# HOSPITAL MANAGEMENT SYSTEM

PROJECT REPORT

Submitted by

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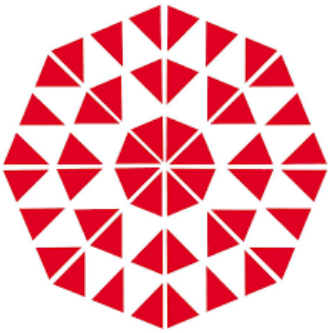
**KMC22MCA-2002**

**to**

the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree

of

*Master of Computer Applications*



**Department of Management Studies & Computer Applications**

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DECEMBER 2023

# DECLARATION

I undersigned hereby declare that the project report "**Hospital Management System**", submitted for partial fulfillment of the requirements for the award of degree of Master of Computer Applications of the APJ Abdul Kalam Technological University, Kerala is a bonafide work done by me under supervision of **Mrs. Resmi S R**. This submission represents my ideas in my own words and where ideas or words of others have been included, I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree.

Place: Kallanthode AKSHAY T VIJAYAN

Date: 10-09-2023

**DEPARTMENT OF MANAGEMENT STUDIES & COMPUTER APPLICATIONS**

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# CERTIFICATE

This is to certify that the report entitled **"Hospital Management System"**submitted by **AKSHAY T VIJAYAN (KMC22MCA-2002)** to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Master of Computer Applications is a bonafide record of the project work carried out by him under our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Internal Supervisor Project Coordinator

External Examiner Head of the Department

# ACKNOWLEDGEMENT

I would like to take this opportunity to extend my sincere thanks to people who helped me to make this project possible. This project will be incomplete without mentioning all the people who helped me to make it real.

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Above all I thank God, the almighty for his grace without which it would not have been possible to complete this work on time.

# ABSTRACT

The Hospital Management System (HMS) is a web-based solution designed to streamline the administrative processes of NEETHI LABS AND SCANS – CHELANNUR. This project aims to digitize and automate various aspects of hospital management, including patient registration, appointment scheduling, billing, and medical record keeping. Through the integration of PHP, MySQL, JavaScript, and other technologies, the HMS offers features such as centralized data storage, online booking, and test result management.

By providing easy access to patient information and improving workflow efficiency, the HMS enhances the overall quality of healthcare delivery at the hospital. The scope of the project includes managing patient records, generating bills, recording diagnoses, and facilitating doctor appointments. With continuous updates and improvements, the HMS serves as a comprehensive solution for modern hospital management needs. The comprehensive integration of Laboratory Management, Pharmacy Operations, and the Online Doctor Booking System during the implementation phase fosters a cohesive healthcare environment. This unified approach enables healthcare providers to make informed decisions, optimize resource utilization, and improve overall patient outcomes.

Moreover, by leveraging advanced technology and systematic processes, hospitals can adapt to evolving healthcare needs and stay ahead in delivering high-quality care. This underscores the pivotal role of the implementation phase in shaping the success and effectiveness of Hospital Management Systems.Implementing patient-centered care models, such as shared decision-making and care coordination, can further enhance patient satisfaction, treatment outcomes, and overall quality of care delivered by the system.Continuously evaluating and enhancing cybersecurity measures to protect sensitive patient data from potential breaches and ensuring compliance with evolving regulatory requirements and industry standards.

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# Chapter 1

# INTRODUCTION

Hospital Management System (HMS) stands as a beacon of innovation and comprehensive healthcare solutions. Rooted in a commitment to transforming healthcare delivery, HMS is a sophisticated platform designed to seamlessly integrate and streamline the intricate web of hospital operations.In the dynamic landscape of healthcare, where precision, efficiency, and patient-centric care are paramount.

HMS is a dedication to enhancing the patient experience, empowering healthcare providers, and optimizing administrative workflows. With a robust suite of features spanning patient management, staff coordination, billing, laboratory and pharmacy management, system is poised to revolutionize the way healthcare institutions operate.

Driven by a vision of technological excellence, HMS is not merely a collection of modules but a cohesive ecosystem designed to foster precision, transparency, and collaboration across the entire healthcare spectrum. From patient registration to appointment scheduling, medication management to billing integration, every facet of HMS is meticulously crafted to elevate healthcare standards, ensuring that both healthcare providers and patients experience a seamless and enriching journey within the healthcare ecosystem.

In the realm of healthcare management, HMS is not just a system; it is a transformative force poised to redefine how healthcare is delivered, experienced, and managed. Welcome to a new era in healthcare administration, where innovation meets compassion, and where the future of healthcare is shaped by the capabilities of advanced HMS.

## 1.1 General Background

This project focuses on advancing healthcare services by integrating laboratory, pharmacy, and doctor online booking functionalities into the Hospital Management System (HMS). In collaboration with key partners, System aim to enhance the overall efficiency and accessibility of healthcare services

The Laboratory Management System within the HMS adopts advanced technologies to ensure the secure and transparent handling of test results and patient data. Patients can conveniently access and verify their laboratory reports, promoting accuracy and expediting the diagnostic process. The Pharmacy Management System is seamlessly integrated into the HMS, optimizing the prescription and dispensing process. This integration aims to provide patients with easy access to medication details and ensure the authenticity of prescribed medications. The Doctor Online Booking System is introduced to empower patients with the convenience of scheduling appointments with healthcare professionals. The HMS guarantees the integrity and security of appointment records, facilitating a seamless and trustworthy interaction between patients and healthcare providers.

## 1.2 Objective

The purpose of this Hospital Management System project is to enhance the maintenance and manipulation of patient services within the medical system. The system aims to minimize the time and resources required by systematically organizing and maintaining detailed patient records, ensuring that data can be retrieved in the quickest possible time.

The resources to be minimized include workforce, financial costs, and paper usage.The system is user-friendly and will benefit doctors, staff, and pharmacists. The Pharmacy Management System, an integral part of this initiative, is designed to reduce the burden on pharmacists and enhance system efficiency by providing more accurate details about drugs in the medical facility.

This project is envisioned to bring transformative improvements to healthcare operations by streamlining processes, reducing resource expenditure, and contributing to a more

sustainable healthcare ecosystem. Through the utilization of technology, the Hospital Management System project aims to modernize healthcare processes, improve overall service quality, and foster a patient-centric approach within the medical system.

## 1.3 Scope

The scope of this project is broad and encompasses several key areas within the healthcare industry. The primary focus is on enhancing the efficiency, accessibility, and security of healthcare services through the integration of laboratory, pharmacy, and doctor online booking functionalities into the Hospital Management System (HMS).

Laboratory Management System Implementing advanced technologies to securely and transparently handle laboratory test results and patient data. Providing patients with convenient access to and verification of their laboratory reports. Streamlining the diagnostic process to improve accuracy and efficiency.

Pharmacy Management System Integrating a system within the HMS to optimize the prescription and dispensing process. Enabling patients to easily access medication details and ensuring the authenticity of prescribed medications. Improving overall efficiency in managing pharmaceutical services.

Doctor Online Booking System Introducing a convenient and user-friendly platform for patients to schedule appointments with healthcare professionals. Guaranteeing the integrity and security of appointment records through the HMS. Enhancing the overall patient experience by facilitating seamless interactions with healthcare providers.

# Chapter 2

# LITERATURE SURVEY

Hospital management systems (HMS) are software applications designed to manage various administrative and clinical functions of hospitals and healthcare facilities. With the increasing demand for efficient and effective healthcare delivery, hospital management systems have become essential tools for managing the day-to-day operations of hospitals.

One of the critical components of hospital management systems is laboratory management. Laboratory management modules in HMS provide a range of functionalities, including sample tracking, test ordering, and result reporting. These modules help laboratories streamline their workflows, reduce errors, and improve turnaround times for test results.

Another essential component of HMS is pharmacy management. Pharmacy management modules in HMS help pharmacies manage their inventory, track patient prescriptions, and ensure medication safety. These modules enable pharmacies to maintain accurate records of patient medications, reduce medication errors, and improve patient outcomes.

Online doctor booking is another key feature of modern hospital management systems. With the increasing popularity of telemedicine and online consultations, HMS with online doctor booking capabilities enable patients to schedule appointments with doctors online. These modules help healthcare providers manage their schedules, reduce no-shows, and improve patient access to care.

Several studies have explored the impact of hospital management systems on healthcare delivery. For instance, a study published in the Journal of Medical Systems found that HMS with laboratory management capabilities improved the efficiency and accuracy

of laboratory operations, resulting in faster turnaround times for test results.1]Esmaeil Mehraeen,Evaluation Of Hospital Information Systems In Selected Hospitals Of Iran [Internet],October 2014.

1) Http://Airccse.Org/Journal/Ijait/Papers/4514ijait01.Pdf 2]Eric W. Fleegler, Referral System Collaboration Between Public Health And Medical Systems: A Population Health Case Report,[Internet]May 2016.

2) Https://Nam.Edu/Wp-Content/Uploads/2016/05/Referral-System-CollaborationBetween-Public-Health-And-Medical-Systems-A-Population-Health-Case-Report.Pdf.

Another study published in the Journal of Healthcare Information Management found that HMS with pharmacy management capabilities improved medication safety and reduced medication errors. The study found that HMS with integrated pharmacy modules helped pharmacies maintain accurate records of patient medications, reducing the risk of medication errors and adverse drug events.

Regarding online doctor booking, a study published in the Journal of Telemedicine and Telecare found that HMS with online doctor booking capabilities improved patient access to care and reduced no-shows. The study found that online doctor booking enabled patients to schedule appointments conveniently, reducing the burden on hospital reception staff and improving patient satisfaction.

In conclusion, hospital management systems with laboratory, pharmacy, and doctor online booking capabilities play a critical role in modern healthcare delivery. These systems help hospitals and healthcare facilities streamline their operations, reduce errors, and improve patient outcomes. Further research is needed to explore the impact of these systems on healthcare delivery and identify opportunities for improvement.

This literature survey will help provide a solid foundation for understanding the current state of research and practice in hospital management, specifically focusing on laboratory management, pharmacy integration, and doctor online booking within the Hospital Management System.

# Chapter 3

# SYSTEM ANALYSIS

## 3.1 Existing System

The existing hospital management systems encompass various modules to streamline administrative and clinical functions in healthcare facilities. These systems typically include components such as patient registration, appointment scheduling, electronic medical records (EMR), billing, pharmacy and inventory management, laboratory and radiology information systems, financial management, reporting and analytics, as well as patient portals and communication tools.

These components work together to improve operational efficiency and enhance patient care. However, challenges such as interoperability, cybersecurity, and the need to integrate AI and machine learning for advanced analytics and personalized medicine persist. As technology continues to advance, the integration of new capabilities will further enhance the effectiveness of these systems in meeting the evolving needs of healthcare organizations and patients.

The current manual system has a lot of paper work. To maintain the records of sale and service manually, is a Time-consuming task. With the increase in database, it will become a massive task to maintain the database. Requires large quantities of file cabinets, which are huge and require quite a bit of space in the office, which can be used for storing records of previous details. The retrieval of records of previously registered patients will be a tedious task. Lack of security for the records, anyone disarrange the records of your system. If

someone want to check the details of the available doctors the previous system does not provide any necessary detail of this type.

**Analysis of Existing System:**

This analysis serves as a pointer on how to embark on building the proposed system. The problems of the current system should be outlined. Followings are some of the problems associated with the existing system;

- The state of drugs in stock is manually checked.
- Mistake of selling expired drugs to customers.
- Too much workload on staffs.
- Filing cabinet in the hospital with paper record.
- Staff records are handled manually by the manager.
- Billing function is done manually, so the probability of occurring errors is high.

