An Undergraduate Project on Toitoi

By

Abdullah Al Muhit

Student ID:**1830479**

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Supervisor:

Ajmiri Sabrina Khan

Lecturer,CSE

Department of Computer Science & Engineering

Independent University, Bangladesh

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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, Abdullah Al Muhit (1830479), have finished the report named ”Toitoi,” 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 Ajmiri Sabrina Khan (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.

12/05/2022

Signature Date

Mohammad Abdullah Al Muhit

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 SSL Wireless Solutions.

I am grateful to my director, Ajmiri Sabrina Khan, Lecturer, Department of Computer Science and Engineering, Independent University, Bangladesh, for her 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. Mr. Bappy (Product Manager, SSL Solutions) and Hasibul Hasan (Project Manager, SSL Solutions) deserve special thanks as well. Likewise, I'dwant to convey my heartfelt gratitude to all SSL 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

May 12, 2022

Ajmiri Sabrina Khan
Lecturer, SETS
Department of Computer Science and Engineering
Independent University, Bangladesh

Dear Madam,

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

From December 1st, 2021 till the present, I worked as an intern at SSL Solutions as a Front End 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 of 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 praythat this report meets all of your criteria and meets your expectations.

Sincerely,
Mohammad Abdullah Al Muhit

Evaluation Committee

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Convener

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.

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

There are hundreds of Travel 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. 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 sig nificant change in the way people travel all over the world. Booking and rating different places 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, havin g an online presence in the travel agency sector has become a significant marketing strat egy.

That's where the Toitoie Travel App comes in handy. Tiotoie owns the project, whic h is an onlinebased travel application for booking and evaluating destinations in Banglad esh. And this project includes all of 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.

- After authentication, the user can view their profile.
- The package information can be viewed by the user.
- Google Maps provides detailed information to users.
- Users can book any location, and hotel guests can use several payment gateways to complete their transactions.

1.3 Scopes

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

1. **Create a reusable user interface** - Create react components that can be reused throu ghout 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.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

We built a strong programming foundation during our studies, which allows us to break down a difficult problem into small structured sections and solve them.[1]
Courses that aided in the developing process include:

- Data Structures, CSE 203.
- Object-Oriented Programming (CSE 213)
- Database Management, CSE 303.
- Web Application and Internet, CSE 309

The goal of our Web Applications course was to teach us the fundamentals of web applications and technologies such as HTML, CSS, JavaScript, and PHP. We covered the fundamentals of d atabase management, including how to create queries and retrieve/post data from/to the databas e. We discovered how the various components of a program communicate with one another.The principles of ObjectOriented Programming were taught (OOP). The entire project is organized in an object-oriented manner.

2.2 Related works

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.In Bangladesh, there a ren't many local travel websites.

This made it difficult to come up with something that would appeal to the Bangladeshi mark et. 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.

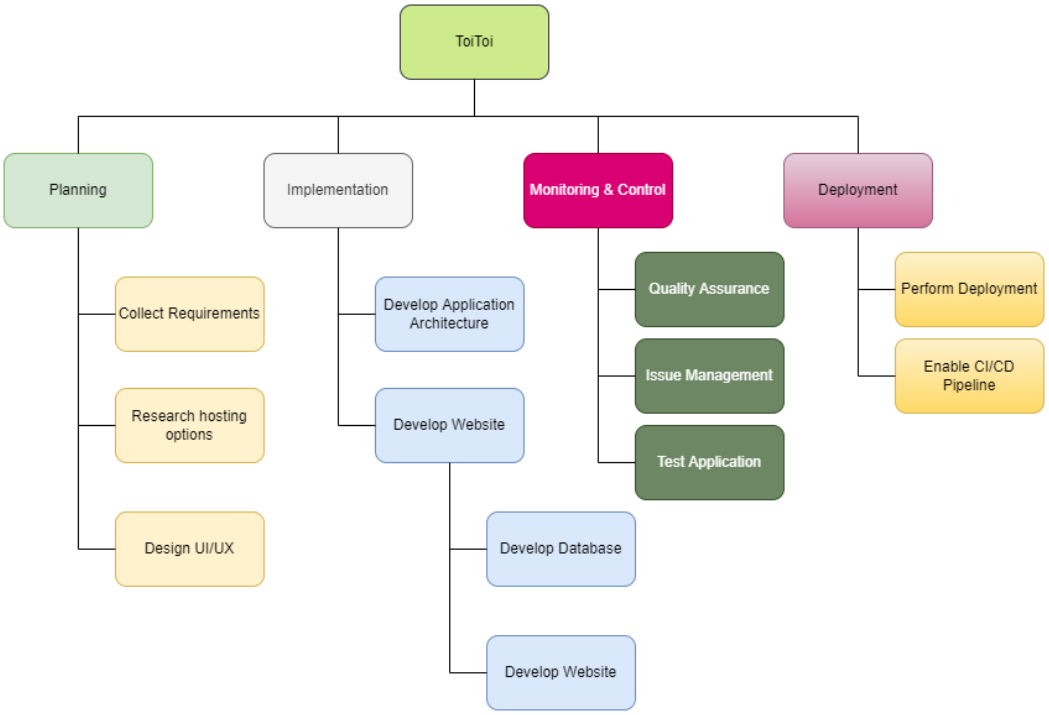

Figure 3.1: WBS of ToiToi

CHAPTER 3. PROJECT MANAGEMENT AND FINANCING

The project was chosen to be completed in stages, with four major phases:

Planning

The team will gather requirements, decide on the technology to be used, explore hosting possibilities, and design the UI/UX depending on the needs during the planning phase.

Implementation

Coding is required during the implementation phase. First and foremost, the project's architecture. It has to be decided. The CQRS (Command and Query Responsibility Segregation) design, for example, was chosen as the architecture for Toitoi. The team will then begin concurrently constructing the website, frontend, and backend.

