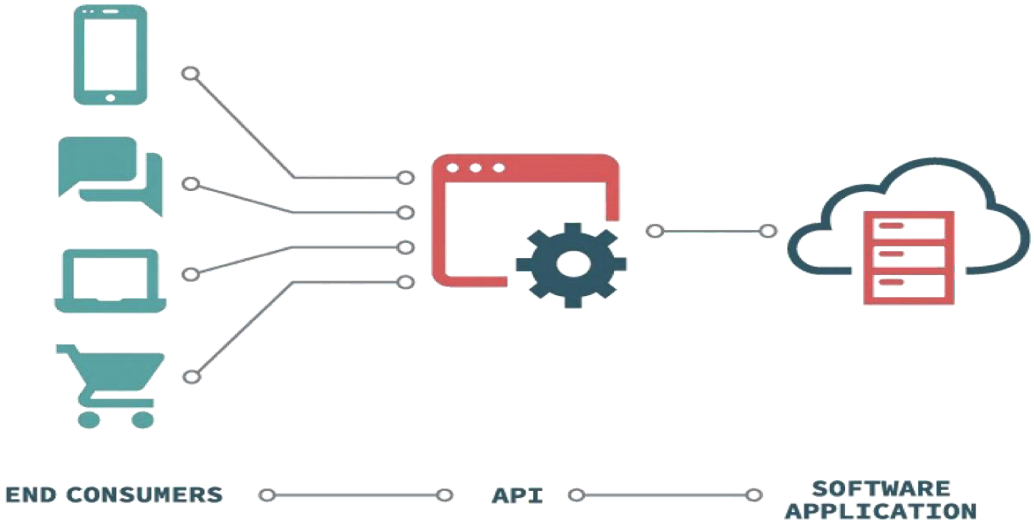


Fig. 2.2 API Working Diagram

NODE.JS

Node.js is an open-source, cross-platform, back-end, JavaScript runtime environment that executes JavaScript code outside a web browser. It was initially released on May 27th, 2009 andis written in c, c++, JavaScript. The main developers or authors are Ryan Dahl and Bryan Cantrill. Node.js is a lot faster, lightweight and less complex from its competitors like Django and php. Node.js excels from python in back-end in web services and real time applications. Node.js is used by users mainly in server-side scripting to produce dynamic web page content before the page is sent to the user's browser window. Node.js represents a "JavaScript everywhere" architecture, unifying web-application development around a single programming language, rather than using different languages for server- side and client-side scripting. Corporate users of Node.js software includes companies like Netflix, PayPal, LinkedIn, Walmart, UBER, Twitter, Yahoo, IBM, Rakuten and Amazon web services.

BABEL

Babel is used to make sure that everyone will be able to run the website. Babel was stably released on 27th February' 2020. Babel is a JavaScript compiler that converts edge JavaScript into plain old ES5 version of JavaScript that can run in any browser (even the old ones). It makes available all the options that were added to JavaScript with the new ES6 specification, including classes, fat arrows and multiline strings. Basically, Babel will convert +ES6 code into ES5 without waiting for browser support. We use Babel along with Node.js and react also.It reduces the code and makes it easy to understand and browser compatible.

WEBPACK

Webpack is an open-source JavaScript module bundler. It was released on 10th of march in 2012. It was primarily made for JavaScript but can also transform HTML, CSS and images etc. It is nowadays impossible for us to create web without module bundlers like webpack. Webpack is a JavaScript build tool and it basically groups the code of the program and other assets together. But the problem is on server when user is using the react modules since node doesn't support these (ES6) Modules. User can use babel in node server side but it transpile code in runtime which is not effective. The most common way to solve this problem is pack backend by webpack. Webpack can also collect all the inline CSS styles in the JavaScript files and bundle them into one.

STRIPE

Stripe is an American financial services and software as a service company headquartered in San Francisco, California, United States. The company primarily offers payment processing software and application programming interfaces for e- commerce websites and mobile applications. In the project we are using Stripe as a payment processor by using react-stripe-elements. Stripe can be used a payment processor for e commerce's and businesses of every scale from individual start-ups to companies like Amazon, Zoom etc. these all-use stripe in their payment processor. We can use Elements with any Stripe product to collect online payments. The Stripe.js / Stripe Elements API reference goes into more detail on the various customization options for Elements (e.g., styles, fonts). The element is a thin React wrapper around Stripe.js and Stripe Elements. It allows user to add Elements to any React app, and manages the payment elements for user.

MONGO DB

MongoDB is a source-available, cross-platform, document-oriented database program. It is Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas and licensed under the Server-Side Public License. It was developed by MongoDB Inc. and was released on 11 February 2009. MongoDB supports field, range query, and regular-expression searches. Queries can return specific fields of documents and also include user-defined JavaScript functions. Queries can also be configured to return a random sample of results of a given size.

SOCKET.IO

Socket.IO is a JavaScript library for real-time web applications. It was developed by automatic and was stably released on September 20, 2019. It enables real-time, bi-directional communication between web clients and servers. It has two parts: a client-side library that runs in the browser, and a server-side library for Node.js. Both components have a nearly identical API. The main features of Socket.IO is instant messaging and chat, real-time analytics. It is being used by Microsoft Office, Yammer, Zendesk etc.

EXPRESS

Express.js, or Express, is a back-end web application framework for Node.js, released as free and open-source software under the MIT License. It was developed by Strong Loop and was stably released on May 25, 2019 It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js. Express is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications. With a myriad of HTTP utility methods and middleware at your disposal, creating a robust API is quick and easy. Express provides a thin layer of fundamental web application features, without obscuring Node.js features that you know.

ATLAS

MongoDB Atlas is the global cloud database service for modern applications. It was developed by MongoDB Inc. and was released on November 30, 2020. It is the best way to deploy, run, and scale MongoDB across Amazon Web Services, Google Cloud, and Microsoft Azure with the most demanding data security and privacy standards.

MONGOOSE

Mongoose is an Object Data Modeling (ODM) library for MongoDB and Node.js. It was developed by Sergey Lyubka and version 7.2 was released on March 9, 2021. It manages relationships between data, provides schema validation, and is used to translate between objects in code and the representation of those objects in MongoDB. Mongoose is a JavaScript library that allows to define schemas with strongly typed data. Once a schema is defined, Mongoose lets you create a Model based on a specific schema. A Mongoose Model is then mapped to a MongoDB Document via the Model's schema definition. Mongoose may be the most popular NoSQL.

WEATHER STACK

Retrieve instant, accurate weather information for any location in the world in lightweight JSON format with supporting a variety of methods to look up any location. Millions of locations can be looked up by city or region name, ZIP code, IP address, longitude coordinates as well. It is being used Microsoft, Warner Brothers, Schneider Electric, Ericsson, Deloitte. It was launched in 2015 and is currently being used by over 75,000 individuals.

MAP BOX

Map box is an American provider of custom online maps for websites and applications such as Foursquare, Lonely Planet, the Financial Times, The Weather Channel and Snapchat. Since 2010, it has rapidly expanded the niche of custom maps, as a response to the limited

choice offered by map providers such as Google Maps. It was founded in 2010 by Eric Gundersen. The API's and SDKs and live updating map data give developers tools to build better mapping, navigation and better search experiences across platforms.

