ONLINE DOCTOR'S APPOINTMENT SYSTEM USING REACT JS

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

This Project titled **Online Doctor's Appointment System Using React Js**, submitted by Md **Arif Jahan**, ID No: **201-15-13890** to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **19th January 2023**.

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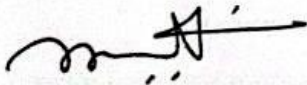Daffodil International University

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I hereby declare that this Project has been done by under the supervision of **Mr. Dewan Mamun Raza, Lecturer (Senior Scale)**, Department of Computer Science and Engineering, Faculty of Science and Information Technology, Daffodil International University. I also declare that neither this research nor any part of this research has been submitted elsewhere for the award of any degree.
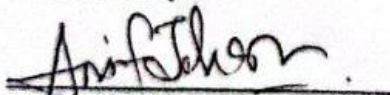
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ABSTRACT

In our country, making an appointment with a doctor becomes a problem for those who want to go to the doctor from far away. This is my solution to many of their problems. I completed this project in two phases: frontend and backend. I worked on the frontend of this project in React JS, where I used a framework from Tailwind called Daisy UI for styling. And to finish the project, I worked on the backend using Express JS for the server, MongoDB for the database, and Node.js. These web applications are accessible. Since the website is fully responsive, users of desktop, mobile, and tablet devices can all access it. Actually, an online doctor's appointment is a service that enables clients to arrange and attend medical consultations with a healthcare provider online, frequently through a video call. Especially during the COVID-19 pandemic, people frequently use this service as a handy substitute for in-person appointments because it can be accessible via a website or mobile app. Making an account, choosing a provider, picking a time, and finally joining the video call at the appointed moment are the normal steps. Patients may also choose to complete medical forms online before their consultation. A subscription or per-appointment fee may be required for some online medical appointment scheduling services, while insurance may cover the cost of others.

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CHAPTER 1
Introduction

1.1 introduction

The goal of this project is to schedule doctor's appointments for patients. While the eHealth market is still declining, Bangladeshis are increasingly using the Internet for health-related purposes. One element of eHealth that could have a significant impact on how health systems are used, the roles and relationships between patients and doctors, and people's health is online doctor-patient communication. In the Health 2.0 era, it is crucial to monitor and comprehend practices, trends, and expectations in this field because doing so could provide all stakeholders with invaluable knowledge.

1.2 Motivation

In recent years, online healthcare portals have spread across the globe. The online consultation website is a popular type of healthcare portal because it connects patients and doctors and saves them time and money when they are looking for medical care. The website for scheduling medical services is another format that enables patients to visit providers offline. Although they are formally distinct, the user behaviors on these two types of websites, including those of patients and doctors, could be connected. By analyzing the overall effect of opening online consultations on offline appointments, this project aims to close this critical gap.

1.3 Project Objectives

1. Planning and research: Identifying the requirements of the website and the target audience, researching the competition and market, and outlining the features and functionality of the website.
2. Design and development: Designing the layout and user interface of the website, and developing the front-end and back-end of the website using technologies such as HTML, CSS, JavaScript, and a web framework like React or Angular.
3. Integration with databases and APIs: Integrating the website with databases, such as MongoDB, and APIs, such as Firebase, to handle user authentication, appointment scheduling, and medical record storage.
4. Payment gateway integration: Integrating the website with payment gateways such as Stripe to handle payments for appointment fees and other charges.
5. Testing and deployment: Testing the website for bugs, errors, and compatibility issues, and deploying the website to a web server for public access.
6. Maintenance and updates: Regularly monitoring and maintaining the website to ensure it runs smoothly, updating the website with new features and fixing any issues that arise.

1.4 Project Goal

Our main objective in this project is to A clinic booking system's core component is an app or a web-based platform. It automates the appointment scheduling procedures that your employees could find challenging to complete manually, such as entering patient information, scheduling doctor appointments, processing paperwork, etc. Tracking revisits and enhancing clinic-patient communication are other benefits of an app. When confirming, canceling, or rescheduling appointments, this may lead to less bother. The goal of an online doctor's appointment website is to provide patients with an easy and convenient way to schedule and attend virtual appointments with healthcare providers. This can help improve access to healthcare, especially for patients who have mobility issues or live in remote areas. Overall, the goal of an online doctor's appointment website is to improve access to healthcare, increase patient engagement, reduce waiting times, increase efficiency, increase revenue, and comply with regulations, all while maintaining patient data security.

