Report on a Web Application – Outpatient Department (OPD)

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Term Project - Sem V

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Abstract

In this paper various components and their various functionalities as per this web app Outpatient Department (OPD) is discussed. Firstly, the paper consists of the Introduction about the web app Outpatient Department (OPD). The paper then goes over the various unique use cases of the components of this web app using a use case diagram. It goes in detail about every Outpatient Department (OPD) component functionality wherein it outlines the various advantages of using this Web App model. Then this paper will go through its different applications

like proper appointment system, inventory management, keeping records of users and medicines and getting rid of usage of papers.

After that it will show different kinds of tech stacks used in this web app and their functionalities.

Problem Statement

In this busy world, no one has time to wait in long lines at the dispensary. Queuing issues at this dispensary are often managed manually by administrative staff. They hand out tokens there, patients have to wait their turn and the most frustrating thing is when patients go there, they are told that the doctor is either on vacation or the doctor is not available for appointment. Our software can help you overcome all these problems. You can also check if your desired doctor is available. A doctor can also confirm or deny an appointment. This will help both the patient and the doctor in the same way a doctor declines an appointment. The patient knows this in advance, and only when the doctor confirms the appointment, at any time, the patient visits the hospital.

Introduction

Our Outpatient Department (OPD) can be presented as a web app that represents various functionalities like registration of patients, storing their details into the system, booking their appointments with doctors, inventory management, keeping records of medicines and getting rid of usage of papers. The Outpatient Department (OPD) can be entered using a username and password. Our software has the facility to give a unique id for every patient and stores their details automatically. Every

user can search availability of a doctor and the details of a patient using the id.

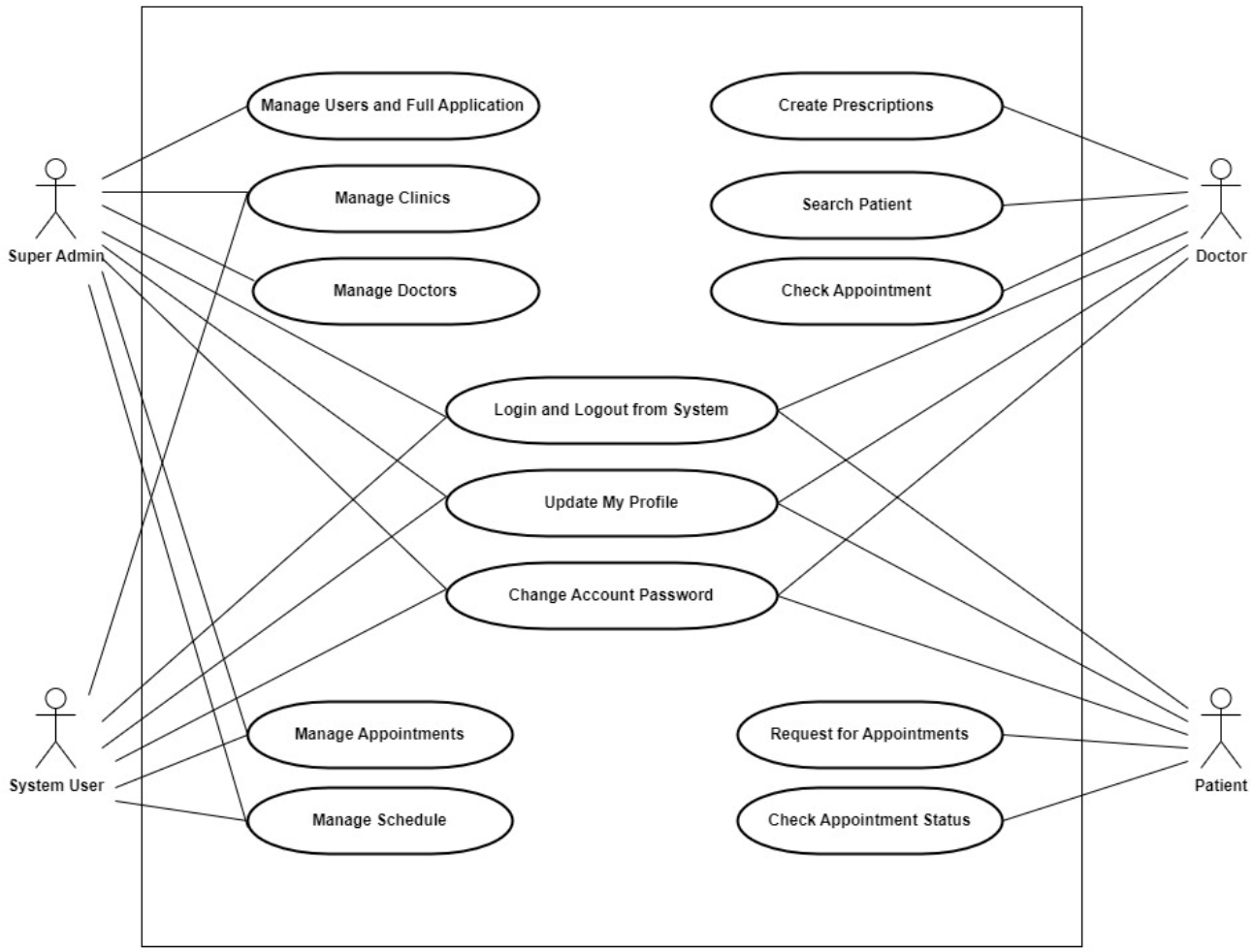
The data of every user is well protected. It can be retrieved easily for personal use and makes the data processing very fast. The interface is very user-friendly. Database is accessible either by admin and only they can add data into it.

