A SUMMER PROJECT REPORT ON

ONLINE APPOINTMENT MANAGEMENT SYSTEM

FOR "Dent Care Plaza"

BY

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College of Applied Business and Technology

A Summer Project Report Submitted to

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STUDENT DECLARATION

This is to certify that I have completed the Summer Project entitled **"Online Appointment Management System"** under the guidance of **Mr. Indra Chaudhary** in partial fulfillment of the requirements for the degree of Bachelor of Information Management at Faculty of Management, Tribhuvan University. This is my original work and I have not submitted it earlier elsewhere.

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ACKNOWLEDGEMENT

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

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Finally, it would be my great pleasure if anyone considers this study report in the future for his/her accomplishments.

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EXECUTIVE SUMMARY

The aim of this project was to produce an interactive web application that could be used by **“Dent Care Plaza”** as well as potential patients which will be so much helpful for requesting for services they desire. Dependability was a central focus of the project as the website was needed to be easy medium for people to request for appointments.

The website will provide descriptive information to the customers of **"Dent Care Plaza"** on what kind of services they can receive for the clinic. This website will include a form where the customers will fill their relevant information about their personal information, service required, date and time for visit that they have chosen, through which the clinic can store those data in the database and respond accordingly.

Background reading into the technologies available and what makes a web application easy to use early in the project identified the need to utilize React Framework and MERN Stack to maintain the content. Research into different development methodologies also identified the Waterfall model as the most suitable development model to follow throughout the development. User involvement throughout the development process was a priority so they were highly involved in the requirements analysis and user evaluation stages. After the implementation a detailed evaluation was conducted using user inspections and user testing techniques to evaluate the success of the system.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATION

CRUD	Create, Read, Update, Delete
CSS	Cascading Style Sheets
ER	Entity Relationship
HTML	Hypertext Markup Language
URL	Uniform Resource Locator
VS Code	Visual Studio Code
MERN	Mongo DB, Express, React and Node.js

CHAPTER I: INTRODUCTION

1.1 Background

The team of Dent Care Plaza, has always been passionate about creating a welcoming and comfortable dental experience. Their journey began with witnessing firsthand the anxieties people face around dental visits. They saw a loved one avoid necessary care due to fear, or maybe they volunteered at a dental clinic and observed the challenges patients faced. This experience fueled their desire to create a different kind of dental practice. The team believes that everyone deserves to have a healthy smile, and Dent Care Plaza reflects that philosophy by providing personalized care in a comfortable environment.

1.2 Introduction to the Organization

Dent Care Plaza is a multi-specialty dental clinic and implant center. Dent Care Plaza offers a warm, comfortable environment, perfect for those who might feel anxious about visiting the dentist. With a focus on personalized care, their experienced dentist will take the time to understand your needs and concerns.

1.2.1 Mission

Dent Care Plaza, we transform smiles, not wardrobes. We empower our patients with cutting-edge dental technology, exceptional care, and a commitment to their comfort. Our goal is to be the trusted partner for your oral health journey, providing a stress-free experience and setting new standards of excellence in dentistry.

1.2.2 Vision

At Dent Care Plaza, we cultivate lifelong smiles. We strive to become the most trusted dental clinic, renowned for exceptional patient care, innovative treatments, and a commitment to your comfort. Our vision is to build a thriving community of patients who prioritize oral health and embrace a confident smile.

1.2.3 Objective

- Achieving Organizational Excellence: We are dedicated to continuous improvement and growth, ensuring that Dent Care Plaza remains consistent at providing their services to the masses.
- Customer Satisfaction: Our top priority is to exceed customer expectations by offering high-quality and exceptional service.
- Providing Quality Service: We are committed to sourcing the finest materials and adhering to strict quality control measures to deliver premium service to our customers.

1.3 Current Situation of an Organization

As a small entity, Dent Care Plaza finds itself in the early stages of establishing its online presence. This involves actively gauging market positioning, obtaining and analyzing initial customer feedback, and addressing challenges encountered. Understanding the dynamics of this stage is vital for laying the foundation for sustained growth and success.

1.4 Issue or Problem of Report

- During development of the project, there was no website in the organization.
- Social media and Online Marketing.

1.5 Objectives of the Report

The primary goal of this project is to develop an ecommerce website that enables customers to browse, select, and purchase their desired clothing items conveniently from their preferred location. The objectives of this project are outlined as follows:

- Enhancing Efficiency and Service Quality
- Facilitating Online Appointments
- Automation and Computerization
- Improving Staff Efficiency
- Enhancing Speed of Service
- Boosting Customer Satisfaction

Through the successful implementation of these objectives, we envision Dent Care Plaza becoming a reliable dental service provider in the heart of Kathmandu.

1.6 Methodology/Procedure adopted for writing the report

Project framework Process

Models

The methodology employed for the website development follows the waterfall model, a structured approach involving sequential phases. It starts with requirements gathering, followed by system design, coding and testing. Each phase is carefully planned and executed, ensuring clear communication and systematic progression. Adherence to the waterfall model prioritizes thoroughness and accuracy, resulting in a well-structured and carefully crafted website meeting user needs and expectations.

Waterfall Model

Waterfall model was used due to its structured and sequential approach. This model is suitable when project requirements are well-defined upfront, ensuring clear communication and stakeholder involvement from the start. Additionally, Waterfall provides predictability in terms of budget and timeline estimation, which can be crucial for ecommerce projects with fixed constraints.