2.5 DEPLOYMENT

Software deployment includes all of the steps, processes, and activities that are required to make a software system or update available to its intended users. The general deployment process consists of several interrelated activities with possible transitions between them. These activities can occur at the server side or at the client side or both. Today, most IT organizationsand software developers deploy software updates, patches and new applications with certain technologies mentioned below. Software deployment is one of the most important aspects of the software development process. Deployment is the mechanism through which applications, modules, updates, and patches are delivered from developers to users. The methods used by developers to build, test and deploy new code will impact how fast a product can respond to changes in customer preferences or requirements and the quality of each change.

HEROKU

Heroku is a cloud platform as a service supporting several programming languages. Heroku was founded by James Linden Baum, Adam Wiggins, Orion Henry in 2007. One of the first cloud platforms, it initially supported only the Ruby programming language, but now supports Java, Node.js, Scala, Python, PHP, and Go. Developers use Heroku to deploy, manage, and scale modern apps. The platform is elegant, flexible, and easy to use, offering developers the simplest path to getting their apps to market.

NETLIFY

Netlify is a San Francisco-based cloud computing company that offers hosting and serverless backend services for web applications and static websites. Netlify was founded by Mathias Biilmann along with Christian Bach on 7th February, 2014. Netlify is a platform user can use toautomatically build, deploy, serve, and manage web apps. It also provides a variety of other features like form processing, serverless functions, and split testing. We can deploy modern static websites with Netlify and get CDN and continuous deployment.

GITHUB

GitHub provides hosting for software development and version control using Git. The best and most used features of GitHub are project management, collaborative coding and public repositories. It offers distributed control and source code management functionality of Git, plus other features. We can easily assign work to our team members on a particular issue or problem.GitHub also helps us to keep track of the individual work and progress.

2.6 Summary

This chapter presents some discussions about the relevant tools and technologies used to develop an Tours booking web application.
JavaScript helps user in developing great front-end as well as back-end software's using different JavaScript based frameworks like jQuery, Node.JS, React etc. that allows user to make web pages interactive. Whereas SASS and CSS are languages that give structure and style to web pages. React is an open-source JavaScript library used in web development for building user interfaces and interactive elements. React makes it easier to create interactive UIs. React helps in making the code more predictable and easier to debug and is used along with JSX. While for back-end Node.js was used for executing JavaScript code outside a web browser and for browser independency Babel was used so that everyone can use the web application. For API purposes, was used which also additionally provides the security to the application while Stripe was used for payment purposes. MongoDB supports field, range query, and regular-expression searches while MongoDB Atlas was used for running MongoDB on cloud database services such as AWS etc. Mongoose lets you create a Model based on a specific schema. A Mongoose Model is then mapped to a MongoDB Document via the Model's schema definition. Mongoose may be the most popular NoSQL. Weather Stack was used for retrieving weather info instantly, while Map Box was used for custom online maps for the application. GitHub, Heroku and Netlify were used for collaborative coding, project management and hosting, managing and deployment of the web application.

Chapter 3
Implementation

3.1 INTRODUCTION

This chapter will describe the key implementation processes, the UML diagrams and some codesnippets of this e-commerce web Application. Implementation in software development is the process of realizing an application's requirements and design. It mainly involves mapping the design into coding in order to achieve the specifications stated for the application. The followingSections define the different modules of the implementation.

3.2 UML ANALYSIS MODEL

Modeling involves the designing of software systems before coding takes place. Modeling playsan important role in any software development project. It guarantees the completeness and correctness of a software system and the fulfillment of end-user's expectations. In addition, modeling serves as the only reference point to cross-check requirements before coding.

A Unified Modeling Language (UML) based tool was used to model this application. UML diagrams give both static and dynamic views of an application and it is well suited for object-oriented languages like Java and C#. The following sub-sections present the UML diagrams usedto model this application

3.2.1 USE CASE DIAGRAMS

The use case diagrams for this application illustrate the interactions that exist between users (actors) and use cases (actions) within the application. There are two actors identified for this application – administrator (admin) and customer actors. As a result, there are two use case diagrams for the software application – admin use case diagram and customer use case diagram. The admin is the owner of the e-commerce store who performs various administrative tasks suchas add products, view orders, and update order status while the customer is any individual who buys a product or products from the online store.

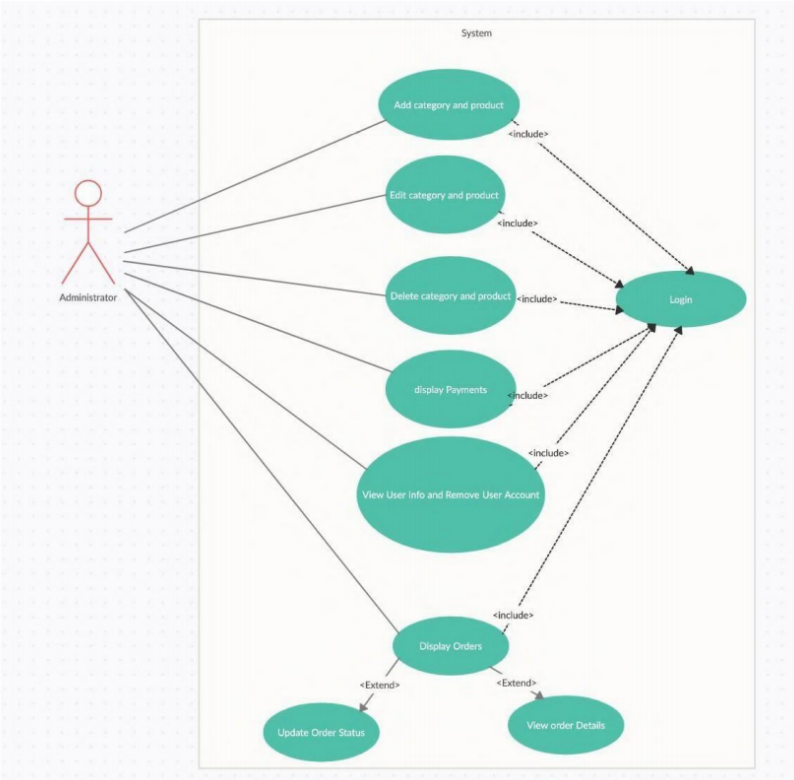


Fig 3.1 Admin User Case diagram

Figure 3.1 shows the admin use case diagram. The diagram depicts how the admin communicateswith the application. More so, it shows all the actions that the admin can perform on the application. As can be seen in the diagram, before any of these actions could be executed the admin will have to login in order to be authenticated.