1.5 Report Layout

Chapter 1: Project Introduction, Motivation, Project Objective and Project goal
Chapter 2: Introduction, Market Situation, Target Group and Audience and Project Structure
Chapter 3: Tasks and activities for the front end, tasks and activities for the back end, and challenges
Chapter 4: Implementation of Interactions, Testing Implementation, Test results and reports
Chapter 5: Discussion and Conclusion, Scope for Future Developments

CHAPTER 2
Organization

2.1 Introduction

For JavaScript programmers building single-page web applications, React.js is a fantastic choice. It enables programmers to build intricate websites with reusable parts. The capability to update only the component with pertinent data is a significant advantage. React will keep track of exactly what has changed via its virtual DOM, rather than reloading the entire page.

Due to it being a library rather than a more opinionated framework, it is quick, scalable, and versatile. Additionally, it has a sizable and vibrant developer community, as well as excellent documentation. The creation of complicated web apps, online stores, and social network services is all possible with web development, as are basic static plain-text web pages.

2.2 Market Situation

A market research report on web design is produced after thorough industry analysis and market sizing. The state of the market is dependent on present and upcoming industry developments. You can look at economic causes, industrial supply discipline, and original and fake buyer status to learn about product values and conditions.

The most important and perfect technique to contact customers or everyone with a single issue today is through websites. Every small to major company organizer has a website, and the esteemed proportion of users is 87.0%, and the number is growing every day, according to a technological survey.

The market for web design services will be worth $11.0 billion in sales in 2022. What will be the growth rate of the US web design services market in 2022? It is predicted that the market for web design services will increase by 2022.

2.3 Target Group and Audience

All medical facilities, clinics, and physicians that are checking on patients in their chambers are our target audience. For doctors who are interested in our application, we are gathering data. Initially, we are promoting there for free, but after a few days, it becomes pay-for-performance in the sense that we are collecting a percentage of the payment made to the doctor for each patient. All of the citizens of our nation who are patients and in need of care comprise our audience.

2.4 Project Structure

How work was given, how personnel were managed, and how much emphasis was placed on accomplishing corporate goals were all determined by the project's structure. A crucial

component of an application's design is its structure. The following should be considered while structuring an application: Modules and components should be segregated and loosely connected. Finding files and beginning work on any component should be simple. A single page often makes up a modest project. Small projects don't actually need a lot of files, nor do they have much substance. They are typically used for landing pages.

CHAPTER 3
Task Projects and Activates
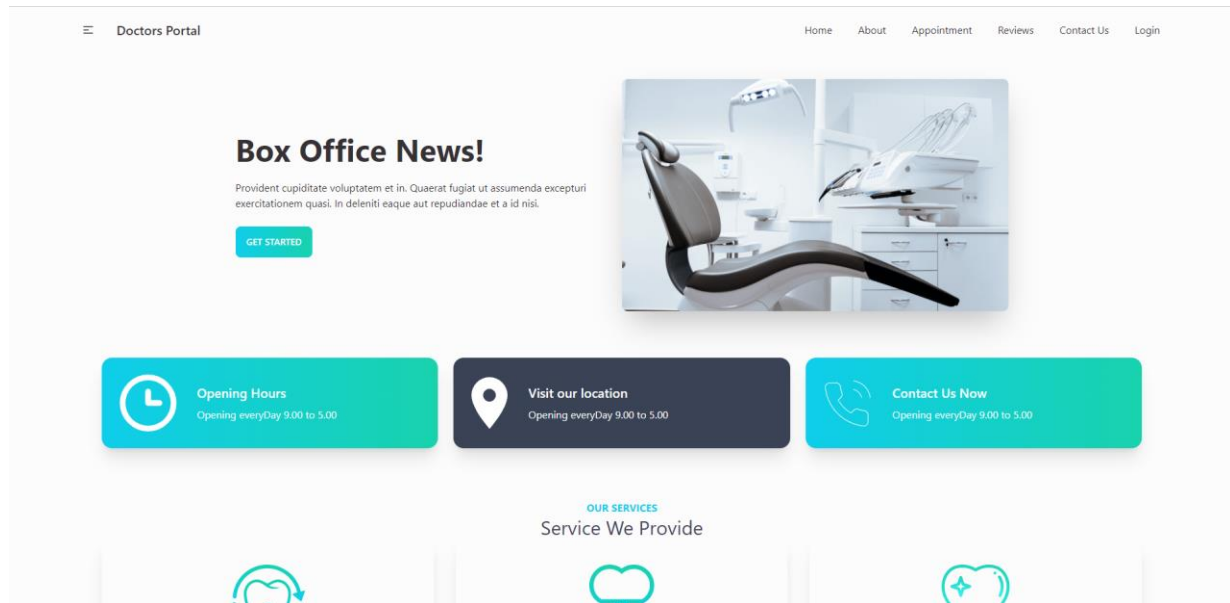
3.1 Task and activities for frontend

