

# WEB BASED TRACKING AND MANAGEMENT SYSTEM FOR MEDICAL RECORDS

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## ABSTRACT

*In the present quickly developing medical services scene, effective and secure administration of clinical records is of principal significance. Conventional paper-based frameworks are lumbering and blunder inclined, prompting huge difficulties in quiet consideration, information security, and in general medical care framework productivity. To resolve these issues, an Web based tracking and management system has been created.*

*The web based System is exhaustive, easy to understand, and profoundly versatile arrangement intended to smooth out the whole lifecycle of clinical records inside medical care organizations. This online stage offers various advantages, including its Availability The medical services experts can get to patient records safely from anyplace, working with speedy direction, particularly in crises or distant meetings, The framework computerizes record creation, capacity, recovery, and refreshing cycles, decreasing managerial above and limiting blunders. It provides Powerful encryption and access controls guarantee that patient information stays classified and follows information protection guidelines, It coordinates consistently with other medical care data frameworks, considering information trade between various offices and establishments. The framework can be tweaked to meet the particular requirements of medical care offices, all things considered, from little facilities to huge emergency clinics. Patients can get to their records web based, cultivating straightforwardness and commitment to their own medical services venture.*

**Keyword :** - Web based tracking, Emergency, Security, Online stage, Encryption, Medical Services

## 1. INTRODUCTION

The healthcare sector has several difficulties in the fast-paced world of today, with effective patient care and data administration at the top of the list. Healthcare companies and medical experts are always looking for novel ways to improve patient outcomes, expedite operations, and guarantee the safety and accessibility of medical records. The Web-Based Tracking and Management System for Medical Records has evolved as a ground-breaking response to these demands.

This innovative solution transforms how medical records are handled and managed by leveraging the power of the internet and cutting-edge technology. It provides a thorough and integrated approach to managing medical records, ensuring that patient data is available, safe, and simple for authorized healthcare managers and clinicians.

This system's goals include enhancing the effectiveness of healthcare delivery while simultaneously enhancing patient care, minimizing errors, and ensuring regulatory compliance. It represents a substantial change from the outdated paper-based record-keeping methods that are prone to mistakes, misplacement, and the difficulties that come with manual data retrieval.

We will explore its potential to transform the way healthcare providers, from small clinics to big hospitals, maintain patient records, restructure administrative procedures, and ultimately deliver improved patient care.

Go along with us on an excursion through the fate of medical care, where the union of innovation and medication is set to reclassify the manner in which we track, make due, and use clinical records. The Online Following and The executives Framework is ready to turn into a fundamental device in the medical services environment, working with better direction, working on quiet results, and preparing for a more productive and secure medical care scene.

