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An Undergraduate Project on PlanMyTrip

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An Undergraduate Project on PlanMyTrip

By

Md. Maruf Rahman

Student ID:**1830025**

Autumn, 2022

Supervisor:

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R&D Officer

Department of Computer Science & Engineering

Independent University, Bangladesh

January 10, 2023

Dissertation submitted in partial fulfillment for the degree of Bachelor of Science in Computer Science

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

This is to verify that I, **Md. Maruf Rahman** (1830025), have finished the report named " **PlanMyTrip**" which was submitted in partial fulfillment of the requirements for the degree of Computer Science and Engineering from Independent University, Bangladesh (IUB). It was finished under the supervision of Mr. Sarwar Shahidi (Supervisor). I also confirm that everything of my work, which I learnt throughout my internship, is original. All information sources utilized in this research and report have been properly acknowledged.

Signature

10/01/2023

Date

Md. Maruf Rahman

Name

Acknowledgement

Above all, I want to express my gratitude Allah Almighty for making me able-bodied and able-minded and for providing me with this chance. It was to my advantage that I was hired by Solution World Limited (SWL).I am grateful to my director, Mr. Sarwar Shahidi, R&D Officer, Department of Computer Science and Engineering, Independent University, Bangladesh, for his valuable advice, constructive criticism, and, most importantly, a one-of-a-kind mentoring that has enabledme to face real-world problems and focus on the growing challenges of the professionalsector. Abdullah Ibn Nurul Islam (Managing Director, SWL) and Md. Jahangir (Project Manager, SWL) deserve special thanks as well. Likewise, I'd want to convey my heartfelt gratitude to all SWL Solutions employees that worked with me to complete my job report.

Last but not least, I'd want to express my gratitude to my parents and other family members for their unwavering support.

Letter of Transmittal

January 10,2023

Mr. Sarwar Shahidi

R&D Officer, SETS

Department of Computer Science and Engineering

Independent University, Bangladesh

Dear Sir,

It is an honor to submit my Internship report on PlanMyTrip under your supervision. In this report, I have attempted to present my project work, my experiences, and my accomplishments.

From October 1st, 2022, till the present, I worked as an intern at Solution World Limited (SWL) as a Full Stack Web Developer. Throughout this time, I have gained real-world job experienceand expertise in a variety of areas. This report contains a summary of all my project work, experiences, and learning during this internship.

I'd want to express my gratitude for your unwavering support, advice, and generosity. I've attempted to do this with the utmost sincerity and honesty. I really hope and pray that this report meets all of your criteria and meets your expectations.

Sincerely,
Md. Maruf Rahman

Evaluation Committee

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Signature Shahidur

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Name Sarwar Shahidur

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Supervisor

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Signature

SANZAR ADNAN ALAM

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Name

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Internal Examiner

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Ajmiri Khan

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External Examiner

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Name

Dr. Mahady Hasan

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Head, Department of Computer Science & Engineering

Abstract

Bangladesh is a rapidly developing country that has made rapid progress toward becoming a digital nation. The enormous growth in Internet usage over the last decadehas had a significant influence on the lives of millions of people across the country. New technologies are rapidly changing our communication techniques, instructional methods, and learning chances. Because of the increased demand for internet access, businessesand other platforms began selling their services and products online.

PlanMyTrip is a website for the Travelling industry, that is interactive, functional, and revenue-generating. This application's main goal is to assist the companyin displaying a certain number of booking packages on their website.

There are hundreds of Travels Booking Websites on the Internet, but the goal of this projectis to create something fresh, inventive, and efficient utilizing cutting-edge technologies like as React.js and Node.js, Express.js, MongoDB. The major focus is on creating a user-friendly website that successfully displays the intended findings on the graphical user interface.

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Chapter 1

Introduction

1.1 Overview of the Work

A tremendous technological transition has occurred in recent years, resulting in a significant change in the way people travel all over the world. Booking and ratingdifferent p laces in the digital realm is a big part of online travel apps.

Customers do a lot of research online before making a reservation. As a result, having an online presence in the travel agency sector has become a significant marketing strategy.

That's where the PlanMyTrip Travel App comes in handy. PlanMyTrip owns the project, which is an online based travel application for booking and evaluating destinations all over the world. And this project includes all the essential features of a typical travel website, as well as a lot more.

1.2 Objectives

By making online applications core and basic, business development can be accomplished. In the middle of their direct interaction between the company and the consumer, their commercial relationship will be strengthened. As a result, the market area might be expanded. The most crucial objective is to have a web presence and attract more clients. Companies are under increasing pressure to expand their customer base, which can be accomplished by providing value-added services while preserving quality.

As a result, one of the key objectives of businesses is to provide impetus for powerful sales and overall product growth.

- User can see all information's but can't reserve room without authentication.
- User can register, login and logout.
- User data are safe as we used JWT to ensure security.
- After authentication, the user can reserve room.
- The Hotels information can be viewed by the user.

1.3 Scopes

The project's scope of work is outlined based on thorough technological research into the application's development possibilities.

1. Create a reusable user interface - Create react components that can be reused throughout the program.

2. API Integration - Consume APIs (both internal and external to the project).

3. Integration of a payment gateway.

4. Optimize the application - By optimizing the application, you can make it run faster.

- Minifying Code
- Optimizing Images (Reduce Size)
- Delete Unnecessary Codes are all included in the Optimize-on feature.

5. Security using JWT.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

The knowledge and skills acquired in undergraduate courses have been helpful in developing the "Plan My Trip" project. The project would have been more challenging if these courses hadn't been completed first. Some of the programs are:

- **Introduction to Programming:** This course covers the fundamentals of programming, including the declaration of variables, iteration, conditional statements, switch-case statements, arrays, and functions, as well as the introduction to a new programming language.

- **Object-Oriented Programming:** The course advances by covering the ideas of classes and objects, variables inside of classes, and different sorts of classes. A Graphical User Interface of a real-life problem.

- **System Analysis and Design:** The course covers the methods and tools needed to develop systems that properly analyze information systems. Some of the topics covered are systems and models, project management, methods for determining system requirements, data flow diagrams, decision tables, and decision trees.

- **Database Management:** This course taught Various well-known planning and strategy techniques including the System Development Life Cycle, Rich Pictures, Requirement Analysis, Relationship Diagram, Business Process Model and Notation Diagram, among others. These methods supported the project's planning and strategy development.

- **Web Application Internet:** This course gives a thorough understanding of web-related technologies and their applications. The front-end languages, HTML and Cascading Style Sheet (CSS), Bootstrap, JavaScript and the back-end languages, PHP and MySQL, are covered in the course talks. Finally, jQuery's responsiveness for devices of various sizes is covered.

2.2 Related Work

Paperwork used to be utilized for unit booking and review. As a result, the process was slow and inconvenient. Our application was created with the goal of digitizing the process, reducing paperwork, speeding up delivery, and ultimately satisfying customers.
As a result, we had to look through a lot of websites to find one that met our requirements.

- https://avijatrik.org/
- https://www.gozayaan.com/
- https://www.tripadvisor.com/
- https://www.lonelyplanet.com/
- https://sharetrip.net/

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

A work-breakdown structure shows the breakdown of the project into smaller components.

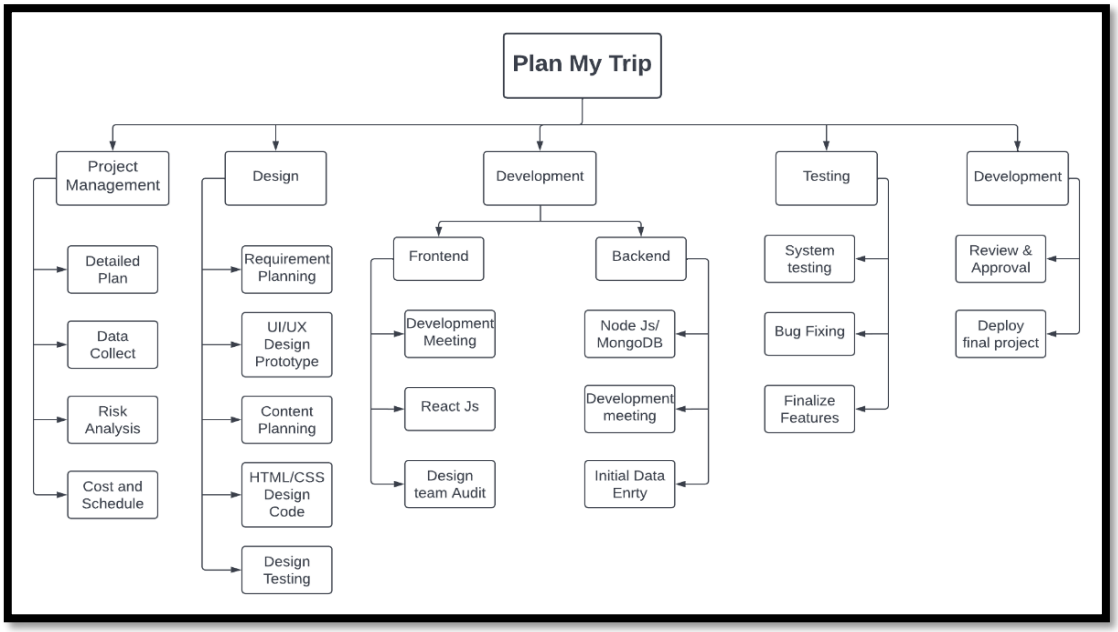

Figure 3.1: WBS of PlanMyTrip

CHAPTER 3. PROJECT MANAGEMENT AND FINANCING

Work is broken down into smaller tasks using the Work Breakdown Structure (WBS) productivity strategy to make it more manageable and approachable.
This method is one of the most significant project management documents.

The task breakdown structure for the booking management system is depicted in the above diagram (WBS). WBS is a hierarchical framework that shows how a project is divided up into smaller components.

We create a WBS for each of our projects to plan out our work.
The WBS provides a visual representation of all the scopes, risks, communication points, duties, expenses, and assurances that don't exclude crucial deliverables.
The team's ideal tool for collaboration and brainstorming is this one.
We have applied the top-down method in our WBS.

3.2 Activity wise Time Distribution

Estimating the time required to finish the project is an important step as it provides the developers a guide as to how to efficiently they need to work in order to meet the Deadlines.