Fig: 3.1 Home Page

The home page for an online doctor's appointment website is the first page that visitors will see when they navigate to the website. It serves as an introduction to the website and provides visitors with an overview of the services offered, as well as a clear call to action to schedule an appointment. Some key elements that are typically included on a home page of an online doctor's appointment website include:

- Navigation menu: This allows visitors to easily navigate to different sections of the website.
- Header or hero image: A large banner image or video that prominently displays the website's branding and highlights the services offered.
- Appointment scheduling: A prominent button or form that allows visitors to schedule an appointment, with the option to select a provider, location and time.
- Testimonials: Positive reviews from satisfied patients to build trust and credibility.

- Information about the online doctor's appointment process: A clear and concise explanation of how the process works, including what to expect during an appointment and any relevant costs or insurance information.
- Contact information: A phone number and email address for customer support, as well as links to social media profiles.
- User account management: A feature that allows patients to manage their account, view past and upcoming appointments, and have access to medical records.

The home page is the first impression of the website, so it should be designed to be user-friendly, visually appealing, and easy to navigate. The information provided should be relevant, accurate, and easy to understand, with a clear call to action to schedule an appointment. I made the home page first. This home page contains several sections. The navbar is located at the top. The next step is the banner. Then there is a special section I created. This area was created so that the viewers could see our efforts and labor. Additionally, there is a footer.
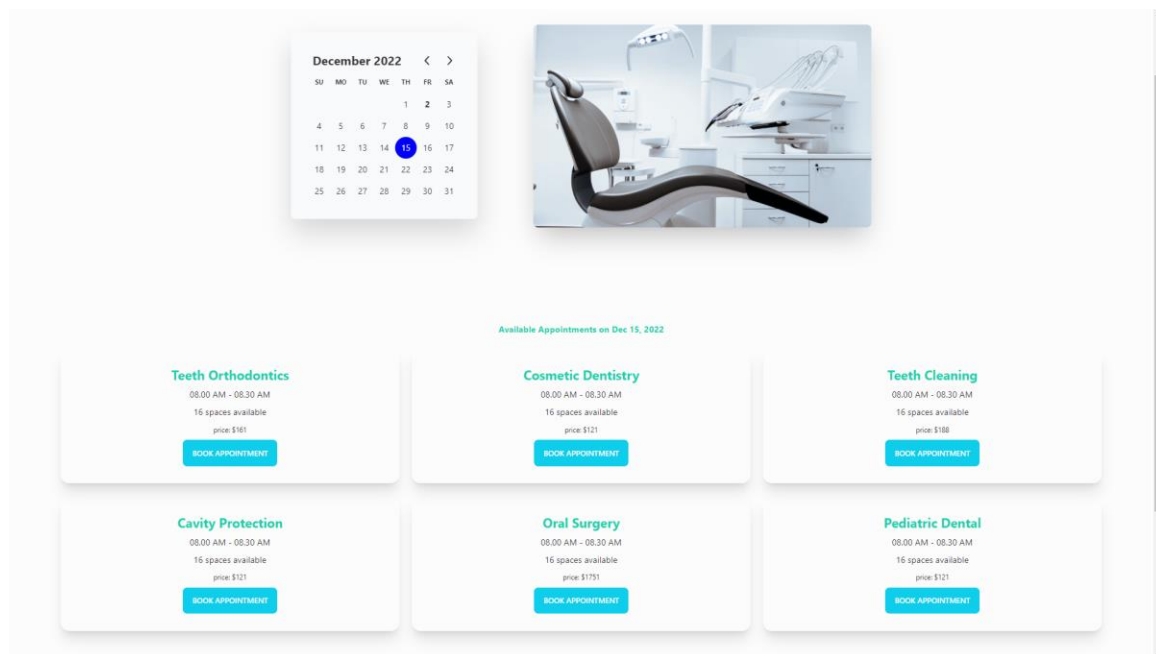