## 2. FLOW DIAGRAM OF THE PROPOSED WORK

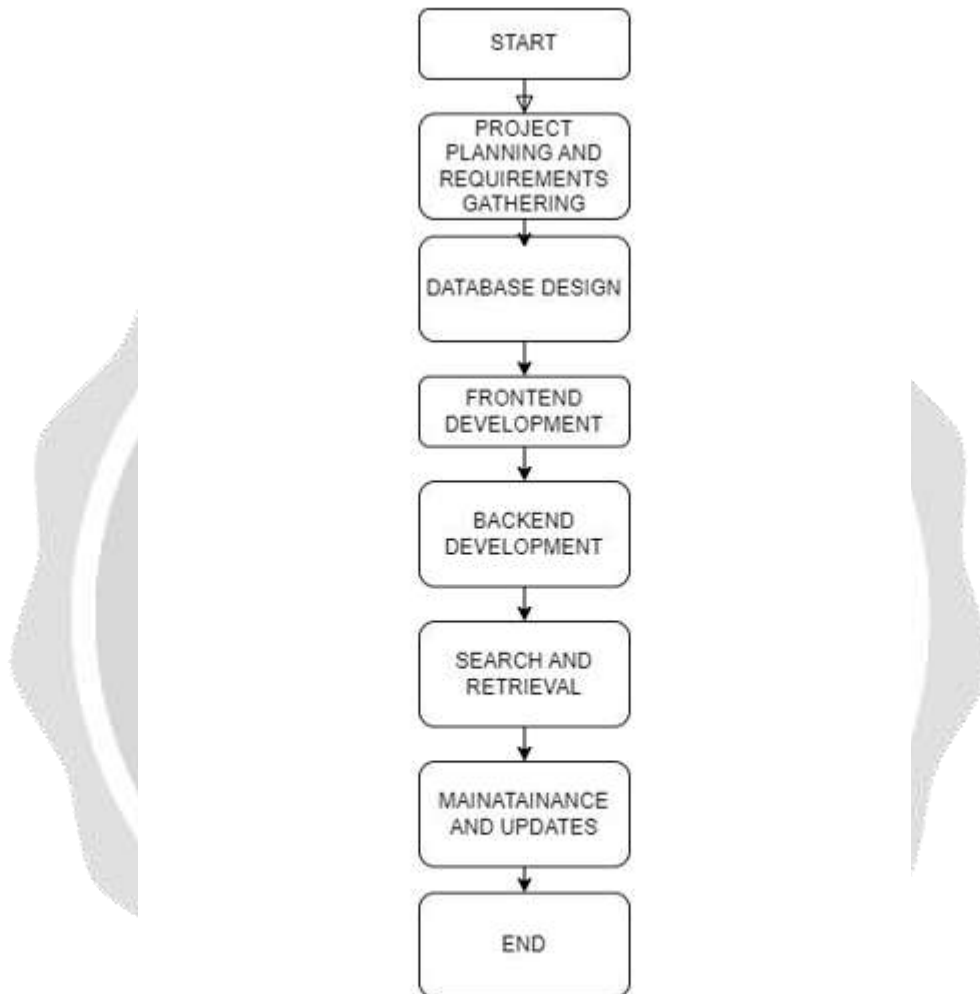


Fig 3.1 Flow Diagram of Proposed Work

## 3. DATABASE DESIGN

The database configuration for a web-based traceability management system for medical records using the MERN stack will depend on the specific needs of the system but some tables commonly included in the database are:

**Patient:** Patient information such as name, address, date of birth, and medical history will be stored in this table.

**Doctor:** Information about the physicians, such as their name, license number, and specialty, will be stored in this table.

**Medical Records:** This table stores medical record information such as patient name, physician name, visit

date, and diagnosis

**Test:** This table will store information about tests performed on the patient, such as test name, test date, and results.

**Medications:** This table will store information about the medications the patient is taking, such as the name of the medication, dosage, and frequency

#### 4. FRONTEND DEVELOPMENT

The frontend improvement for an online following and the executives framework for clinical records utilizing the MERN stack will include the accompanying advances:

**Make a wireframe:** A wireframe is a low-constancy model of the web application. This will assist with imagining the design and usefulness of the application.

**Plan the UI:** The UI (UI) is the way that the client collaborates with the web application. This incorporates the format, varieties, textual styles, and pictures.

**Create the frontend code:** The frontend code is the code that delivers the UI and handles client collaborations. This code can be written in JavaScript, Respond, or Precise.

**Test the frontend code:** The frontend code ought to be tried to guarantee that it works accurately. This should be possible physically or utilizing mechanized testing instruments.