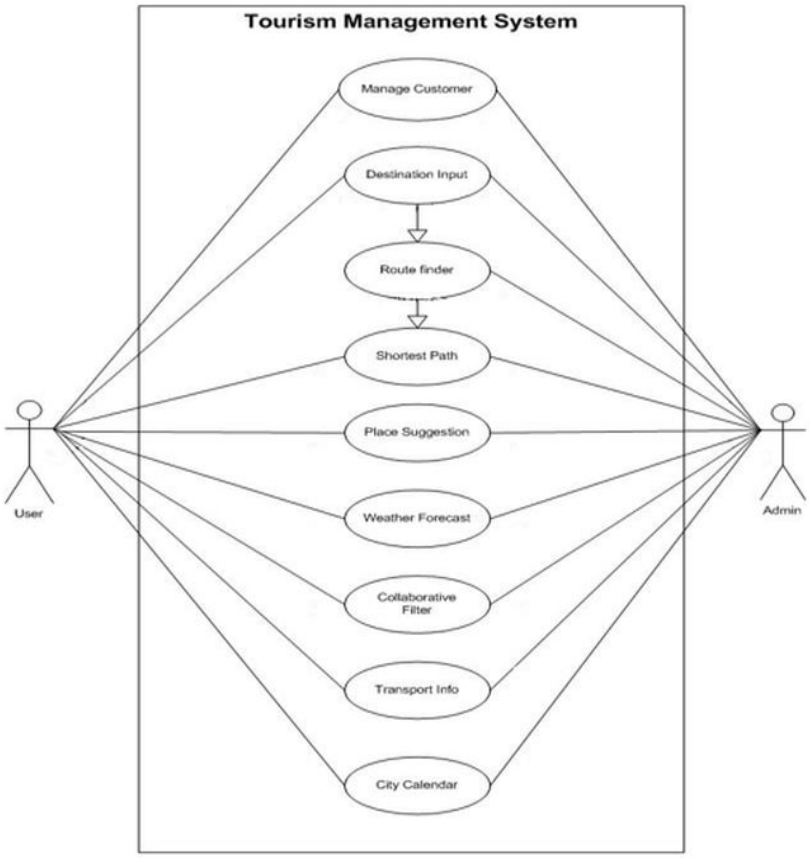


Fig 3.2 UML diagram-1

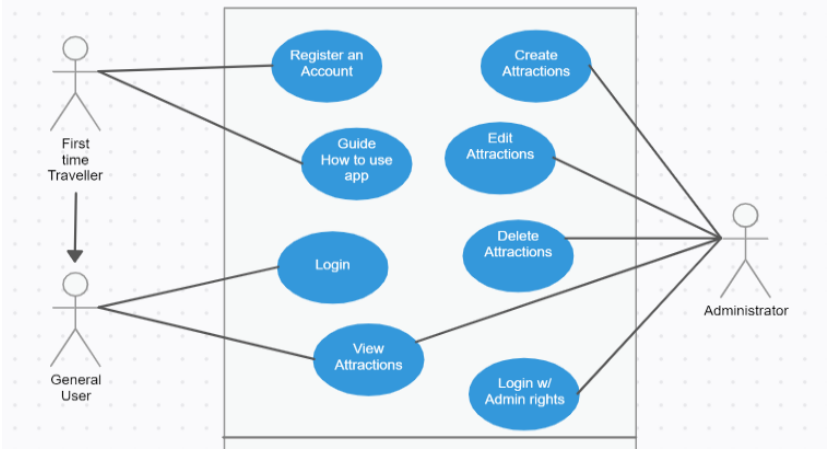


Fig 3.3 UML diagram – 2

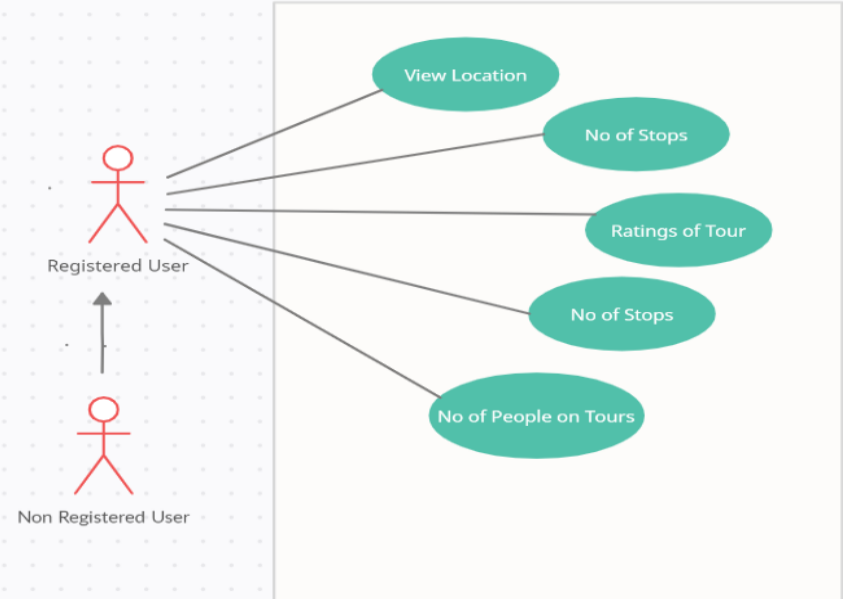


Fig 3.4 User Use case diagram -1

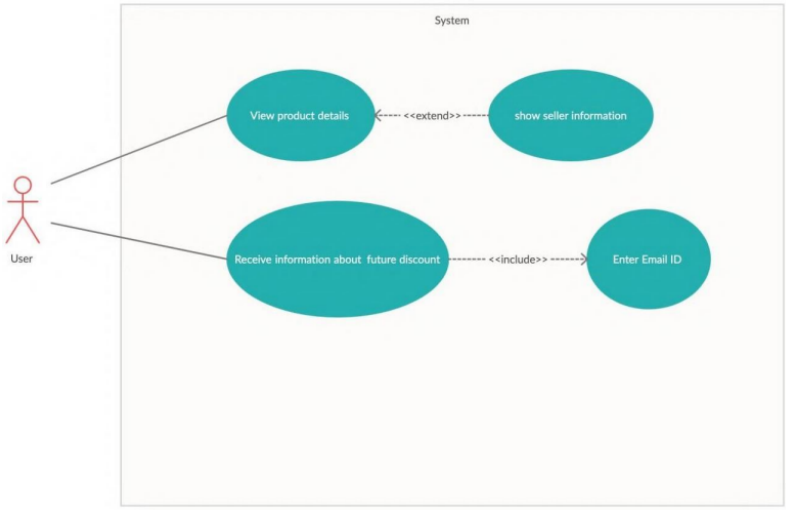


Fig 3.5 User use case diagram - 2

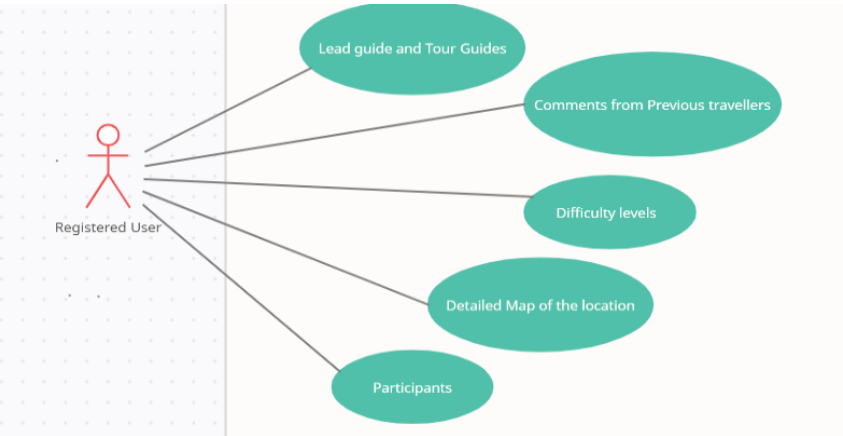


Fig 3.6 User Use case diagram – 3

Fig 3.2 and Fig 3.3 shows the UML diagram for the project. Thus, showing all the major and basic functionality and services.