Fig: 3.2 Appointment Page

This is the page for appointments. Patients can schedule an appointment at the appropriate time and day on this website. When they make an appointment, the information is entered into a database, and an email is sent to them asking them to confirm the booking. This is solely for verification.
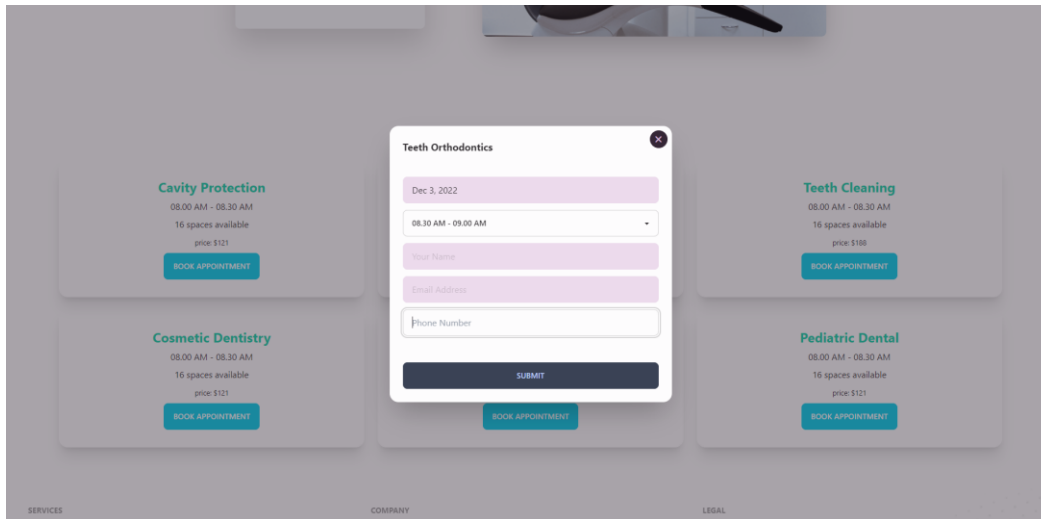
Fig: 3.3 Booking Information Modal

This booking page for an online doctor's appointment website is where patients can schedule and confirm appointments with a healthcare provider. This page is typically accessed by clicking on the "book appointment" button on the home page or through the navigation menu. Key components that are frequently present on a booking page for an online website for doctor's appointments include:

- Provider selection: a list of available healthcare providers, with the option to filter by specialty, location, and availability.
- Appointment scheduling: A calendar or scheduling tool that allows patients to choose a date and time for the appointment, with the option to select a preferred provider or location.
- Confirmation and payment: Once the appointment is scheduled, patients will typically receive a confirmation email or text message and will be prompted to pay for the appointment, if applicable.
- Appointment details: A summary of the appointment details, including the date, time, provider, location, and any relevant notes or instructions.
- Reschedule and Cancellation: A feature that allows patients to reschedule or cancel their appointment if needed.
- Medical Forms: Some sites may require patients to fill out medical forms prior to the appointment, which can be accessed and completed on the booking page.

The booking appointment page should be designed to be user-friendly and easy to navigate. The information provided should be accurate and up-to-date, with clear instructions for scheduling and confirming an appointment. The page should also be secure to protect the patient's personal and sensitive information. The booking module is shown here. A popup similar to this appears when a user or patient clicks to make an appointment. The user

receives some information from this popup. once all the data has been collected. open a confirmation modal by clicking the submit button. then notify the consumer through email that their appointment has been made with the chosen doctor.
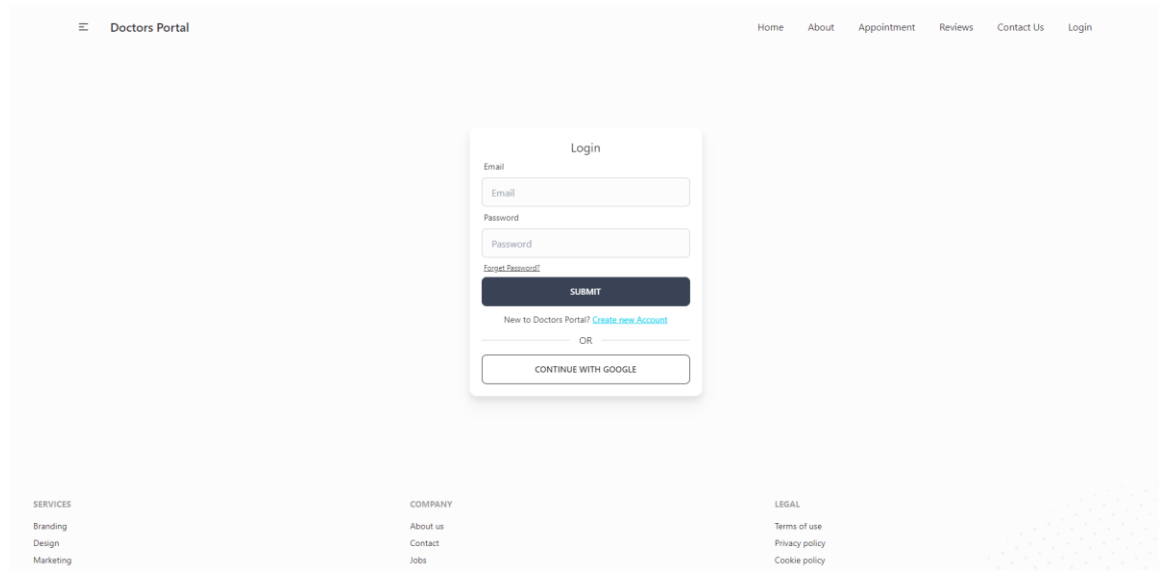