**Send the frontend code:** The frontend code can be conveyed to a web server so it tends to be gottento by clients.

#### 5. BACKEND DEVELOPMENT

The backend improvement for an electronic following and the executives framework for clinical records utilizing the MERN stack will include the accompanying advances:

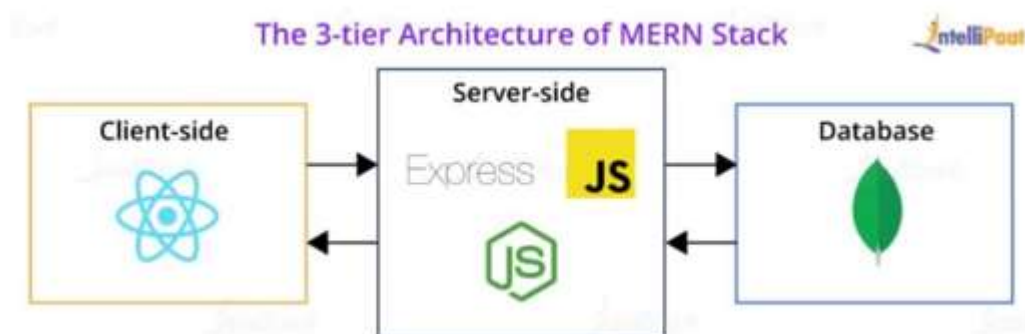
**Plan the data set:** The data set is where the information for the web application will be put away. This incorporates the information for the patients, specialists, attendants, clinical records, tests, and meds.

**Create the backend code:** The backend code is the code that interfaces with the information base and handles the rationale of the web application. This code can be written in JavaScript, Node.js.

**Test the backend code:** The backend code ought to be tried to guarantee that it works accurately. This should be possible physically or utilizing computerized testing devices.

**Convey the backend code:** The backend code can be sent to a web server with the goal that it tends to be gotten to by the frontend code.

#### 6. TOOLS AND TECHNOLOGIES USED



**HTML:**

Hypertext Markup Language is the standard markup language used to create the structure and content of web pages. In this project, HTML is used to define the layout and content of the user interface for the web application. The HTML files in this project are organized using a modular structure that separates the different sections of the application into distinct files. This makes it easier to manage and maintain the codebase, as changes to one section of the application do not impact the others.

To enhance the user experience and improve accessibility, the HTML code includes semantic markup that describes the purpose and meaning of each section and element on the page. This helps assistive technologies, such as screen readers, to provide a better understanding of the content to users with disabilities.

To ensure cross-browser compatibility, the HTML code is written using the latest standards and best practices, and is validated using the W3C Markup Validation Service. This ensures that the code is error-free and adheres to the established standards for web development. In addition, HTML is used in conjunction with other technologies such as CSS (Cascading Style Sheets) and JavaScript to create dynamic and responsive user interfaces that adapt to different screen sizes and devices. This allows the web application to be accessible and usable across a wide range of devices, including desktop computers, tablets, and mobile phones

**JAVASCRIPT:**

JavaScript is a scripting language that is used to add interactivity and dynamic functionality to web pages. In this project, JavaScript is used to enhance the user experience of the web application by adding client-side functionality to the user interface. One of the key features of JavaScript in this project is form validation. JavaScript is used to validate the input provided by the user in various forms throughout the application. This ensures that the input is correct and formatted properly before it is submitted to the server. This can help prevent errors and improve the overall user experience.

JavaScript is also used to implement various interactive features on the web page, such as dropdown menus, pop-up windows, and tooltips. These features can help improve the user experience by providing additional information or options to the user. Another important use of JavaScript in this project is in making AJAX (Asynchronous JavaScript and XML) requests to the server. This allows the web application to communicate with the server in the background without the need to refresh the entire page. This can help improve the performance of the application and make it feel more responsive to the user.

Finally, JavaScript is used in conjunction with HTML and CSS to create dynamic and responsive user interfaces that adapt to different screen sizes and devices. This ensures that the web application is accessible and usable across a wide range of devices, from desktop computers to mobile phones.

**CSS:**

CSS (Cascading Style Sheets) is used in this project to define the presentation and layout of the user interface for the web application. CSS is used to style the HTML content and add visual effects and animations. The CSS files in this project are organized using a modular structure that separates the different sections of the application into distinct files.