Fig 3.4 shows the detailed information about the tour. The user can also see the total journey as day-to-day location change in the provided map.

Fig3.5 shows the functionality for the option to see the details of the product and information about the seller. The user is also notified in the apps if there is change in availability of the productor any discounts/change in price

Fig3.6 shows the services provided by the web application to the users booking for their desired tour through the application.

3.2.2 CLASS DIAGRAMS

A class diagram depicts the classes in a software system and how they interact with each other. Also, the class attributes and functions are illustrated in a class diagram.

Figure 3.7 shows the class diagram for this application. It shows the relationships between classesin the application and constraints applied to these relationships.

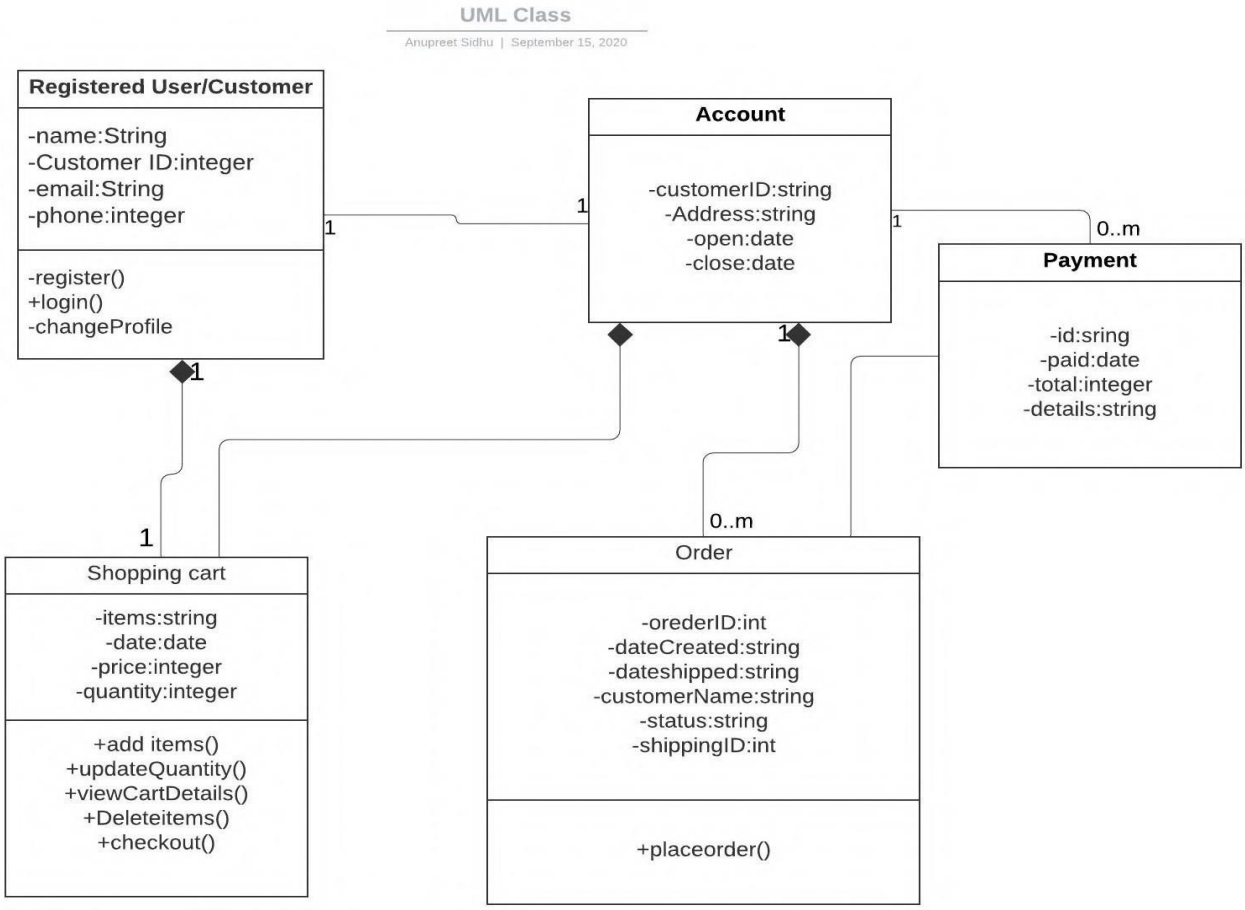


Fig 3.7 Class Diagram

3.2.3 SEQUENCE DIAGRAMS

A sequence diagram gives a detailed visual description of how the various classes in a system interact with each other. Also, it depicts the order in which different objects exchange messages with one another in a system. The sequence diagrams for this application are presented in the following sub-sections.

Admin login Sequence Diagram

Figure 3.8 gives a detailed sequence of events needed for the admin to login to the admin page ofthe 1application. After providing the login credentials on the admin login page, the admin is authenticated through a form-based authentication method provided by the Apache Tomcat web server. After a successful authentication process, the admin is forwarded to the adminmenu page, which contains links to several administrative functions. However, if the authentication process fails, the admin is redirected to the admin login page with displayed error message. For the remaining sequence diagrams required for the administrative tasks, see Appendices.