Figure 3.4 : Authentication Page

Firebase Authentication is a service provided by Firebase that allows developers to easily add authentication to their web and mobile applications. It supports various methods of authentication, including email and password, phone number, and social media providers such as Google, Facebook, and Twitter. In the context of an online doctor's appointment website, Firebase Authentication can be used to securely manage patient accounts and protect sensitive personal and medical information. Here's an example of how Firebase Authentication could be implemented in an online doctor's appointment website:

- Sign Up: Patients can create an account by providing their email and password, or by using one of the supported social media providers.
- Login: Patients can log in to their account using their email and password, or by using one of the supported social media providers.
- Role-based access: Firebase Authentication also allows for role-based access control, so that different types of users (e.g. patients, doctors, admin) can only access the information and features that are relevant to them.

By using Firebase Authentication, developers can easily add secure and robust user authentication to their online doctor's appointment website, without having to build and maintain their own authentication system. This page is for authentication. This page connects us with the right user. The majority of applications require the user's identification. Having access to a user's identity enables an app to safely store user data in

the cloud and deliver the same individualized experience across all of the user's devices. To authenticate users for your project, Firebase Authentication offers backend services. When a person visits our website, they provide us with some reliable and accurate information; otherwise, we are unable to add it. If a user already has an account on our website, nothing has to be done. only sign in to access our primary website. If they don't already have one, they must create one on the register page in order to use our major website features. The Firebase console uses this authentication system. Google is currently the greatest and most potent authentication mechanism, as far as we are aware. Therefore, we employ it to strengthen our authentication system.

3.2 Task and activities for Backend

Creating a server on the backend using express js. My project was dynamically executed on a server. Among other things, it connects to databases. My database is MongoDB, which I use. All user information, payments, appointment information, and bookings are kept here.

Figure 3.5: User Dashboard

This user dashboard for an online doctor's appointment website is a personalized interface that allows patients to manage their account, view upcoming appointments, and access their medical history and records. The dashboard can be accessed after the user is authenticated and logged into the website.

- User Profile: The dashboard would display the patient's personal information, such as their name, contact details, and insurance information.
- Appointment History: Patients can view a list of their past and upcoming appointments, and have the option to reschedule or cancel appointments if needed.
- Medical Records: Patients can view and download their medical records, such as test results and prescriptions, that are stored in MongoDB.

- Communication with the doctor: Patients can communicate with the doctor regarding their appointment, medical history or any other queries.
- Payment: Patients can view and manage their billing information and make payments for their appointments.