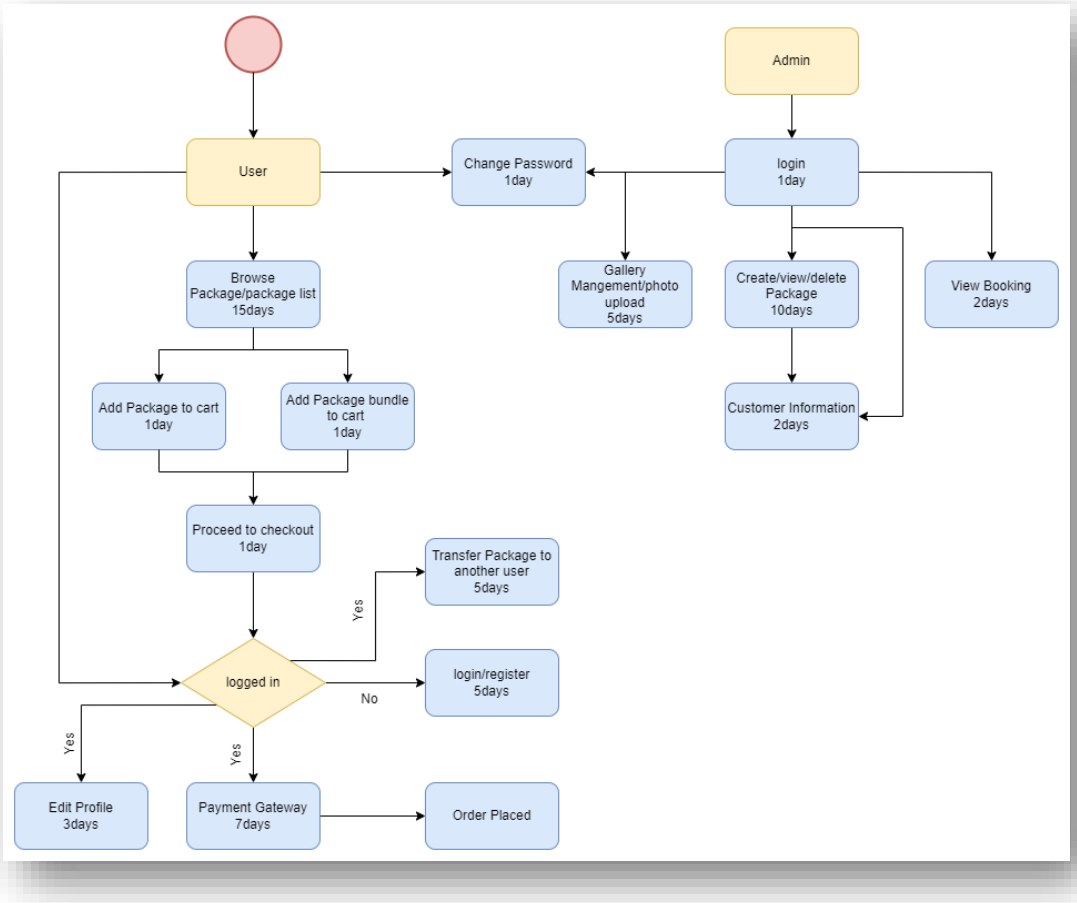

Figure 3.2: Time Distribution of PlanMyTrip

3.3 Gantt Chart

The time duration for the project was decided to be 3 months. Here is the Gantt Chart that shows the estimated time it would take for each task.

The different phases of the project were assigned a time duration to make efficient use of time. According to the chart, the highest amount of time is taken during implementation of the website by coding.

With the Gantt chart, it's easier to explain the overall schedule, show timing of critical steps and their dependencies on other tasks or present the status of project activities over time.

	Task Name	Durantion	Start	ETA
2	Complete Project Execution	78	10/1/2022	12/18/2022
3	Planning	15	10/1/2022	10/16/2022
4	Gathering Requirements	7	10/1/2022	10/8/2022
5	Research Hosting option	3	10/5/2022	10/8/2022
6	Design Ui/Ux	8	10/7/2022	10/15/2022
7	Implementation	30	10/16/2022	11/15/2022
8	Develop Application Architecture	6	10/18/2022	10/24/2022
9	Develop Website	6	10/18/2022	10/24/2022
10	Connect Website To Database	21	10/25/2022	11/15/2022
11	Monitoring and Controlling	3	11/16/2022	11/19/2022
12	Quality Assurance	13	12/10/2022	12/23/2022
13	Issue Management	5	12/13/2022	12/18/2022
14	Test Application	3	12/15/2022	12/18/2022
15	Deployment	5	12/17/2022	12/22/2022
16	Perform Development	3	12/25/2022	12/28/2022
17	Enable Ci/Cd Pipeline	9	12/19/2022	12/28/2022

Figure 3.3: Gantt Chart of The Project

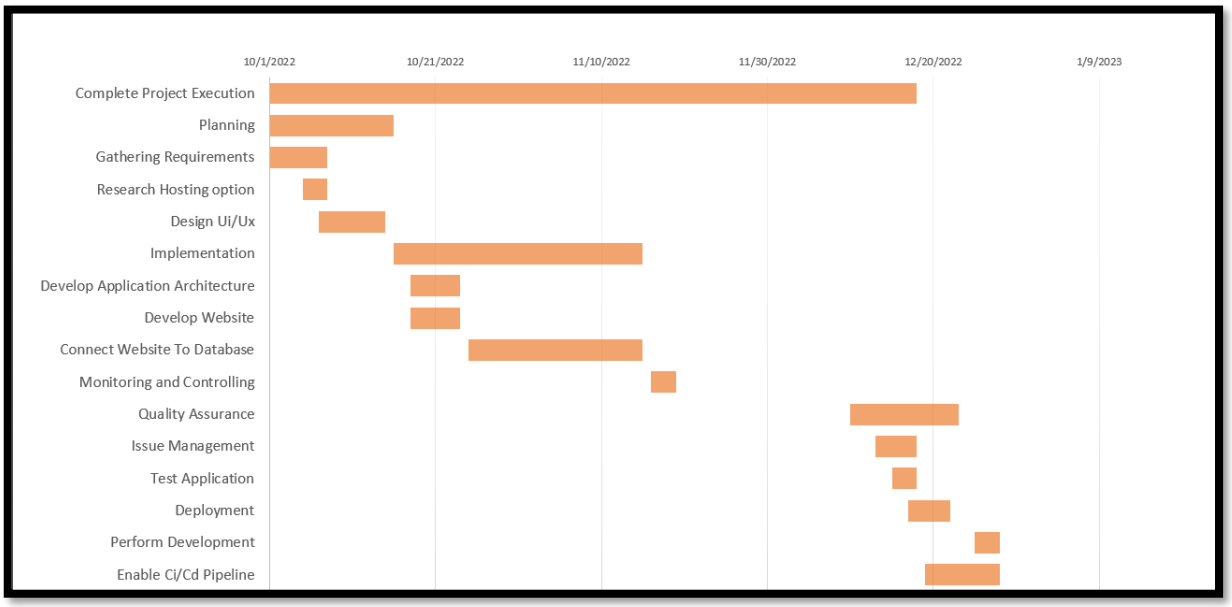

Figure 3.4: Gantt Chart Graph of Plan My Trip

3.4 Process/Activity wise Resource Allocation

Resource Type	Name	Description
HARDWARE	Desktops/Laptops	Platform needed to work
	Routers	Assigned to the team to get maximum speed
	Hard Disks (HDD/SSD)	Needed to store the projects and its relevant files
	USB Drives	Offline data transfer
NETWORK	Internet	Connection to the web
	Hosting	Making website available via World Wide Web
	Domain	Website identification string
HUMAN	Project Manager	Organizes and allocates work
	UI/UX Designer	Designs website interface
	Developers	Code and develop the project
	DevOps	Optimizes the flow of data and automates infrastructure
SOFTWARE	Visual Studio Code	Text Editor and Development environment
	Windows	Operating systems preferred by developers
	Linux	
	MacOS	
	Postman	Test APIs

Table 3.1: Resource Allocation Table

3.5 Estimated Costing

Resource Type	Name	Price
HARDWARE	Desktops/Laptops	Tk.480,000
	Routers	Tk.10,000
	Hard Disks (HDD/SSD)	Tk.10,000
	USB Drives	Tk.5,000
NETWORK	Internet	Tk.2000/month
	Hosting	Tk.4995/year
	Domain	Tk.1000/year
HUMAN	Project Manager	Tk.40,000/month
	UI/UX Designer	Tk.10,000/month
	Developers	Tk.35,000/month
	DevOps	Tk.25,000/month
SOFTWARE	Visual Studio Code	Free
	Windows	Tk.25,000
	Linux	
	MacOS	
	Postman	Test APIs

Table 3.2: Estimated Costing

Chapter 4

Methodology

A software development methodology is a procedure or set of methods used in the creation of software.
Agile methodology, which incorporates iterative development and prototyping, is frequently employed in a wide range of industry projects as a lightweight development process that can adapt to changing requirements. The agile methodology was the methodology of choice in our project.
To keep our clients informed of our progress, the PlanMyTrip application has been deployed on a test site. Meetings are held at fixed intervals so that we can receive input from clients and make necessary modifications.
Agile is a project management method that involves breaking a project down into stages, frequent collaboration with stakeholders, and continuous improvement and iteration at each level.

Reasons for choosing agile methodology

1. Faster time to market - Instead of taking up months to deliver something to the Clients, it is better to show signs of improvement and get the project online as soon as possible.

2. Customer satisfaction - The option to add frequent new highlights based on the client's feedback makes them happy. This helps us to build good relationships with our customers, one where we are working together to get problems solved.

3. Early risk reduction - By consulting early with the clients and getting their feedback, we reduce our chance of building an inappropriate product. Changes needed can be handled early, which saves both time and money.

4. Higher quality product - Project phases could also be so filled with features that developers have to rush to finish them and very little time is left for testing. As a result, they'll not have the time needed for correct mobile application testing. On xc an Agile project, the team does not work on all features at once. Instead, the team assigns a smaller subset of features to every teammate. That way, the developers have longer to perfect those items before release

Chapter 5

Body of the Project

5.1 Work Description

PlanMyTrip is a travel web app that specializes in booking various travel and restaurant packages. The website's developers will have to devise and implement tactics that allow for viewing and booking.

The following are some of the jobs and responsibilities:

1. Work with the Web Development team to determine the system's requirements and solutions.

2. Conceive, design, and implement solutions that include integrations with third-party libraries.
3. Demonstrate and instruct business users on how to use the system effectively.
4. To verify that project requirements are satisfied, monitor and track system processing and performance KPIs.
5. Create the webpage and make the necessary adjustments.