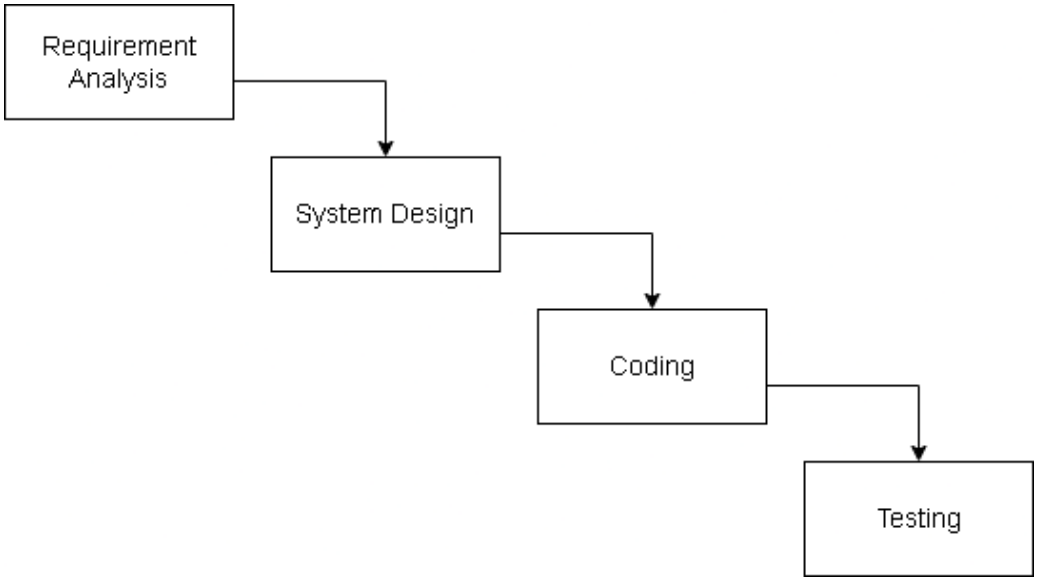

Figure 1.1: Waterfall Model

Data and Information Collection Interviews

Interviews are used to collect data from a small group of subjects on a broad range of topics. Interview was conducted in person and was semi-structured.

Research

Research through the internet enables efficient, cost-efficient data collection and facilitates access to large samples of data. Internet play a vital role during this project.

Tools Used

- **Visual Studio Code:** In this project, VS Code has been used for writing and editing code, managing commands, debugging, customizing the workspace, and staying focused on development.
- **MongoDB:** In this project, MongoDB has been employed for managing backend data. This includes storing and fetching data
- **React:** React has been implemented to make the project future proof with easily available support and resources.
- **Java Script:** Java Script has been utilized to create components for the admin side client interface implementing React framework.
- **Tailwind:** Tailwind has been utilized to streamline and enhance the styling process, providing pre-designed components and layouts for rapid development of a responsive and visually appealing user interface.
- **MERN Stack:** MongoDB, Express, React and Node.js stack has been used to build robust and scalable application.

CHAPTER II: TASK AND ACTIVITIES PERFORMED

2.1. Analysis of Tasks and Activities

Many tasks and activities had performed which had helped to fulfil the main objective of our project. Major objectives of the project were to get the information about the use of technology in one the organization in the country. Some of the tasks that is performed is given below:

Organization Selection:
Selection of an organization is an important decision for the project, as the type of organization dictates the majority of the requirement for a system. After some research and visiting different small organizations, "Dent Care Plaza" was selected for the project.

Getting Information about the Organization:
After the selection of the organization, the other task was to gather relevant information about the clinic. The main techniques that were used for this purpose was direct observation of the procedures caried out by each of the staff members of the organization. Further information was collected through the direct interviewing with the owner and staff members of organization with relevant questions.

2.2. Analysis of Problem

Dent Care Plaza faces several challenges in streamlining the patient experience. Currently, the clinic relies on manual appointment scheduling, which can be time-consuming and prone to errors. Additionally, managing patient flow during busy periods can be difficult, leading to long wait times. Optimizing the check-in and check-out process is also an area for improvement.

2.3. Analysis of Possible Solutions

Developing a secure online appointment booking system could be a key solution to streamlining patient scheduling at Dent Care Plaza. Currently, the clinic relies on manual methods for scheduling appointments, which can be inefficient and lead to errors. An online system would eliminate the need for phone calls and allow patients to schedule appointments at their convenience. This approach is expected to improve patient satisfaction and potentially lead to increased appointment bookings.

2.4. Feasibility Analysis

Feasibility study is an analysis of how successfully a project can be completed, accounting for factors that affect it such as technological, economic, legal and organizational. It shows how the business is associated with the business strategy. The feasibility study of launching an appointment scheduling system encompasses various critical aspects such as technical, economical and operational feasibility.

Technical Feasibility

It is technically possible to produce this program since the website was constructed using Typescript, an open-source content management system with a wide range of plugins and themes. The localhost server is the one in use. Several tools are used, including Clerk, Tailwind CSS, and MongoDB, to improve the website. I was able to work more effortlessly because I had enough knowledge about all this sites. It was therefore possible to construct this website.

Operational Feasibility

The website will provide customers an easy means to request for the service they require, and allow staff to manage the database efficiently. The user-friendly and attractive design ensures that both employees and customers can use the website with ease, making it operationally feasible.

Economic Feasibility

The open-source program like VS Code, Bootstrap were used to construct this project. All of its plugins and themes were available for free. Therefore, there is no requirement for a large budget. This indicates that it was determined that the idea was economically feasible.

Schedule Feasibility

A project took roughly three months to complete. Thus, it was feasible to complete this project in the allotted time. It was anticipated that the project will be finished ahead of schedule. As a result, it was determined that the project could be completed on schedule.

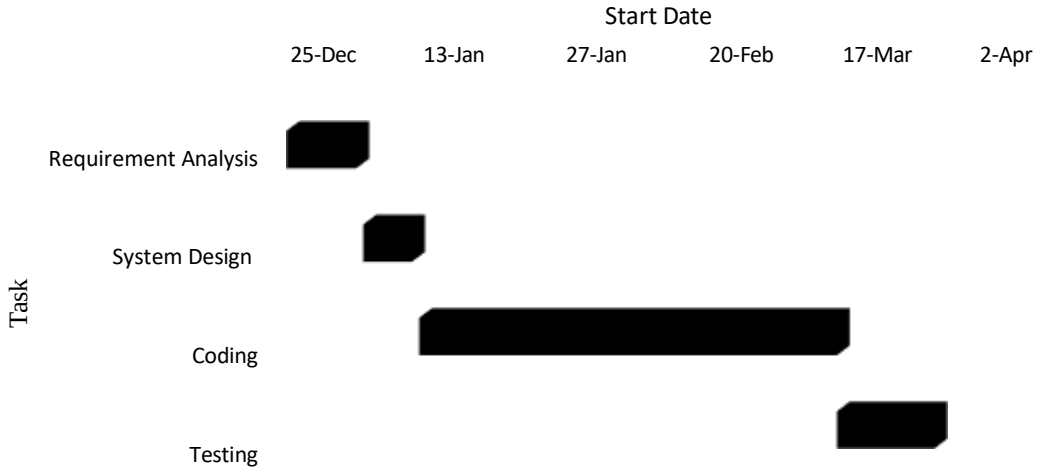

Figure 2.1: Gantt Chart

The Gantt chart depicted the timeline and duration of tasks for a project, with each task represented by a black bar. The tasks included Requirement Analysis, System Design, Coding, and Testing. Requirement Analysis started on 25-Dec and took 9 days to complete, ending on 5-Jan. System Design began on 6-Jan, lasted for 8 days, and concluded on 13-Jan. Coding started on 14-Jan, spanned more than 60 days, and ended on 16-Mar. Finally, Testing commenced on 19-Mar, took 14 days, and finished on 2-Apr. This visual representation allowed for easy tracking of project progress and scheduling.