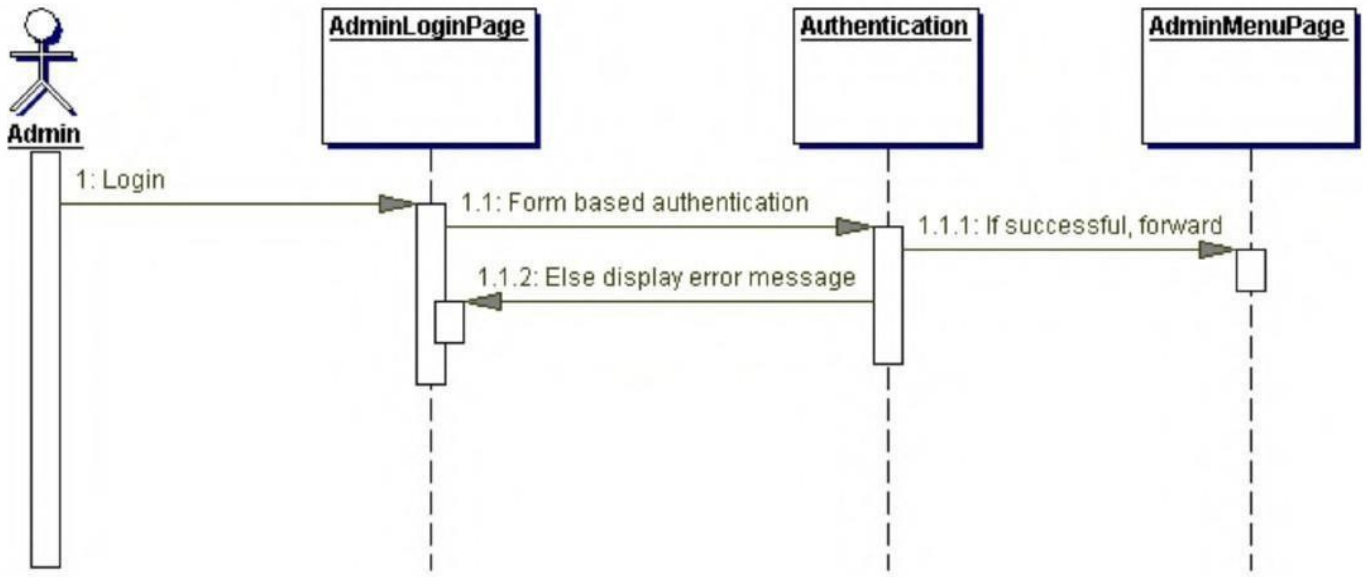


Fig 3.8 Admin Login sequence Diagram

3.3 SUMMARY

This chapter was about showing and Explaining the Use Case diagrams for the administrator as well as the general user, the Class Diagrams to show the interaction between different parts of system, also the admin login sequence diagram.

CHAPTER 4
RESULT AND CONCLUSION

4.1 TESTING

Software Testing is a method to check whether the actual software product matches expected requirements and to ensure that software product is Defect free. It involves execution of software/system components using manual or automated tools to evaluate one or more properties of interest. The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual requirements.

Table 4.1 Software testing template and results.

S/N	Test Description	Steps	Expected System Response	Status
1.	Access home page of the application to view available tours .	Enter the home page URL of the application on a web browser.	The home page of the application is displayed with available products.	Pass.
2.	View tours available by category.	Click any of the category links on thehome page.	The products for theclicked category are displayed.	Pass.

3.	Add tour to the wishlist	Click the add to cart button on the displayedproduct on the home page.	The application navigates on the cart page with the numberof items in the cart updated and shown on the top ofthe home page	Pass.
4.	View the wishlist	Click the view cart link on the home page of the application.	The shopping cart ofthe application is displayed with its items.	Pass.
5.	Update a tour planned in the wishlist	Edit the quantity of an item in the cart and clickthe update button.	The item quantity, its price and the total price of all items in thecart are updated accordingly.	Pass.
6.	Remove tour from the wishlist	Click the remove button of the item to be removed.	The item is removed from the cart and the total price of all itemsin the cart is updated accordingly.	Pass.
7.	Clear all tours from the Wishlist	Click the clear cartbutton.	The cart is empty.	Pass.

8.	Continue booking from the Home page.	Click the continue shopping link.	The user is redirectedto the products page of the application to continue shopping.	Pass.
9.	Check out withStripe.	Click the Stripe check out button onthe shopping cart page.	The application redirects to the loginpage of Stripe.	Pass.
10.	Confirm order aftera successful payment authorization on Stripe.	Click the confirm orderbutton on the order review page of the application.	The order confirmation page isdisplayed with details of the transaction. Also, anemail order confirmation is sent to the email address of thebuyer.	Pass.
11.	Access the admin page of the application to carry administrative tasks.	Enter the admin page URL of the application on a webbrowser.	The admin loginpage of the application is displayed.	Pass.
12.	Check for empty login data on the admin login form.	Click the login buttonwith one empty field.	The application displays a prompt message telling theuser to enter data in the empty field.	Pass.

13.	Check for incorrect login credentials onthe admin login form.	Enter the incorrect logindetails. Click the login button.	The login form with anerror message is displayed.	Pass.
14.	Check for correct login credentials on the admin loginform.	Enter the correct login details. Click the loginbutton.	The admin menu page isdisplayed.	Pass.
15.	Access the admin menu items on the admin menu page.	Click any of the menulinks on the page.	The appropriate pageis displayed.	Pass.
16.	Check for emptydata inputs on forms accessibleby the admin.	Enter the required data on the form with one or more empty inputs and submit the form.	The application displaysa message prompt telling the user to enter data in theempty field(s).	Pass.
17.	Add/ edit availa bletou rs .	Enter the required data on the appropriate form and submit.	An appropriate page is displayed to show the added/edited category orproduct.	Pass.
18.	Delete available tours.	Click the appropriatedelete button.	The application displays an appropriate page to confirm the deleted category or product.	Pass.

4.2 RESULT AND SCREENSHOTS

After successfully compiling the Final Code and Deploying the E-commerce W/A the finalResults achieved are shown below.

4.2.1 All tours Page

The Home page of the W/A acts as a passage to different Pages on the Site

Fig 4.1 shows all the tours that the web Application has to offer for bookings.