6. To generate updated material, collaborate with several teams (product management, graphics, and sales).

7. Make the website so that it doesn't need to be reloaded.

8. Ability to multitask and fulfill deadlines while keeping a high level of attention to details.

5.2 System Analysis

To identify the objectives of a system, system analysis is conducted for the purpose of studying it and its parts. This is a problem-solving process that determines how efficiently the system is running to accomplish its purposes. Planning, analysis, design, deployment, and maintenance are some of the phases covered in this section. It is a process of interpreting and collecting facts, finding out the problems, and splitting up the system into its components.

5.2.1 Six Element Analysis

Process	Human	Non computing hardware	Computing hardware	software	database	Network and communication
Access Website	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Login/Registration	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Add Package to cart	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Place order	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Make Payment	All users	Payment Card	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Edit Profile	All users	Camera	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Add New Package	Admin	Unit Information	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Update Package	Admin	Unit Information	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Delect Package	Admin	Unit Information	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Upload Images	Admin	Images	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN
Change Password	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	MongoDB	WAN

Table 5.1: Six Element Analysis

5.2.2 Feasibility Analysis

The purpose of a feasibility analysis is to determine if a proposed project is feasible and should be pursued. This is referred to as a feasibility study. The main goal of this analysis is to complete the design, plan, and strategy. Assumptions, restrictions, decisions, and methodologies can all be validated using this method. The following are some of the components of a feasibility analysis:

1. Technical feasibility: examines the software, hardware, and other technological requirements of the proposed system. This section explains how we intend to provide the consumer with a product or service. It assists companies in identifying whether technical resources are adequate for their requirements and whether the technical team is capable of translating concepts into practical solutions.
PlanMyTrip was created utilizing NodeJS Core and the Reacts framework. The combination of JavaScript components and standard HTML, CSS, and JS allowed for the creation of a much more efficient and speedier website.
Furthermore, these technologies are quite common in current industry and are widely used in many businesses.

2. Operational feasibility - The operational feasibility test examines and assesses whether the project can meet the needs of the organization. During the requirement analysis phase, operational feasibility studies look at how well a project plan meets the needs specified.

PlanMyTrip has been designed in such a way that it is very simple to carry out.

It's a well-thought-out system. This system underpins the organization's whole business strategy. To use this system, users do not require a lot of technical knowledge. The users can understand every instruction. We hope that this system will be able to meet all of the users' needs.

3. Economic feasibility - This economic feasibility analysis involves a cost/benefits analysis of the project, which helps firms determine the project's costs and benefits prior to allocating financial resources. It also acts as a third-party project appraisal and helps to establish project credibility. This aids decision-makers in assessing the project's financial benefits to the company.

The existing project's business will be totally dependent on the suggested system. If this technology can be able to reach people, it will undoubtedly provide benefits. People may effortlessly organize various vacations using this approach.

5.2.3 Problem Solution Analysis

Despite the benefits, a business using online system as a platform has challenges of its own. Here are some of the problems and their solutions:

1. Competitor analysis - In this competitive business field, there are other competitors offering the same product and services. This makes it hard for our platform to make a mark.

Solution: Conduct a very thorough competitor analysis to identify the services they provide. Figure out the services that are in high demand. In the case of PlanMyTrip, the payment gateway already sets apart our system from any other online booking applications in Bangladesh.

2. Customer loyalty - A business tries to grow its customer base and focuses on attracting new customer. But existing customers should also be a priority. It can cost up to five times more to acquire new customers than to maintain existing ones.
The success of selling rate to an existing customer is much higher than that of a new one.

Solution: To maintain customer loyalty, excellent customer service should be provided. Positive experiences must be provided to the customers so that their trust is gained. Happy customers will likely make a purchase again or recommend new users.

3. Data security: Of all the booking application business challenges today, technical issues in application can be one of the most difficult to overcome. And worst kind of technical issue is related to data security. Attackers can not only infect the website with viruses, but they can also expose confidential data.

Solution: For PlanMyTrip, data security was given handled by using the Node Js Core technology for backend. This provides a decent layer of security, and for the authentication and authorization the Dot net core identity package was used which is recommended by Microsoft themselves.

5.3 System Design

5.3.1 Rich Picture

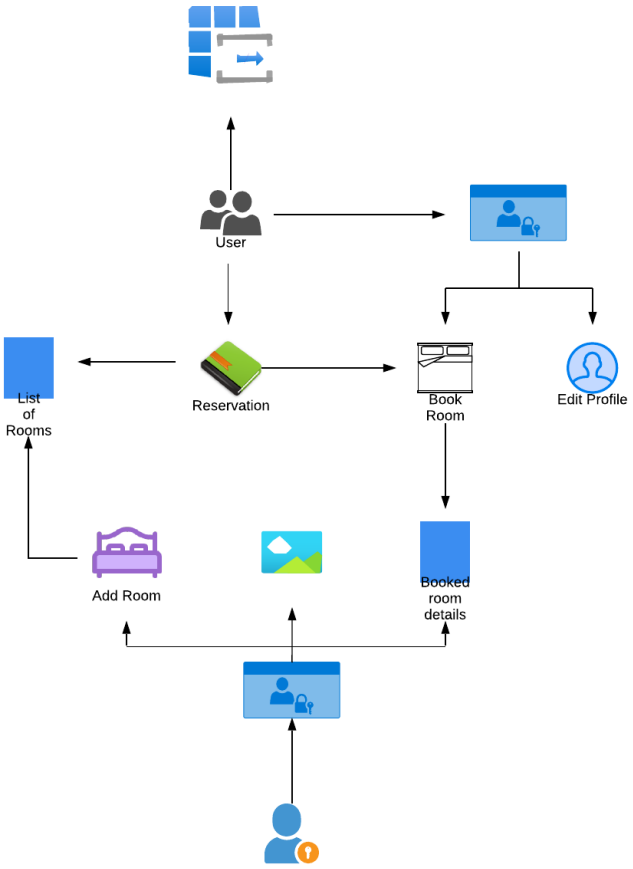

Figure 5.1: Rich picture of PlanMyTrip

CHAPTER 5. BODY OF THE PROJECT

A Rich Picture is a process of examining, recognizing, and defining a situation, then describing it with diagrams to create a basic mental model. A thorough graphic facilitates conversation and the development of a broad, common understanding of a topic. PlanMyTrip colorful artwork summarizes the project and depicts all of its essential steps.

5.3.2 Use Case Diagram:

A use case diagram is a way of summarizing the details of a system and the users within that system. It is usually shown as a graphical representation of the interactions between various elements in the system.

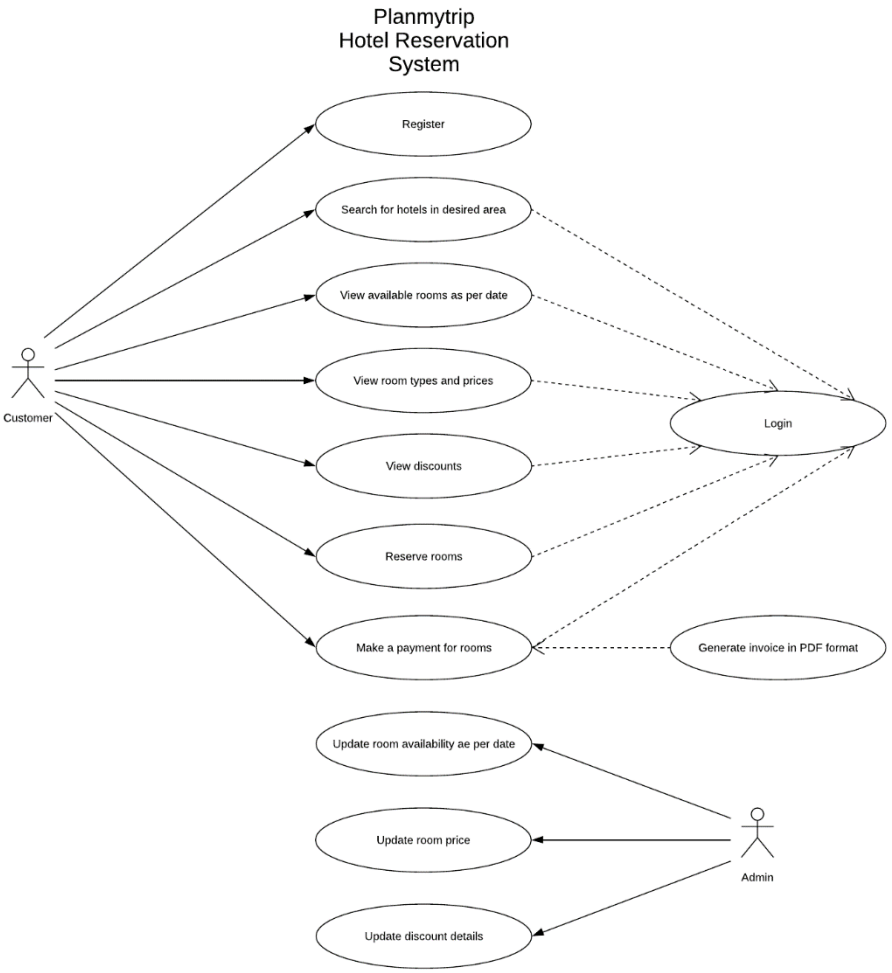

Figure 5.2: Use Case Diagram of PlanMyTrip

5.3.3 Entity Relationship Diagram:

Class diagrams are a key component of object-oriented modeling. It is used for general conceptual modeling of the structure of the application and for detailed modeling that translates the model into programming code. Class diagrams can also be used for data modeling. The classes in the class diagram represent the major elements, interactions within the application, and the classes being programmed.