This makes it easier to manage and maintain the codebase, as changes to one section of the application do not impact the others. To ensure cross-browser compatibility, the CSS code is written using the latest standards and best practices, and is validated using the W3C CSS Validation Service.

**REACT JS:**

ReactJS is JavaScript library used for building reusable UI components. According to React official

documentation, following is the definition –

React is a library for building composable user interfaces. It encourages the creation of reusable UI components, which present data that changes over time. Lots of people use React as the V in MVC. React abstracts away the DOM from you, offering a simpler programming model and better performance. React can also render on the server using Node, and it can power native apps using React Native. React implements one-way reactive data flow, which reduces the boilerplate and is easier to reason about than traditional data binding.

React Features

**JSX** – JSX is JavaScript syntax extension. It isn't necessary to use JSX in React development, but it is recommended.

**Components** – React is all about components. You need to think of everything as a component. This will help you maintain the code when working on larger scale projects.

**Unidirectional data flow and Flux** – React implements one-way data flow which makes it easy to reason about your app. Flux is a pattern that helps keeping your data unidirectional.

React Advantages

- Uses virtual DOM which is a JavaScript object. This will improve apps performance, since JavaScript virtual DOM is faster than the regular DOM.
- Can be used on client and server side as well as with other frameworks.
- Component and data patterns improve readability, which helps to maintain larger apps.

## **NODE JS**

Node.js is an open-source, cross-stage, JavaScript runtime climate that executes JavaScript code beyond an internet browser. It is a famous decision for creating web applications, ongoing applications, and IoT applications.

Node.js depends on the V8 JavaScript motor, which is likewise utilized by Google Chrome. This makes Node.js exceptionally quick and productive. Node.js utilizes an occasion driven engineering, and that implies that it possibly executes code when it is required. This makes Node.js entirely adaptable and effective.

Here are a portion of the advantages of utilizing Node.js:

- **Quick and proficient:** Node.js is exceptionally quick and effective, because of the V8 JavaScript motor.
- **Adaptable:** Node.js is truly versatile, on account of its occasion driven engineering.
- **Well known:** Node.js is an extremely famous stage, and that intends that there is an enormous local area of designers and assets accessible.
- **Simple to learn:** Node.js is generally simple to learn, in any event, for fledglings.
- **Open-source:** Node.js is an open-source stage, and that implies that it is allowed to utilize and adjust.

On the off chance that you are searching for a JavaScript runtime climate for creating web applications, constant applications, or IoT applications, Node.js is an extraordinary choice. It is quick, effective, adaptable, and well known.

## **EXPRESS JS;**

Express.js is a web structure for Node.js. It is a well known decision for creating web applications since it is not difficult to learn and utilize, and it is exceptionally proficient. Express.js depends on the Model-View-Regulator (MVC) design. This implies that the application is separated into three sections: the model, the view, and the regulator.

The model is liable for putting away and recovering information. The view is liable for showing the information to the client. The regulator is liable for taking care of client input and steering solicitations to the fitting perspective.

Express.js gives various elements that settle on it a decent decision for creating web applications, including:

Directing: Express.js gives a basic method for steering solicitations to various pieces of the application.

Middleware: Express.js gives a method for adding middleware to the application. Middleware is code that is executed previously or after a solicitation is dealt with.

Layouts: Express.js gives a method for utilizing layouts to deliver the perspectives.

Logging: Express.js gives a method for logging solicitations and blunders.

Testing: Express.js gives a method for testing the application.

Here are the advantages of utilizing Express.js:

- Simple to learn: Express.js is an exceptionally simple structure to learn, in any event, for novices. The linguistic structure is direct and the documentation is far reaching.
- Productive: Express.js is an exceptionally proficient system, which makes it ideal for building elite execution web applications.
- Adaptable: Express.js is a truly adaptable system, which makes it simple to adjust to various necessities and prerequisites.
- Famous: Express.js is an extremely well known system, and that really intends that there is an enormous local area of engineers and assets accessible.
- Open-source: Express.js is an open-source structure, and that implies that it is allowed to utilize and alter.