## 3.2 Proposed System

In the integrated Hospital Management System (HMS), patients seamlessly initiate the healthcare journey by scheduling appointments with their chosen doctors. System accommodates both offline and online appointment scheduling, providing flexibility to both patients and staff. The efficient staff then meticulously organizes and prioritizes appointments to optimize the healthcare workflow. Once appointments are scheduled, the assigned doctors review and approve them, ensuring a streamlined and verified appointment process. Subsequently, the staff diligently updates the appointment statuses, maintaining real-time transparency within the system. Following the doctor's examination, prescriptions are seamlessly generated and automatically transmitted to both the pharmacy and laboratory departments. This automated transfer expedites the healthcare process, reducing manual intervention and enhancing accuracy.In the laboratory segment, the staff efficiently schedules and organizes both offline and online appointments for sample collection. Patients experience a hassle-free process, while the staff systematically updates the status of collected samples, ensuring a comprehensive overview for all stakeholders.

Finally, the pharmacy team receives electronic prescriptions, enabling them to efficiently gather all prescribed medicines. The system automates the billing process, ensuring accuracy and reducing the margin for error. This end-to-end automation fosters a cohesive healthcare ecosystem, prioritizing patient care, optimizing staff workflows, and enhancing overall efficiency within the hospital. Hospital Management System (HMS) is prioritize patient empowerment and seamless access to health information. Patients can easily retrieve and review their comprehensive medical history through a user-friendly interface. System allows patients to securely download and view their medical records, fostering transparency and empowering individuals to actively engage in managing their health.

Through a secure patient portal, users gain convenient access to a detailed overview of their medical history, including past appointments, prescribed medications, laboratory results, and any relevant healthcare documentation. This feature not only promotes patient autonomy but also encourages a collaborative and informed approach to healthcare decision-making.

By offering a downloadable format, patients can keep a personal copy of their medical records for reference or to share with other healthcare providers when necessary. This ensures continuity of care and facilitates smoother transitions between different healthcare settings. Commitment to data security and privacy means that patient information is protected throughout the download and viewing process. This emphasis on confidentiality aligns with regulatory standards and reflects dedication to maintaining the highest standards of healthcare information security. In essence, the patient-centric design of HMS not only streamlines administrative processes but also places a strong emphasis on providing patients with easy access to their health information, fostering a sense of control and involvement in their healthcare journey.

In cutting-edge Hospital Management System (HMS), the Laboratory Management module stands as a testament to commitment to precision, efficiency, and patient-centric care. With a suite of advanced features, this module seamlessly integrates into the broader healthcare ecosystem, streamlining laboratory operations and enhancing the overall quality of patient diagnostics. Patients benefit from a user-friendly interface that allows for easy scheduling of both offline and online laboratory appointments. Comprehensive Test Catalog ensures that patients and healthcare providers have access to detailed information about available tests, facilitating informed decision-making. The module excels in the management of sample collection, providing a systematic approach to appointments and real-time status updates. Automation extends to the generation and management of laboratory test results, fostering accuracy and timely communication. Automated result notifications ensure that healthcare providers and patients are promptly informed, facilitating swift medical interventions when necessary.

Integration with the Electronic Health Records (EHR) system further enriches the patient's healthcare journey, providing a holistic view of their health data. Quality control and assurance measures are embedded to maintain the highest standards in laboratory processes, and inventory management ensures that supplies and reagents are efficiently tracked and replenished. Billing integration guarantees accurate and timely processing of laboratory test charges, contributing to a seamless financial workflow. Robust user authentication and authorization protocols, along with stringent data security measures, ensure the confi-

dentiality and integrity of laboratory data, aligning with healthcare regulations and industry standards. Laboratory Management module is not merely a technological component but a cornerstone in delivering precise, reliable, and patient-focused healthcare services. It embodies commitment to innovation, transparency, and the continuous improvement of healthcare delivery for the benefit of both patients and healthcare professionals. An interactive application for managing stock, billing, manage employees, generate reports etc. It helps in maintaining the records of medicine, the users and store details and also reduce the work of searching the records of the medicine. The main aim of this application is applying technology to reduce the human effort.

The project has been developed based on "Stock managing" and its "billing process" being presently used in the medical stores for storing and retrieving the available information in the store. The user must get his username and password from the admin by providing the name, address, phone no, id proof and can get the access to the application. Without the username and password, he cannot get access to the application.

Admin has almost all the permission to work with. Every user has permission of make edit their profile data . Anybody including the customer can search the availability of particular product through the system. It is good for the customers who don't want to waste their valuable time in queues for non-stock items. Pharmacy users need to check the relevant details of the prescription and update the state. Customer can see it by logging to their account. The reports can be generated through the system. After generated relevant report it can be download as a PDF or an Excel document. Can insert data to the database directly, by uploading excel or csv. SMS and email is available in the proposed system.

HMS is not merely a collection of modules but a cohesive ecosystem designed to foster precision, transparency, and collaboration across the entire healthcare spectrum. From patient registration to appointment scheduling, medication management to billing integration, every facet of HMS is meticulously crafted to elevate healthcare standards, ensuring that both healthcare providers and patients experience a seamless and enriching journey within the healthcare ecosystem.

HMS is a dedication to enhancing the patient experience, empowering healthcare providers, and optimizing administrative workflows. With a robust suite of features spanning patient

management, staff coordination, billing, laboratory and pharmacy management, system is poised to revolutionize the way healthcare institutions operate.

**Analysis of Proposing System:**

- Improved patient experience with convenient online appointment booking.
- Enhanced operational efficiency for doctors, laboratories, and pharmacies.
- Real-time updates and communication to ensure transparency in healthcare processes.
- Secure and centralized storage of patient data for easy accessibility and management.
- Pharmacists having access to the proposed system at any time.
- Ensuring effective policing by providing statistics of the drugs in stock.
- Improving the efficiency of the system by ensuring effective monitoring of services and activities.
- Generating report within a specified period of time.
- Reducing the Staff's workload.

**Main activities of system are:**

**Patient Management:**

At the heart of an effective hospital management system lies patient management. Hospital Management Systems simplify processes such as patient registration, patient treatment, ensuring a seamless and patient-centric experience.

**Appointment Scheduling:**

Discover how advanced scheduling modules enable patients to book appointments effortlessly and help healthcare providers manage their availability, optimizing resource utilization and reducing waiting times.

**Doctor and Staff Management:**

Efficient management of doctors and staff is crucial for a well-functioning hospital. Learn how HMS streamlines tasks such as scheduling, profile management, and qualifications, contributing to overall operational efficiency.

**Inventory and Pharmacy Management:**

Maintaining a delicate balance, Hospital Management Systems contribute to accurate stock tracking and efficient dispensing of medications. Explore how these systems streamline pharmacy operations.

**Laboratory Information System (LIS):**

Uncover the pivotal role of Laboratory Information Systems and Electronic Health Records in diagnostics and maintaining comprehensive patient records. These systems enhance test scheduling, result management, and the creation of centralized electronic health records.

**Reporting and Analytics:**

Data-driven insights are transforming healthcare administration. Learn how reporting and analytics tools empower administrators to make informed decisions, optimize resource allocation, and enhance overall operational efficiency.

**Security and Access Control:**

In an era of digital information, safeguarding patient data is paramount. Discover the security measures implemented in Hospital Management Systems to protect sensitive information, ensuring patient confidentiality and compliance with data protection standards.

**Make Payments or Billing:**

Customer can make payments of their amount.

## 3.3 Module Description

### 3.3.1 Laboratory Management

This module displays the test results of a specific patient.The admin has extensive access to various crucial insights, including the total number of registered users, new appointments, approved appointments, rejected appointments by admin, canceled appointments by users, total received samples, uploaded reports, and the total count of employees. The admin can manage test details, additions, and updates, as well as manage employees by adding or updating employee information. They can review and modify the status of booking appointments and add remarks as needed. The system provides a comprehensive view of registered users, and the admin can search for specific appointment details using parameters such as patient appointment number, name, and mobile number. On the other hand, an employee has access to a concise overview of essential metrics, including the total number of newly assigned appointments, total samples collected, total samples sent to the lab, and the overall count of appointments.

### 3.3.2 Patient Management

Patient management is an important module in a Hospital Management System (HMS) that handles all aspects related to patient care. This module enables patients to book, modify, or cancel online and offline appointments. Patient management involves the efficient handling of patient information, appointments, tests, medicine, medical records, billing, and other related tasks. The module serves both the patients and the doctors with easy access to historical medical information that could give insights about the next steps in improving the patient's health or dealing with their ailments. A hospital database management system must be secure with sustainable tech to protect the patient's identity and health or treatment information.

### 3.3.3 Online Doctor Appointments and Consulting

This Module allows getting complete information about the services of doctors. In this detailing of doctors such as their specialization field, their work or efficiency, and their duty

hours and many other details and information could be managed by the system. Doctors are empowered with a comprehensive view of patient data, streamlined appointment management, and digital prescription services. This not only boosts their productivity but also allows for a more personalized approach towards patient care.

It manages the journey of patients in the hospital, right from registration. This role enables patients to view their medical records, book appointments, and access other healthcare services with ease. Accessing personal medical history and records. Scheduling appointments with doctors. Making payments for medical services. Reviewing prescriptions and medical advice. Staff is responsible for all activities in the hospital, right from staff registration. It manages patient test requests, record keeping of test results, appointment scheduling for patients in online and offline, Checking doctors' availability for further appointments, Rescheduling or cancelling appointments and conducted offline bill desk section.

### 3.3.4 Pharmacy Management

Administer and user management tasks by assigning permissions, granting privileges, and managing pharmacist details, drug companies, and medicines. Manage the inventory by allocating expired medicines, controlling drug availability, and calculating total expenses.Access the system through an admin login with a provided username and password. Oversee daily pharmacy operations, including prescription dispensing, staff management, and inventory control. Conduct financial analysis by analyzing medicine bills and payments. Provide user access for pharmacists, allowing login with a given username and password or the creation of new credentials. Store pharmacist details, including address, contact number, prescriptions, and transaction history. Enable pharmacists to view available, expired, and unstocked medicines. Facilitate medicine transactions by allowing pharmacists to select and purchase medicines. Implement security measures such as regular password updates and mandatory identity verification for buyers. Include billing information capturing the preferred name and address of the person purchasing the medicine. .

## 3.4 Feasibility Study

A feasibility study is a preliminary investigation conducted to ascertain and record the viability of a project. The purpose and logical goal of this study is to identify the advantages and disadvantages of a current or proposed system, as well as the possibilities and risks that exist in the surrounding environment. A feasibility study considers numerous limitations that the system should be operated and developed within. In order to establish whether the identified user's needs can be met using current software and hardware technologies, an estimate is made in this study, including the resource needed for implementation and expenses at the earliest possible time. Additionally, this analysis will determine whether the suggested system can be created within the available financial limits and will be cost-effective from a commercial standpoint. The study's findings are considered while deciding whether to move forward with the project or not.

### 3.4.1 Operational Feasibility

The aspect of the study is to examine the level of acceptance of the system by the users. It involves the process of training the user to use the system efficiently. The level of acceptance of the system by users depends on the methods used to educate the user about the system and familiarize him with it. His confidence level should be raised so that he can give some constructive criticism which is welcome as he is the end user of the system. The proposed system is more user friendly for the hospital staffs and patients. This system will reduce workload of the hospital staff. The feasibility of a Hospital Management System, encompassing doctor online booking, pharmacy, and laboratory modules, relies on robust appointment scheduling, secure database management, and seamless integration with the hospital's main system. Key considerations include user authentication, inventory management, test result recording, and the implementation of security measures for safeguarding patient data. Scalability, interoperability, and a reliable network infrastructure are essential components for a successful implementation.