Control & Monitoring

The monitoring and control phase follows. It is necessary to perform quality assurance, issue management, and testing.

Deployment

The deployment phase is the final step. After the project has been deployed, a CI/CD pipeline should be set up to handle any future updates.

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.

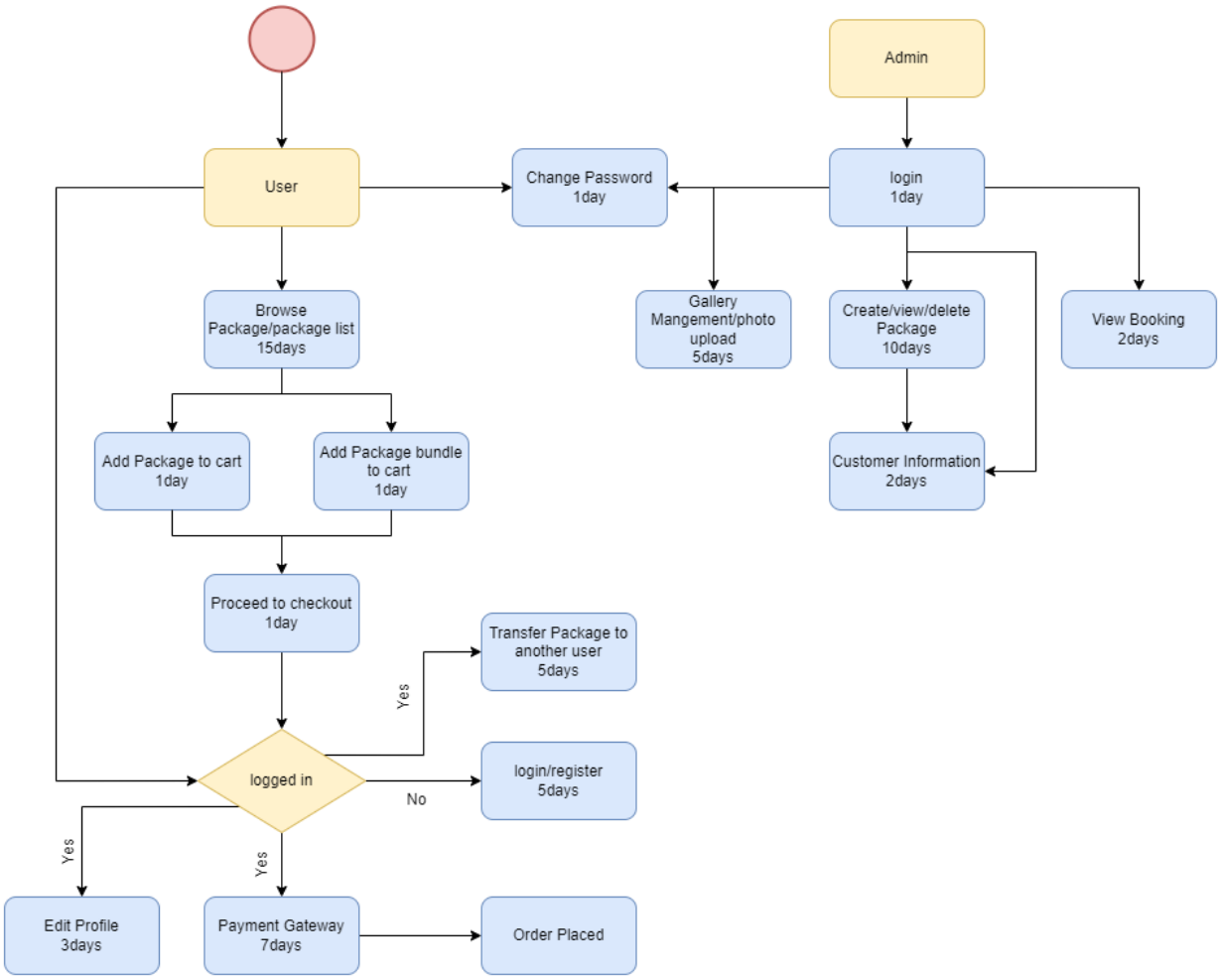

Figure 3.2: Time Distribution of ToiToi

3.3 Gantt Chart

The time duration for the Toitoi 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	Duration	Start	ETA
1	Complete project execution	89	12/1/2021	2/28/2022
2	Planning	15	12/1/2021	12/16/2021
3	Gathering Requirements	5	12/1/2021	12/6/2021
4	Research Hosting Option	3	12/4/2021	12/7/2021
5	Design UI/UX	8	12/7/2021	12/15/2021
6	Implementation	30	12/16/2021	1/15/2022
7	Develop application architecture	6	12/18/2021	12/24/2021
8	Develop database	6	12/18/2021	12/24/2021
9	Develop website	21	12/25/2021	1/15/2022
10	Connect website to database	3	1/16/2022	1/19/2022
11	Monitoring and control	13	2/10/2022	2/23/2022
12	Quality assurances	5	2/13/2022	2/18/2022
13	Issue management	3	2/15/2022	2/18/2022
14	Test Application	5	2/17/2022	2/22/2022
15	Deployment	3	2/25/2022	2/28/2022
16	Perform Deployment	2	2/19/2022	2/21/2022
17	Enable CI/CD Pipeline	8	2/20/2022	2/28/2022