2.5. Requirement Analysis

Requirement analysis is about figuring out what needs to be done to create or improve a product or project. It includes understanding what different people want, like stakeholders, and then writing down and checking these needs to make sure everyone agrees. These needs are split into two types: what the system should do (functional) and how well it should do it (non-functional).

2.5.1. Functional Requirements

These are statements of services the system should provide, how the system should react to particular inputs, and how the system should behave in particular situations. In some cases, the functional requirements may also explicitly state what the system should not do. (Sommerville, 2011).

Some of the functional requirements of "Online Appointment Booking System" includes:

- Users can register an account.
- Users can login.

- Users can view doctors.
- Users can book for the doctor.
- Doctors can login.
- Doctors can check for scheduled appointments.
- Admins can view the appointment.
- Admins can maintain users.
- Admins can add doctors.
- Admins can manage the appointment.

Use-Case Diagram

A use case diagram is a visual representation that shows how different types of users interact with a system and what they can do. It's like a map that outlines the various actions or tasks users can perform, called "use cases," and how they relate to each other and the system. These diagrams help understand the system's functionality from a user's perspective and are useful for planning and designing software systems.

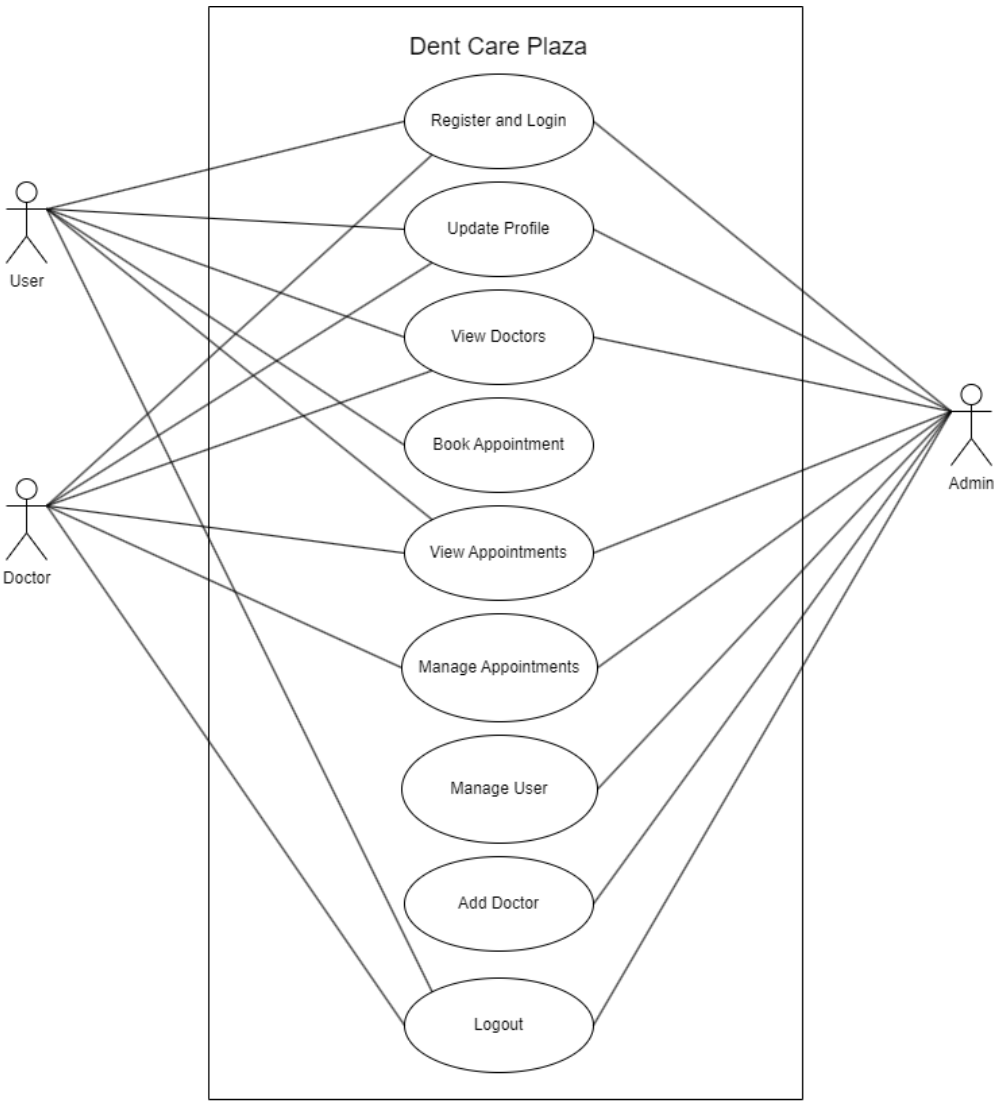

Figure 2.2: Use-case diagram for user and admin

Customer:

- Register and Login: Customers can register and login to their profile.
- Update Profile: Customer can edit their profile details.
- View Doctors: Customer can check for available doctors to make appointment.
- Book Appointment: Customers can book appointment for the doctor.
- View Appointment: Customers can check the details of their appointment.

Doctor:

- Register and Login: Doctors can register and login to their profile.
- Update Profile: Doctors can edit their profile details.
- View Appointment: Doctors can view the appointments.
- Management Appointment: Doctors can check the details of their appointment.

Admin:

- Register and Login: Admin can register and login to their profile.
- Update Profile: Admin can edit their profile details.
- View Appointment: Admin can view the appointments.
- Manage User: Admin can manage users.
- Add Doctor: Admin can add user as doctor.

2.5.2. Non - Functional Requirements

These are constraints on the services or functions offered by the system. They include timing constraints, constraints on the development process, and constraints imposed by standards. Non-functional requirements often apply to the system as a whole, rather than individual system features or services. (Sommerville, 2011)
The non-functional requirements are as follows:

- **Usability**
  The system is easy to operate and understand. It has intuitive and responsive design.
- **Reliability and Compatibility**
  The system can operate reliable while performing CRUD operation and other functionality. The system is compatible on all the web browsers.
- **Performance**
  The system can maintain security of user credentials and data. There is no any lag while performing different operations.