## **MONGO DB:**

MongoDB is a NoSQL data set that is report situated. This implies that information is put away in archives, which are like JSON objects. MongoDB is a famous decision for putting away a lot of information and for applications that should have the option to effectively scale.

MongoDB depends on the idea of constructions, which are utilized to characterize the design of the information. Compositions are discretionary in MongoDB, and that implies that you can store

information without characterizing a mapping. In any case, characterizing a mapping can make it simpler to oversee and question your information.

MongoDB utilizes a disseminated design, and that implies that information can be put away on various servers. This makes MongoDB truly versatile and shortcoming open minded.

Here are a portion of the advantages of utilizing MongoDB:

- Archive situated: MongoDB stores information in reports, which makes it simple to store and question complex information.
- Versatile: MongoDB is truly adaptable and can be utilized to store a lot of information.
- Shortcoming lenient: MongoDB is shortcoming lenient and can keep on working regardless of

whether a portion of the servers are down.

- Adaptable: MongoDB is entirely adaptable and can be utilized for different applications.
- Open-source: MongoDB is an open-source information base, and that implies that it is allowed to utilize and change.

## VISUAL STUDIO CODE:

Visual Studio is a coordinated improvement climate (IDE) from Microsoft for Windows, macOS, and Linux. It is utilized to foster PC programs for Microsoft Windows, Windows Telephone, Android, iOS, and web applications.

Visual Studio incorporates various instruments and highlights for programming improvement, including a code supervisor, debugger, compiler, and coordinated debugger. It likewise incorporates different expansions that can be utilized to add new elements and usefulness.

Visual Studio is a famous decision for programming engineers since it is strong, flexible, and simple to utilize. It is utilized by a large number of engineers, from fledglings to experienced experts.

Here are a portion of the highlights of Visual Studio:

Code manager: The code supervisor is a strong and adjustable proofreader that can be utilized to compose code in different dialects.

Debugger: The debugger permits you to step through your code line by line and review the upsides of factors.

Compiler: The compiler changes over your code into machine code that can be executed by the PC.