Figure 3.3: Gantt Chart of ToiToi

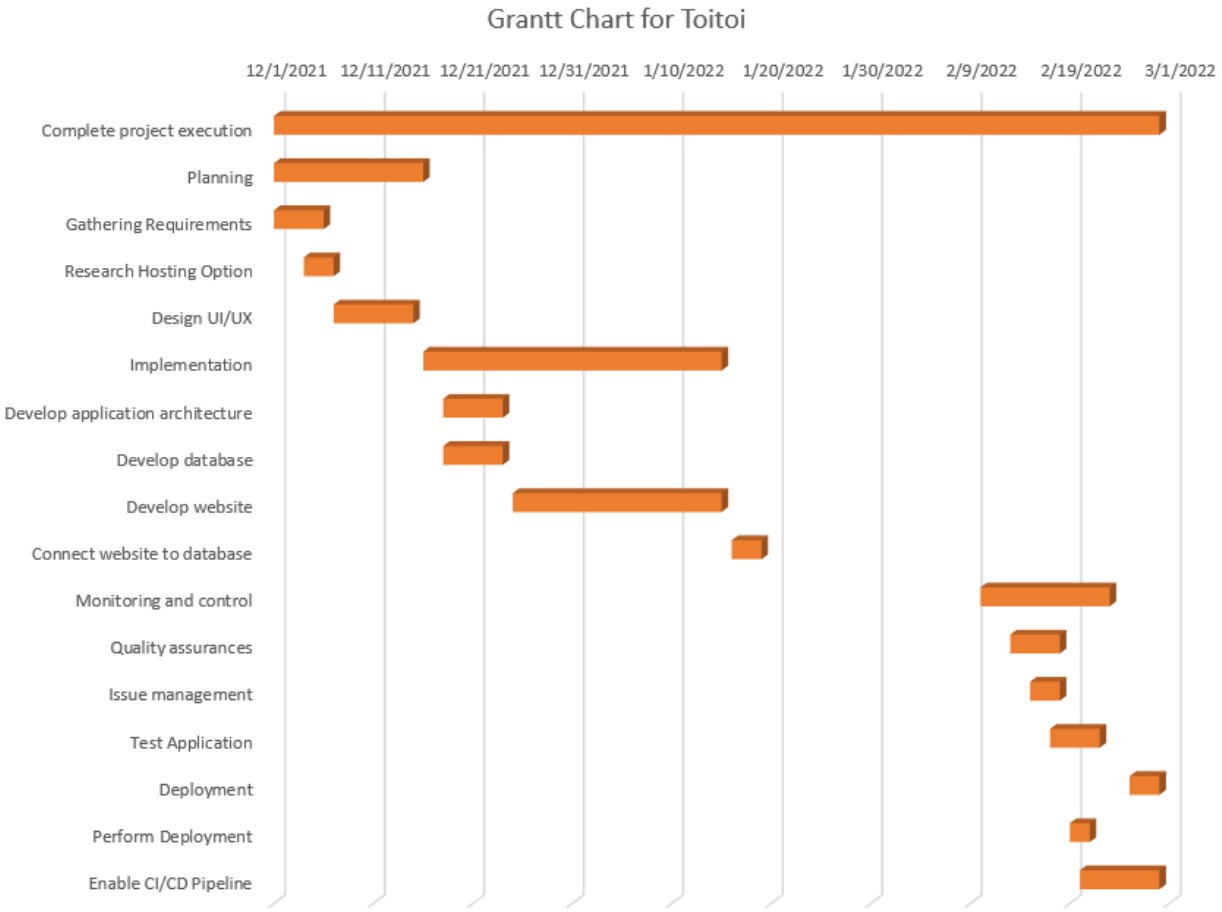

Figure 3.4: Gantt Chart Graph of ToiToi

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.[3]

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.[4] The agile methodology was the methodology of choice in our project.

To keep our clients informed of our progress, the Toitoi 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

Toitoi 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 detail.

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	SQL Server	WAN
Login/Registration	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Add Package to cart	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Place order	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Make Payment	All users	Payment Card	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Edit Profile	All users	Camera	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Add New Package	Admin	Unit Information	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Update Package	Admin	Unit Information	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Delect Package	Admin	Unit Information	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Upload Images	Admin	Images	PC,Laptop,Smartphone,Tab	Browser	SQL Server	WAN
Change Password	All users	n/a	PC,Laptop,Smartphone,Tab	Browser	SQL Server	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.
Toitoi was created utilizing Node.Js 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.
Toitoi 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 is 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 Toitoi, 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 Toitoi, 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

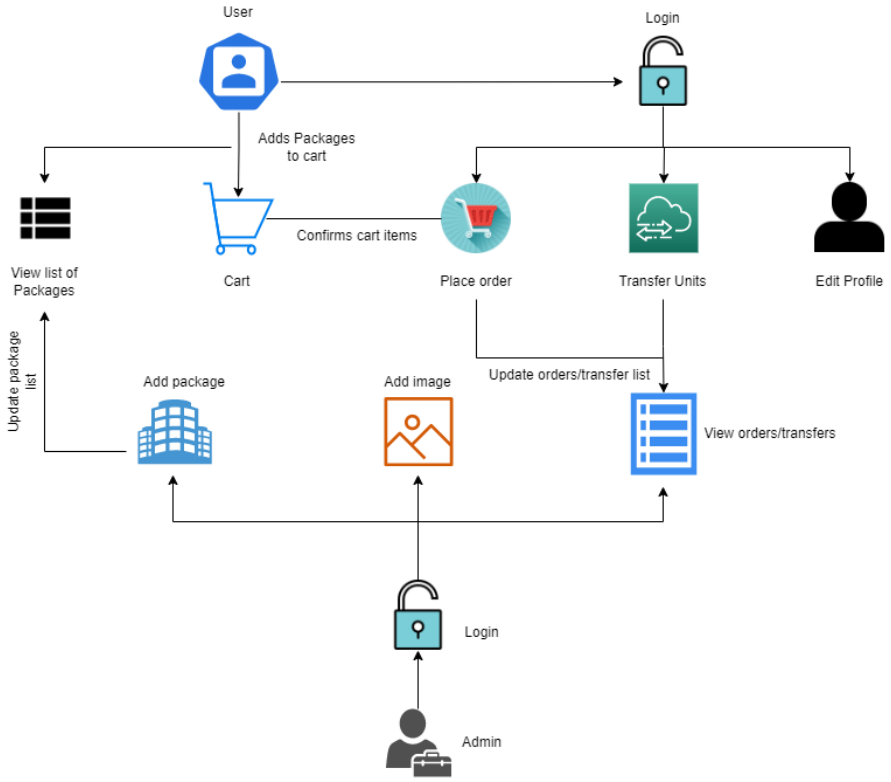

Figure 5.1: Rich picture of Toitoi

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. Toitoi's colorful artwork summarizes the project and depicts all of its essential steps.