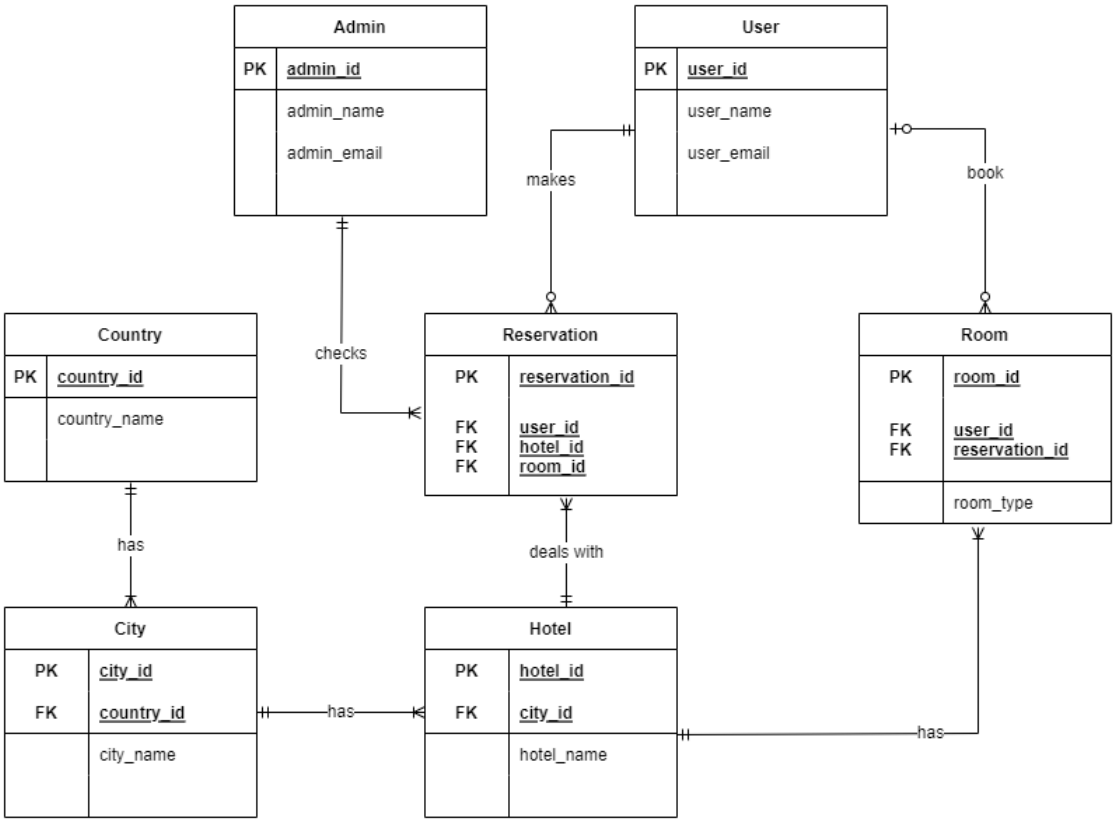

Figure 5.3: ERD class of PlanMyTrip

5.3.4 Functional and Non-Functional Requirements

Functional requirements:

The basic system behavior is defined by functional requirements. They describe what the system does or does not do and can be conceived of in terms of how the system reacts to inputs. Calculations, data input, and business processes are frequently included in functional requirements, which specify the if/then behaviors.

Functions	Input	Process	Output
Add package to cart	Click on add-to-cart button	Add an package or booking hotel to the cart	Notify user Package has been added
Login/Registration	Fill up form and submit	Logs in or creates a new account	Redirects to the last page with authorized privileges
Place order	Click place order button on cart page	Confirms and places the order	Redirects to SSL Commerce procedure
Transfer Package	Provide necessary information and password	Transfers the package to another user	Notify the user package has been transferred
Edit profile	Enter profile details	Updates the profile with the new data	Redirects to updated profile page
Change password	Provide new password	Updates the password	Notify the user password

			has been changed
Add/update/delete	Enter necessary information	Updates the list	Redirects to the list of updated

Table 5.2 Functional Requirements

Non-functional requirements:

A non-functional requirement, simply put, is a specification that outlines the system's operational capabilities and limitations that improve its functionality. These can include things like speed, security, and dependability.

• **Performance and scalability** - This determines how quickly the system returns results and how well it works as workloads increase. We will test our system in GTMetrix and Google Page Speed after it is launched to see how fast it is and how responsive it is.

• **Portability and compatibility** - This decides which operating systems, browsers, hardware, and versions are supported by the website, as well as if it interferes with other processes in these environments.

• **Security** - This determines how the system and its data protected against attacks are. In our system we have implemented JWT Authentication which prevent attacks such as SQL Injection.

• **Usability** - It means how easy it is for our users to use the system. PlanMyTrip has been built by keeping every kind of user in mind. It is and interactive website made with ReactJS and easy functionality. This makes it user-friendly and therefore has high usability.