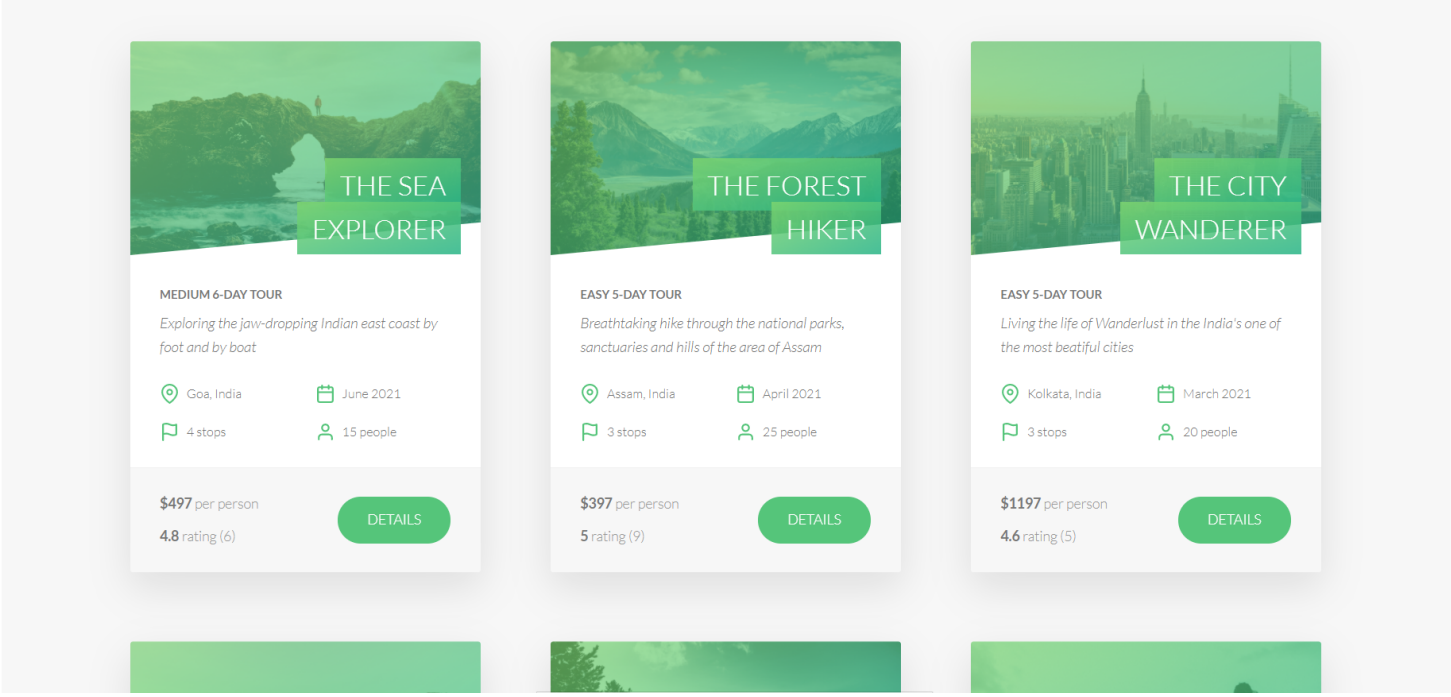


Fig 4.1 All tours Page

4.2.2 Logged In User page

As shown in Fig 4.2 the logged in user can view and edit his/her name ,email, bookings ,profile photo etc.

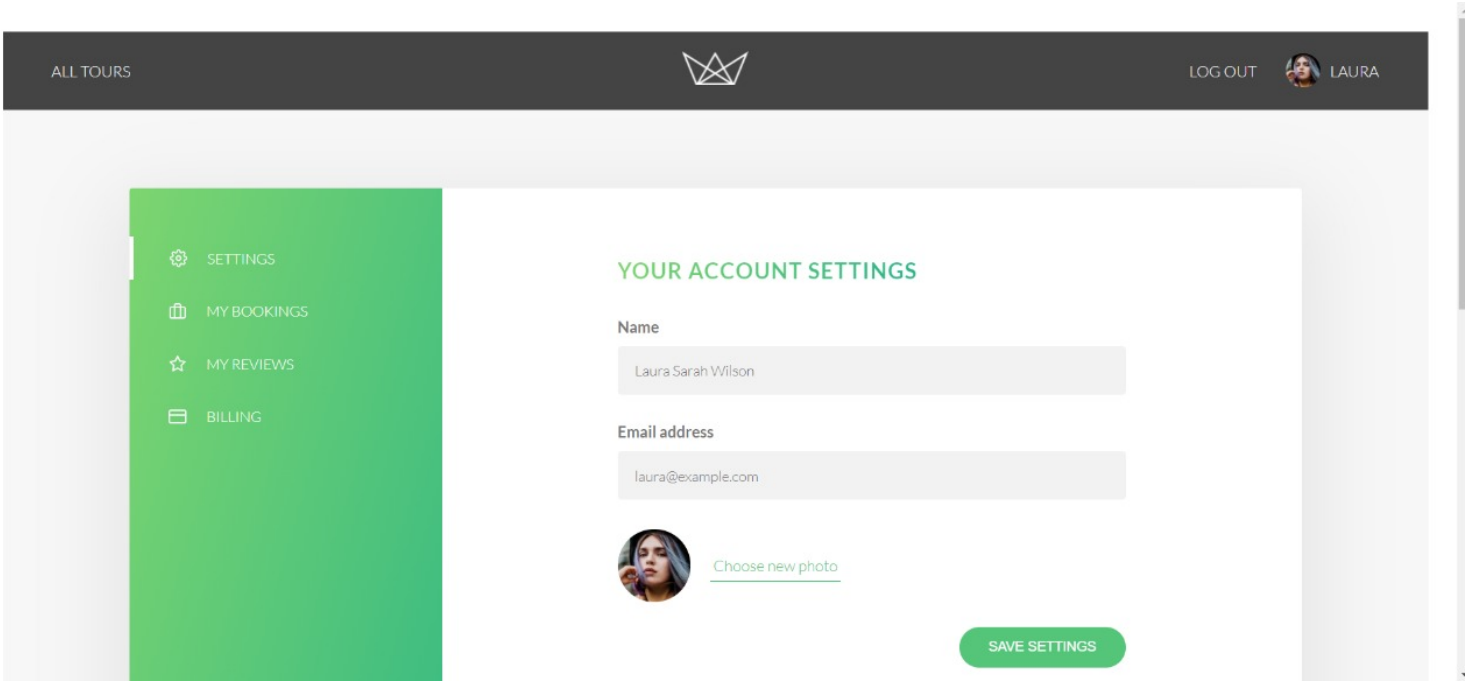


Fig 4.2 Logged In User Page

4.2.3 Login Page

Fig 4.3 Shows the page where user can login into his/her account using email ID /Password.