To implement this functionality, the website's backend would be built using Express.js, which is a popular framework for building web applications. The backend would handle user authentication and provide an API for the front-end to access data stored in MongoDB. The data would be stored in MongoDB, which is a popular NoSQL database that is well-suited for storing unstructured data like medical records. To ensure security and privacy, the data would be encrypted when stored in MongoDB, and access to the data would be restricted only to authorized users.
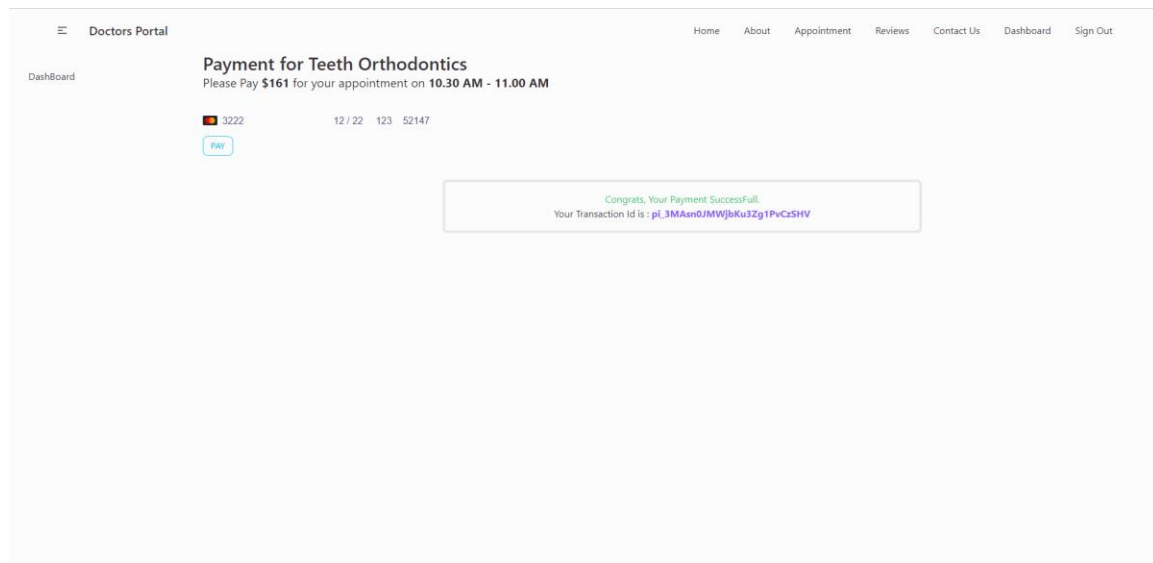

Figure 3.6: Payment

Stripe is a popular payment processing platform that allows businesses to accept payments online and in mobile applications. In the context of an online doctor's appointment website, Stripe can be used to handle payments for appointment fees and any other charges.

- Payment form: A payment form would be added to the website, which patients can use to enter their credit or debit card information. The form would be securely hosted on Stripe's servers, so sensitive data never touches the website's server.
- Payment processing: Once the patient submits the payment form, Stripe will process the payment and return a confirmation or error message to the website.
- Payment confirmation: After a successful payment, the website would display a confirmation message to the patient, and store the payment information in the database, such as Stripe's transaction ID, payment status, and other details.

- Refunds and Cancellations: Stripe allows for refunds and cancellations of payments, so if a patient cancels an appointment, the payment can be refunded easily.
- Security: Stripe uses industry-standard security measures to protect sensitive data, such as PCI compliance and encryption, so you can be sure that the payment process is safe and secure for both the patient and the doctor.

By using Stripe, an online doctor's appointment website can easily accept payments from patients, without having to worry about managing sensitive payment information or complying with industry regulations. Stripe also provides detailed reporting and analytics, which can be useful for tracking payment trends and identifying fraud. As a payment processor, Stripe enables entrepreneurs to accept and process payments made using credit and debit cards. Businesses may use Stripe to take payments through mobile wallets and buy now, pay later services. Additionally, Stripe accepts payments in a number of currencies. It has Level 1 PCI Service Provider certification. This is the highest degree of certification that is currently offered in the payments sector. To do this, Stripe maintains a high degree of security using best-in-class security technologies and procedures. If someone wants to pay for the services, they should click the "pay" button for the chosen services. When users click the pay button, a new page loads. Currently, just one system—a Master or any Visa card—is functional on this page. The payment transaction key is sent to us after a user makes a successful payment so that we can verify it, and the admin panel may use it to verify the user's identification the following time.