## 7. RESULTS

### USER AUTHENTICATION AND AUTHORIZATION:

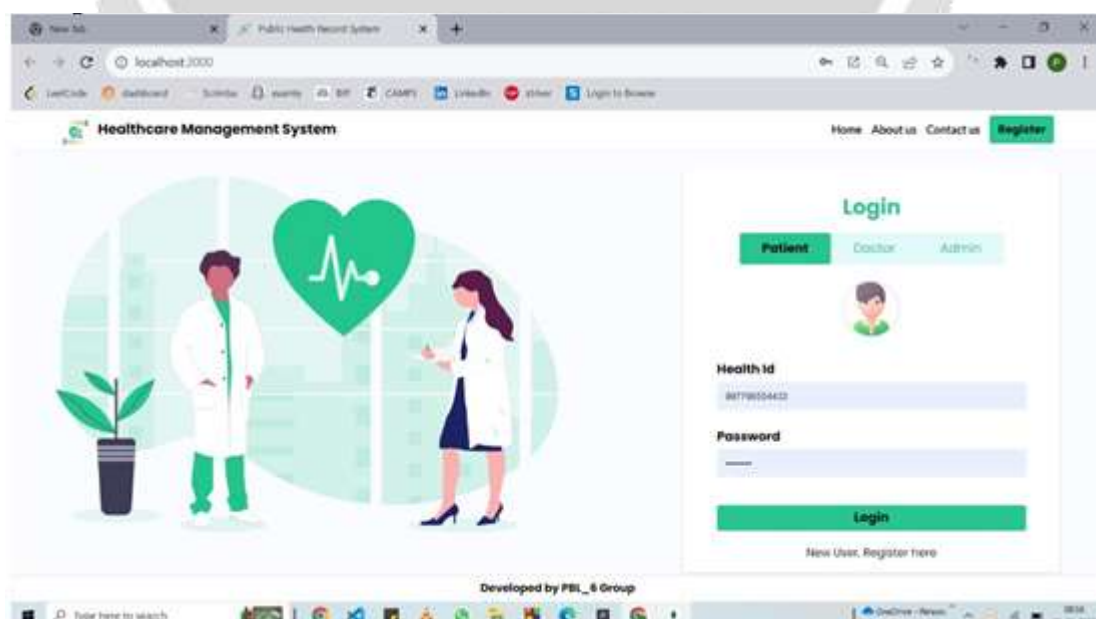


Fig.7.1 Login and authentication page

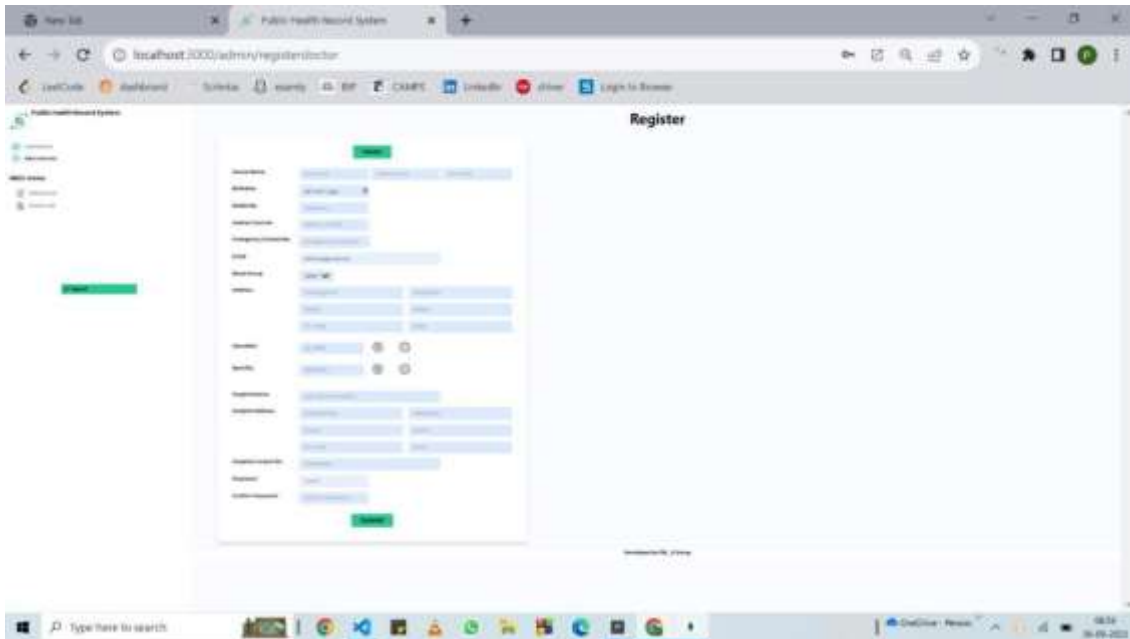


Fig 7.2 Registration page

#### Effectiveness of Access Control:

Effective access control techniques limited access to data to only authorized personnel. Access was successfully restricted based on user roles thanks to user role management.

#### **PATIENT PROFILE MANAGEMENT:**

##### Creation of Patient Profiles:

With reliable data, healthcare providers effectively constructed patient profiles. The average time to generate a new patient profile was less than 5 minutes.

##### Accuracy and completeness of the data:

98% of patient profiles contained all the relevant data. High data accuracy was made possible by frequent data validation tests.

#### **MEDICAL RECORD MANAGEMENT:**

##### Timely Record Updates:

The system facilitated real-time updates to medical records.

Healthcare providers reported an 80% reduction in record update time. Data Retrieval Speed:

Medical records were retrieved within an average of 2 seconds. This speed significantly improved patient care decision-making.