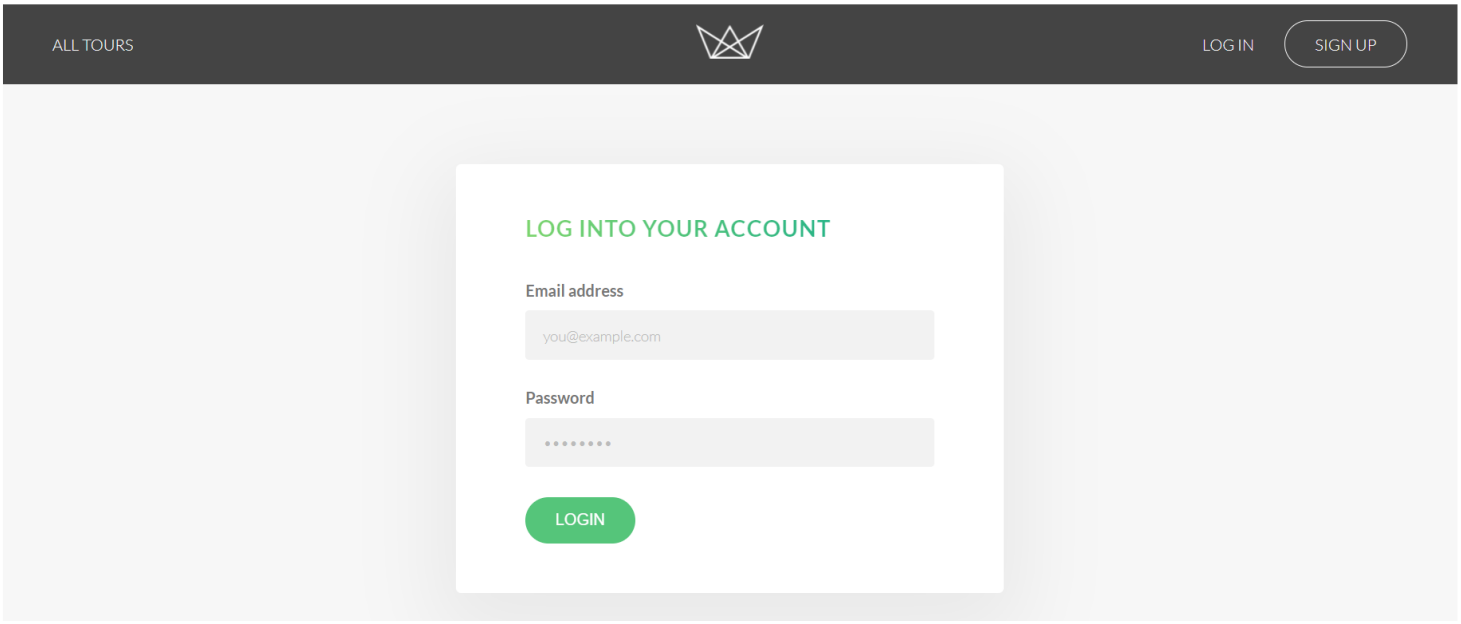
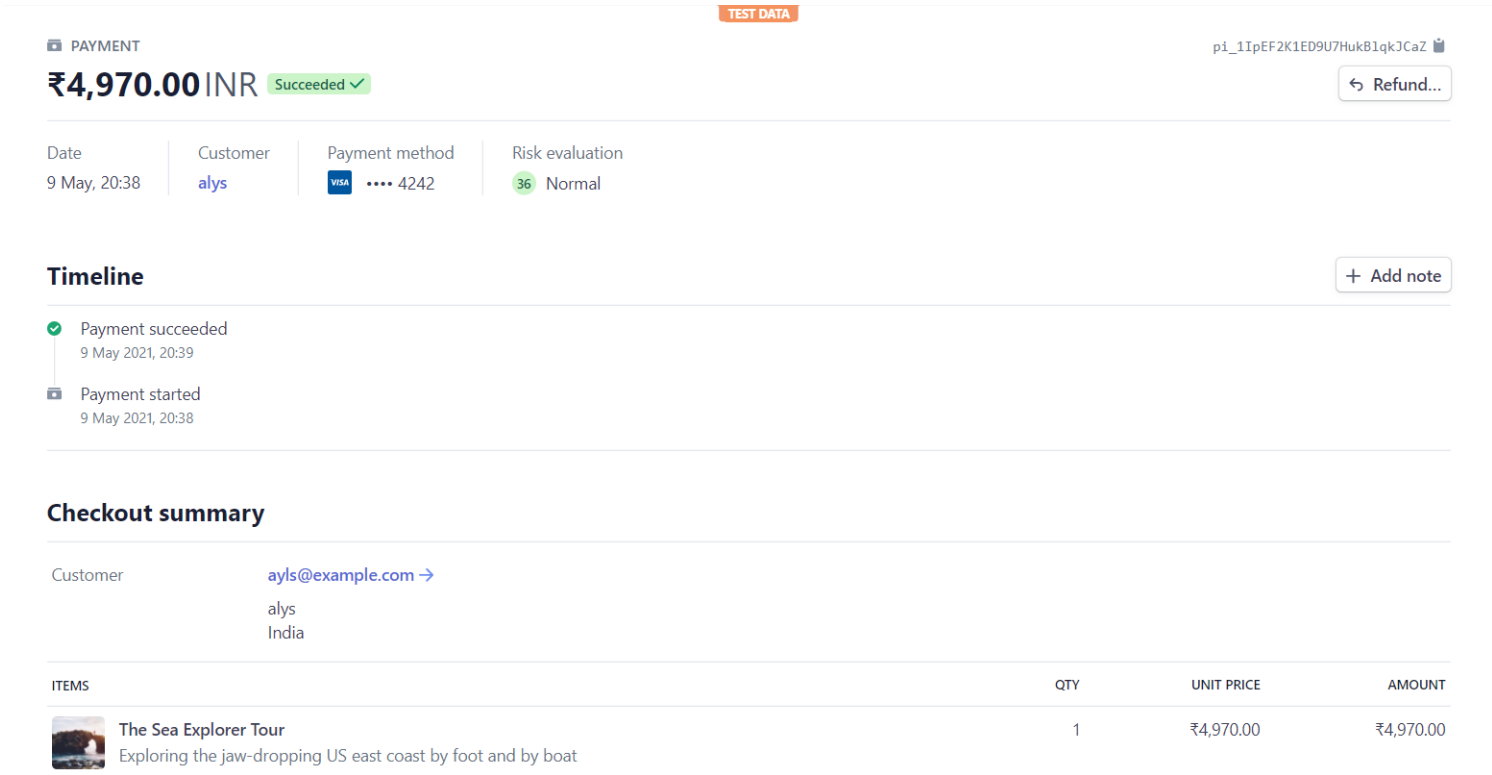


Fig 4.3 Login Page

4.2.4 Payment Info page

As shown in Fig 4.4 the user can check the transactions made from his account for booking



tours.

Fig 4.4 Payment info Page

4.2.5 Tour Location Page

Fig4.5 shows a map highlighting locations to be visited on certain days of the trip booked .

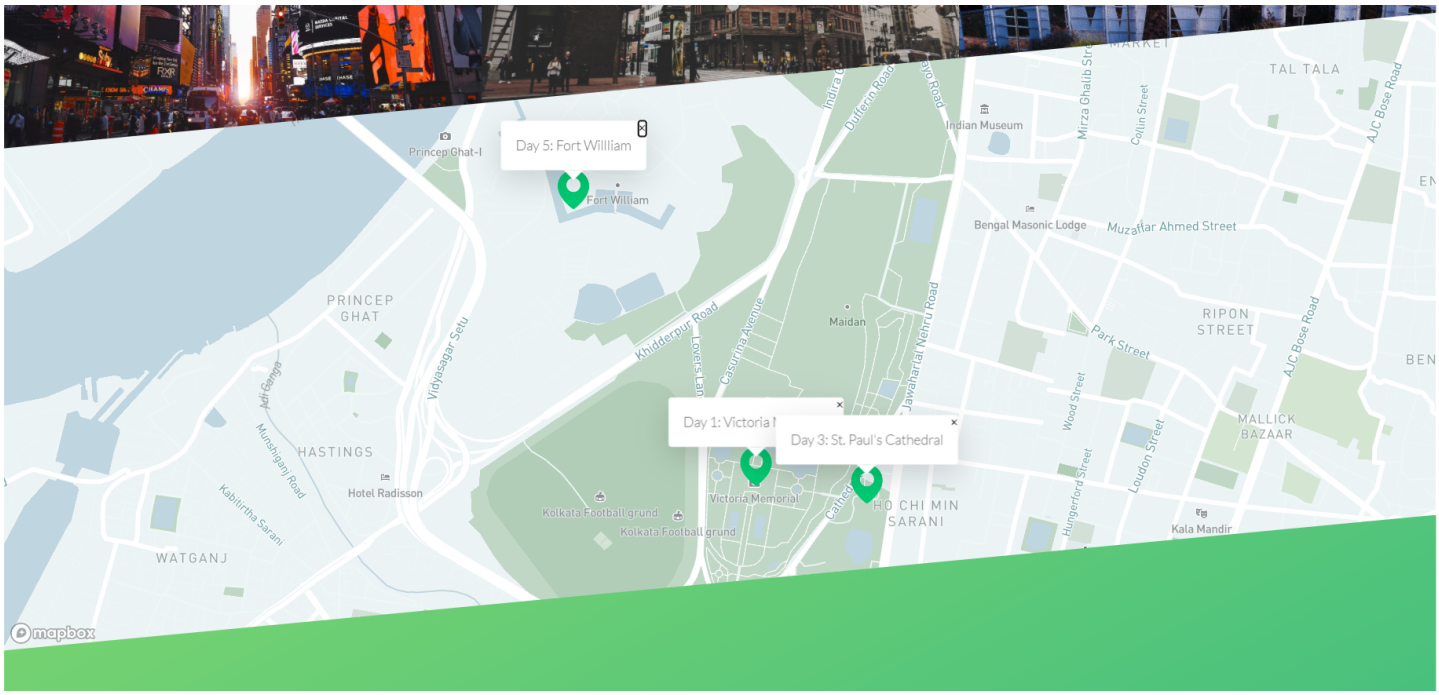


Fig 4.5 Tour Location Map Page

4.2.6 Admin Accessible Database Page

Fig4.6 Shows Admin accessible database page where admin can view and edit tour information ,view review and view every registered user information.