5.3.2 UML Diagrams

The goal of a UML Diagram is to depict the model of an application. UML diagrams are diagrams that can be efficiently mapped to object-oriented languages and are therefore frequently used in the construction process.

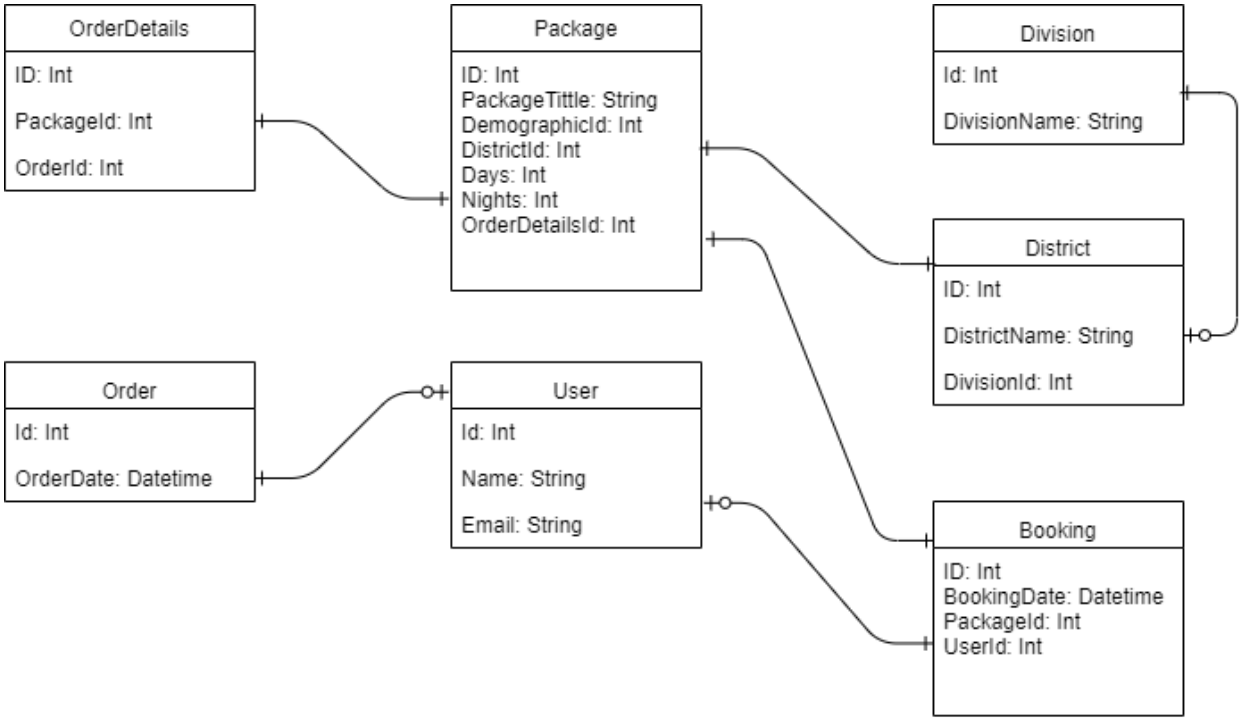

Figure 5.2: UML class of Toitoi

5.3.3 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 Package	Enter necessary information	Updates the package list	Redirects to the list of updated package

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 are the system and its data protected against attacks. 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. Toitoi 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