Outpatient Department (OPD) asks first to sign up if a user does not have an account on Outpatient Department (OPD). If they already have an account on Outpatient Department (OPD) then they only need to login and then they can use its different functionalities like getting the details of visiting hours of doctors, booking their appointments with them, storing their details into the system. They can log out whenever they want.

The web app’s frontend is made using React JS and its components. And for backend services we have used Firebase in which we have used Firebase – Authentication, Firebase Cloud Database, Firebase Cloud Storage.

Use Case Diagram

A use case diagram is a way to summarise details of a system and the users within that system. It is generally shown as a graphic depiction of interactions among different elements in a system. The below figure shows the use case diagram of the application.



Usecase Diagram of Outpatient Department (OPD)

Actors

The actors in our use case are: Super Admin, System User, Patient and Doctor.

"System Admin" who can manage login and logout from system. They can manage users and their full application. They also manage clinics and doctors.

"System User" who can manage all the appointments of the patients and their schedules. They can also manage their profile and update it and change the password of their choice.

"Doctors" who can search for the patients who have taken the appointment and create prescriptions for them. They also have a profile and can manage it by update the profile and password.

"Patient" who can request for appointments of the required doctor and check the status of appointment. They also have a profile and can manage it by update the profile and password.

Use Case

The use cases in our diagram are: **Sign Up** which Super Admin, System User, Patient and Doctor uses to obtain credentials to access the app.

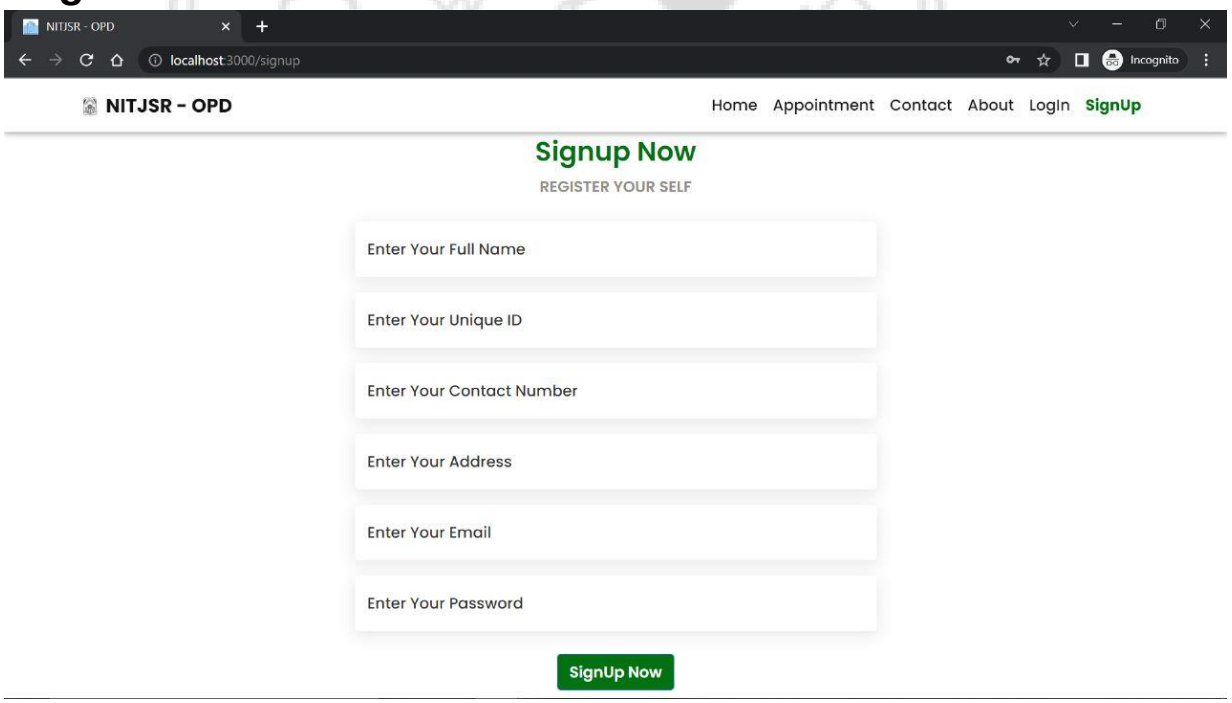
- Online Appointment
- Online track of medical history of student's
- Online dispensary
- Online details of doctors
- Specialist doctor's information
- Online bill generation
- Online prescription