2.6. System Design

System design involves creating a structured and functional system, including architecture, modules, interfaces, and data flow, to meet specific business needs. Software requirement analysis, a key part of this process, helps define system requirements. In this project, a database stores customer account information.

2.6.1. Activity Diagram

An activity diagram is like a flowchart, showing the steps or actions in a system. It's commonly used in business to model processes or in use case diagrams. Activities can happen one after another or at the same time. Every activity diagram starts and ends with a clear point.

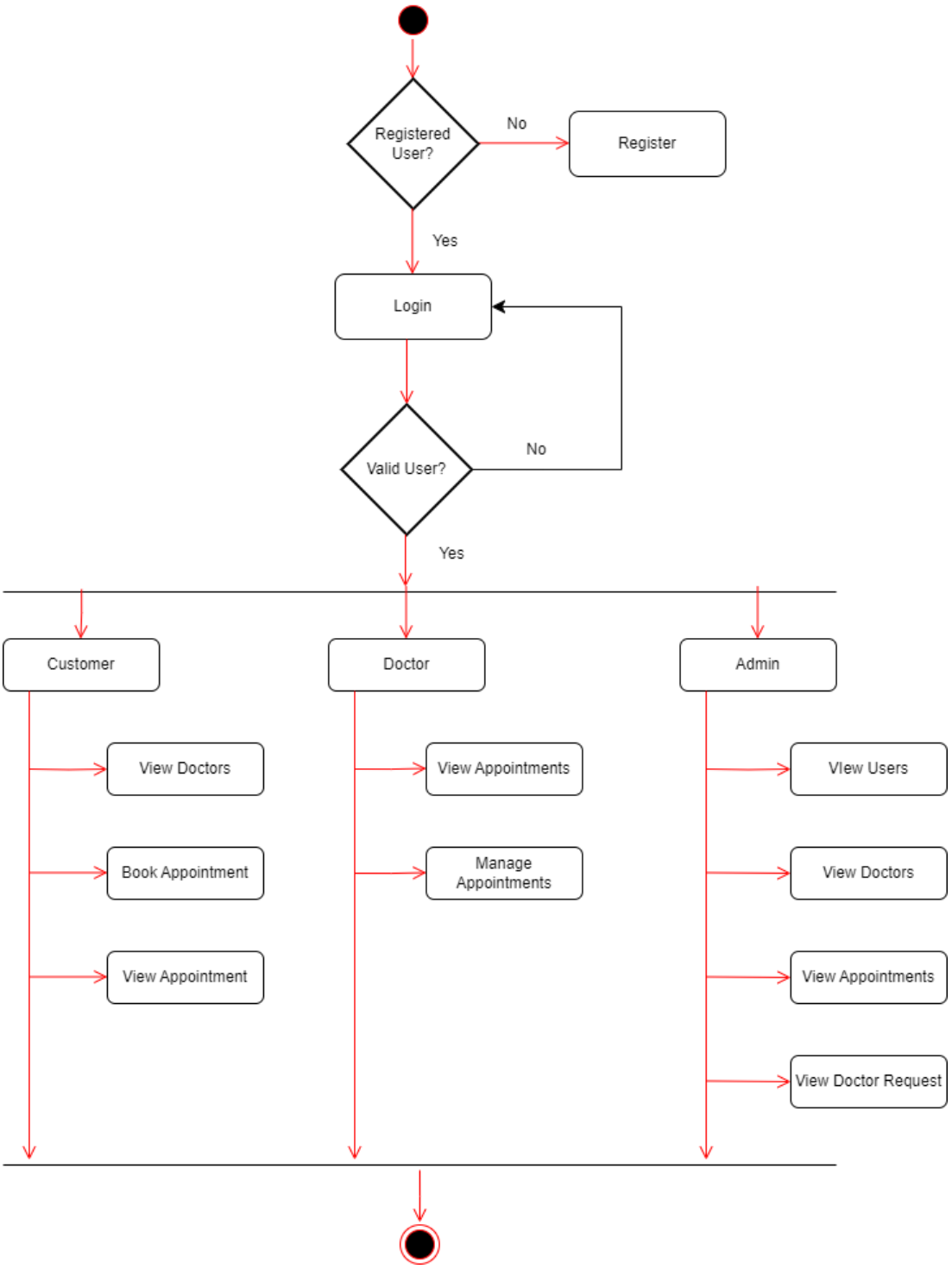

Figure 2.3: Activity Diagram

2.6.2 Sequence Diagram

In an online food ordering system's sequence diagram, each step of the ordering process is visually depicted. It shows how users select items, how their choices are processed, and how orders are confirmed and stored in the database. This diagram simplifies understanding of the system's workflow, aiding in its design and operation.