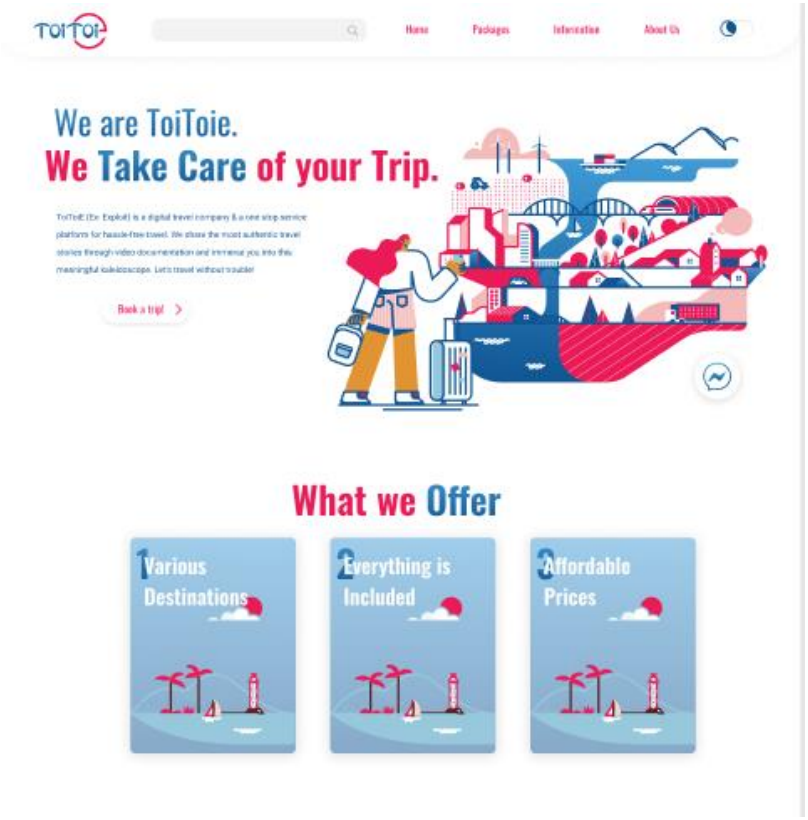

Figure 5.3: Homepage of the application

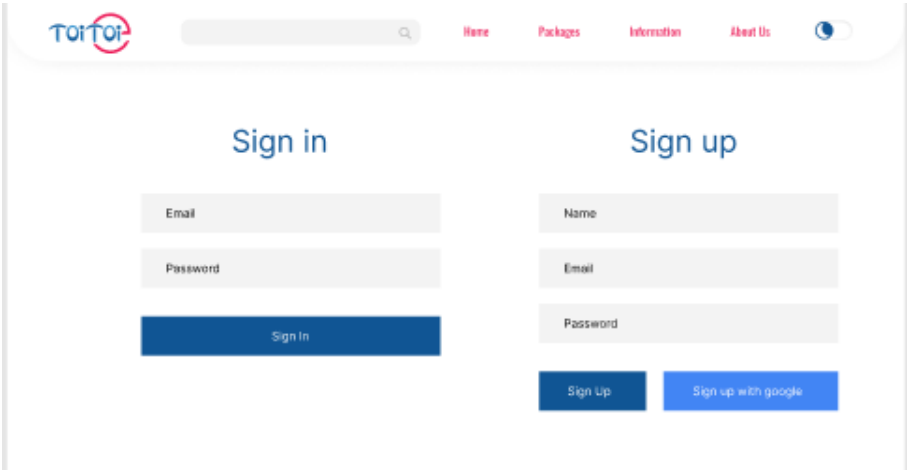

Figure 5.4: Sign in and Signup for users.

Figure 5.5: Looking for Spots.

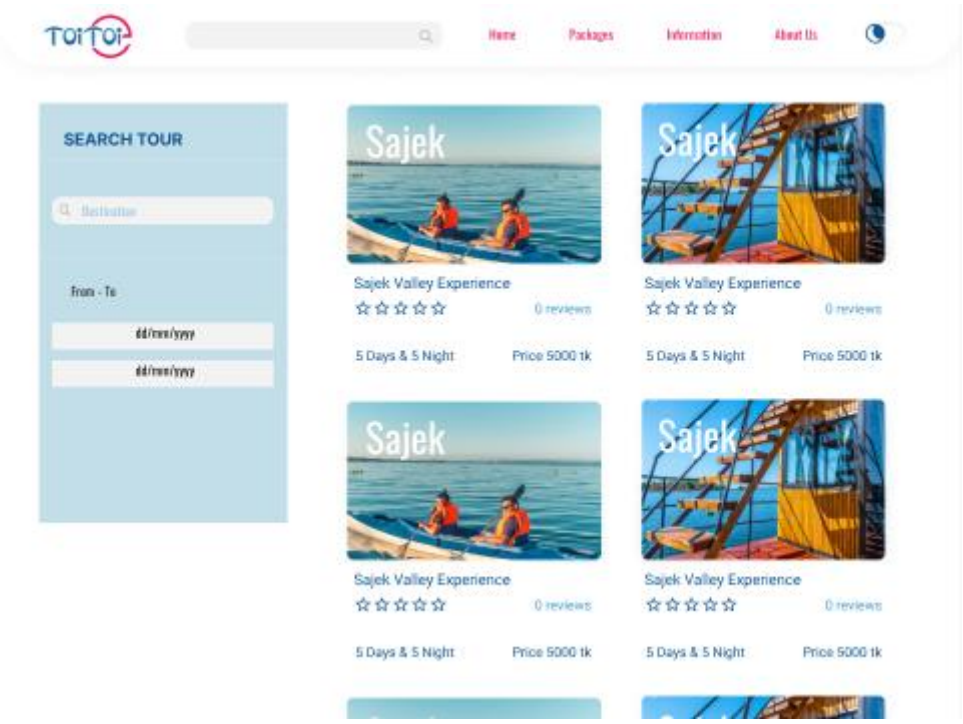

Figure 5.6: Searching for Spots.

5.4.2 Output

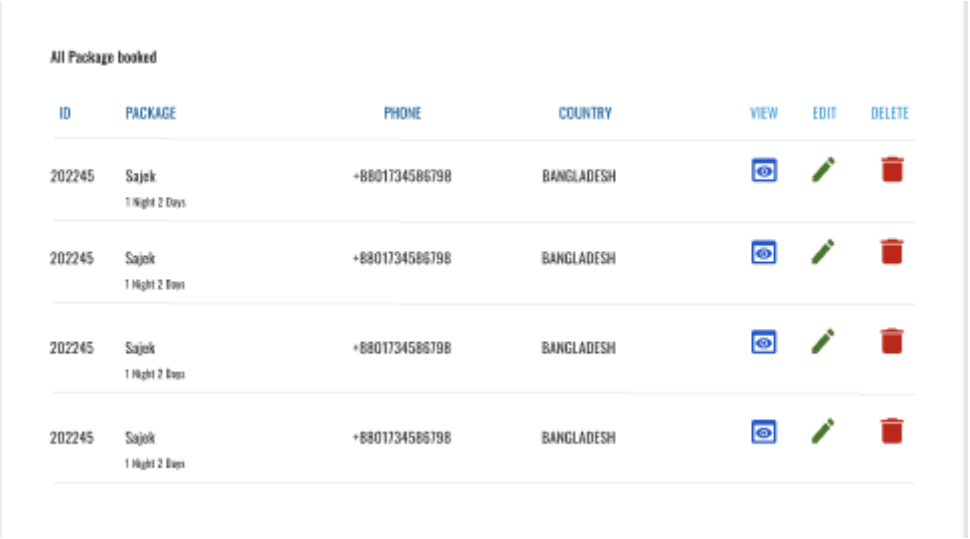

Figure 5.7: Admin Panel Chart.