5.4 Product Features

5.4.1 Input

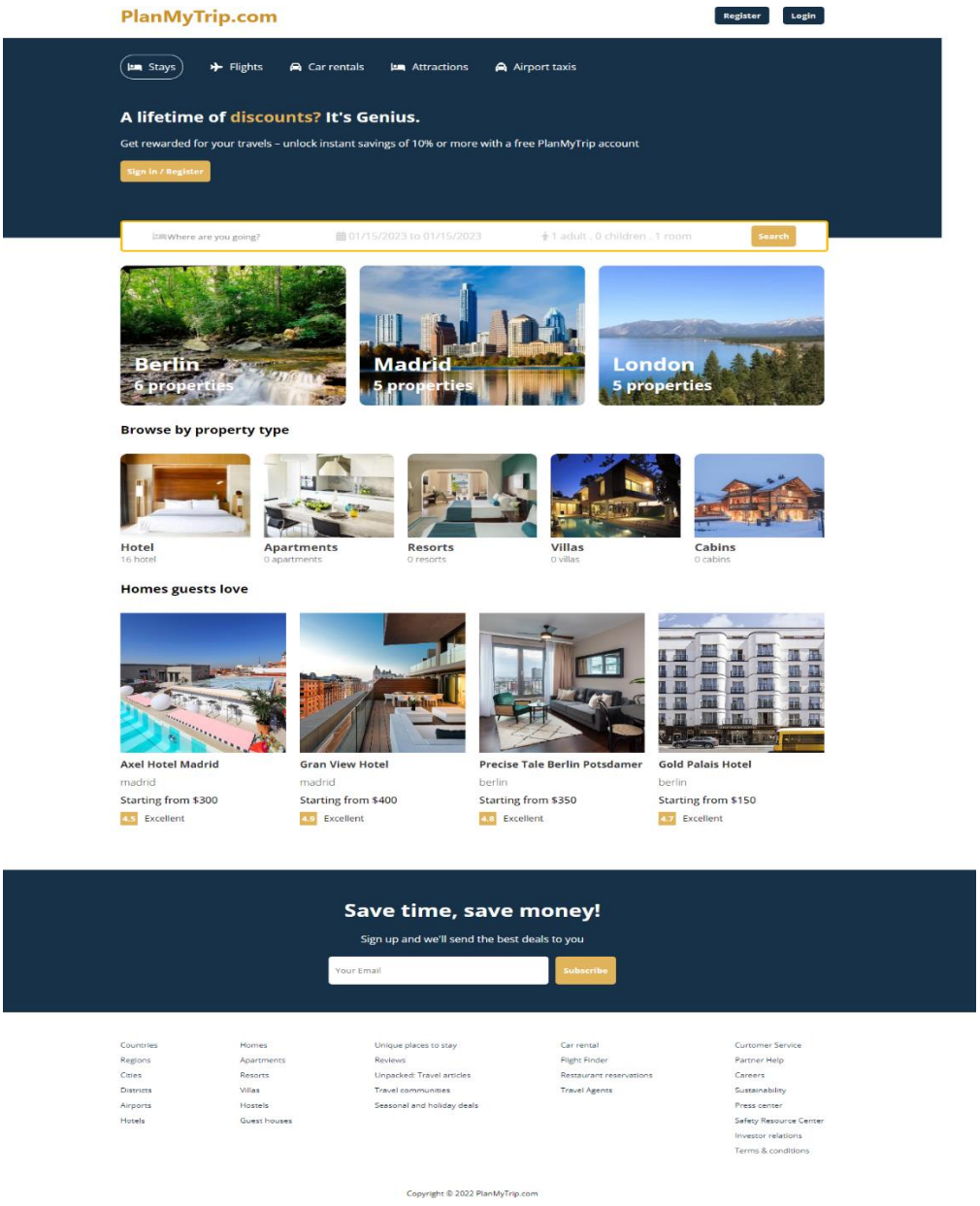

Figure 5.4: Homepage of the application

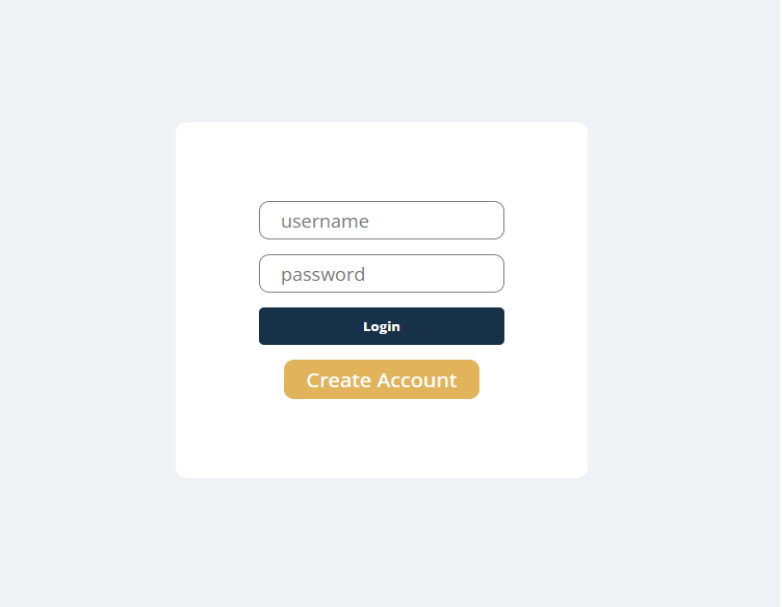

Figure 5.5: Login page of the application

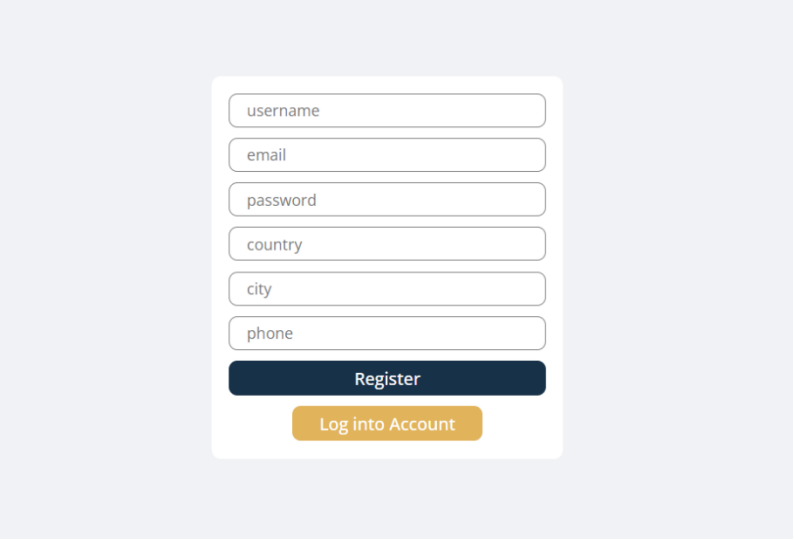

Figure 5.6: Register page of the application

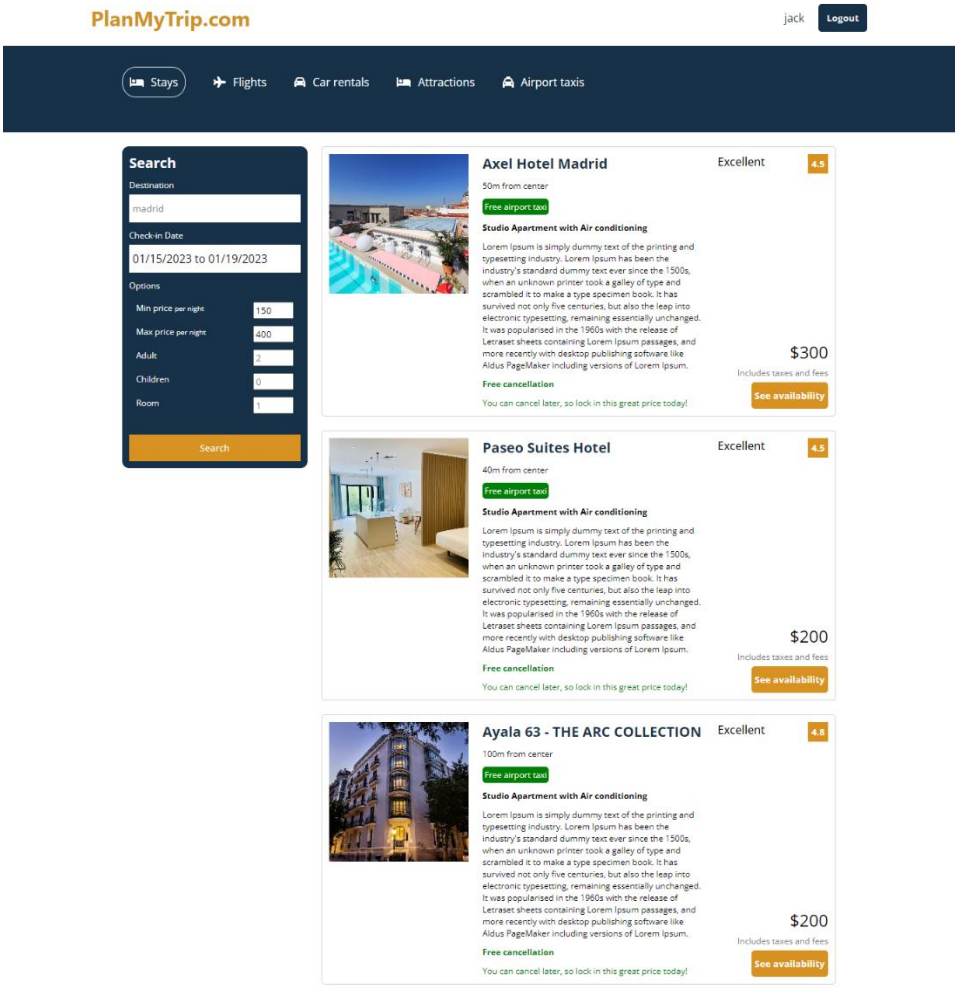

Figure 5.7: Result of Searching

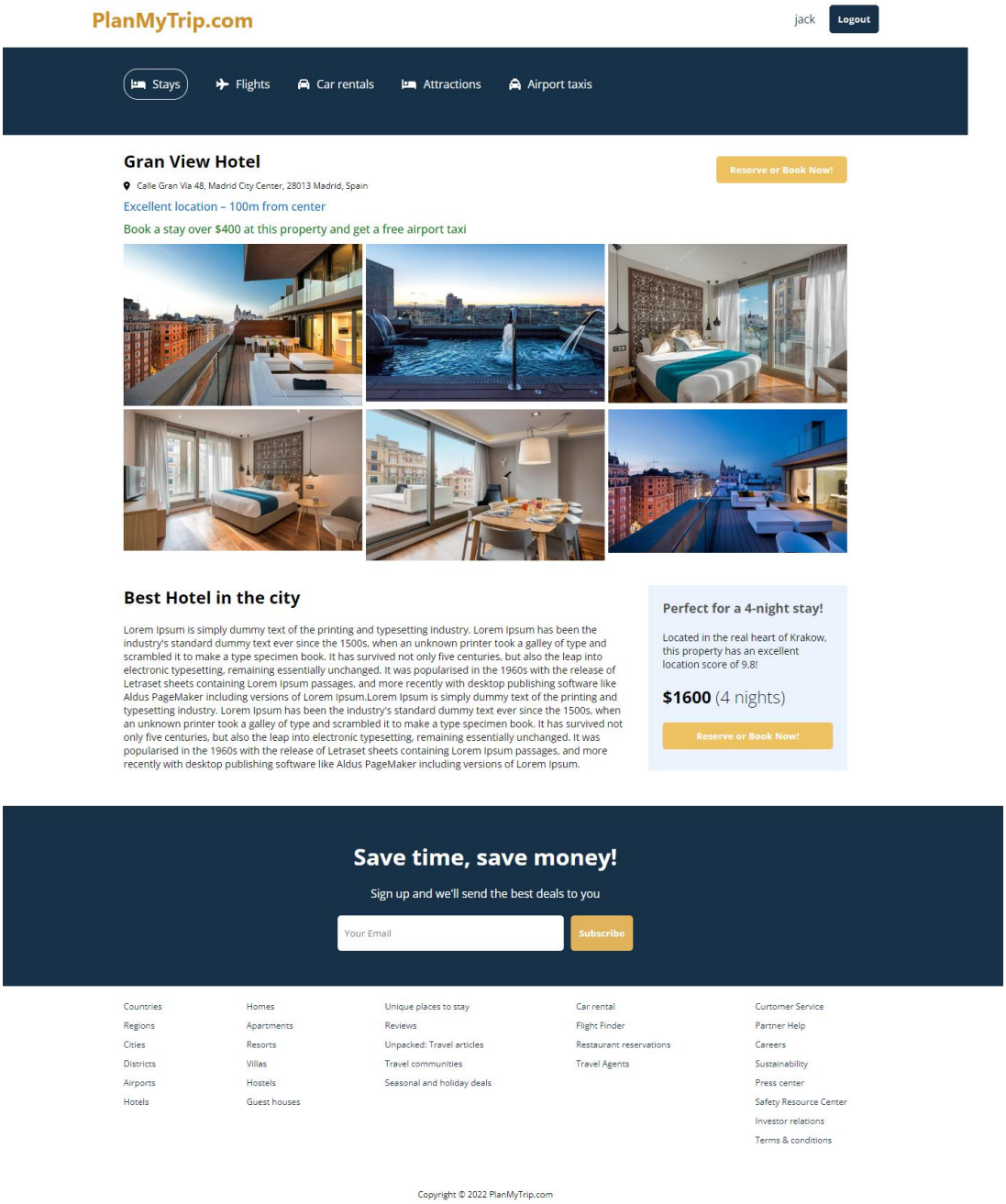

Figure 5.8: Single Hotel Page

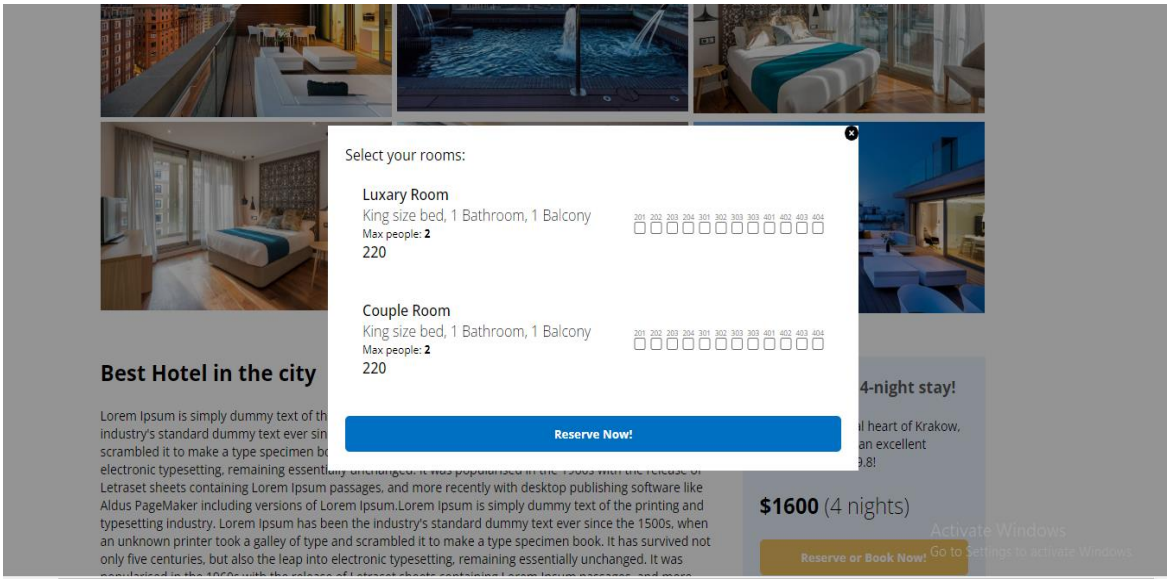

Figure 5.9: Reserve Room

5.4.2 Output

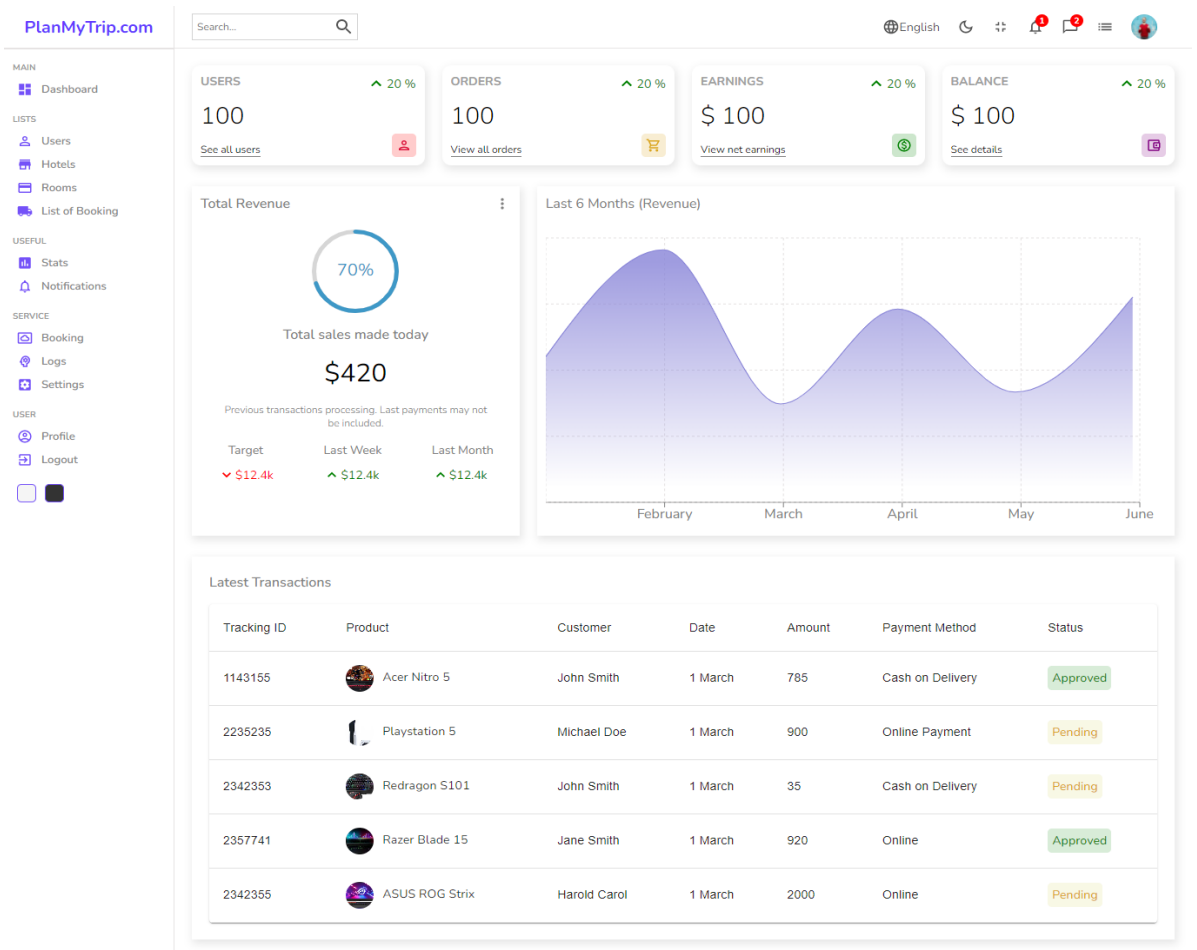

Figure 5.10: Admin Site Homepage

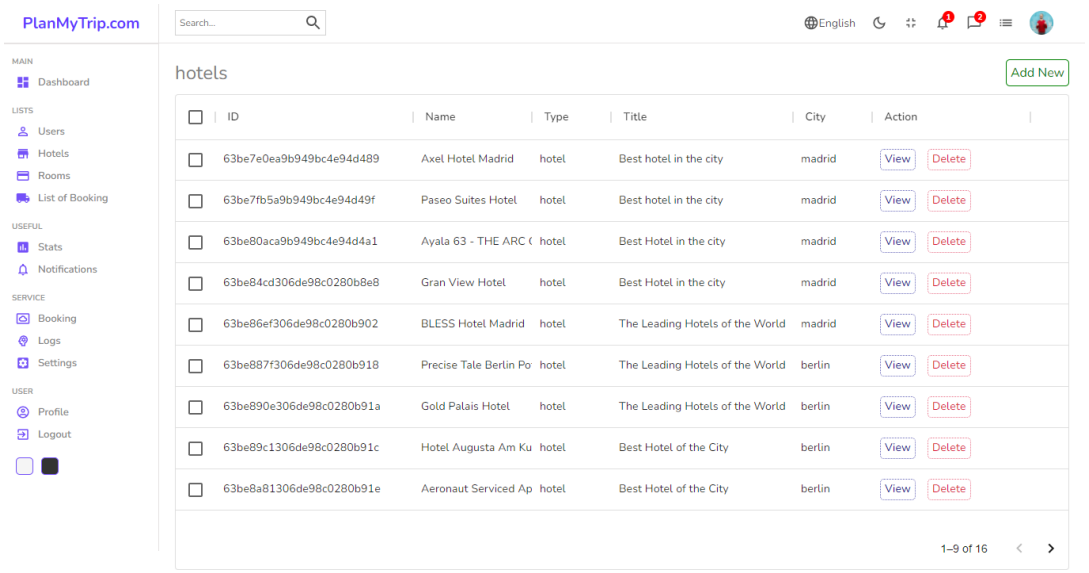

Figure 5.11: List of Hotel In Admin Site

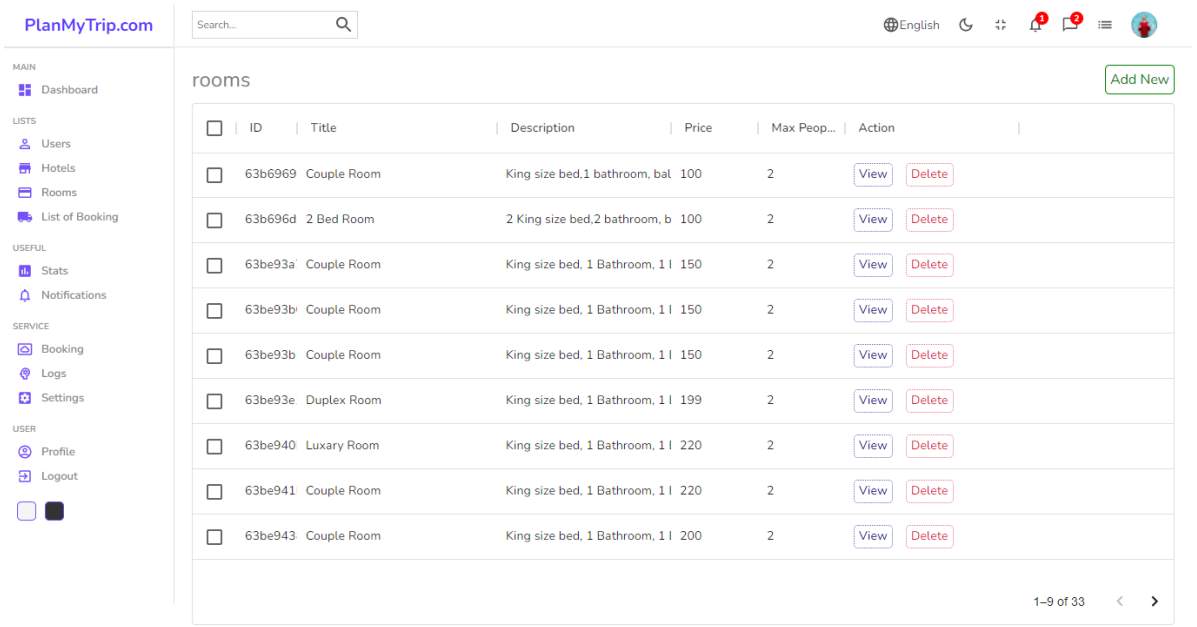

Figure 5.12: List of Room In Admin Site

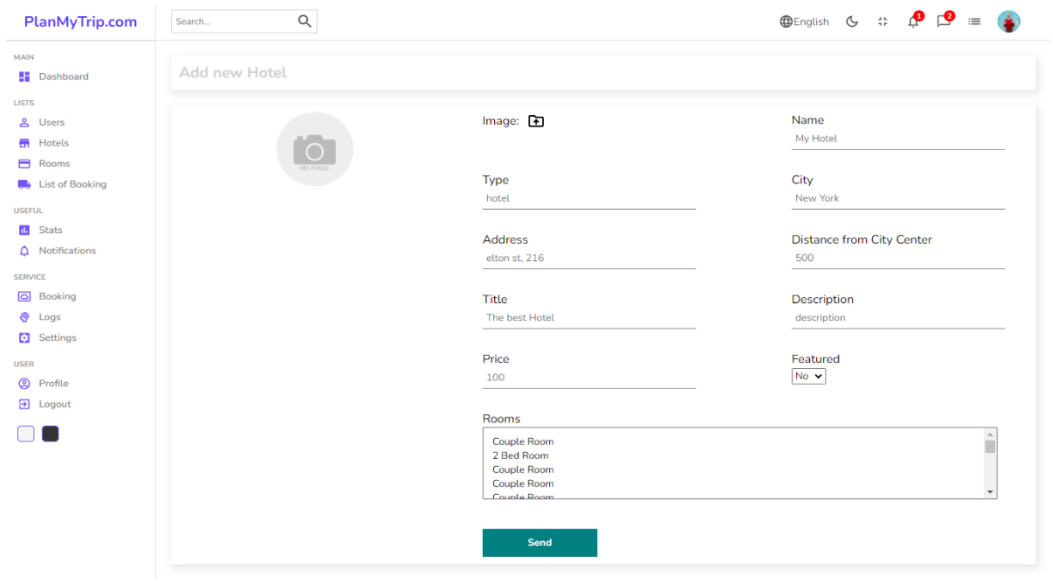

Figure 5.13: Add New Hotel

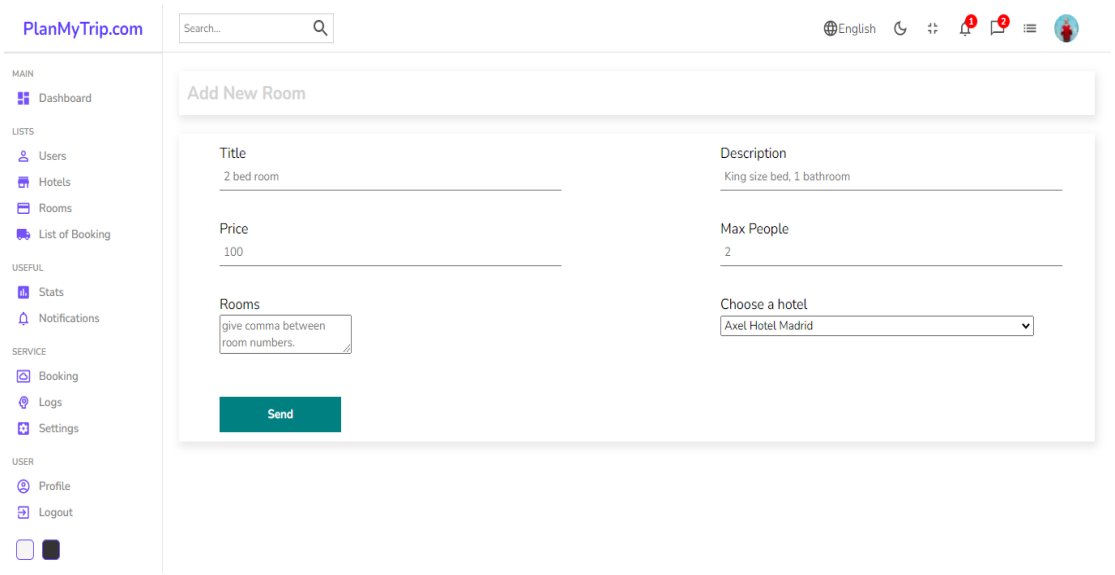

Figure 5.14: Add New Room

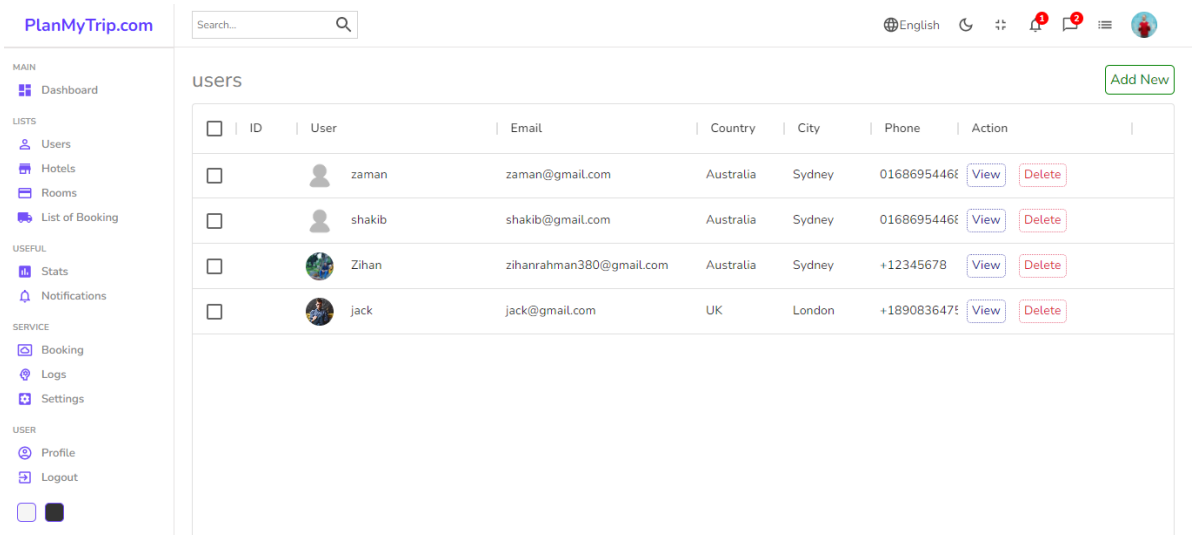

Figure 5.15: List of User

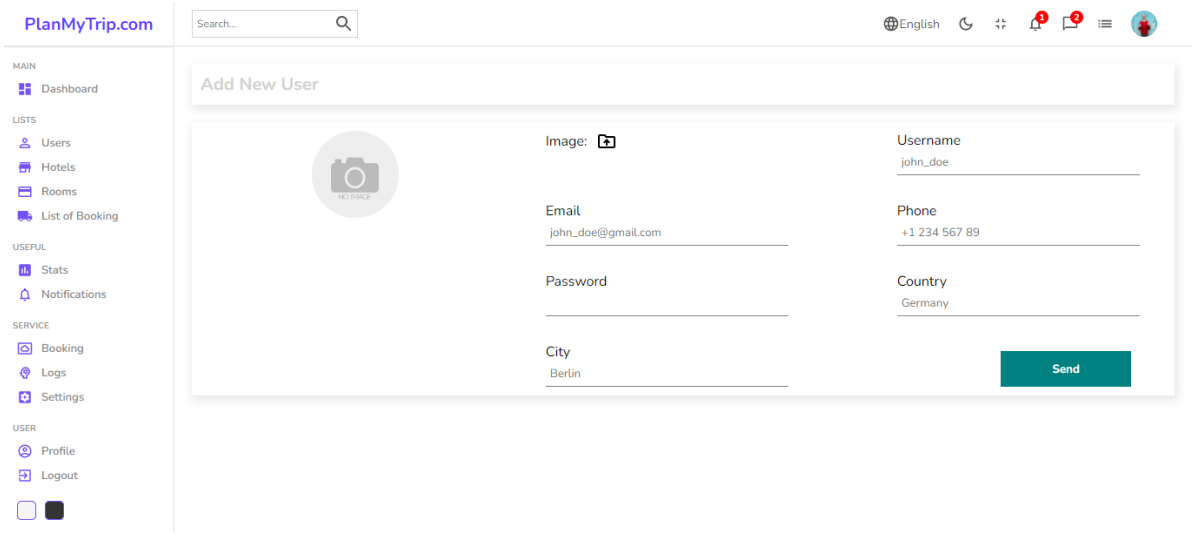

Figure 5.16: Add New User

5.4.3 Architecture

This is a MERN stack project that spans multiple projects. Clean Architecture, CQRS, and the Mediator pattern were used to construct Js, making the code simple to understand, reason about, and extend.