### 3.4.2 Technical Feasibility

Technical feasibility study deals with the hardware and software and technology which are required to accomplish the user requirements in the system with in the allocated time and budget. The proposed system requires HTML, CSS, JavaScript, PHP, Tailwind and MySQL platform open source. Due to open source of languages it may not become complex to maintain and develop the system. The system can also be easily upgraded to the higher level with less effort and maintenance. This application can be easily used with their laptops or phones anywhere and also this application is very much user friendly. Hence the proposed work is technically feasible.

### 3.4.3 Economic Feasibility

The economic feasibility of implementing a comprehensive Hospital Management System is rooted in the potential cost savings and revenue enhancements it offers. By streamlining appointment scheduling, optimizing pharmacy inventory management, and improving laboratory processes, operational efficiency can be significantly increased. While upfront development and implementation costs may be incurred, the long-term benefits of reduced administrative overhead, improved resource allocation, and enhanced patient care can contribute to a positive return on investment. Furthermore, the system's ability to attract more patients through convenient online booking and streamlined services may lead to increased revenue generation, making the proposed Hospital Management System economically feasible in the long run.

## 3.5 System Environment

### 3.5.1 Developer Requirement

**Hardware Requirement**

- Processor : Intel Core i3 or above
- RAM : 4 GB or above
- Storage : 500GB Hard disk

**Software Requirement**

- Operating system : Windows 8 or above
- Front end : HTML, CSS, BOOTSTRAP,JS, AJAX.
- Back end : MySQL
- Languages : PHP
- IDE : VS code
- Web browser : Google Chrome/Firefox

### 3.5.2 User Requirement

- Any Smartphone/Computer/ Laptop
- Stable Internet Access

## 3.6 Actors and Their Roles

### 3.6.1 Admin

The Admin is responsible for the overall management of this system.

- User Registration and Login.
- Add and Manage Doctor/ Staff.
- Add and Manage Pharmacist/ Supplier.
- Add and Manage Medicines/ Tests.
- View and Manage Patients.
- View booked Appointments.
- View the status of collected samples.
- View the history and lab report.

### 3.6.2 Patients

Patients can avail various services and features provided by the system after login.

- User Registration and Login.
- View/Update Profile.
- Make Tests booking and Doctor booking.
- View all Test and appointment details.
- View status of results.
- View all reports.

### 3.6.3 Pharmacist

Pharmacists can avail various services and features provided by the system after login.

- User Registration and Login.
- View /search Patients Profile.
- Add Prescription.
- Add and Manage Medicines.
- View /search Expired Medicine.
- Add and Manage Medicine Supplier.
- View Expenses and Revenue.
- View Bills and Billing History.
- View Payment History and Receipt.

### 3.6.4 Doctor

Doctor can avail various services and features provided by the system after login.

- User Registration and Login.
- View/Update Profile.
- View appointments and Approve them.
- Prescribe Tests and Medicines .
- View Patient Medical History.

### 3.6.5 Staff

- Staff Registration and Login.
- View/Update Profile.
- Make Offline Booking.
- View and schedule All Booking.
- Upload Reports.
- View sample details.
- Upload sample informations and status.

# Chapter 4

# SYSTEM DESIGN

## 4.1 Introduction

This project follows Agile methodology. Agile software development comprises various approaches to software development under which requirements and solutions evolve through the collaborative effort of self organizing and cross-sectional teams and their users. It advocates adaptive planning, evolutionary development, early delivery and continuous improvement and it encourage rapid and flexible response to change. It's a process for managing a project that involves constant collaboration and working in iterations. Today, the word Agile can refer to these values and the frameworks for implementing them, including Scrum, Kanban, Extreme Programming (XP), and Adaptive Project Framework (APF). One thing that separates Agile from other approaches to software development is the focus on the people doing the work and how they work together. Solutions evolve through collaboration between self-organizing cross-functional teams utilizing the appropriate practices for their context.