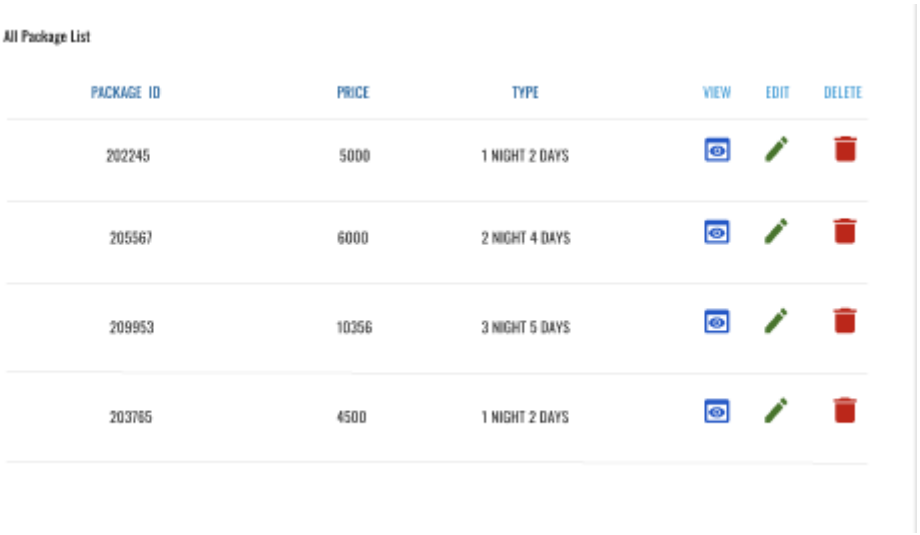

Figure 5.8: List of all Booking.

5.4.3 Architecture

Clean Architecture

This is a React and Node 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.

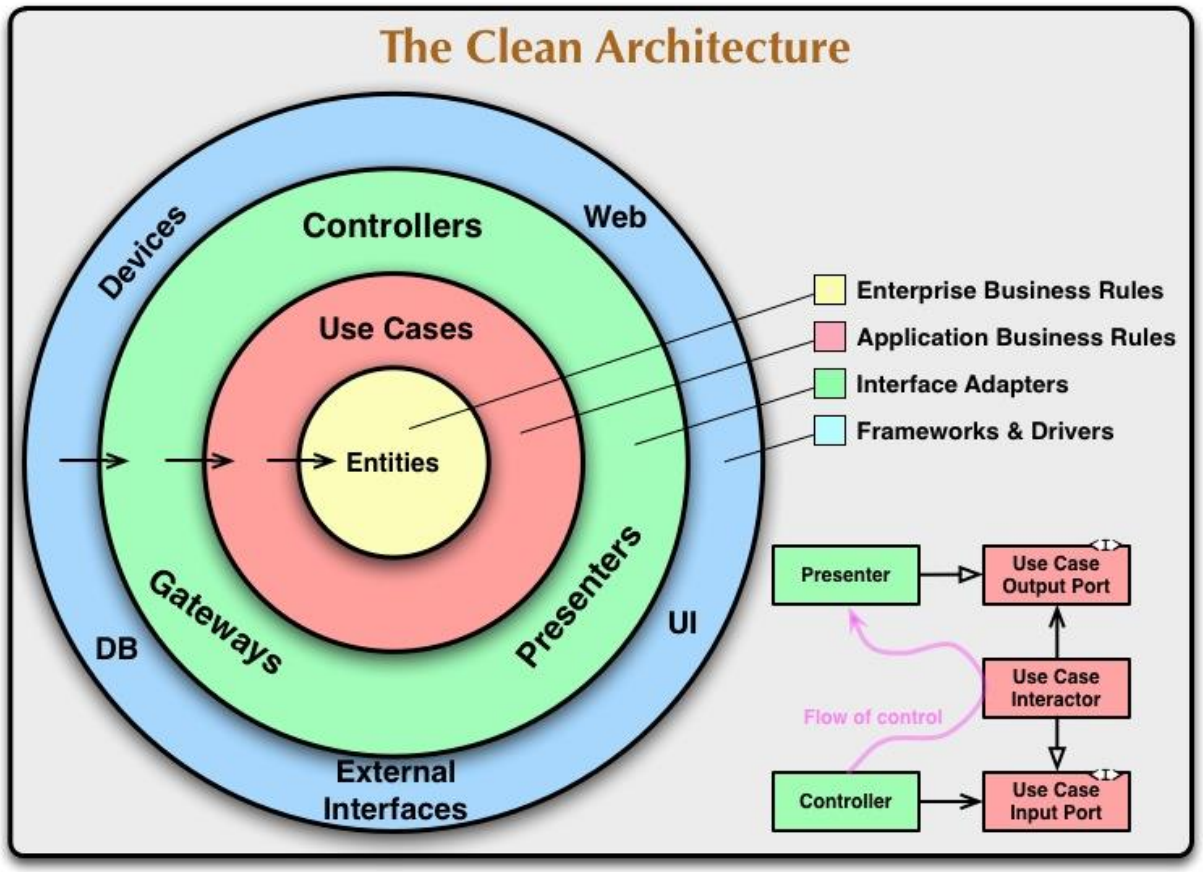

Figure 5.9: The Clean Architecture Diagram.