The separation of concerns is the goal of clean architecture. The software is organized into layers to achieve this separation. There are at least two layers for business rules and interfaces in each.

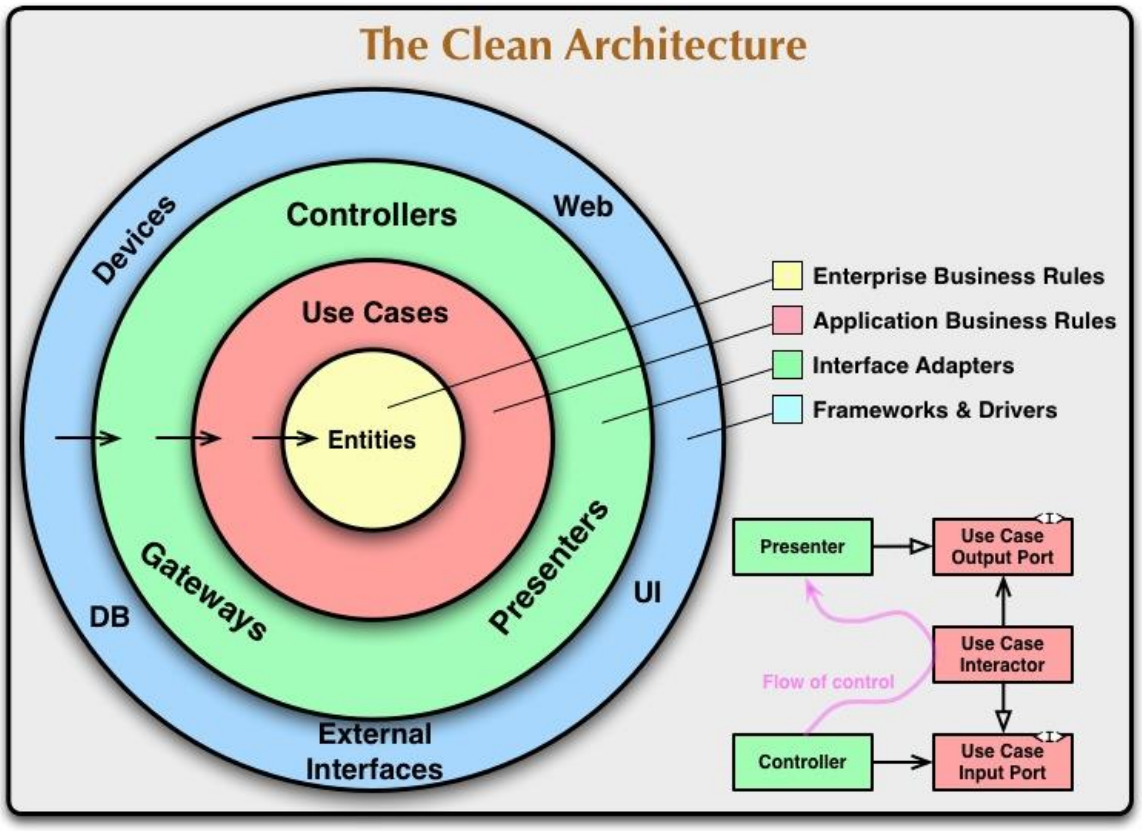

Figure 5.17: The Clean Architecture Diagram.

The overriding rule that allows this design to work is the Dependency Rule. According to this criterion, source code dependencies can only point inwards. Nothing in the inner circle is allowed to know what is happening in the outer circle. An inner circle's code must not, for example, mention the name of something specified in the outer circle. Functions, classes, variables, and any other entity fall within this category.

CQRS Mediator pattern

Command Query Responsibility Segregation (CQRS) is an acronym for Command Query Responsibility Segregation. As a result, an application's Command (write) and Query (read) models are split to scale, read, and write actions independently, rather than having all four CRUD activities together.