## 4.2 Use case Diagram

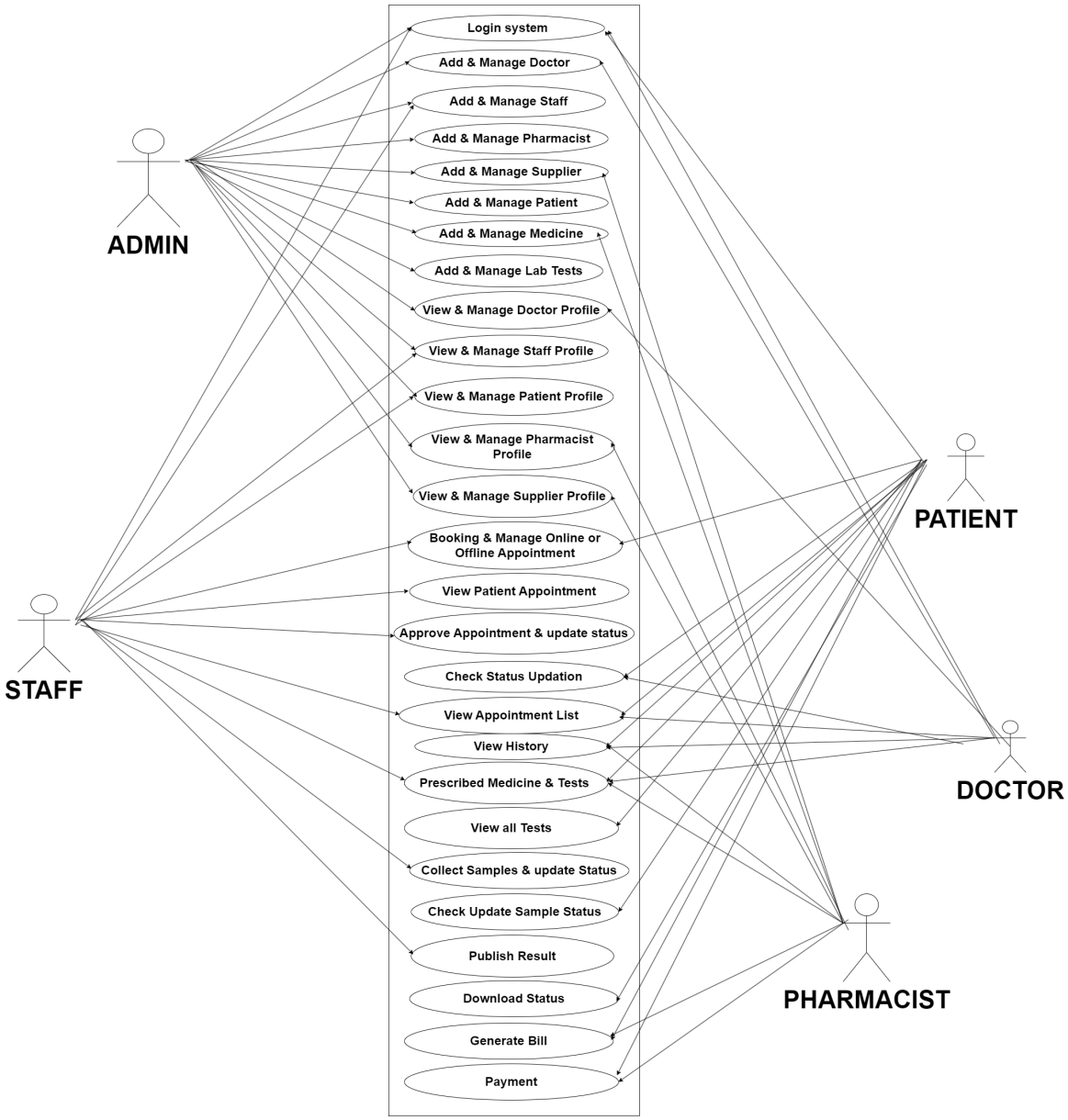


Figure 4.1: Use case diagram of Admin and User

## 4.3 Activity Diagram

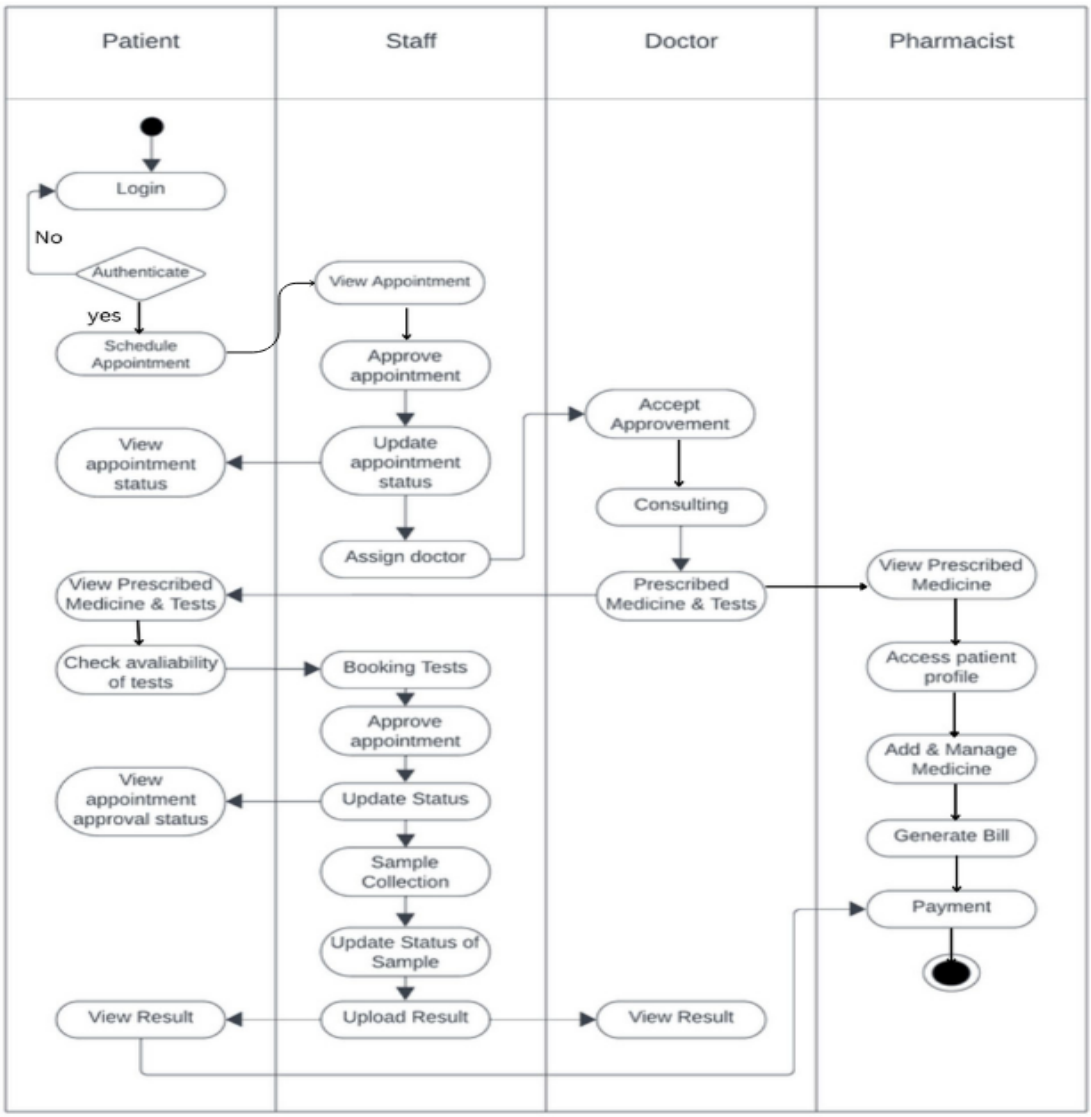


Figure 4.2: Activity Diagram

## 4.4 Class Diagram

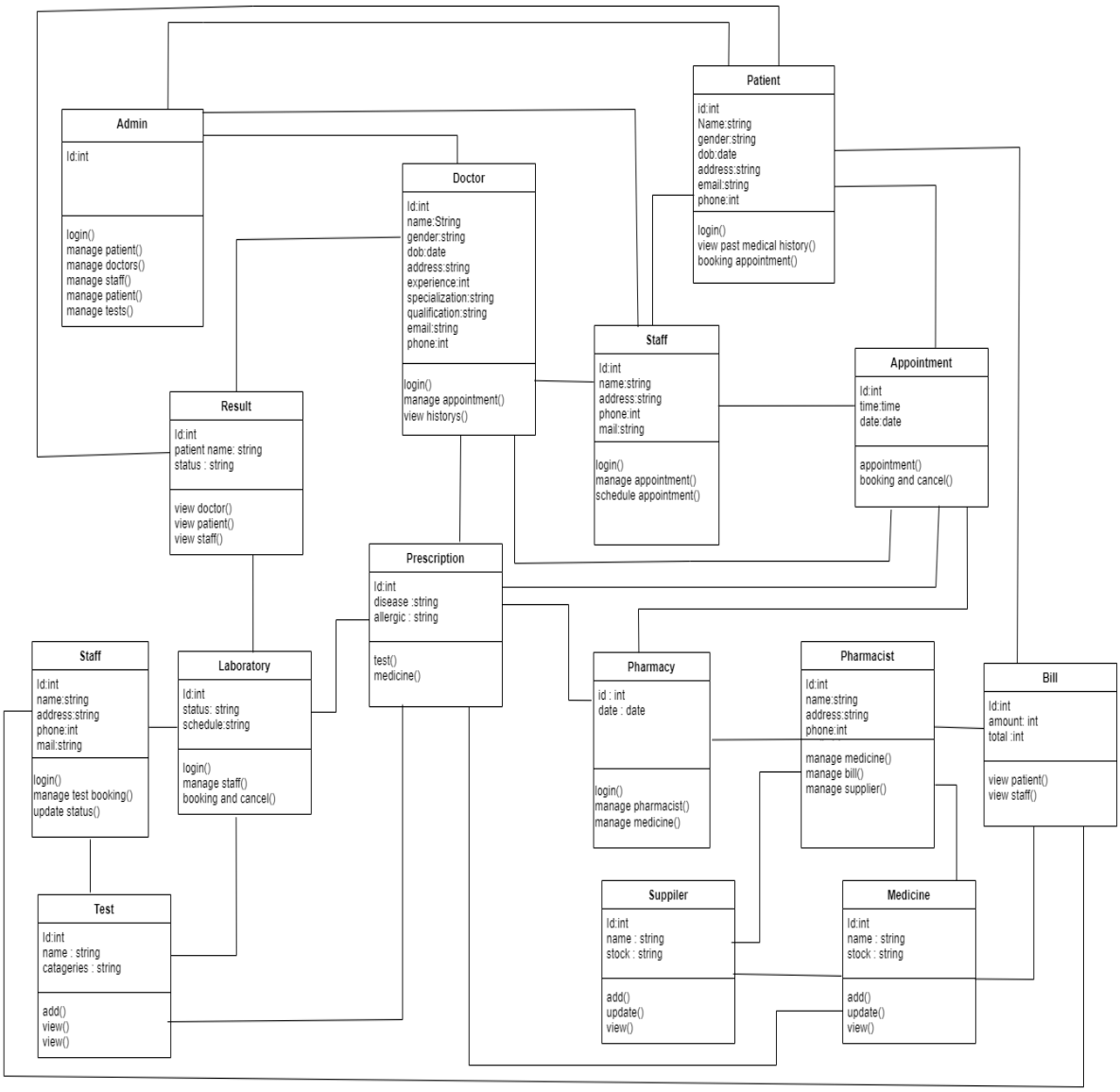


Figure 4.3: Class Diagram

## 4.5 User Story

| **User story ID** | **As a <Type of Users >** | **I want to <Perform some task >** | **So that I can <Achieve some goal >** |
|---|---|---|---|
| 1 | Admin, Doctor, Staff, Pharmacist, Patient | Login or Register | Access the system. |
| 2 | Admin | Add & Manage Doctors | Admin can Add & Manage Doctors. |
| 3 | Admin | Add & Manage Pharmacists | Admin can Add & Manage pharmacists. |
| 4 | Admin | Add & Manage Staff | Admin can Add & Manage staff. |
| 5 | Admin, Doctor, Staff, Pharmacist, Patient | Homepage | Homepage for all users. |
| 6 | Admin,Pharmacist | Add & Manage Supplier | Pharmacists can Add & Manage Supplier. |
| 7 | Admin, Doctor | View & Manage Profile | Doctor can View & update their own profile. |
| 8 | Admin,Pharmacist | View & Manage Profile | Pharmacist can View & update their own profile. |
| 9 | Admin,Supplier | View & Manage Profile | Pharmacist can View & update Supplier profile. |
| 10 | Admin, Staff | View & Manage Profile | Staff can View & update their own profile. |
| 11 | Admin, Patient | View & Manage Profile | Patient can View & update their own profile. |
| 12 | Patient | Book Appointment | Schedule an appointment with a chosen doctor. |
| 13 | Staff | View Patient Appointments | View all Appointments and Schedule online and offline appointments. |
| 14 | Staff | Approve all Book Appointments and update Status | Approve or Confirm patient appointments. |

| **User story ID** | **As a <Type of Users >** | **I want to <Perform some task >** | **So that I can <Achieve some goal >** |
|---|---|---|---|
| 15 | Doctor | View Appointments | Doctor can view booking details of patient. |
| 16 | Patient, Doctor | View Patient Medical History and previous appointments History | Access and review patient medical history. |
| 17 | Doctor | Prescribe Medicines & Tests | Doctor prescribe medicines & Lab Tests. |
| 18 | Admin | Add & Manage Tests and Price Details | Admin can Add & Manage category of test and Price Details. |
| 19 | Patient | View all available Lab Tests | Patient can View the available Tests. |
| 20 | Patient | Booking a lab test using online and offline methods. | patients can choose Online and Offline methods to book lab tests. |
| 21 | Staff | Approve all Book Tests and update Status | Approve or Confirm patient Tests. |
| 22 | Staff | Update the Status of Sample Collection | Update the status of sample collection. |
| 23 | Staff | Publish Test Results | Staff can publish the Test Results. |
| 24 | Patient | Download Test Results | Retrieve and download results of conducted tests. |
| 25 | Pharmacist | Add & Manage Medicine | Pharmacist can Add & Manage medicines. |
| 26 | Pharmacist | View Doctor Prescription | Pharmacist can View Doctor Prescription. |
| 27 | Pharmacist | Generate medicine Bill | To Generate medicine Bill. |
| 28 | Pharmacist | View Medicine History and payment History | Access and view the Medicine history and payment History. |
| 29 | Pharmacist | Receipt Download | Download Receipt . |

Table 4.1: User Story

### 4.6 Product Backlog

| User Story ID | Priority (Low,High, Medium) | Size | Sprint | Status (Planned, Progressed, Completed) | Release Date | Release Goal |
|---|---|---|---|---|---|---|
| 1 | Medium | 5 | 1 | Planned | 02/02/2024 | Admin Login |
| 2 | High | 9 | | Planned | 04/02/2024 | Patient Registration. |
| 3 | High | 7 | | Planned | 06/02/2024 | Homepage Management. |
| 4 | High | 8 | | Planned | 08/02/2024 | Add and manage Doctor. |
| 5 | High | 7 | | Planned | 11/02/2024 | Add and manage Staff. |
| 6 | Medium | 5 | 2 | Planned | 14/02/2024 | Add and manage Patient. |
| 7 | High | 7 | | Planned | 17/02/2024 | View and Update Doctor Profile. |
| 8 | Medium | 5 | | Planned | 20/02/2024 | View and Update Staff Profile. |
| 9 | High | 8 | | Planned | 23/02/2024 | View and Update Patient profile. |
| 10 | High | 8 | | Planned | 25/02/2024 | Patient Booking Appointment. |
| 11 | High | 7 | 3 | Planned | 27/02/2024 | View and Manage Appointment. |
| 12 | High | 6 | | Planned | 01/03/2024 | Doctor Prescription. |
| 13 | High | 7 | | Planned | 03/03/2024 | Patient view Prescription. |

| User Story ID | Priority (Low,High, Medium) | Size | Sprint | Status (Planned, Progressed, Completed) | Release Date | Release Goal |
|---|---|---|---|---|---|---|
| 14 | Medium | 5 | | Planned | 06/03/2024 | Laboratory Login. |
| 15 | High | 7 | | Planned | 09/03/2024 | Add and Manage Tests. |
| 16 | High | 8 | 4 | Planned | 12/03/2024 | Booking Tests. |
| 17 | High | 7 | | Planned | 15/03/2024 | Approve Test and Update Status. |
| 18 | High | 7 | | Planned | 18/03/2024 | Sample Collection And Check status updation. |
| 19 | High | 8 | | Planned | 21/03/2024 | Staff Publish Result. |
| 20 | Low | 3 | | Planned | 23/03/2024 | Pharmacy Login. |
| 21 | High | 8 | 5 | Planned | 26/03/2024 | Add and Manage Pharmacists. |
| 22 | High | 8 | | Planned | 29/03/2024 | Add and Manage Supplier. |
| 23 | High | 8 | | Planned | 31/03/2024 | Control whole inventory management. |
| 24 | High | 8 | | Planned | 02/04/2024 | generate bill and payment. |
| 25 | High | 8 | | Planned | 04/04/2024 | Download medical history. |

Table 4.2: Product Backlog

## 4.7 Project Plan

| User Story ID | Task Name | Start Date | End Date | Days | Status Goal |
|---|---|---|---|---|---|
| 1 | Admin Login page | 01/02/2024 | 02/02/2024 | 2 | Planned |
| 2 | Patient Registration | 03/02/2024 | 04/02/2024 | 2 | Planned |
| 3 | Homepage Management | 05/02/2024 | 06/02/2024 | 2 | Planned |
| 4 | Add and manage Doctor | 07/02/2024 | 08/02/2024 | 2 | Planned |
| 5 | Add and manage Staff | 09/02/2024 | 11/02/2024 | 3 | Planned |
| 6 | Add and manage Patient | 12/02/2024 | 14/02/2024 | 3 | Planned |
| 7 | View and Update Doctor Profile | 15/02/2024 | 17/02/2024 | 3 | Planned |
| 8 | View and Update Staff Profile | 18/02/2024 | 20/02/2024 | 3 | Planned |
| 9 | View and Update Patient profile | 21/02/2024 | 23/02/2024 | 3 | Planned |
| 10 | Patient Booking Appointment | 24/02/2024 | 25/02/2024 | 2 | Planned |
| 11 | View and Manage Appointment | 26/02/2024 | 27/02/2024 | 2 | Planned |
| 12 | Doctor Prescription | 28/02/2024 | 01/03/2024 | 3 | Planned |
| 13 | Patient view Prescription | 02/03/2024 | 03/03/2024 | 2 | Planned |
| 14 | Laboratory Login | 04/03/2024 | 06/03/2024 | 3 | Planned |
| 15 | Add and Manage Tests | 07/03/2024 | 09/03/2024 | 3 | Planned |

| User Story ID | Task Name | Start Date | End Date | Days | Status Goal |
|---|---|---|---|---|---|
| 16 | Booking Tests | 10/03/2024 | 12/03/2024 | 3 | Planned |
| 17 | List and Approve Test and Update Status | 13/03/2024 | 15/03/2024 | 3 | Planned |
| 18 | Sample Collection And Check status updation | 16/03/2024 | 18/03/2024 | 3 | Planned |
| 19 | Staff Publish Result | 19/03/2024 | 21/03/2024 | 3 | Planned |
| 20 | Pharmacy Login | 22/03/2024 | 23/03/2024 | 2 | Planned |
| 21 | Add and Manage Pharmacists | 24/03/2024 | 26/03/2024 | 3 | Planned |
| 22 | Add and Manage Supplier | 27/03/2024 | 29/03/2024 | 3 | Planned |
| 23 | Control whole inventory management | 30/03/2024 | 31/03/2024 | 2 | Planned |
| 24 | Generate bill and payment | 01/04/2024 | 02/04/2024 | 2 | Planned |
| 25 | Download and View all medical history | 03/04/2024 | 04/04/2024 | 2 | Planned |