Project Overview:

Key features of Outpatient Department (OPD) includes:

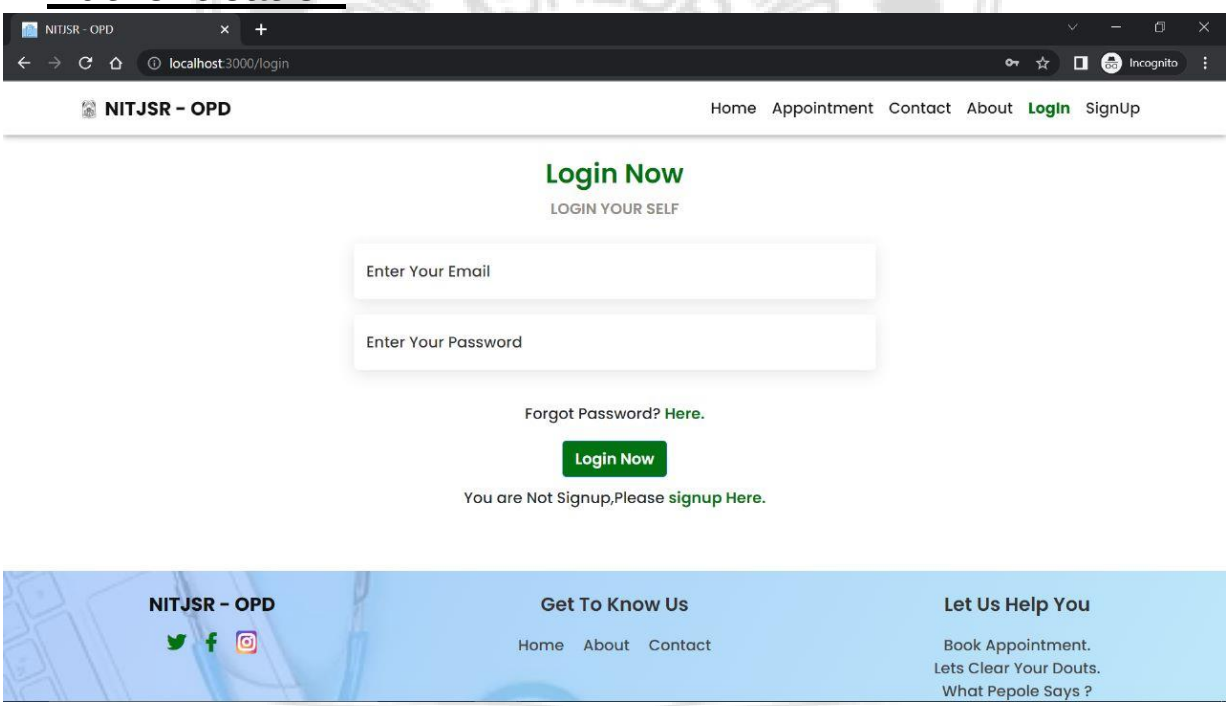
- **Registration**
- **Authentication**
- **Online Appointment**
- **Latest Health News**
- **Online Duty Chart**
- **Patient's Medical Record**
- **Feedback Section**

1. Registration



In the Sign up page we have taken into consideration six fields which are- Name, User id, Contact Number, Address, Email id and Password.