To decouple the application, we create interfaces for our data access layer, inject them into the constructor of the API controller, and run the operations. However, when our application develops in size, the number of dependents expands as well, necessitating the injection of several interfaces into the API controller, further complicating the program. CQRS and the Mediator pattern come into play here.

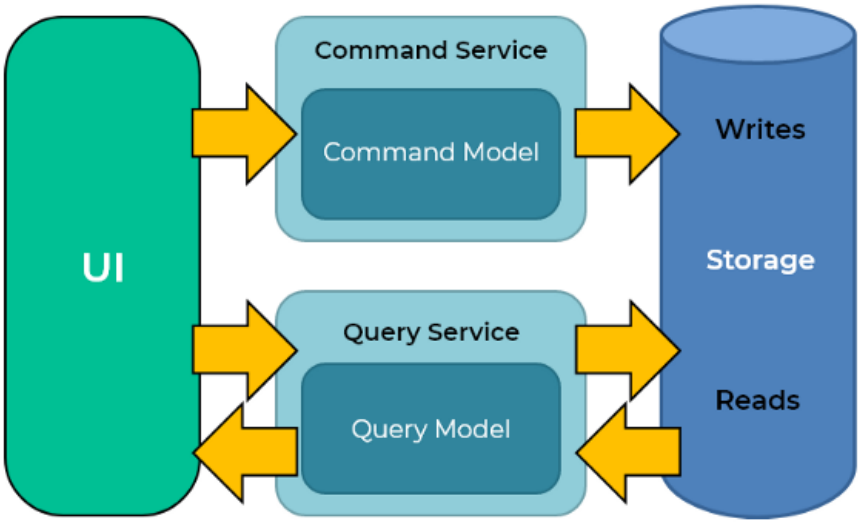

Figure 5.18: The CQRS Pattern

Mediator is a tool that makes communication between different objects or classes easier. This approach produces a mediator class that manages all communication between different classes and supports loose coupling for simpler code maintenance. A behavioral pattern, the mediator pattern is classified. The CQRS and Mediator patterns are favored over large projects because they execute two types of operations:

• Accepts incoming requests
• Handles incoming requests and provides response

Chapter 6

Results & Analysis

The PlanMyTrip project was largely designed to make it easy for getting travelling information all over world. The main goal was to compile all the project details onto a single website so that potential buyers could find everything they needed without having to physically go out and research for it.