Table 4.3: Product Plan

## 4.8 Database Design

### 4.8.1 Login Table

The login table is the cornerstone of user authentication in the project, containing essential fields such as login ID, username, password, and user type. Each row represents a distinct user account, with the login ID serving as a unique identifier. Usernames allow users to log in securely, while passwords are securely hashed to protect sensitive information. The ”type of user” column categorizes users into different roles within the project, including admin, hospital administrator, doctor and patient.

| No. | Name | Type | Constraints | Description |
|---|---|---|---|---|
| 1 | Login_id | INT(11) | PRIMARY KEY | Login id |
| 2 | Username | VARCHAR(25) | NOT NULL | Email id of user |
| 3 | Password | VARCHAR(25) | NOT NULL | Password of user |
| 4 | Usertype | VARCHAR(25) | NOT NULL | Type of user |

Table 4.4: Login Table

### 4.8.2 Staff

This is Staff table which contains id, name, location, phone number, email.

| No. | Name | Type | Constraint | Description |
|---|---|---|---|---|
| 1 | Staff_id | INT(11) | PRIMARY KEY | id of Staff |
| 2 | Fname | VARCHAR(10) | NOT NULL | Staff First Name |
| 3 | Lname | VARCHAR(10) | NULL | Staff Last Name |
| 4 | Location | VARCHAR(250) | NOT NULL | Staff Location |
| 5 | Email | VARCHAR(25) | NOT NULL | Staff Email ID |
| 6 | Phone_number | BIGINT | NOT NULL | Staff phone number |
| 7 | Dob | DATE | NOT NULL | Staff Age |
| 8 | Gender | VARCHAR(15) | NOT NULL | Staff Gender |

Table 4.5: Staff Table

#### 4.8.3 Doctor Table

This is Doctor table which contains id, name, status, address, phone number, email.

| No. | Name | Type | Constraint | Description |
|---|---|---|---|---|
| 1 | Doctor _id | INT(11) | PRIMARY KEY | id of Doctor |
| 2 | Fname | VARCHAR(10) | NOT NULL | Doctor First Name |
| 3 | Lname | VARCHAR(10) | NULL | Doctor Last Name |
| 4 | Location | VARCHAR(250) | NOT NULL | Doctor Location |
| 5 | Email | VARCHAR(25) | NOT NULL | Doctor Email ID |
| 6 | Phone | BIGINT | NOT NULL | Doctor Phone number |
| 7 | DOB | INT | NOT NULL | Date of Birth |
| 8 | Gender | VARCHAR(15) | NOT NULL | Doctor Gender |
| 9 | DocFees | INT(5) | NOT NULL | Doctor Fees |
| 10 | Spec | INT(5) | NOT NULL | Specialization |
| 11 | Qualification | VARCHAR(250) | NOT NULL | Educational Qualification |
| 12 | State | VARCHAR(15) | NOT NULL | State |
| 13 | District | VARCHAR(15) | NOT NULL | District |
| 14 | Experience | VARCHAR(250) | NOT NULL | Doctor Experience |

Table 4.6: Doctor Table

### 4.8.4 Pharmacist

This is Pharmacist table which contains id, name, location, status, address, phone number, email.

| No. | Name | Type | Constraint | Description |
|---|---|---|---|---|
| 1 | Pharmacist_id | INT(11) | PRIMARY KEY | id of Pharmacist |
| 2 | Name | VARCHAR(10) | NOT NULL | Pharmacist Name |
| 3 | Location | VARCHAR(250) | NOT NULL | Pharmacist Location |
| 4 | Status | INT(10) | NOT NULL | Active or NOT |
| 5 | Email | VARCHAR(25) | NOT NULL | Pharmacist Email ID |
| 6 | Phone_number | BIGINT | NOT NULL | Pharmacist phone number |

Table 4.7: Pharmacist Table

### 4.8.5 Drug Supplier

This is Drug Supplier table which contains id, name, location, status, address, phone number, email.

| No. | Name | Type | Constraint | Description |
|---|---|---|---|---|
| 1 | Supplier_id | INT(11) | PRIMARY KEY | id of Supplier |
| 2 | Name | VARCHAR(25) | NOT NULL | Drug Supplier Name |
| 3 | Location | VARCHAR(250) | NOT NULL | Supplier Location |
| 4 | Status | INT(25) | NOT NULL | Active or NOT |
| 5 | Email | VARCHAR(25) | NOT NULL | Supplier Email ID |
| 6 | Phone_number | BIGINT | NOT NULL | Supplier phone no: |

Table 4.8: Drug Supplier Table

### 4.8.6 Patient Table

This is Patient table which contains id, fname, lname, contact, gender, email.

| No. | Name | Type | Constraint | Description |
|---|---|---|---|---|
| 1 | Patient _id | INT(11) | PRIMARY KEY | id of Patient |
| 2 | Fname | VARCHAR(10) | NOT NULL | Patient First Name |
| 3 | Lname | VARCHAR(10) | NULL | Patient Last Name |
| 4 | Location | VARCHAR(250) | NOT NULL | Patient Location |
| 5 | Email | VARCHAR(25) | NOT NULL | Patient Email ID |
| 6 | Phone | BIGINT | NOT NULL | Patient Number |
| 7 | Age | INT | NOT NULL | Patient Age |
| 8 | Gender | VARCHAR(15) | NOT NULL | Patient Gender |
| 9 | State | VARCHAR(15) | NOT NULL | State |
| 10 | District | VARCHAR(15) | NOT NULL | District |

Table 4.9: Patient Table

### 4.8.7 Sales Table

This is Sales details table. It contains Sales id, medicine id, name,unit price, labfees , issused date, balance.

| No. | Name | Type | Constraints | Description |
|---|---|---|---|---|
| 1 | Sales_id | INT(11) | PRIMARY KEY | Sales id |
| 2 | Staff_id | INT(11) | FOREIGN KEY | id of Staff |
| 8 | Total | VARCHAR(25) | NOT NULL | Total amount |
| 9 | Dose | DATE | NOT NULL | Drug issued date |

Table 4.10: Sales Table

#### 4.8.8 Test Table

This is the Test table,it contains Medicine id, name, catagories, price.

| No. | Name | Type | Constraints | Description |
|---|---|---|---|---|
| 1 | Test_id | INT(11) | PRIMARY KEY | Id of Test |
| 2 | Test Name | VARCHAR(20) | NOT NULL | Name of Test |
| 3 | Test Image | BLOB | NOT NULL | Test Image |
| 4 | Test price | FLOAT | NOT NULL | Test Price |
| 5 | Catagories | VARCHAR(50) | NOT NULL | Test Catagories |

Table 4.11: Drugs Table

#### 4.8.9 Medicine Table

This is the Medicine table,it contains Medicine id, name, stock, price, type.

| No. | Name | Type | Constraints | Description |
|---|---|---|---|---|
| 1 | Medicine_id | INT(11) | PRIMARY KEY | Id of Medicine |
| 2 | Supplier_id | VARCHAR(25) | FOREIGN KEY | Supplier name |
| 3 | Name | VARCHAR(20) | NOT NULL | Name of Medicine |
| 4 | Type | VARCHAR(25) | NOT NULL | Type of Medicine |
| 5 | Sprice | FLOAT | NOT NULL | Selling Drugs |
| 6 | Bprice | FLOAT | NOT NULL | Buying Drugs |
| 7 | Profit | FLOAT | NOT NULL | Medicine Profit |
| 8 | Stock | INT | NOT NULL | Available Medicine |
| 9 | Expired date | DATE | NOT NULL | Expired Medicine |
| 10 | Tax | FLOAT | NOT NULL | Medicine Tax |

Table 4.12: Drugs Table

#### 4.8.10 Online Doctor Appointment

Appointment table contains the Appointment details etc .The Appointment table has essential fields like pat id, App id,Doc id. This design ensures a compact yet informative representation of Appointment details

| No. | Name | Type | Constraint | Description |
|---|---|---|---|---|
| 1 | Appointment _id | INT(11) | PRIMARY KEY | id of Appointment |
| 2 | Patient_id | INT(11) | FOREIGN KEY | id of Patient |
| 3 | Doctor _id | INT(11) | FOREIGN KEY | id of Doctor |
| 4 | Appdate | DATE | NOT NULL | Appointment Date |
| 5 | Apptime | TIME | NOT NULL | Appointment Time |

Table 4.13: Appointment Table

#### 4.8.11 Prescription

This is Prescription table which contains id, fname, lname, contact, gender, email.

| No. | Name | Type | Constraint | Prescription |
|---|---|---|---|---|
| 1 | Prescription _id | INT(11) | PRIMARY KEY | id of Prescription |
| 2 | Medicine _id | INT(11) | FOREIGN KEY | id of Medicine |
| 3 | Test _id | INT(11) | FOREIGN KEY | id of Test |
| 4 | Appointment _id | INT(11) | FOREIGN KEY | id of Appointment |
| 5 | Allergic | VARCHAR(250) | NOT NULL | Allergic type |
| 6 | Disease | VARCHAR(250) | NOT NULL | Patient Disease |

Table 4.14: Prescription Table

#### 4.8.12 Pharmacy Table

Pharmacy table contains the Pharmacy details etc .The Pharmacy table has essential fields like phar id, App id,Pre id, Med id. This design ensures a compact yet informative representation of Pharmacy details .

| No. | Name | Type | Constraints | Description |
|---|---|---|---|---|
| 2 | Pharmacist_id | INT(11) | FOREIGN KEY | id of Pharmacist |
| 3 | Prescription _id | INT(11) | FOREIGN KEY | id of Prescription |
| 4 | Medicine_id | INT(11) | FOREIGN KEY | Id of Medicine |

Table 4.15: Pharmacy Table

#### 4.8.13 Laboratory Table

Laboratory table contains the laboratory details etc .The Laboratory table has essential fields like unique Lab id, associated Login id, Staff id, App id,Pre id. This design ensures a compact yet informative representation of hospital details.

| No. | Name | Type | Constraints | Description |
|---|---|---|---|---|
| 1 | Laboratory _id | INT(11) | PRIMARY KEY | id of Laboratory |
| 2 | Staff_id | INT(11) | FOREIGN KEY | id of Staff |
| 3 | Prescription _id | INT(11) | FOREIGN KEY | id of Prescription |
| 6 | Date | DATE | NOT NULL | Appointment Date |
| 7 | Time | TIME | NOT NULL | Appointment Time |
| 8 | User Status | INT(15) | NOT NULL | Approve/Pending/Cancel |
| 10 | Schedule | INT(15) | NOT NULL | Schedule |

Table 4.16: Laboratory Table

## 4.9 User Interface Design

### 4.9.1 Admin Login Page

The hospital login page provides authorized personnel secure access to the hospital's digital platform. It serves as the gateway for administrators, healthcare providers, and staff to log in using unique credentials, ensuring confidentiality and data security. Through a user-friendly interface, the login page enhances authentication processes, safeguarding sensitive information and enabling seamless navigation of the hospital's digital systems.