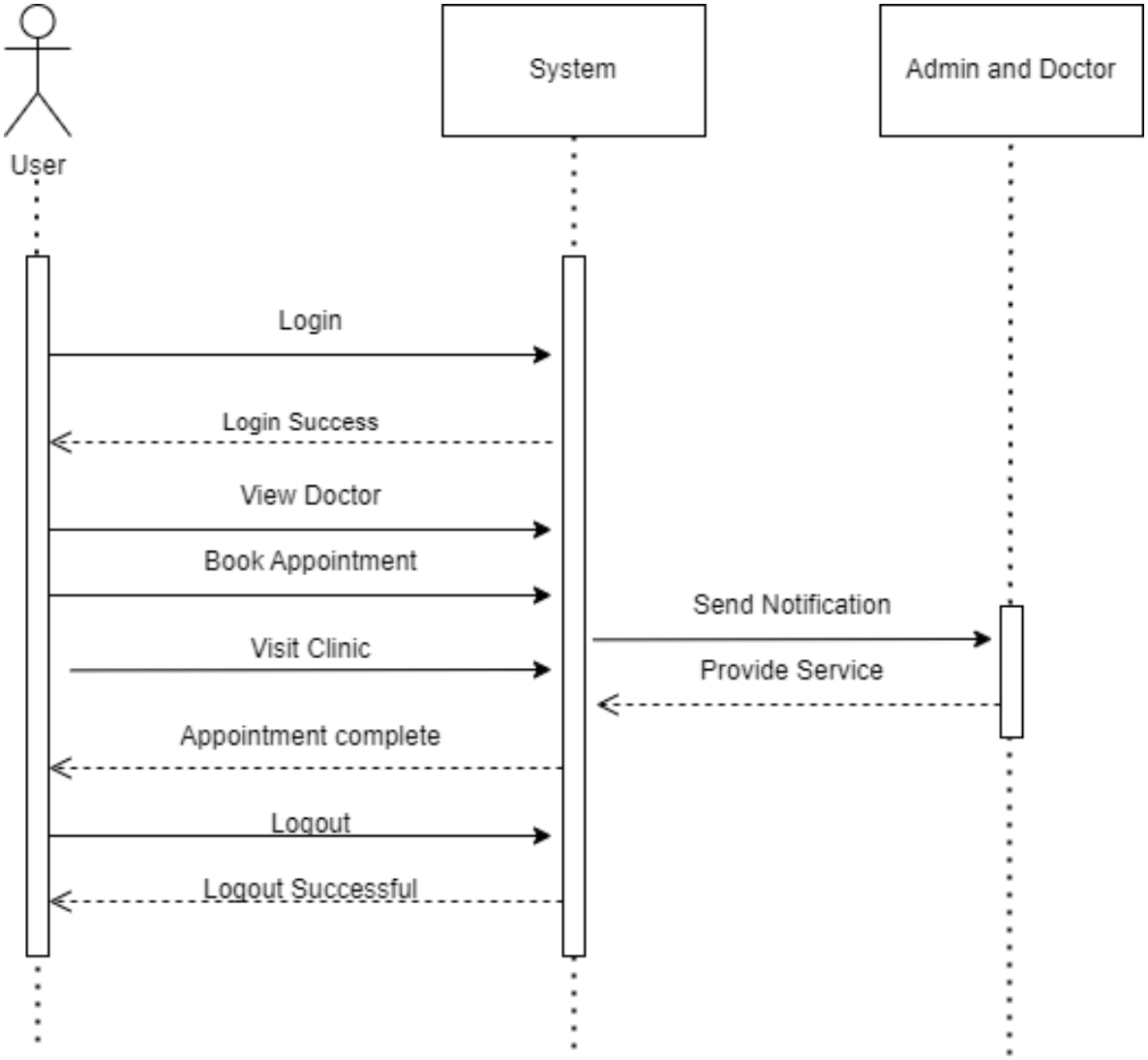

Figure 2.4: Sequence Diagram

2.7. System Implementation

In this phase, the code is written based on the design plans. Each part of the system undergoes thorough testing to address any issues. Users may require training on how to utilize it effectively, and documentation is crafted to aid in understanding and maintaining the system. Continuous maintenance and support ensure smooth operation and alignment with user needs.

2.7.1. Module Description

It shows the different pages of the system and following are the different modules of the system.