2. Authentication:

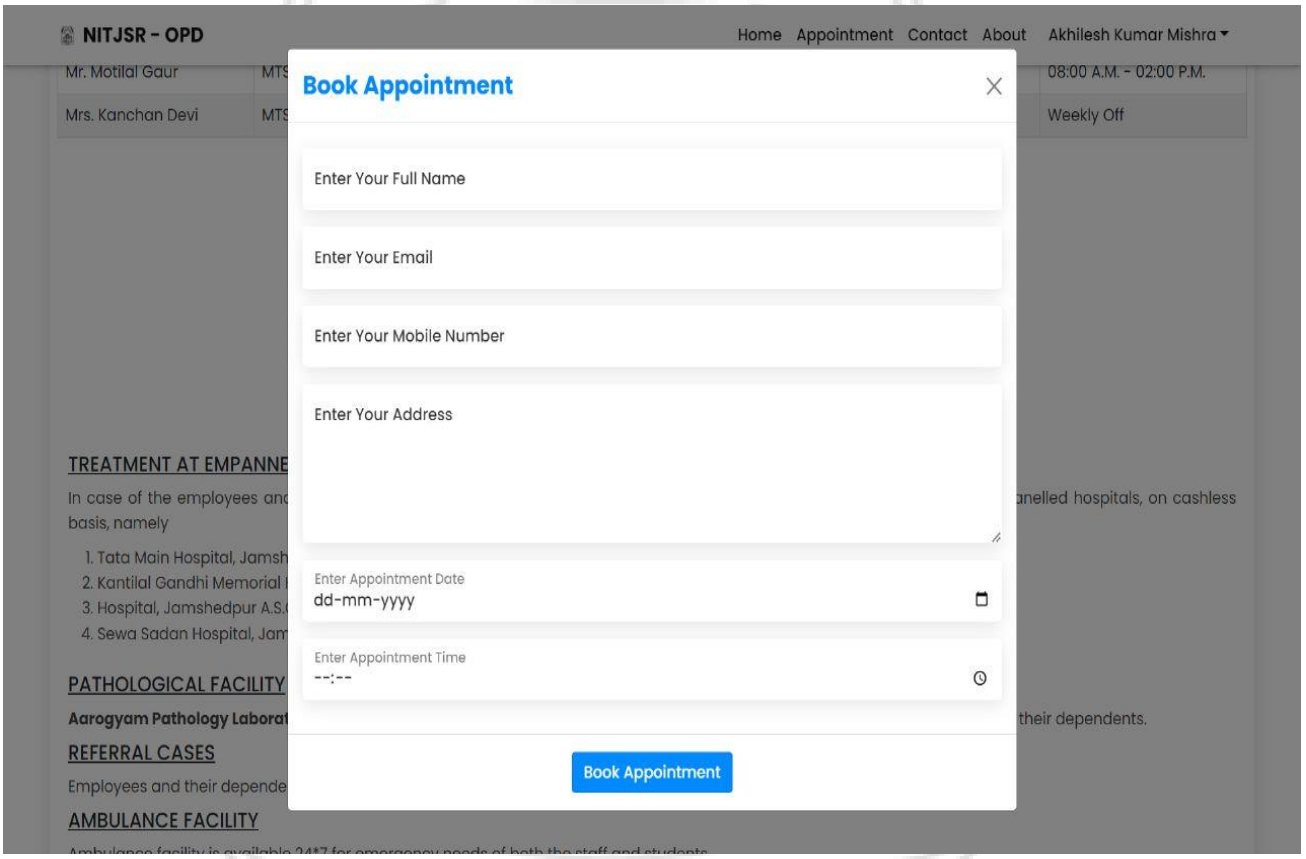


Outpatient Department (OPD) has a feature of authentication where a user has to first create an account and then can login in the account.

In the login section we have taken into consideration two fields for login into an account – Email id and Password. There is a button to remember me which keeps the user logged in state even if the user is not active. There is also a button for the forgotten password which can be used by the user to retrieve the password if he/she does not remember.

The authentication has been implemented using the Firebase authentication in which when the user login the token is generated which is stored in the form of cookies which validates that the user is logged in or not.