Figure 3.7: Admin role dashboard

Figure 3.8: Admin role for All Users

Figure 3.9: Admin role Add Doctors
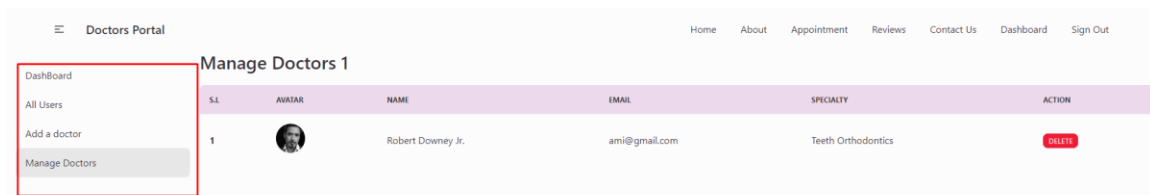
Figure 3.10: Admin Role: Manage Doctors
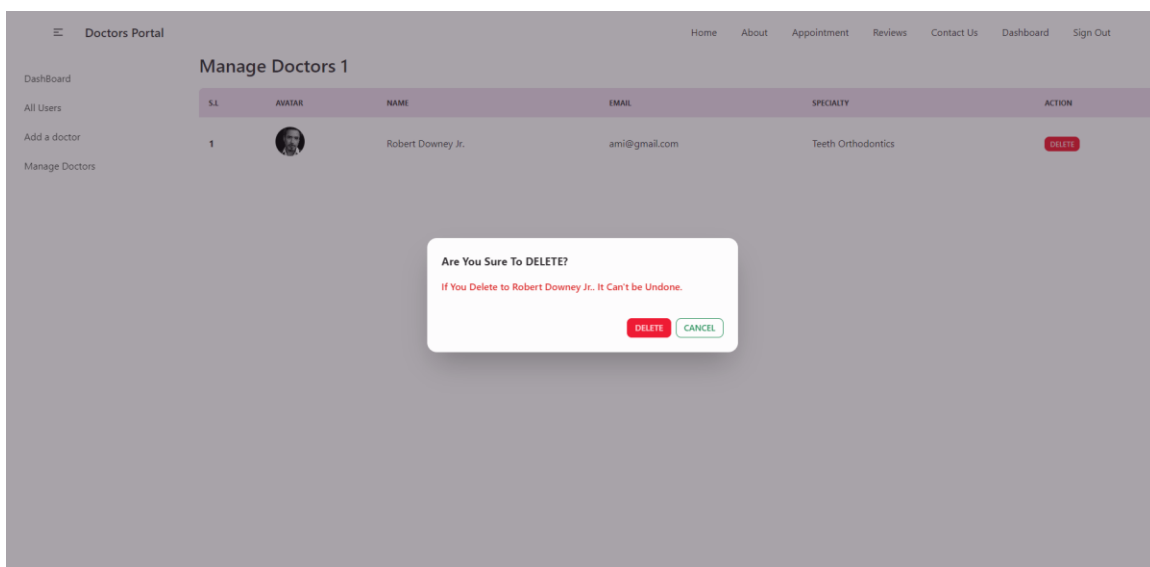
Figure 3.11: Delete doctors

In an online doctor's appointment system, the term "admin" typically refers to a user with special privileges and access to manage and oversee the system. The responsibilities of an admin can vary depending on the specific system, but some common responsibilities include:

- Managing providers and staff: Admins can add, edit, and delete providers and staff members, as well as assign roles and permissions.
- Managing appointments: Admins can view and manage all appointments in the system, including scheduling, rescheduling, and canceling appointments.

- Managing patient records: Admins can access and manage patient records, including personal and medical information, appointment history, and payment information.
- Monitoring system activity: Admins can view system-wide statistics and metrics, such as appointment bookings, cancellations, and no-shows, to monitor the performance of the system.
- Managing system settings: Admins can configure system settings, such as appointment duration, time slots, and pricing, as well as manage billing and payments.
- Managing billing and payments: Admins can view and manage billing and payment information, including invoices, refunds, and chargebacks.
- Managing support tickets: Admins can view and respond to customer support tickets, and resolve any issues or complaints.
- Managing security: Admins can manage security settings, such as user roles and permissions, and ensure the system is in compliance with relevant regulations and security standards.

Admins are responsible for overseeing the entire system and making sure that it is running smoothly and efficiently. They also ensure that the platform is compliant with relevant regulations and security standards.

CHAPTER 4
Implementation and Testing

4.1 Implementation of Interactions

Testing is a critical step in the development of an online doctor's appointment website, as it helps ensure that the website is functioning correctly and is free of bugs and errors. There are several types of testing that can be performed on an online doctor's appointment website, including:

- Unit Testing: This type of testing focuses on individual components or units of the website, such as a specific function or module. Unit tests are typically written by developers and are used to ensure that each component of the website is working as expected.
- Integration Testing: This type of testing focuses on the interactions between different components of the website, such as how the front-end and back-end interact with each other. Integration tests are used to ensure that the different components of the website are working together correctly.
- Functional Testing: This type of testing focuses on the overall functionality of the website, such as how the website behaves in response to user input. Functional tests are used to ensure that the website is working as expected and that all features are functioning correctly.
- Performance Testing: This type of testing focuses on how the website performs under different loads and conditions. Performance tests are used to ensure that the website can handle a large number of users and transactions without any issues.
- Security Testing: This type of testing focuses on the website's security, such as how it handles user data and prevents unauthorized access. Security tests are used to ensure that the website is secure and that user data is protected.
- Usability Testing: This type of testing focuses on the ease of use of the website and its user interface. Usability tests are used to ensure that the website is easy to use and understand for patients.