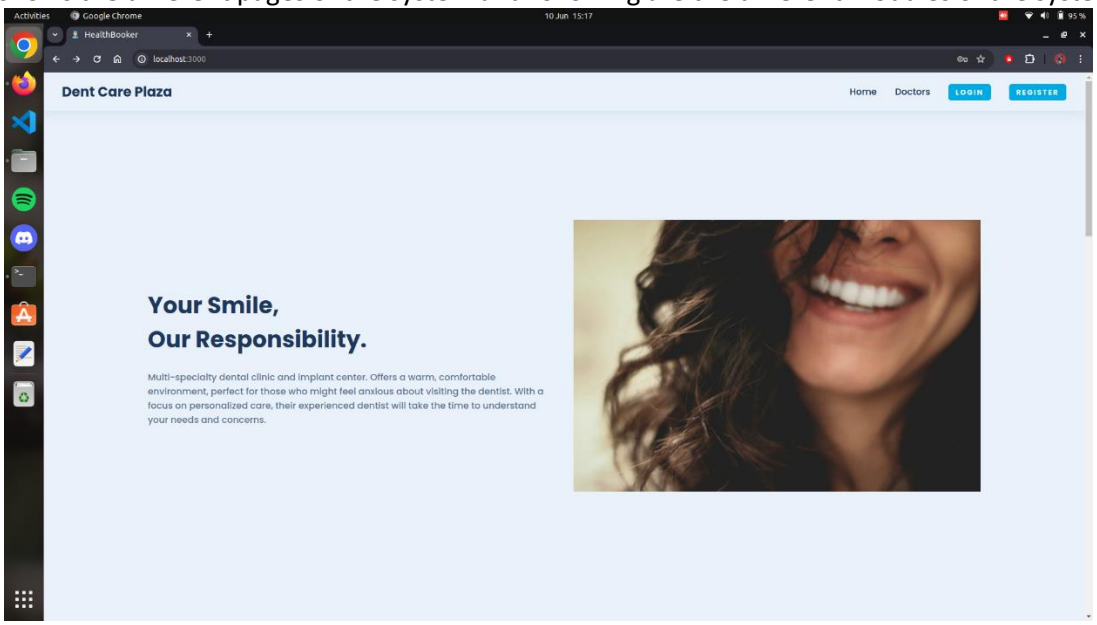

Figure 2.6: Home Page

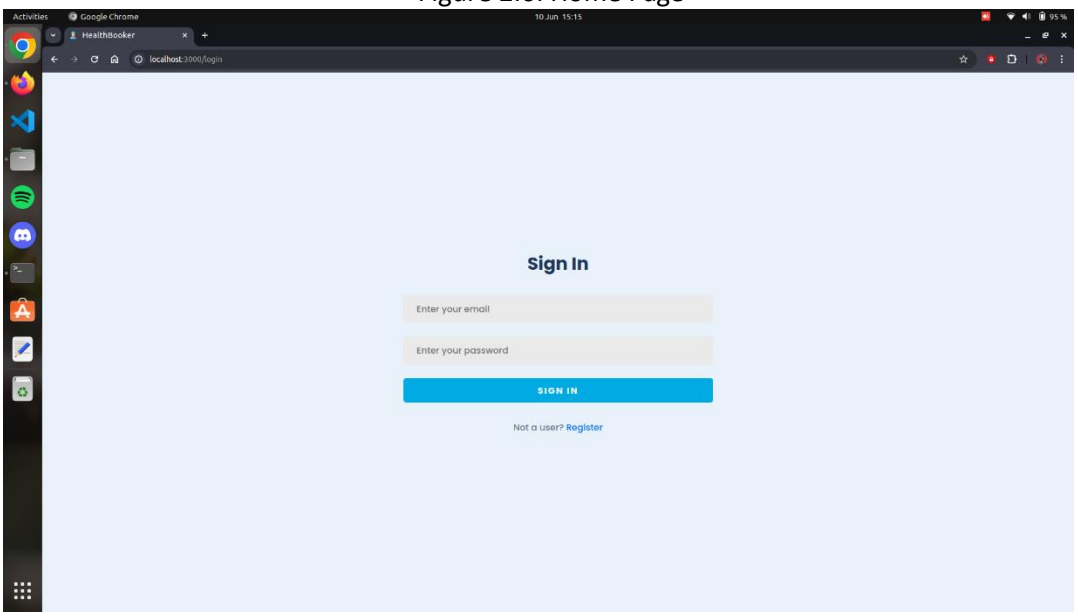

Figure 2.7: Sign-In Page

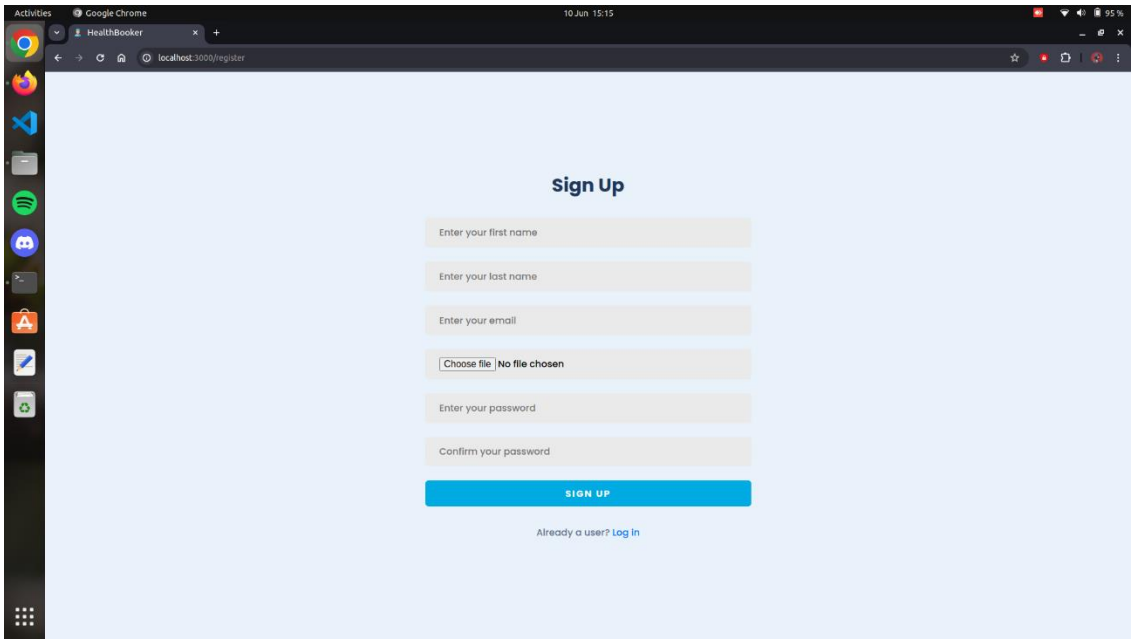

Figure 2.8: Sign-Up Page

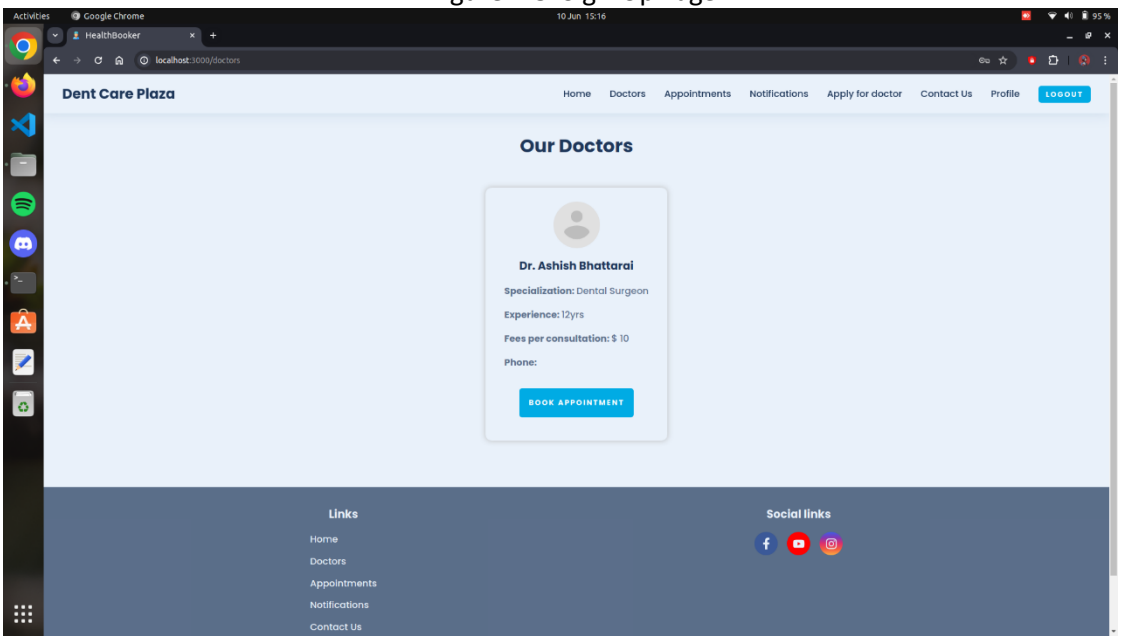

Figure 2.9: Doctors Page

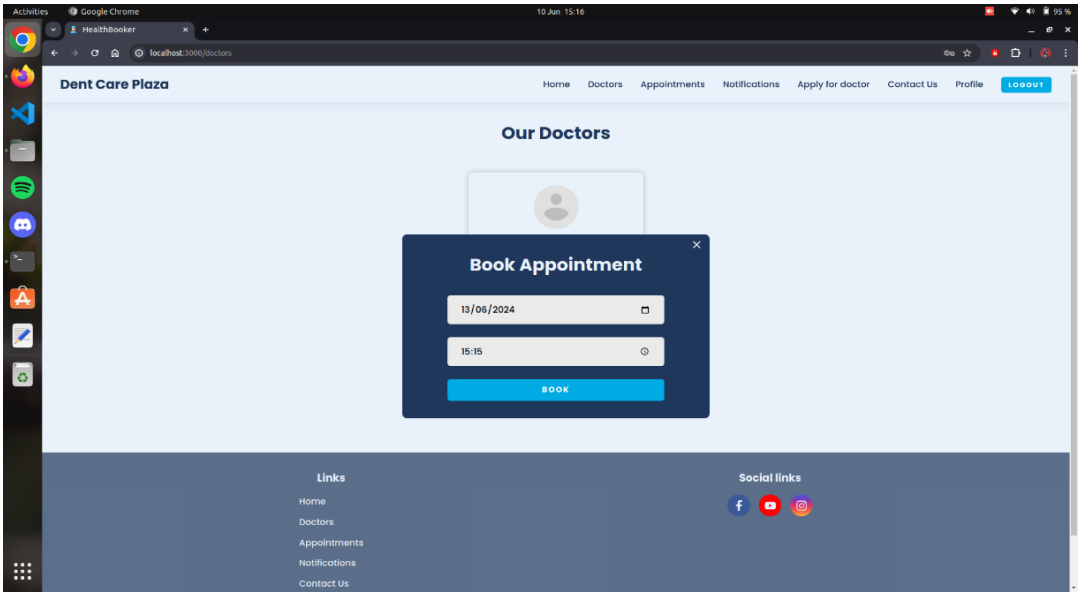

Figure 2.10: Book Appointment Page

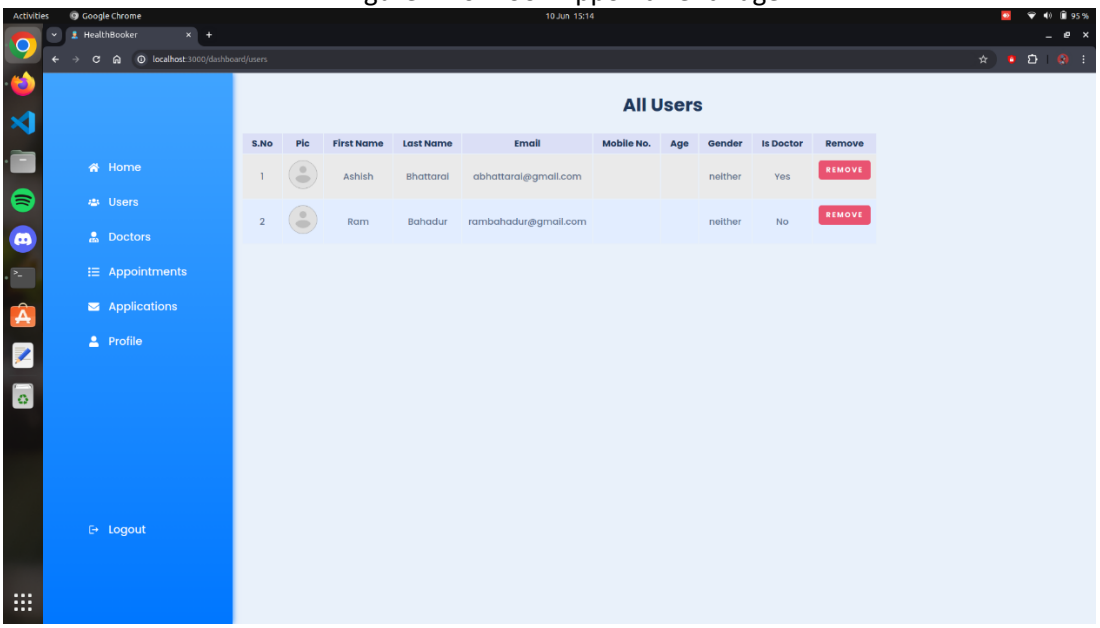

Figure 2.11: Dashboard Page

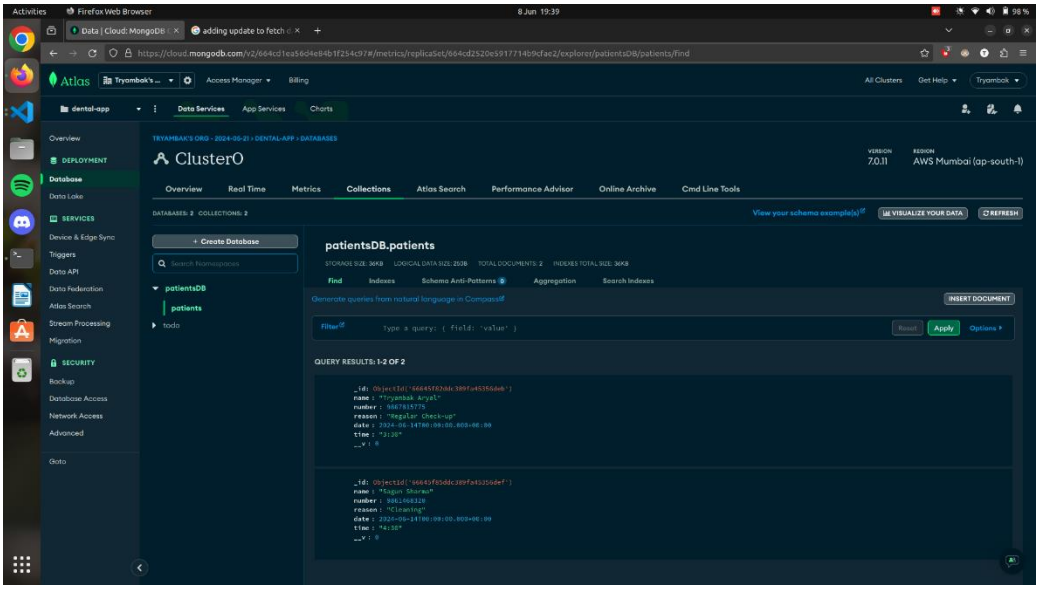

Figure 2.12: Database

2.8. Testing

During testing, comprehensive tests were conducted to validate the functionality and performance of the entire system. This included testing the interaction between various components, ensuring smooth data flow, and confirming that the system behaved as expected under different scenarios. Any detected issues were thoroughly investigated and resolved to ensure the system's reliability. The system was only considered ready for operational use once all tests passed successfully and it met the specified requirements.