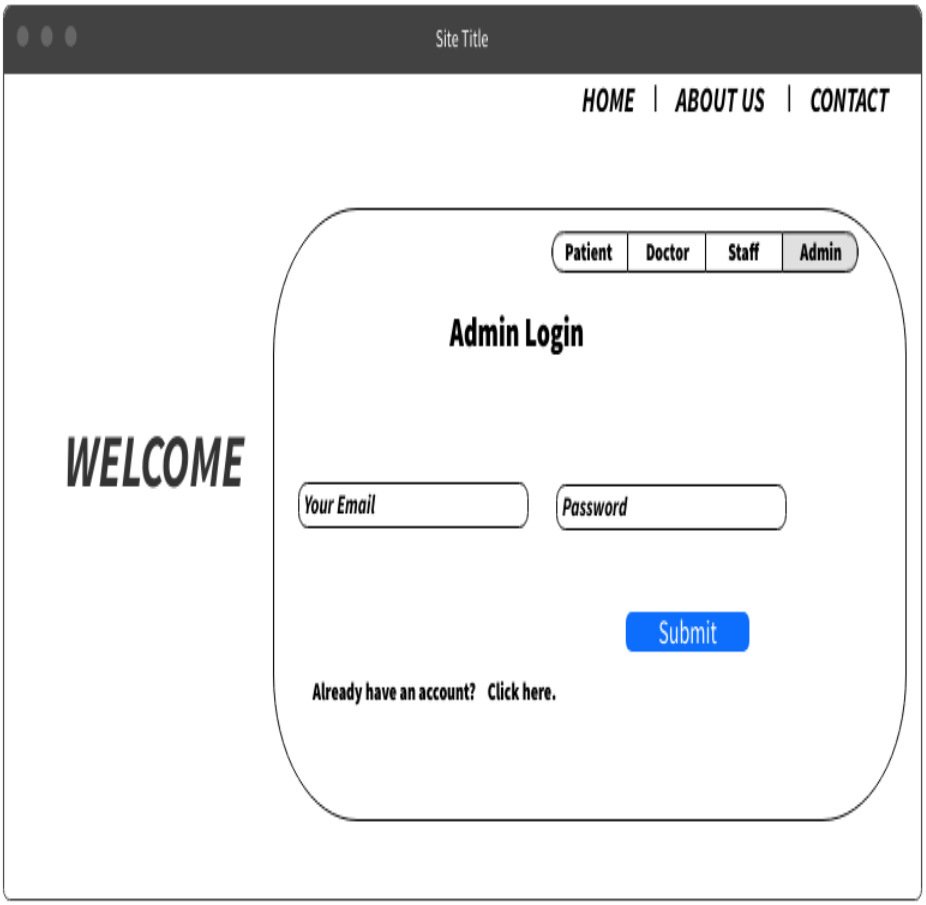


Figure 4.4: Login Page

### 4.9.2 Registration page

The hospital administrator page allows administrators to register new patients within the system. This functionality includes capturing essential patient details such as personal information and contact details. By providing this capability, administrators can efficiently add and maintain accurate records for each patient in the hospital system.

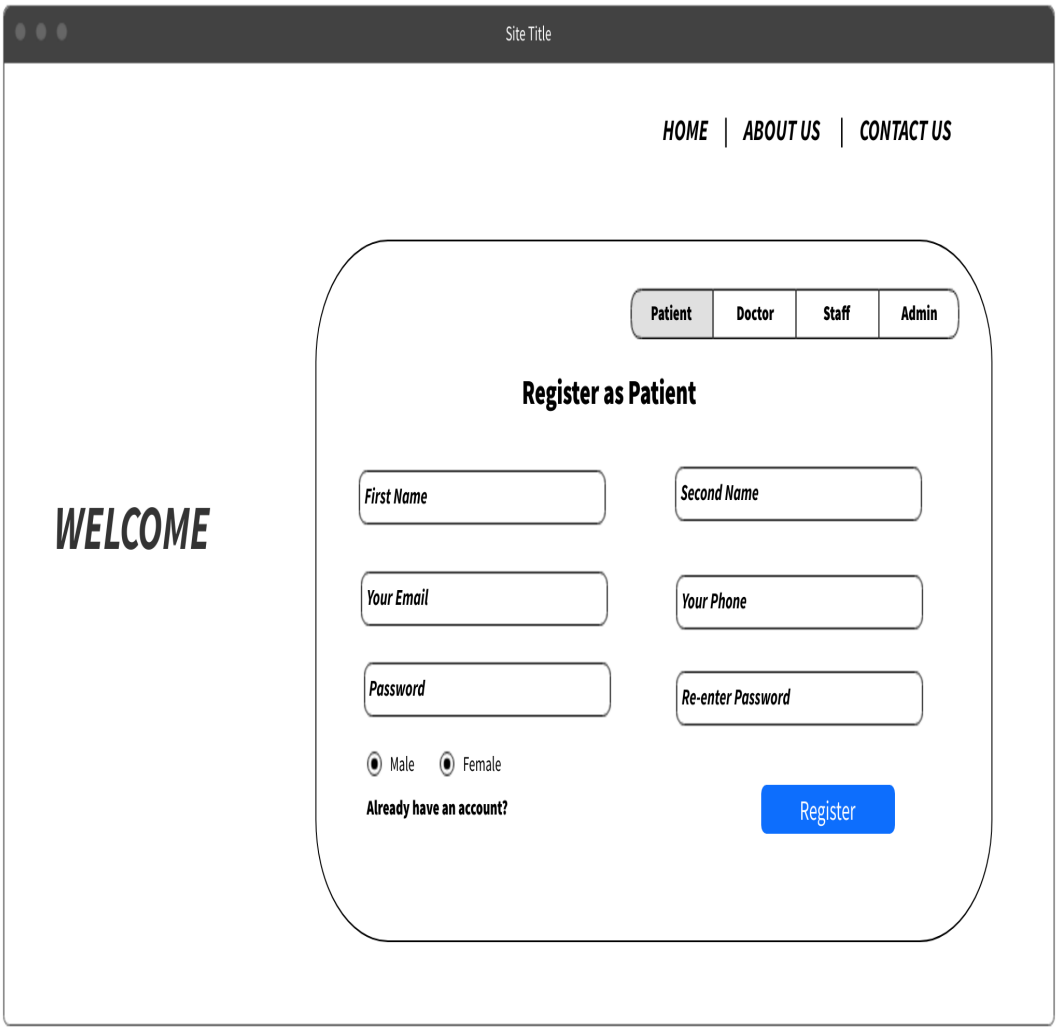


Figure 4.5: Registration page

### 4.9.3 Admin Dashboard

The Admin homepage for system is a central hub for overseeing and managing the entire system. This page is designed for providing a comprehensive dashboard that allows the Admin to perform various responsibilities seamlessly.

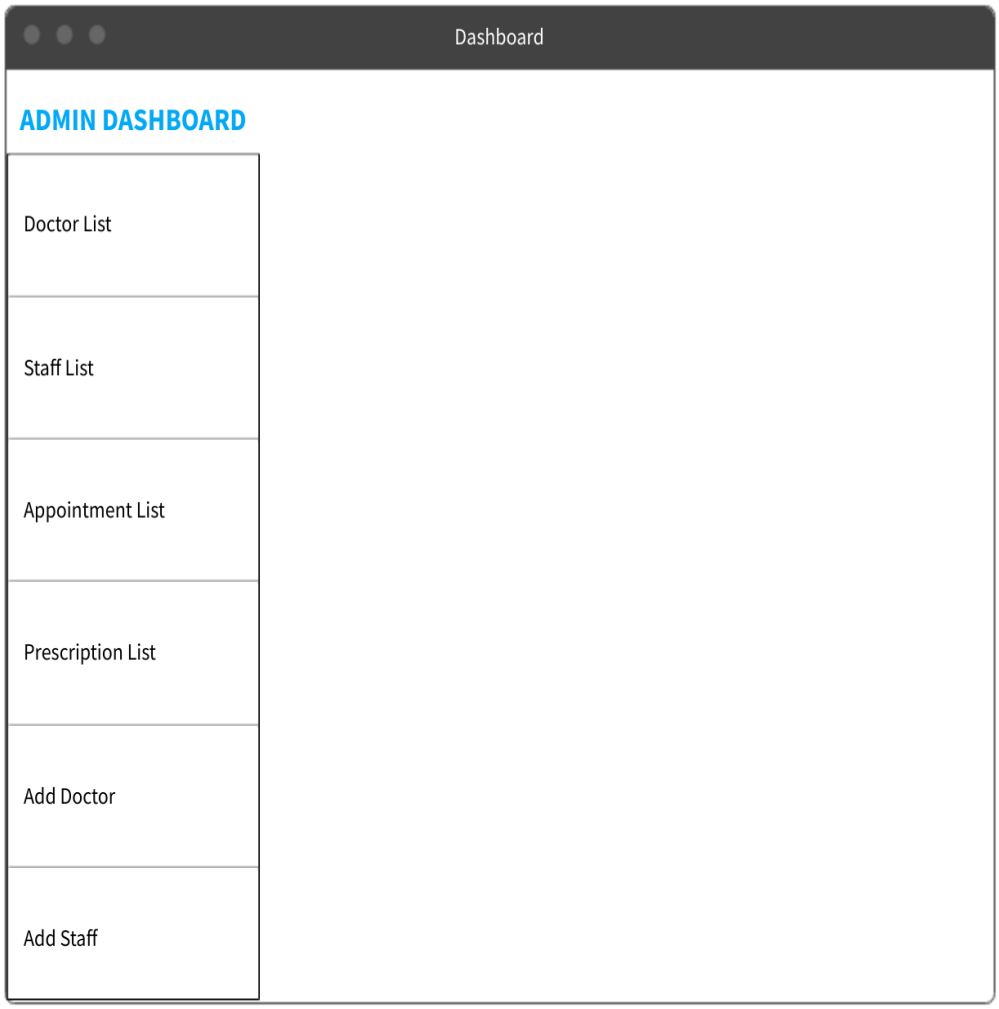


Figure 4.6: Admin Dashboard

### 4.9.4 Admin page for managing patient

The admin page provides a feature for administrators to access and view information about patients within the system. This functionality includes details such as patient names, contact information, and other pertinent data. By offering a centralized interface, administrators can efficiently oversee and manage the list of patients in the system, contributing to effective hms administration.


Figure 4.7: admin page for managing patient

### 4.9.5 Admin Add Doctor

The hospital administrator page facilitates the addition of doctors to the system. Administrators can input essential details such as doctor's name, specialization, contact information, and other relevant data. This functionality streamlines the process of on boarding new doctors, ensuring that the system maintains an up-to-date and comprehensive record of hms personnel.