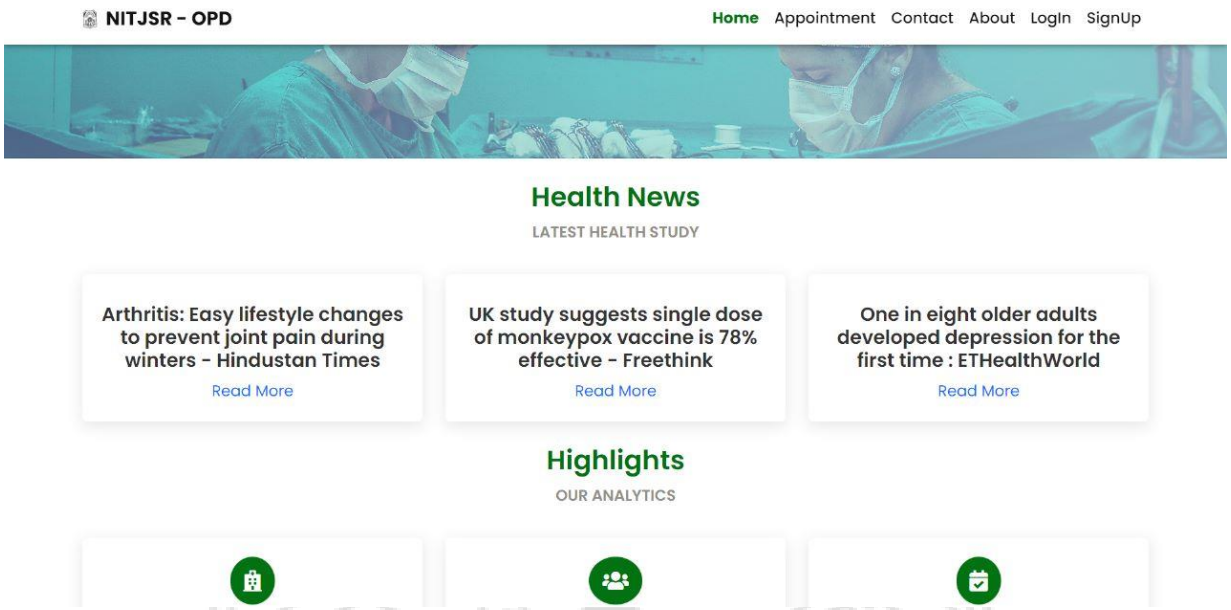
3. Online Appointment



Booking online is easiest and best option for making an appointment and receiving immediate confirmation.

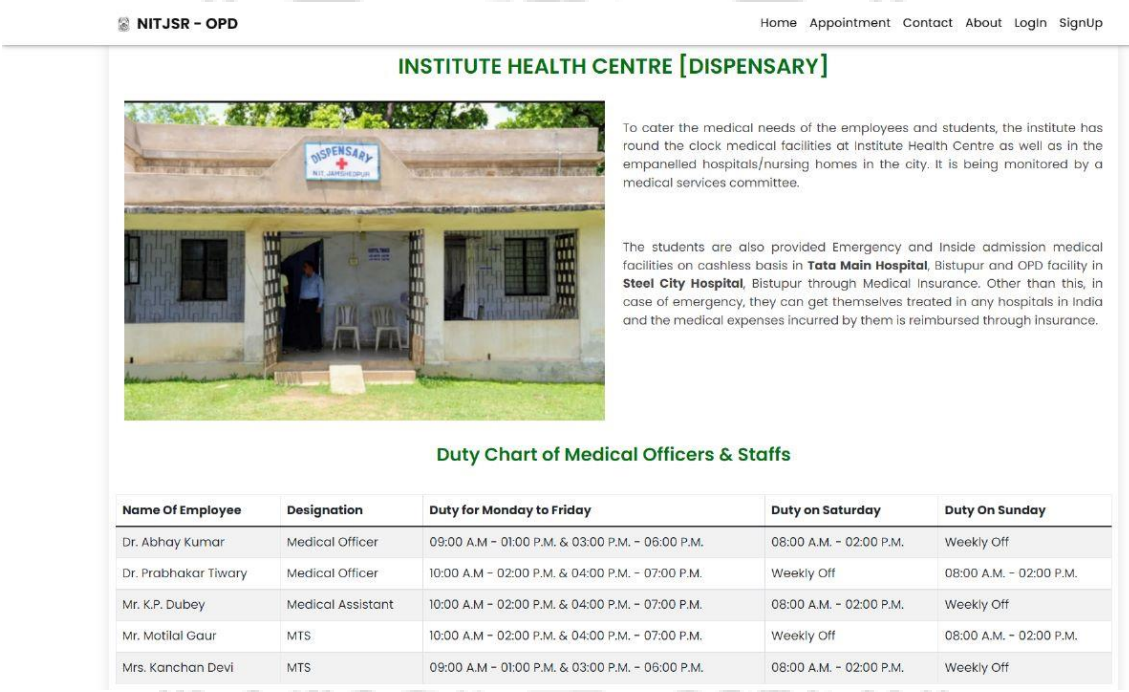
In order to book an appointment with doctors, a institute id will be required. If you miss or fail to cancel your appointment within 48 hours, it will be cancelled automatically.

4. Latest Health News



News API is a simple HTTP REST API for searching and retrieving live articles from all over the web. The main use of News API is to search through every article published by over 80,000 news sources and blogs in the last 4 years. We are using this API for getting the latest news about different diseases spread across India in order to keep ourselves updated about the various seasonal viruses and flues by accessing the reports provided on the website.

5. Online Duty Chart



NITJSR – OPD

Home Appointment Contact About Login SignUp

INSTITUTE HEALTH CENTRE [DISPENSARY]

To cater the medical needs of the employees and students, the institute has round the clock medical facilities at Institute Health Centre as well as in the empanelled hospitals/nursing homes in the city. It is being monitored by a medical services committee.