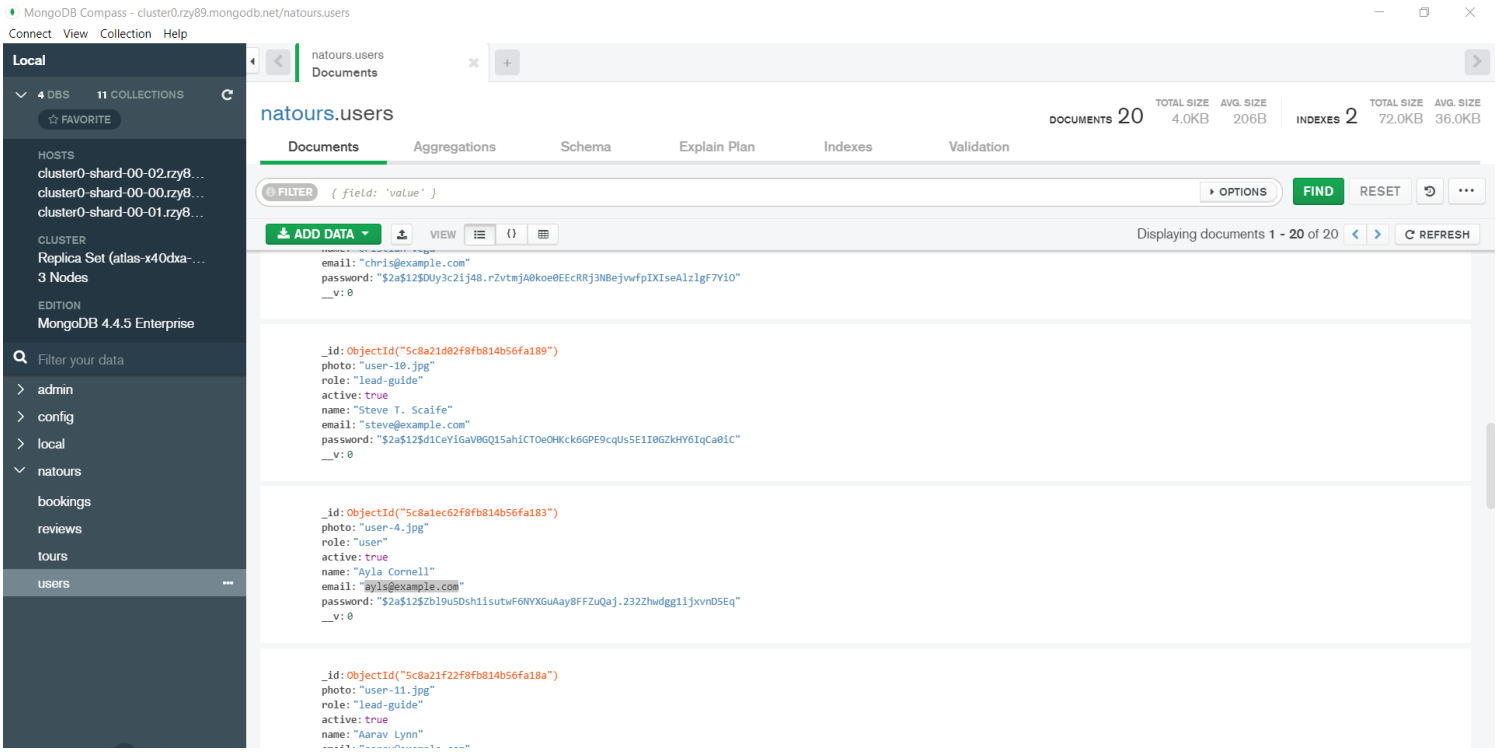


Fig 4.6 Admin Product Page

4.3 CONCLUSION AND FUTURE SCOPE

The main objective of this Practicum project was to develop fully functioning project using the existing technologies and the knowledge obtained so far and if needed then further increasing thatknowledge. The Project intention was to build a full stack tour booking web application with the theme of planning and booking tours online to the Indian market where the user can sign in their account, book tours on their accounts, add tours to the wish lists on their accounts, remove tours from the wishlist of their account, have their information stored on the cloud after their application is closed,search and filter places for tours and make payments during their booking.

Challenges

One of the biggest challenges faced during the development of the W/A was embedding admin panel in api. Working with MongoDB was somewhat difficult since it does not easily integrate with payment tools because it has very different architecture as compared to other SQl available. So, the learning curve during development was steep.

Future Scope

Although the requirements set out for the web application have been met, while there are still some future scopes and areas which can be improved later on. A mobile version can be developed for the application so that the users can have access to the application from their mobile phones as well. Also, other online payments like payment wallets like Paytm, UPI payments like gpay etc. and other payment methods can be implemented for the application. Products recommendation system can also be implemented for the application.

References

1.What exactly is Node.js? . FreeCodeCamp. [Online]
https://medium.freecodecamp.org/what-exactly-is-node-js-ae36e97449f5

2.What is HTML? HTML Source. [Online]
http://www.yourhtmlsource.com/starthere/whatishtml.html

3.Introduction to CSS. MDN Web Docs. [Online]
https://developer.mozilla.org/en-US/docs/Learn/CSS/Introduction_to_CSS

4.What is Express.js? . [Online]
https://stackoverflow.com/questions/12616153/what-is-express-js

5.Crockford, Douglas. JavaScript: The World's Most Misunderstood Programming Language.
http://www.crockford.com/javascript/javascript.html

6.Init.js: A Guide to the Why and How of Full-Stack JavaScript.
http://www.toptal.com/javascript/guide-to-full-stack-javascript-initjs

7.Understanding the Node.js event loop. https://nodesource.com/blog/understanding-the-nodejsevent-loop

8.Comparing Node.js vs PHP performance. http://www.hostingadvice.com/blog/comparing-nodejs-vs-php-performance/

9.Understanding Express. http://evanhahn.com/understanding-express/

10.Object Modeling in Node.js with Mongoose .https://devcenter.heroku.com/articles/nodejsmongoose

11.You're Doing Node.js Wrong! Avoid Synchronous Code. http://www.nodewiz.biz/your-doingnode-js-wrong-avoid-synchronous-code/

12.Stripe Documentation, Stripe, San Francisco, California [Online] https://stripe.com/docs/stripe-js/react

Appendix

GITHUB: https://github.com/sahilssj03/PRACTICUM_2