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.[7]

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.

CQRS Pattern

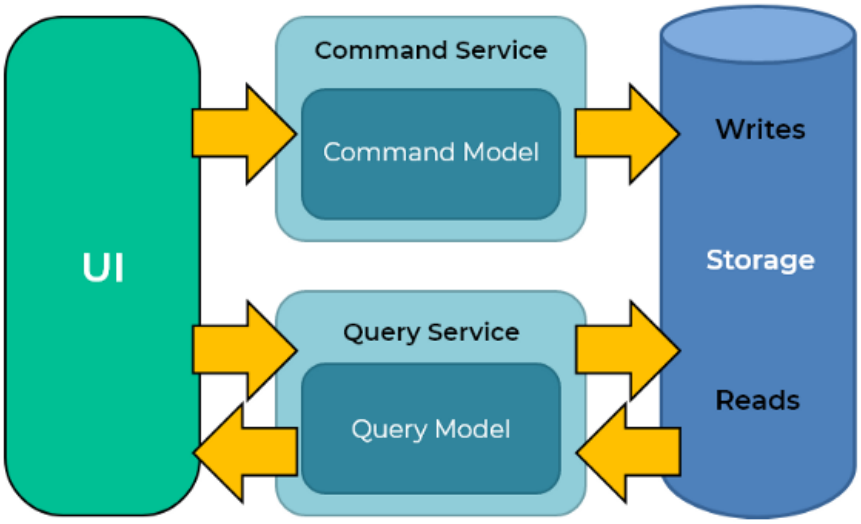

Figure 5.10: The CQRS Pattern.

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 responses

Chapter 6

Results & Analysis

The Toitoi project was largely designed to make it easy for getting travelling information all over Bangladesh .The main goal was to compile all of 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.

The following is a summary of what we've accomplished thus far and how it will help website visitors:

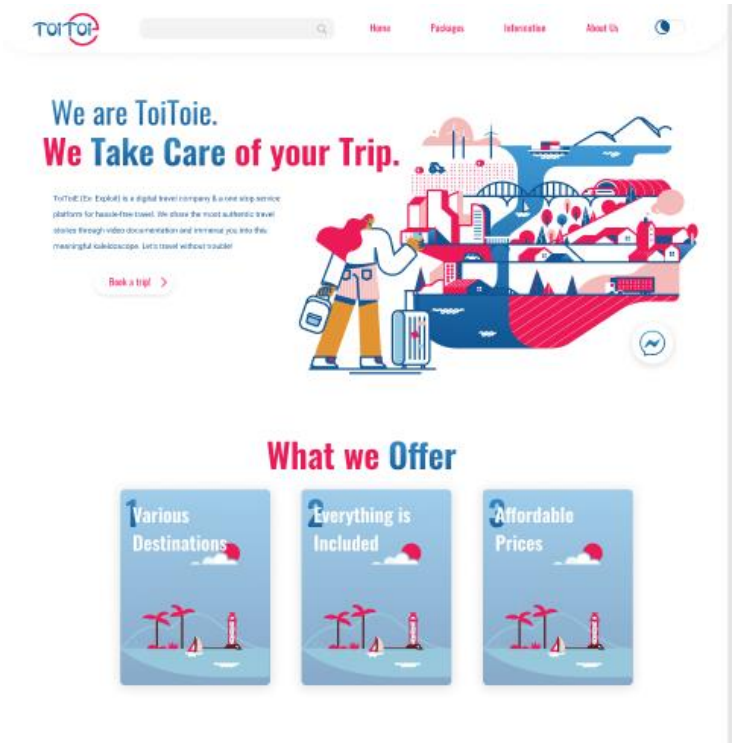

Figure 6.0: Toitoi landing page

This is the **landing page** of our project. The requirement was to display the mottoin a creative way.

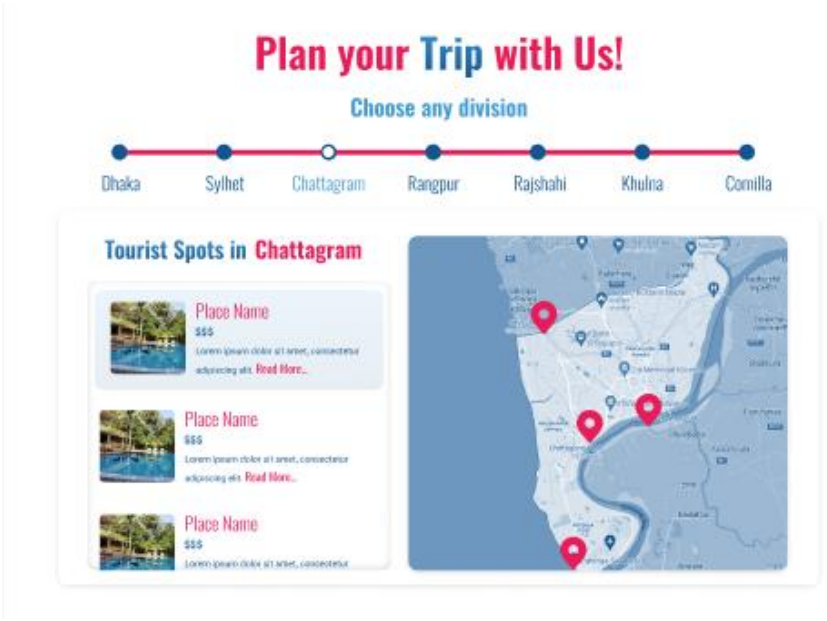

Figure 6.1: Spot selection

Then comes the spot searching page, where we can sort the units by its price and size. The Packages can be selected by clicking the nicely designed checkboxes. The selected Package will be shown as slides.