Testing is an ongoing process and should be done at different stages of development, starting with unit testing, then functional, integration and performance testing. It's also important to perform security testing and usability testing before the website is launched. By performing thorough testing, developers can ensure that the website is functioning correctly and providing a good user experience for patients. Our primary emphasis when creating a web application was the client's need for a lightweight, user-friendly, and interactive system. Through the technique we used, we were able to reach a wide number of customers of all ages and demographics. As a result, our program is now far more interactive for our users.

Through phone number verification and providing a password for his own profile, the user registers for the Doctors Portal application. The user sees the dashboard, where they may add a doctor to their schedule after successfully logging into the application. They have access to payment alternatives on their dashboard as well.

Any changes to the web application's services like Dashboard, All Users, add a doctor, and Manage Doctors will be communicated to the admins via the admin dashboard. The administrator will also be alerted whenever any user adds something to his favorites. If there is any fraudulent activity or unsuitable suspicious movement while the admin is watching, the admin has the authority to block or remove the user from the database.

4.2 Testing Implementation

We tested our collaboration on an intent-to-intent basis when several of our initiatives were still in the early phases of development. We are very familiar with customer requirements because we lack professional testers and have learned about them from our company's experience. As a result, we may assert that we perform unit, integration, and acceptance testing, among other forms of testing. Additionally, in order to achieve perfection, we develop a few unique prerequisites

S. L	Testing Purpose
01	Checking if the program runs
02	Checking for registration
03	Checking the login
04	Checking Server Connection
05	Checking for database API
06	Checking database connection
07	Checking payment option
08	Checking payment transaction id
09	Checking JWT Token

Table: 4.1 Testing the implementation of the application

4.3 Test Results and Reports

The results of the tests, as determined by the test cases described in the earlier section of this chapter, are shown in Table 5.2.

S. L	Testing Purpose	Result
01	Checking if the program runs	Success
02	Checking for registration	Success
03	Checking the login	Success
04	Checking Server Connection	Success
05	Checking for database API	Success
06	Checking database connection	Success
07	Checking payment option	Success
08	Checking payment transaction id	Success
09	Checking JWT Token	Success

Table: 4.2 Testing and Implementation Results

CHAPTER 5
Conclusion and Future Scope

5.1 Discussion and Conclusion

Online doctor appointments have a number of advantages for both patients and medical professionals. They offer patients an easy and comfortable way to get medical care, especially for those who live in distant places or have mobility problems. By removing the need for traveling and lowering the chance of contracting a disease in a doctor's office, online appointments also save time and money.

Online appointments can boost patient involvement and a healthcare provider's effectiveness. It also provides the opportunity to connect with a larger patient base and provide more flexible scheduling options.

Online doctor appointments do have certain restrictions nonetheless. Some patients might prefer the personalized touch of an in-person visit, which might not be appropriate for all kinds of medical issues. The quality of the consultation might also be impacted by the internet connection and video call quality.

Finally, online doctor's appointments offer a useful service to both patients and medical professionals. They provide a practical and accessible method of receiving medical care, but it's crucial to think about the drawbacks and balance the benefits and drawbacks before scheduling an online session. It's also advised to discuss coverage alternatives with your insurance company.

5.2 Scope for Future Developments

As technology advances and healthcare systems transform to meet the demands of a changing medical landscape, the future of online doctor appointments appears bright. A few probable changes for online doctor appointments in the future are listed below:

1. Increased Integration with Electronic Health Records (EHRs): As online doctor visits become more integrated with EHRs, better diagnosis and improved continuity of care are possible.
2. Advancements in Telemedicine Technology: Telemedicine technological advancements will make it possible to conduct more engaging and productive online consultations through the use of virtual reality, augmented reality, and other telemedicine technologies.

3. Enhanced Remote Monitoring: To better care for patients with chronic diseases, online doctor's appointments will increasingly involve remote monitoring of vital signs and other data.
4. More Specialized Services: Tele dermatology and mental health counseling are only a couple of the services that will be available during online medical visits.
5. Wider Adoption: The availability and affordability of online medical care will increase with a wider use of online doctor's visits by healthcare providers, insurance companies, and public healthcare systems.

In general, it is anticipated that online doctor appointments will gain popularity and become a crucial component of contemporary healthcare delivery. During the pandemic crisis, it has become a requirement for many patients and healthcare professionals.

ONLINE DOCTOR'S APPOINTMENT SYSTEM USING REACT JS

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