2.8.1. Unit Testing

During unit testing, the login process underwent thorough checks to ensure its smooth operation. Various aspects, such as verification, request post, and error handling, were tested rigorously. Any issues identified were promptly resolved to guarantee the reliability of the login feature. Once all tests passed successfully, it was confirmed that the login functionality was ready for integration into the larger system

Test Case
Title: Online Appointment Management System.
Description: The system should be able to have the characteristics of Login functionality.
Precondition: The system's database has email="tryam@gmail" and password="pass123".
Assumption: The login U/I have text field to enter email and password.
Test Steps: Open login file, Enter username and password & Press Login button
Expected Result: The entered email and password must validate with database's username and password and after validation success, it is expected to locate for homepage.
Post Condition: System should able to store the activity done by the user after he/she successfully login into the system.

Table 2.1 Test-case for Login Page

ID	Test Scenario	Test Data	Expected Results	Actual Results	Status
1	Check response when invalid email and password is entered	email= abc@ab.np Password= password	Message Display "Unable to login user"	Message Display " Unable to login user"	Pass
2	Check response with blank email and blank password is submitted	email= Password=	Message display "Input field should not be empty"	Message display " Input field should not be empty”	Pass
3	Check response when correct email and incorrect password is entered	email= tryam@gmail.com Password= abcccc	Message Display " Unable to login user "	Message Display " Unable to login user "	Pass
4	Check Response when incorrect email and correct password is entered	email= abc@ab.np Password= pass123	Message Display " Unable to login user "	Message Display " Unable to login user "	Pass
5	Check response when valid email and password is entered	email= tryam@gmail.com Password= pass123	Redirect to Admin Panel	Redirect to Dashboard	Pass

Test Case
Title: Online Appointment Management System.
Description: The system should be able to have the characteristics of register functionality.
Precondition: The system's database has email="tryam@gmail".
Assumption: The signup U/I have text field to enter first name, last name, image, email and password.
Test Steps: Open login file, Enter username and password & Press Login button
Expected Result: The entered email and password must validate with database's username and password and after validation success, it is expected to locate for homepage.
Post Condition: System should able to store the activity done by the user after he/she successfully login into the system.

Table 2.2: Test case for User registration

ID	Test Scenario	Test Data	Expected Result	Actual Result	Status
1.	Check response when valid email and password is entered with correct password confirmation.	email= abc@ab.com Password= pass123 Password Confirmation = pass123	Message Display: "User Registration Successful"	Message Display: "User Registration Successful"	Pass
2.	Check response when existing username is entered	email= tryam@gmail.com Password= hello@123 Password Confirmation = hello@123	Message Display: "Unable to Register User"	Message Display: "Unable to Register User"	Pass
3.	Check response with blank username and blank password and confirmation is submitted	Username= Password= Password Confirmation =	Message Display: "Input fields should not be empty."	Message Display: "Input fields should not be empty."	Pass

2.9. Findings

Completing the dental clinic management system project has provided valuable insights. It revealed real-world challenges faced by dental practices and potential solutions. Contrasts between classroom theory and practical application became evident, emphasizing the complexities of real-world scenarios. Through detailed problem analysis, solutions were explored and some implemented successfully. The project also highlighted alternative uses of the programming language employed. Overall, it offered a hands-on learning experience, teaching valuable problem-solving skills in the context of dental clinic management.

CHAPTER III: DISCUSSION AND CONCLUSION

3.1. Discussion

The goal of this project was to create a web application for Appointment Management customized for Dent Care Plaza. Despite facing challenges, we successfully completed the project with support from various sources. We invested significant time and effort to meet the organization's requirements.

Despite the obstacles, we finished the project within the specified timeframe. The system underwent through testing, involving the requirements of clinic owner and staffs. Their feedback helped refine the system to ensure it meets user expectations.

Through teamwork and perseverance, we delivered a solution that improves the online management experience for Dent Care Plaza, fulfilling their specific needs.

3.2. Conclusion

The development of the Online Appointment Management System for Dent Care Plaza has been successfully completed. This success was achieved through substantial support and significant effort to meet the organization's needs and ensure the system worked properly. The project involved overcoming many challenges and adhering to a detailed plan. It highlights the importance of teamwork and coordination in system development. Additionally, the new system will enhance the appointment process.

3.3. Recommendations

To ensure the Online Appointment Management System, for Dent Care Plaza operates at its best we have some suggestions. Firstly, it's important to set up a system for improvement to deal with any issues and adapt to changing requirements. Secondly make sure the clinic staff receive training to use the system effectively. Thirdly use the system for marketing by promoting deals and loyalty programs. Also make sure the system works well on devices to reach an audience. Have a way to get feedback from customers to understand their preferences better and prioritize protecting their information. Keep an eye on how the system's working and fix any technical problems quickly. Look into options for growth. Provide customer support when needed. These steps will improve how well the system works how easy it is to use. Its success, in meeting both business and customer needs.

REFERENCES

Codepentor. (2024). *Appointment Management System*. Retrieved from DevProjects: https://www.codementor.io/projects/web/appointment-management-system-compu19a0t

Data, Refsnes. (2024). *w3schools*. Retrieved from JavaScript Tutorial: https://www.w3schools.com/js/

ED-ROH. (2023). *Github*. Retrieved from ed-roh: https://github.com/ed-roh/react-admin-dashboard/commits?author=ed-roh

geeksforgeeks. (2024). *GeeksforGeeks*. Retrieved from Introduction to Software Engineering: https://www.geeksforgeeks.org/software-engineering-introduction-to-software-engineering/

Inc, Stack Exchange. (2024). *StackOverflow*. Retrieved from https://stackoverflow.com/

Karki, A. (2022). *Hospital Appointment Management System.* Kathmandu: Morgan International College.

Majhi, K. (2022). *Appointment Management System for Sumeet Guitar Restoration.* Kathmandu: College of Applied Business.

Meta. (2024, January). *React.dev*. Retrieved from React: https://react.dev/learn

MongoDB Inc. (2024, January). *Documentation*. Retrieved from Mongo DB: https://www.mongodb.com/docs/atlas/

Refsnes Data. (2024). *w3schools*. Retrieved from MongoDb: https://www.w3schools.com/mongodb/index.php

Saleh MD. Abir, S. K. (2022). *Doctor Appointment System.* Dhaka: Eastern University.

SHARMA, A. (2022). *HOSPITAL MANAGEMENT SYSTEM.* TADONG, GANGTOK: SCHOOL OF INFORMATION TECHNOLOGY.

Sommerville, I. (2011). *SOFTWARE ENGINEERING.* Pearson.

Tailwind Labs. (2024, January). *docs*. Retrieved from Tailwindcss: https://tailwindcss.com/docs/