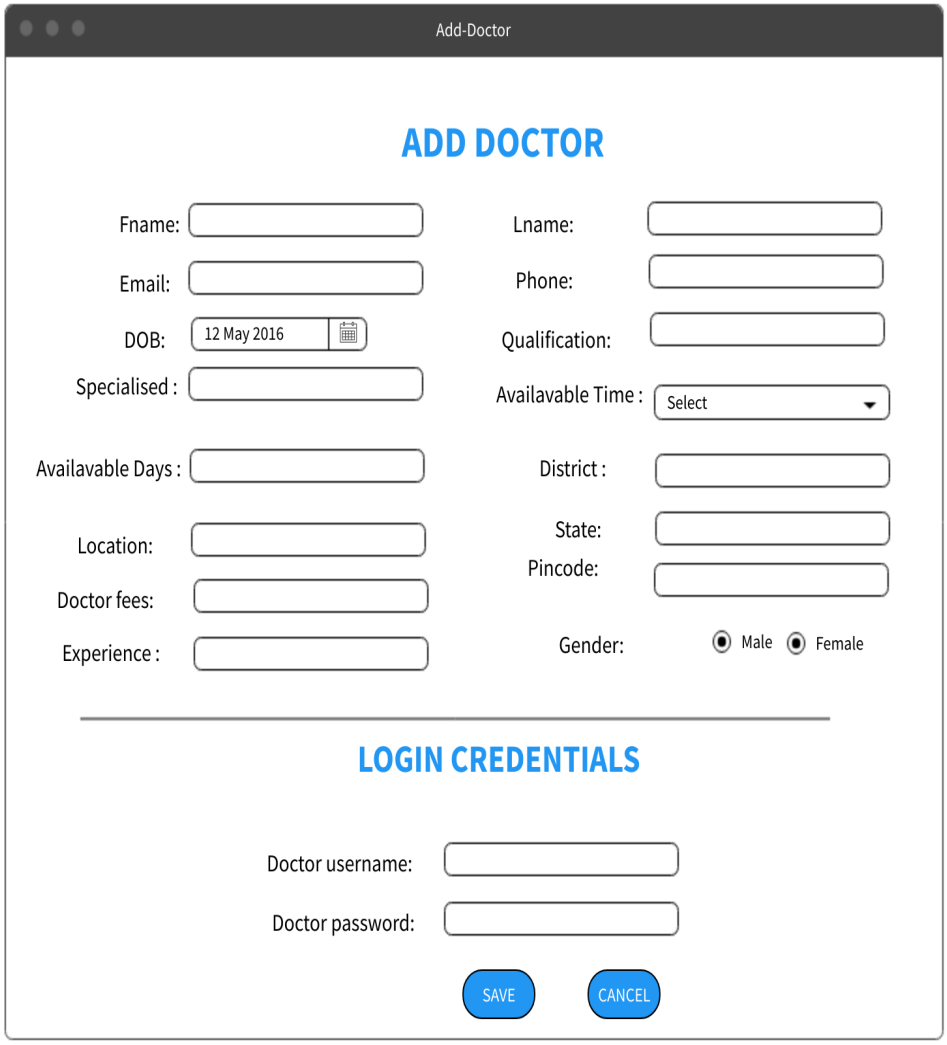


Figure 4.8: Add Doctor Page

### 4.9.6 Admin can view doctor

The admin page allows administrators to view information about doctors within the system. This functionality provides a comprehensive overview of the registered doctors, including details such as their names, specialties, contact information, and any other relevant data. The page serves as a centralized interface for administrators to access and manage the list of doctors in the system, facilitating efficient oversight.

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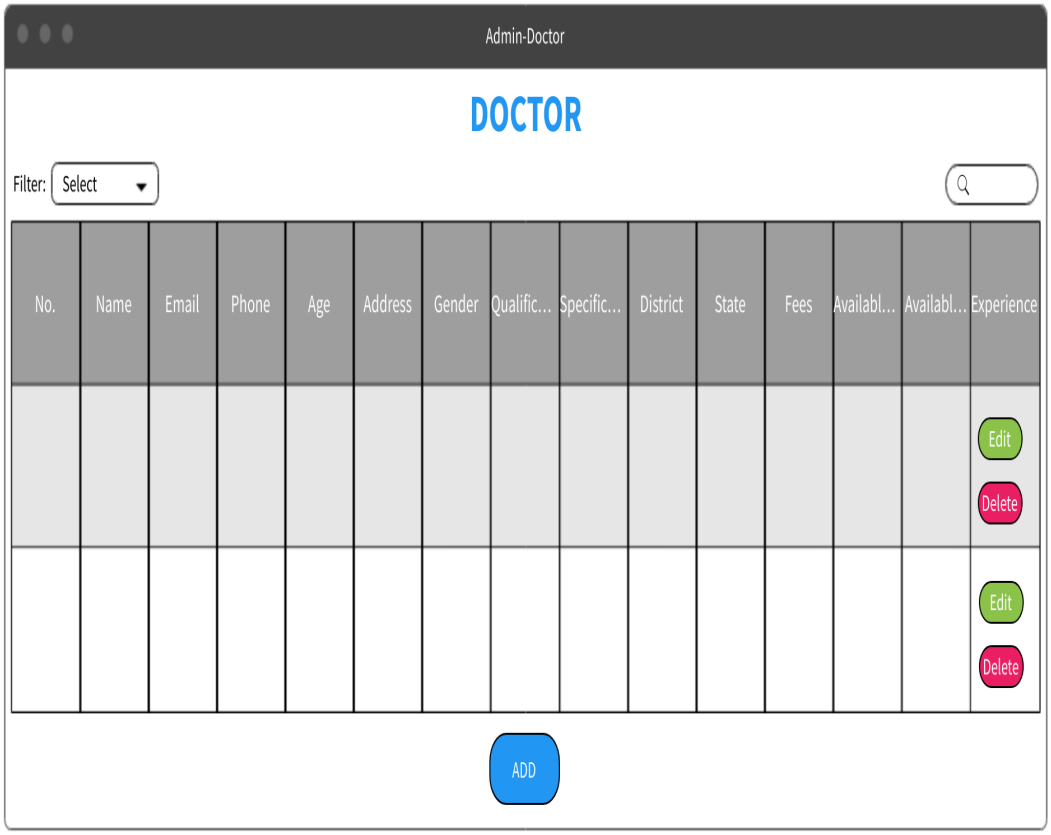



Figure 4.9: Admin can view doctor

### 4.9.7 Admin Add Staff

The hospital administrator page facilitates the addition of Staff to the system. Administrators can input essential details such as Staff's name, contact information, and other relevant data. This functionality streamlines the process of on boarding new Staff, ensuring that the system maintains an up-to-date and comprehensive record of hms personnel.

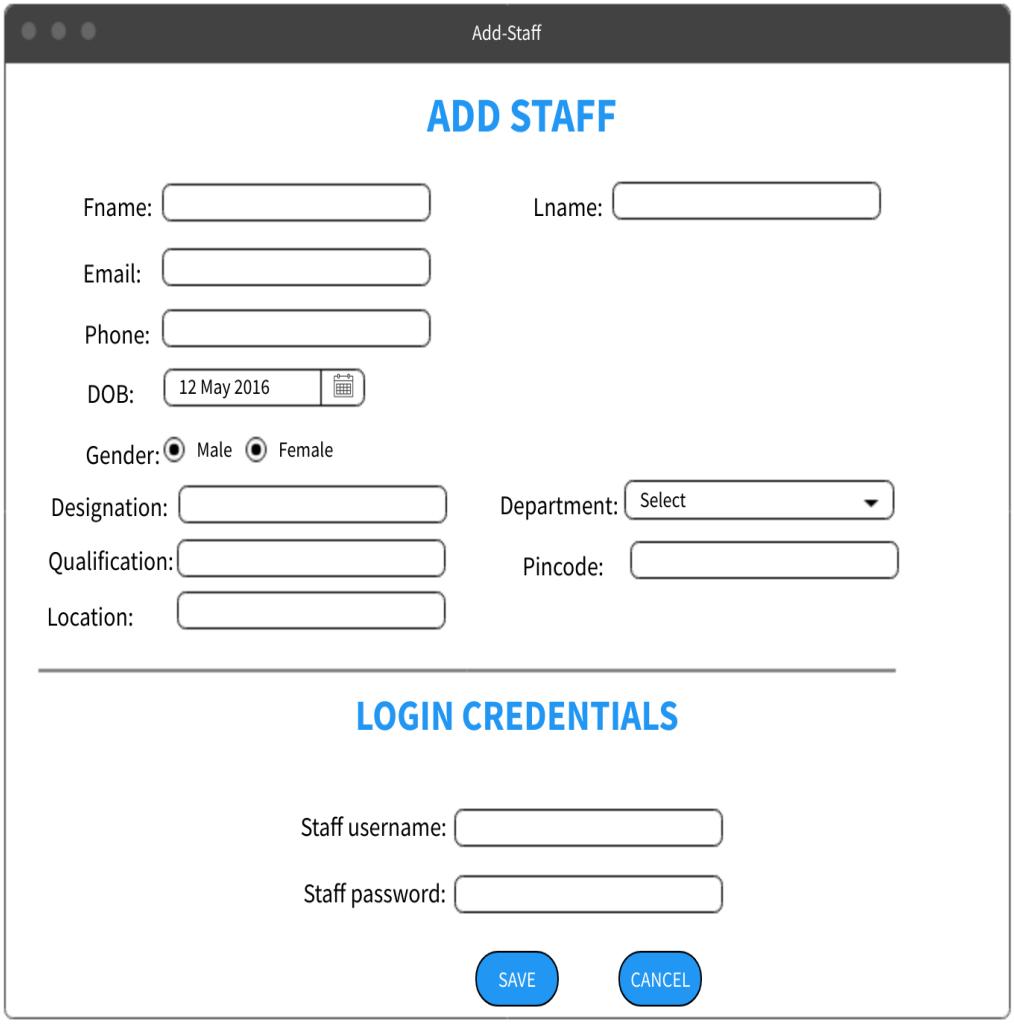



Figure 4.10: Add Staff Page

### 4.9.8 View Staff Page

The admin page provides a feature for administrators to access and view information about staff within the system. This functionality includes details such as patient names, contact information, and other pertinent data. By offering a centralized interface, administrators can efficiently oversee and manage the list of staff in the system, contributing to effective hms administration.

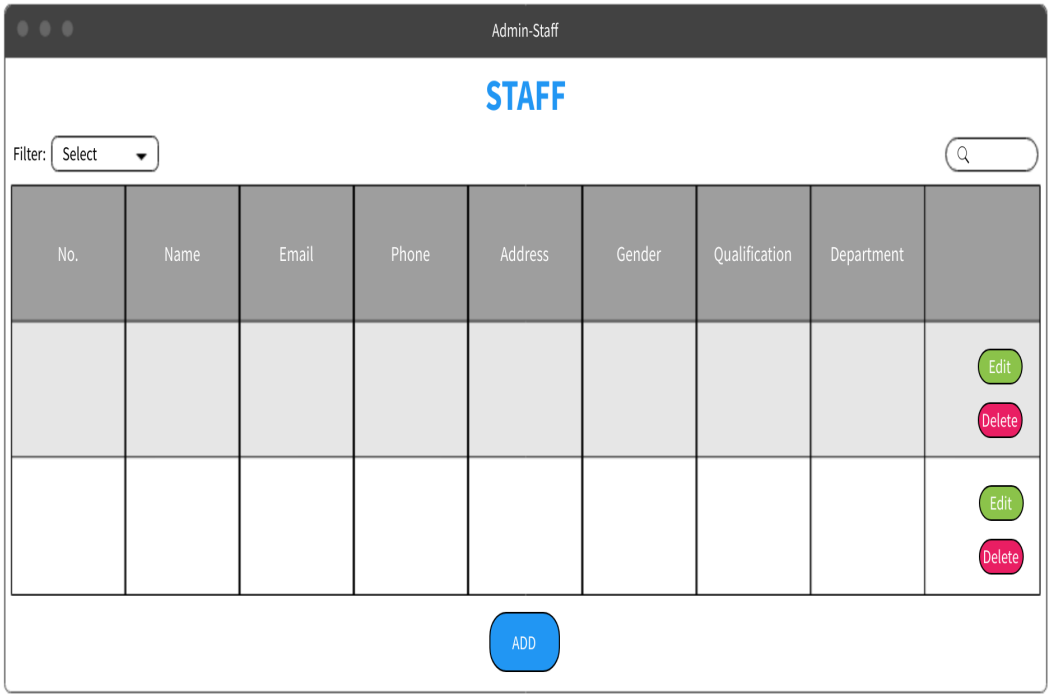



Figure 4.11: View Staff Page

### 4.9.9 Online and Offline Appointment page

The Appointment page facilitates the addition of bookings through a userfriendly interface. User can efficiently input appointment details, such as patient information, doctor selection, date, and time, streamlining the process of managing appointments within the hospital system..