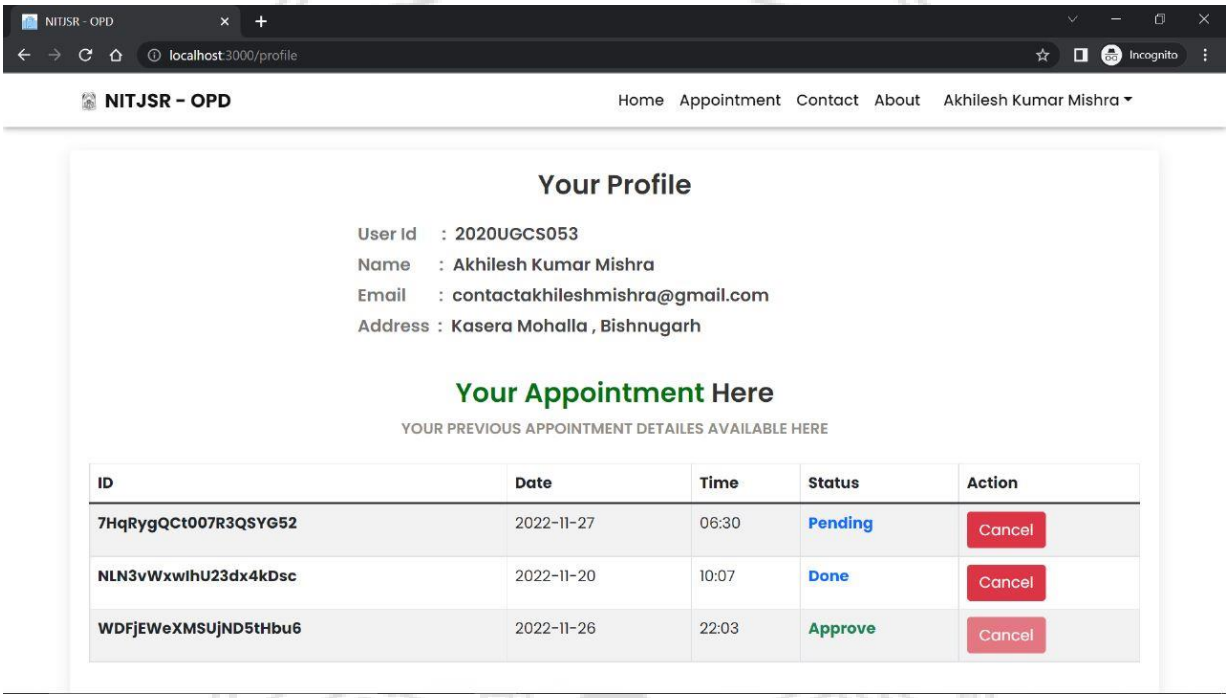
The students are also provided Emergency and Inside admission medical facilities on cashless basis in **Tata Main Hospital**, Bistupur and OPD facility in **Steel City Hospital**, Bistupur through Medical Insurance. Other than this, in case of emergency, they can get themselves treated in any hospitals in India and the medical expenses incurred by them is reimbursed through insurance.

Duty Chart of Medical Officers & Staffs

Name Of Employee	Designation	Duty for Monday to Friday	Duty on Saturday	Duty On Sunday
Dr. Abhay Kumar	Medical Officer	09:00 A.M – 01:00 P.M. & 03:00 P.M. – 06:00 P.M.	08:00 A.M. – 02:00 P.M.	Weekly Off
Dr. Prabhakar Tiwary	Medical Officer	10:00 A.M – 02:00 P.M. & 04:00 P.M. – 07:00 P.M.	Weekly Off	08:00 A.M. – 02:00 P.M.
Mr. K.P. Dubey	Medical Assistant	10:00 A.M – 02:00 P.M. & 04:00 P.M. – 07:00 P.M.	08:00 A.M. – 02:00 P.M.	Weekly Off
Mr. Motilal Gaur	MTS	10:00 A.M – 02:00 P.M. & 04:00 P.M. – 07:00 P.M.	Weekly Off	08:00 A.M. – 02:00 P.M.
Mrs. Kanchan Devi	MTS	09:00 A.M – 01:00 P.M. & 03:00 P.M. – 06:00 P.M.	08:00 A.M. – 02:00 P.M.	Weekly Off