6.1 Software Testing

Software testing is a method that the actual software product meets the expected requirements. This involves running software/system components manually or using automated tools to evaluate one or more properties of interest. The purpose of software testing is to identify bugs, gaps, or missing requirements, not actual requirements.

Software testing determines the safety, accuracy, and quality of new software. Approval refers to the process of verifying that the generated computer software fits the NCL requirements. The main goal of software testing is to find bugs in the program.

Our supervisor sir checked our project and he test our system with software tester and found many bugs. Then he suggested us how to fix them. We all fixed our bugs by the help of him.

6.2 Graphical User Interface Result

The graphical user interface is a form of user interface that allows users to interact with devices through graphical icons and audio indicator such as primary notation, instead of text-based user interfaces, typed command labels or text navigation.
This is the system of interactive visual components for computer software. A GUI displays objects that convey information and represent actions that a user can perform. Objects change color, size, or visibility as the user interacts with them.

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

The PlanMyTrip project was done with ReactJS, NodeJS, ExpressJS, MongoDB. Those are the most popular JavaScript frameworks. It takes a long time to train developers in a new technology. React, on the other hand, is a breeze to pick up and utilize. The codes are comparable tothe principles of JavaScript. React components make it easy to create amazing front-end designs for users, ensuring that they have the best possible experience while using the App. The framework is also lightweight and allows pages to render quickly.

- **JSX and Components** - JSX is a JavaScript syntax extension that makes creating your own components a lot easier. It accepts HTML quoting and simplifies the rendering of subcomponents.

  While JSX is frequently disputed, it can be useful in developing high-volume apps or custom components, preventing mistakes in massive tree structures, and making the conversion from HTML mockups to React Element trees easier. Additionally, it gives React developers with helpful warning and error signals, as well as aids in theprevention of code injections.

- **Faster Rendering** - When developing a high-load application, it's critical to think about how the structure will affect the app's overall performance. Because the DOM (document object model) is tree-structured, even tiny changes at the higher layer might generate severe ripples in the interface.

- **Stable code** - ReactJS solely employs downward data flow to ensure that even minor changes in the child structures do not affect their parents. When developers change an object's state, they simply make modifications, and only specific components are updated after that. This data binding pattern promotes code stability and consistent app performance.

- **NodeJS as Backend-** NodeJS is very efficient with real-time applications: it facilitates handling multiple client requests, enables sharing and reusing packages of library code, and the data sync between the client and server happens very fast. Node.js will be incredibly useful when you need something fast and scalable.

- **ExpressJS-** Express was created to make APIs and web applications with ease. It saves a lot of coding time almost by half and still makes web and mobile applications are efficient. Another reason for using express is that it is written in JavaScript as JavaScript is an easy language even if you don't have a previous.

- **MongoDB as Backend Server-** MongoDB is built on a scale-out architecture that has become popular with developers of all kinds for developing scalable applications with evolving data schemas. As a document database, MongoDB makes it easy for developers to store structured or unstructured data. It uses a JSON-like format to store documents.

7.2 Social and Environmental Effects and Analysis

PlanMyTrip makes life easy for purchasers by allowing them to book spots without needing to be there at the time of purchase. This also means they can shop whenever they want without interrupting their everyday routine. The service is always available. Because the buyer does not have to physically visit the place when making an online purchase, pollution is avoided. As going there would necessitate the customer using a motor vehicle (depending on distance), which has a negative impact on the environment, avoiding the requirement for this has a good impact on the environment. Most businesses produce wastepaper. When information is shared digitally, physical paper is no longer required in the workplace.

7.3 Addressing Ethics and Ethical Issues

We spend plenty of time discussing topics that help us grow our business, such as SEO and data analysis. However, most people who take their business online overlook some of the most basic ethical concerns.

The sellers, on the other hand, have a duty to their buyers. They must ensure that data theft or security breaches do not occur as a result of their transactions. Customers provide us with a great deal of personal information in order to complete a transaction, such as:

- Personal information
- Credit card numbers
- Email addresses and a password, which they may share across many accounts

With that information, hackers may cause a lot of harm to customers. We don’t want to jeopardize your consumers’ confidence. Here are some of the things that should be considered:

- Use HTTPS/SWL, especially on pages that collect sensitive information
- Add further levels of security, such as a web application firewall
- Only keep the customer information that is needed
- For financial transactions, data storage & use trustworthy plat- forms.

CHAPTER 8

Lesson Learned

8.1 Problems Faced During this Period

For me, an internship is an entirely new experience. During my internship, I ran into a few obstacles and issues, and I had to figure out how to fix them. My internship taught me a lot of new things. For me, this experience has taught me something entirely new, and I have liked it.

Adjusting to Corporate Culture: The culture of each corporate office setting must be acquired and tailored to the collective behavior of the personnel; it is not predetermined. After being exposed to such an environment, it was difficult for me to adjust to the company's learning and working stages. The learning aspect of my internship involved more than just software; it also covered hardware, networking, and self-education in how to interact with people of different backgrounds and from other departments.

Adapting to New Technologies: Since this was the first time, I have ever worked on a web application in an office environment I had to learn and adapt to new technologies of the company. Although acquiring the skill set was possible it became hard to apply them in real life situations. First time I learned HTML, CSS, JavaScript and framework ReactJS, NodeJS, ExpressJS, MongoDB at the starting of our internship.

Keeping up to Speed: After learning new technologies and putting them to use was a slow process for me initially as it was the first time, I have ever used it with an office environment. Hence, it was quite difficult to meet weekly deadlines, and this slowed down the overall pace at which the application was developing.

Time management: As my home is far away from Solution World Limited, so I had faced many problems to go to my office.

8.2 Solution of those Problems

With the help of my supervisor, I overcame the difficulties that emerged during my internship while the engineers working on the NCL project overcome their difficulties. My internship experience involved both working and learning simultaneously. To make sure I was familiar with the field of work, my supervisor first introduced and educated me on the principles of the technology I would need to use in actual projects as well as the type of commercial work being done there. This helped me get through the obstacles and issues I ran into as I was developing the system.

Adjusting to Corporate Culture: At NCL, I was able to open up and contribute more to the project's operations since my boss and coworkers, in particular, were truly helpful. Senior staff members at the company helped me better understand the basics of the project and how it operates, which helped me understand it more clearly and put more effort into it. Their enthusiasm encouraged me to inquire, push myself beyond my comfort zone, and ultimately acclimate to the corporate culture of the company.

Adapting to New Technologies: In the beginning it was a difficult situation for me to adopt with new technologies. But after some days I habituate with the entire process by the help of my supervisor and support of web developer team.

Keeping up to Speed: Since it was my first time using it in an office setting, the process started off slowly for me. It became simpler to sustain workload and speed after a few days.

Identifying and Fixing Bugs: The shared Google Drive file where we regularly update a list of the issues and features, we are working on is connected to project boards. This makes understanding the state of the code-base and fixing bugs easier for me and also for the web developer team.

Time management: First month I had faced many difficulties then I adjusted with it. I went to office at the given time.

Chapter 9

Future Work & Conclusion

9.1 Future Work

The Plan project has plans to extend its user support and increase its user base. Better ways need to be discovered to reduce the cost of the owner organization and simultaneously improve the user experience. Some of our future works include:

1. **User support chat system** - Customers will be able to communicate directly with the management party without having the need to call them. A real-time chat system implemented with SignalR will the provide the users an easy way of communication with the sellers.

2. **Cloud migration -** As a result of the worldwide pandemic, more and more organizations are moving to the cloud, redefining their products, and becoming more cost-effective, flexible, and inventive in their operations.

3. **Switch to Next.js -** Next.js is a React framework that allows you to create single- page JavaScript apps. This framework has several advantages, both for our clients' applications and for our development team. We have decided to use Next.js for several reasons, focusing mainly of speed and performance. Next.js makes the Server-Side-Rendering (SSR) very easy.

4. **Add payment gateway.**

9.2 Conclusion

Firstly, I thanked to our Dean sir to give me the opportunity to work with such a great platform like Solution World Limited. He helped me by taking brainstorming session.

Solution World Limited provided me with an excellent learning opportunity during my internship. Because I live so far away from the workplace, it was difficult to stay committed to visiting office hours. This internship gave me the opportunity to get a taste of what people act in the commercial. I had also adjusted to the office culture. Every day I learned different things from office, my supervisor and my teammates.

The internship has been a very fruitful and worthy experience for me. I was able to work, hands-on, in an industry that I had no prior knowledge about. The process of transforming the rich theoretical knowledge with the practical knowledge of the industry has dawned on me.
Interns do not usually get to work on live projects and contribute to the workflow of an ongoing project in the office. I was worth giving a chance to and tasked me with such projects that would help me grow in every aspect of my career. Being the youngest there and the least experienced of the bunch, I got a lot of advice from the people of the company. I also learned the uses of tools and techniques for develop a project.

Finally, I'd like to express my gratitude to my university supervisor (Mr. Sarwar Shahidi), who assisted me in writing my internship report, as well as Abdullah Ibn Nurul Islam Sir (Managing Director of SWL) who introduced me to the practical work of software engineering by assisting me with PlanMyTrip and showing me the way to achieve the best results. Their suggestions helped me get through the internship. Their encouragement and motivation have given me the confidence to work such a platform. They assisted me in developing confidence and professionalism, allowing me to smoothly transition into my professional job.
The project taught me how to read and write codes while collaborating with others. I am currently thinking about pursuing a career as a MERN Stack developer

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An Undergraduate Project on PlanMyTrip

By

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Student ID: 1830025

Autumn, 2022

Consent from Supervisor

The student modified the internship final report as per the recommendations made by her academic supervisor during final viva and the department can use this version for archiving.

(Signature of the Supervisor)

Mr. Sarwar Shahidi

Department of Computer Science & Engineering

Independent University, Bangladesh