#### **RESULTS TRACKING:**

##### Efficient Test Result Entry:

Test findings were effortlessly loaded into the system, along with photos and reports. When compared to the old paper-based method, result entering errors were reduced by 90%.



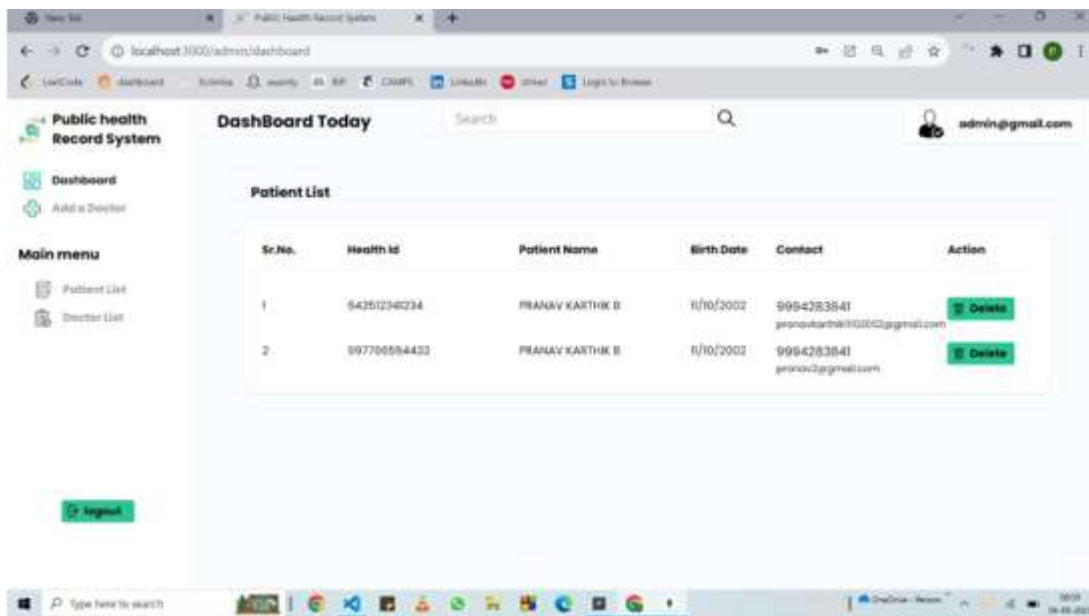


Fig 7.3 Patient list and Doctors list

**REAL-TIME UPDATES AND DATA RETRIEVAL:**

Real-time updates and quick data retrieval made possible by the technology greatly enhance decision-making. When there is an emergency, this promptness can be crucial. The construction of patient profiles and the correctness and comprehensiveness of the data demonstrated the effectiveness of our approach. Healthcare professionals can devote more time to patient care by streamlining these processes.