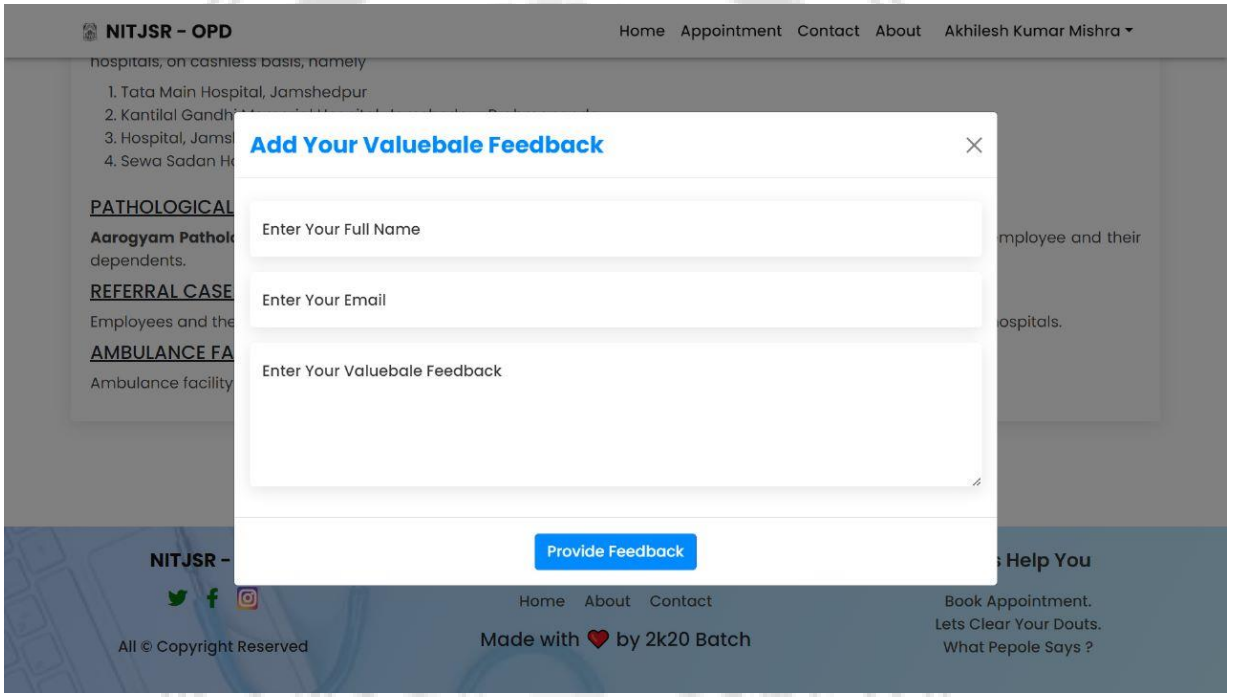
- It shows all the details about the dispensary.
- It also shows the duty chart of medical officers and staffs with their visiting day and hour.

6. Patient's Medical Record



- It shows the user's credentials.
- It shows all appointment details with their current status.

7.Feedback Section



Users can give their valuable feedback to the website.

Customer feedback is information provided by customers about their experience with a product or service. Collecting customer feedback can help product, customer success, customer support, and marketing teams understand where there is room for improvement. Feedback can be collected proactively by polling and surveying customers, interviewing them, asking for reviews, or implementing the right tools that collect implicit feedback.

Tech Stack Used:

HTML:

HTML stands for Hyper Text Markup Language. HTML is the standard markup language for creating Web pages. HTML describes the structure of a Web page. HTML consists of a series of elements. HTML elements tell the browser how to display the content. HTML elements label pieces of content such as "this is a heading", "this is a paragraph", "this is a link", etc.

CSS:

CSS stands for Cascading Style Sheets. CSS describes how HTML elements are to be displayed on screen, paper, or in other media
CSS saves a lot of work. It can control the layout of multiple web pages all at once. External stylesheets are stored in CSS files

Bootstrap:

Bootstrap is a free, open-source front-end development framework for the creation of websites and web apps. Designed to enable responsive development of mobile-first websites, Bootstrap provides a collection of syntax for template designs.

As a framework, Bootstrap includes the basics for responsive web development, so developers only need to insert the code into a pre-defined grid system. The Bootstrap framework is built on Hypertext Markup Language (HTML), cascading style sheets (CSS) and JavaScript. Web developers using Bootstrap can build websites much faster without spending time worrying about basic commands and functions.

JavaScript:

Whether you plan to specialize in front-end, back-end, or full-stack development, JavaScript is an essential programming language for any web developer. Without JavaScript, we wouldn't have the dynamic and interactive websites that have become the standard user experience we all know, love, and rely on. JavaScript makes websites dynamic. Before JavaScript, websites were created using only HTML and CSS. HTML and CSS are only capable of creating static pages that can be styled, but not interactive, except for hyperlinks. Most websites, including the most popular ones like Google, YouTube, and Facebook, use JavaScript. JavaScript is best known as a web language because it is native to the web browser. The web browser naturally understands the language. For Frontend, we have also used Bootstrap, which is a free open-source front-end development framework for building websites and web applications. It is designed to enable responsive mobile web development.

With an extensive collection of JavaScript frameworks, developers can efficiently create mobile and web applications. Frameworks are libraries of pre-written JavaScript code that developers use for standard functionality.