Details of Selected Units

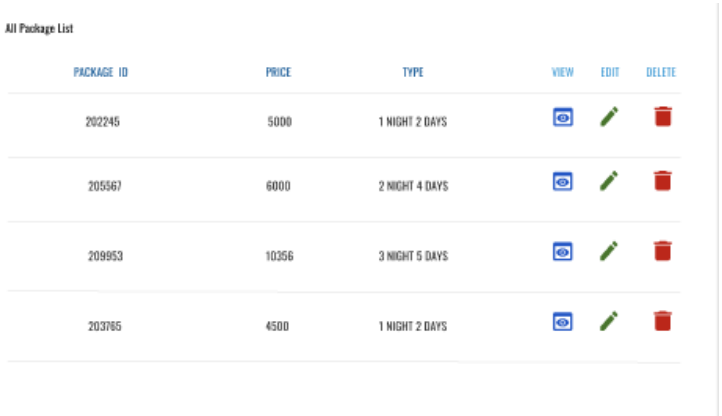

Figure 6.2: Selected Packages as slides

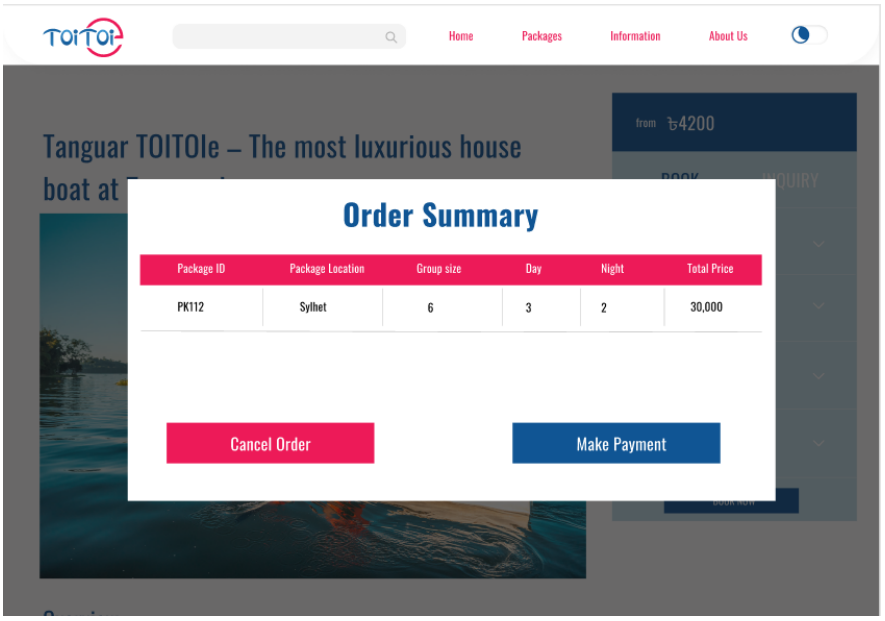

Figure 6.3: Order confirmed from cart page

The Shopping Cart

The products that have been added to the cart display all key information, such as the total price, the number of Packages in the cart, and so on. The order is placed after confirmation.

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

The Toitoi project was done with ReactJS. One of the most popular Javascript frameworks is React.js. 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 theapp. 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 makingthe conversion from HTML mockups to ReactElement 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 developerschange an object's state, they simply make modifications, and only specific com- ponents are updated after that. This data binding pattern promotes code stability and consistent app performance.

When it comes to the advantages and disadvantages of React js, three adjectives come to mind: non-risky, responsive, and advanced. It enables developers to work with a virtual browser (DOM) that is far faster and more user-friendly than the real one. All of these benefits contribute to the project's long-term viability. This makes the project sustainable.

7.2 Social and Environmental Effects and Analysis

Toitoi 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 available at all times. 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. The majority of businesses produce waste paper. 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/SSL, 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, and other purposes, use trustworthy plat- forms.

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CHAPTER 8

Lesson Learned

8.1 Problems Faced During this Period

Through this project I learned a lot of new technologies and methods. The most important things that I learned are:

- **Github** - To work efficiently with other co-workers, using platforms like github is a must. It is important to know the essential commands of github in order to increaseproductivity.
- **Axios** - Axios is a promise-based HTTP Client for node.js and the browser. Itis used to make api calls. It has easier syntax and better error handling than JavaScript's out-of-the-box fetch function.
- **Mobx** - Mobx is a JavaScript library that makes state management in a Reactapp simple and scalable. It makes it simple to connect the reactive data of your application with the UI.

The client has come up with requirements every time we submit the work. This was the major problem. They also had criteria for custom carosole building packages, which was not fully part of the work.

8.2 Solution of those Problems

To resolve this issue, I saved the selectedUnits array into the browser's **localstor-age**. This makes the array persist even on reload. The localstorage and the array gets cleared when unmounting the ”details” component.

I also positioned the add-to-cart button and added a notification toast system which notifies the user of every interaction whether it is successful or not. The client also wanted the cart to be cleared automatically every 5 minutes, which could be done with a javascript setTimeout function. We had to arrange scrum meetings regularly to full fill the requirements. We also needed to override the default function with CSS with dev tools to make it happen.

Chapter 9

Future Work & Conclusion

9.1 Future Works

The Toitoi 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 a number of reasons; focusing mainly of speed and performance. Next.js makes the **Server-Side-Rendering (SSR)** very easy.

9.2 Conclusion

Working as an intern with SSL Solutions was a fantastic experience. My workwith my coworkers has taught me a lot. They made me feel completely at ease workingwith technologies about which I knew very nothing. Despite the fact that I was having so many issues completing my project work, the others attempted to assist me as much asthey could. The organization 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 React.js developer.

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