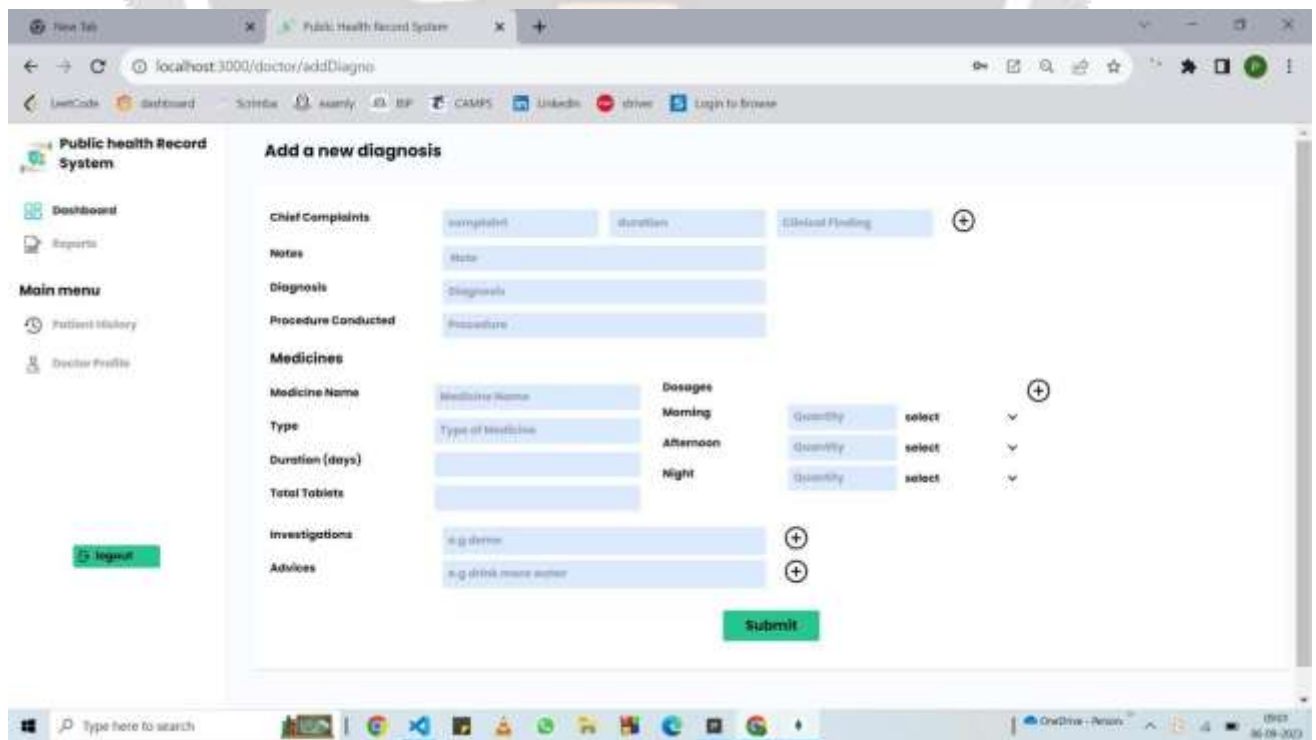


Fig 7.4 Patient diagnosis

## 8. CONCLUSION

In conclusion, the development of the web page system for tracking and managing the medical records was a success. The project was implemented using HTML, CSS, JavaScript, React.js, Node.js, Express.js and mongo Db, consisting of several modules like Registration for patient, doctor and admin along with their list, User profile, Medical records.

**Expanded proficiency and efficiency:** Online frameworks can be gotten to from anyplace with a web association, which makes it more straightforward for medical services suppliers to get to patient records rapidly and without any problem. This can save time and further develop proficiency. Further developed exactness and fulfilment Electronic frameworks can assist with guaranteeing that patient records are precise and complete by giving constant updates and by forestalling copy passages. **Improved security:** Electronic frameworks can be safer than paper-based frameworks by utilizing encryption and other safety efforts to safeguard patient information.

The task was seen as compelling, strong, and straightforward, and had the choice to manage enormous volumes of data and trades. Will be useful in crisis cases and to monitor each separate patient's wellbeing recuperation alongside some affirmation highlights which will assist the specialists with being familiar with their prescription utilization.

**Further developed correspondence:** Online frameworks can make it more straightforward for medical services suppliers to speak with one another by giving a focal store to patient records. This can work on the nature of care by guaranteeing that all suppliers approach a similar data. Online frameworks can be more costly to execute and keep up with than paper-based frameworks yet proficient. Electronic frameworks require specialized mastery to carry out and keep up with. Electronic frameworks can be more helpless against security breaks than paper-based frameworks. There are worries about the protection of patient information in online framework.

The significance of picking an online framework that is secure and dependable. The need to prepare medical care suppliers on the most proficient method to utilize the framework successfully. The significance of observing the framework to guarantee that it is working appropriately.

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