JavaScript is a client-side language, which technically makes it a front-end language. But with the Node.js framework, JavaScript can be used in the backend as well. Having as much code as possible in the same language makes it easier to maintain, manage, update and build within a single team.

REACTJS:

React.js is the most popular front-end JavaScript library for building Web applications. Most of the popular websites including the ones designed for popular companies use ReactJs. React.js is an open-source JavaScript library that is used for building user interfaces specifically for single-page applications. It's used for handling the view layer for web and mobile apps. React also allows us to create reusable UI components. React allows developers to create large web applications that can change data, without reloading the page. The main purpose of React is to be fast, scalable, and simple. It works only on user interfaces in the application. This corresponds to the view in the MVC template. It can be used with a combination of other JavaScript libraries or frameworks.

React creates an in-memory data structure cache which computes the changes made and then updates the browser. This allows a special feature that enables the programmer to code as if the whole page is rendered on each change whereas react library only renders components that actually change. In addition to all this ReactJs is relatively simpler and faster to implement that is why we used ReactJs for our project.

NEWS API- INDIAN HEALTH

News API is a simple HTTP REST API for searching and retrieving live articles from all over the web. The main use of News API is to search through every article published by over 80,000 news sources and blogs

in the last 4 years. We are using this API for getting the latest news about different diseases spread across India in order to keep ourselves updated about the various seasonal viruses and flues by accessing the reports provided on the website.

NODE-JS:

Node.js is not a programming language. Rather, it's a runtime environment that's used to run JavaScript outside the browser. Node-Js is an open source and cross platform JavaScript run environment. It is a popular tool for almost any kind of project. It executes JavaScript code outside a web browser. It uses event-driven, non-blocking I/O architecture, which makes it efficient and suitable for real-time applications.

It provides vast scalability for applications. Node.js, being single-threaded, is capable of handling a huge number of simultaneous connections with high throughput. A vast set of open-source Node.js packages is available that can simplify your work. There are more than one million packages in the NPM ecosystem today.

In addition to all this NodeJs is one of the fastest growing technologies in the world right now and it is being favoured over other backend technologies. Also Node.js is an easy choice for developers since both the frontend and backend can be managed with JavaScript as a single language. Node.js has a massive community of active developers and boasts the world's largest open-source package repository, NPM, which presently contains over a million packages.

Express:

Express.js, or simply **Express**, is a backend web application framework for Node-js. Since Express.js only requires JavaScript, it becomes easier for programmers and developers to build web applications and API without any effort. Express.js is a framework of Node.js which means that most of the code is already written for programmers to work with. You can build a single page, multi-page, or hybrid web applications using Express.js. Express.js is lightweight and helps to organise web applications on the server-side into a more organised MVC architecture. Express.js provides a simple routing for requests made by clients. It also provides a middleware that is responsible for making decisions to give the correct responses for the requests made by the client.
Thus using Express with NodeJs allows us to develop and maintain our backend easily.

MongoDB:

MongoDB is an open source No-SQL database management program. NoSQL is used as an alternative to traditional relational databases. NoSQL databases are quite useful for working with large sets of distributed data. MongoDB is a tool that can manage document-oriented information, store or retrieve information. MongoDB makes use of records which are made up of documents that contain a data structure composed of field and value pairs. Documents are the basic unit of data in MongoDB. MongoDB doesn't require predefined schemas. It stores

any type of data. This gives users the flexibility to create any number of fields in a document, making it easier to scale MongoDB databases compared to relational databases.

Thus, given its ease of scalability and the flexibility of using any type of data, we used MONGODB as our database.

Conclusion:

Operating on the project was a tremendous experience. It helped us to understand the significance of planning, designing and implementation thus far we have got learnt in our concept books. It helped us unleashing our creativity even as working in a team. It also realized the importance of team running, communicate as a part of this assignment.

The task was efficiently finished after a lot of efforts and paintings hours. This assignment underwent variety of compiling, debugging, casting off errors, making it malicious program free, adding greater facilities in health centre control device and interactivity making it more reliable and useful.

This assignment targeted that scheduling a task and adhering to that schedule creates a difficult feel of time management. It has also let us regarded that co-operative teamwork usually produce powerful effects. The entire challenge has been advanced and deployed as per the requirements said via the consumer.

There are also few features which can be integrated with this system to make it more flexible. Below list shows the future points to be consider:

- Billing and payment system can be added.
- Descriptions can be added to the use's profile.
- Security of the whole system.
- Staff management (work roster, availability, scheduling).
- Management functions (report generations, accounting).
- Specialist Doctors can be added to the website.
- Comprehensive database.

- Web Interface (proposed for future).

Finally, we like to conclude that we put all our efforts throughout the development of our project and tried to fulfil most of the requirements of the user.