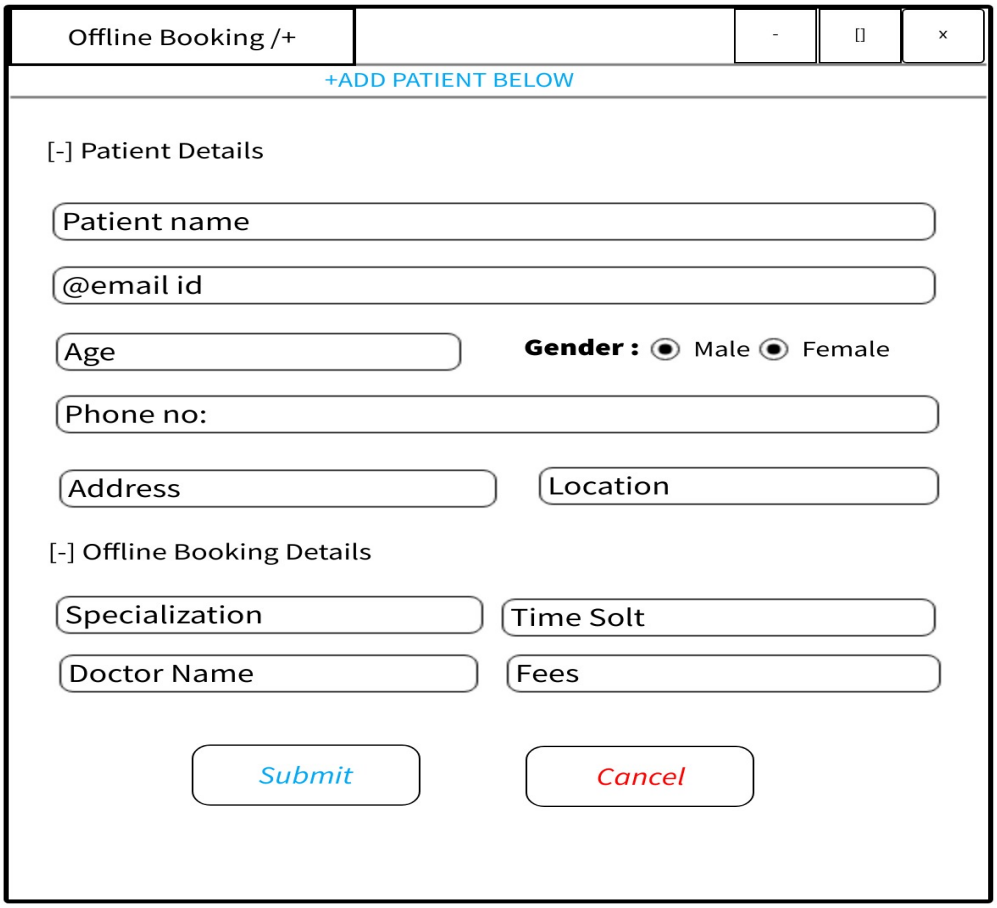



Figure 4.12: Appointment page

### 4.9.10 All Appointment

The hospital administrator page empowers administrators to effectively manage appointments within the system. This functionality includes the ability to view, edit, or cancel existing appointments, ensuring efficient coordination and organization of hms. Staff can utilize this page to oversee and optimize the appointment scheduling process for patients and doctors.

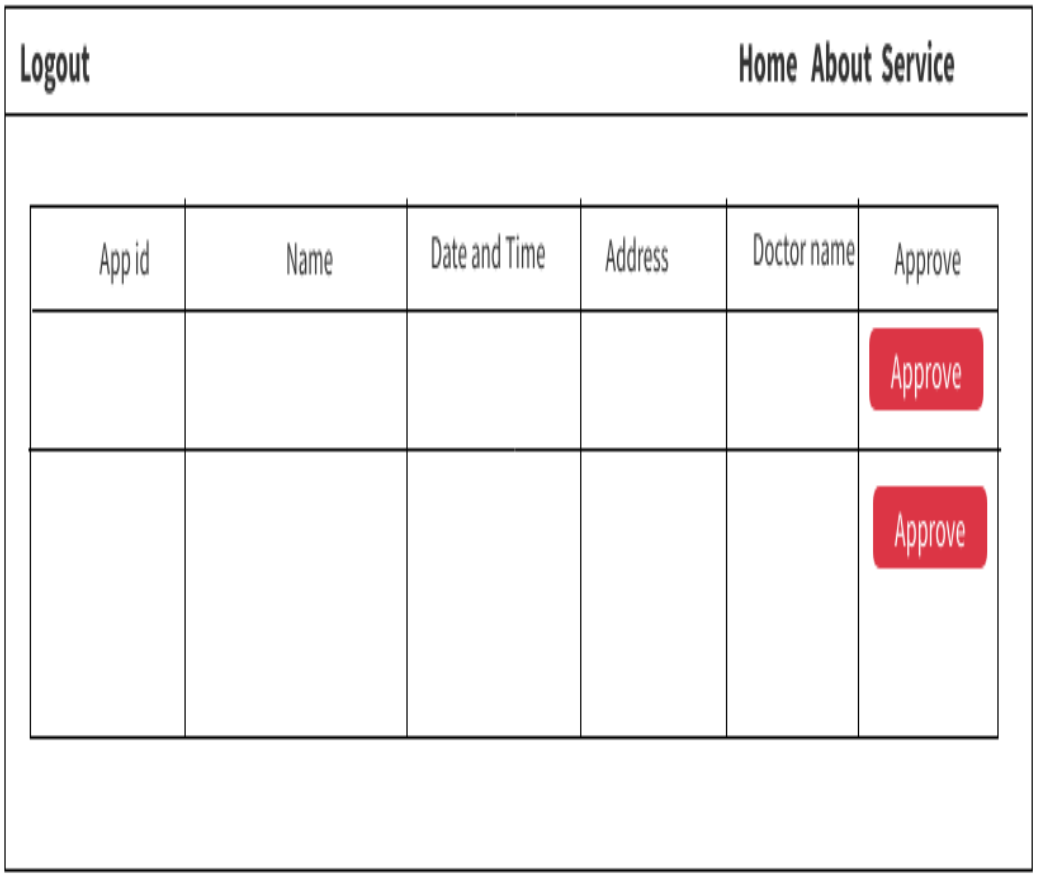



Figure 4.13: All Appointment

### 4.9.11 Doctor Prescription Page

The doctor page facilitates the addition of new Prescription to the system. Doctors can input essential details about a patient's current health status, diagnoses, prescribed medications, and other relevant information. This functionality ensures that the system maintains up-to-date and comprehensive records, allowing healthcare providers to deliver accurate and informed medical care..

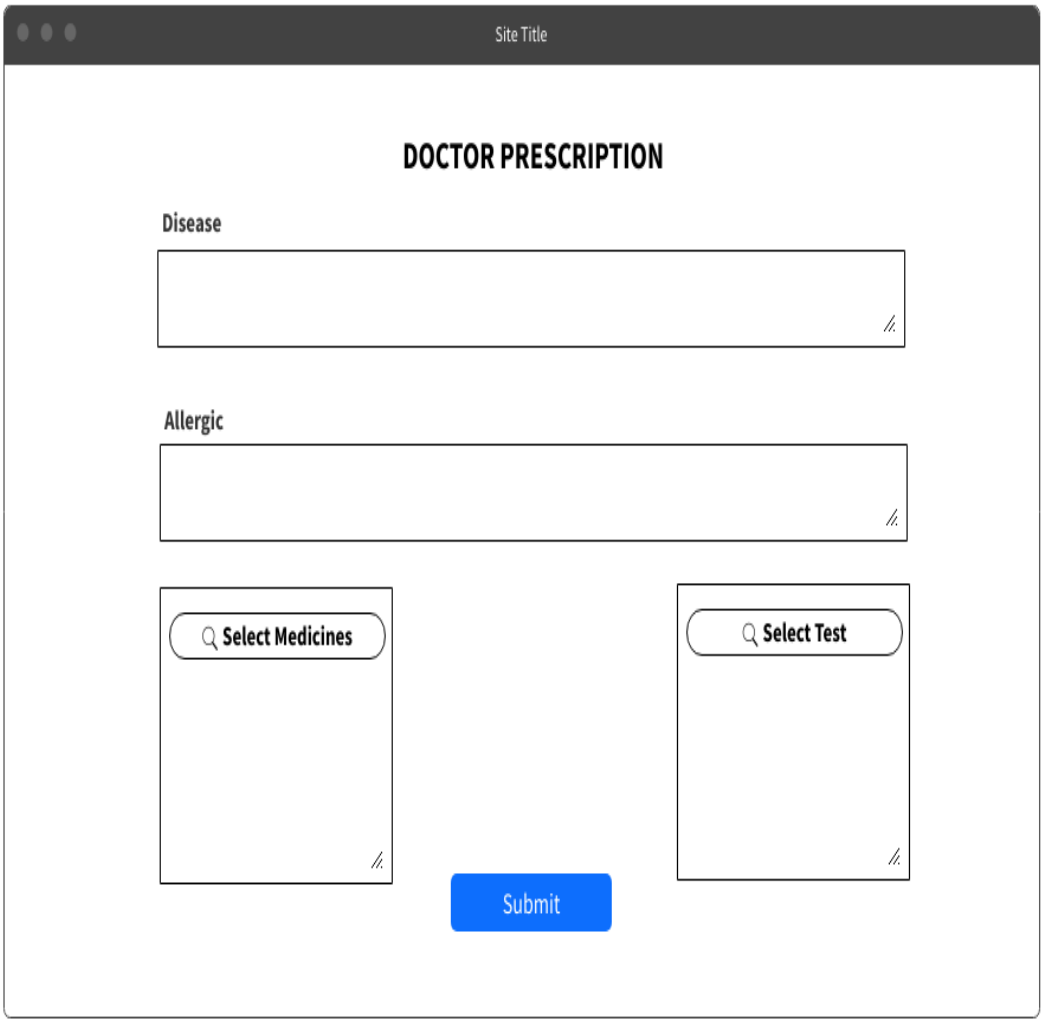



Figure 4.14: Doctor Prescription Page

### 4.9.12 Laboratory Login page

The laboratory login page serves as the gateway for authorized personnel, such as laboratory technicians and administrators, to access the hospital's laboratory information system (LIS) securely. It provides a secure authentication mechanism, ensuring that only authorized individuals can access sensitive patient data and perform laboratory-related tasks.


Figure 4.15: Login page

### 4.9.13 Laboratory Registration page

The laboratory registration page facilitates the registration process for new laboratories within the hospital's network. It serves as a centralized platform for laboratory administrators or managers to submit essential details and documentation required for registration.

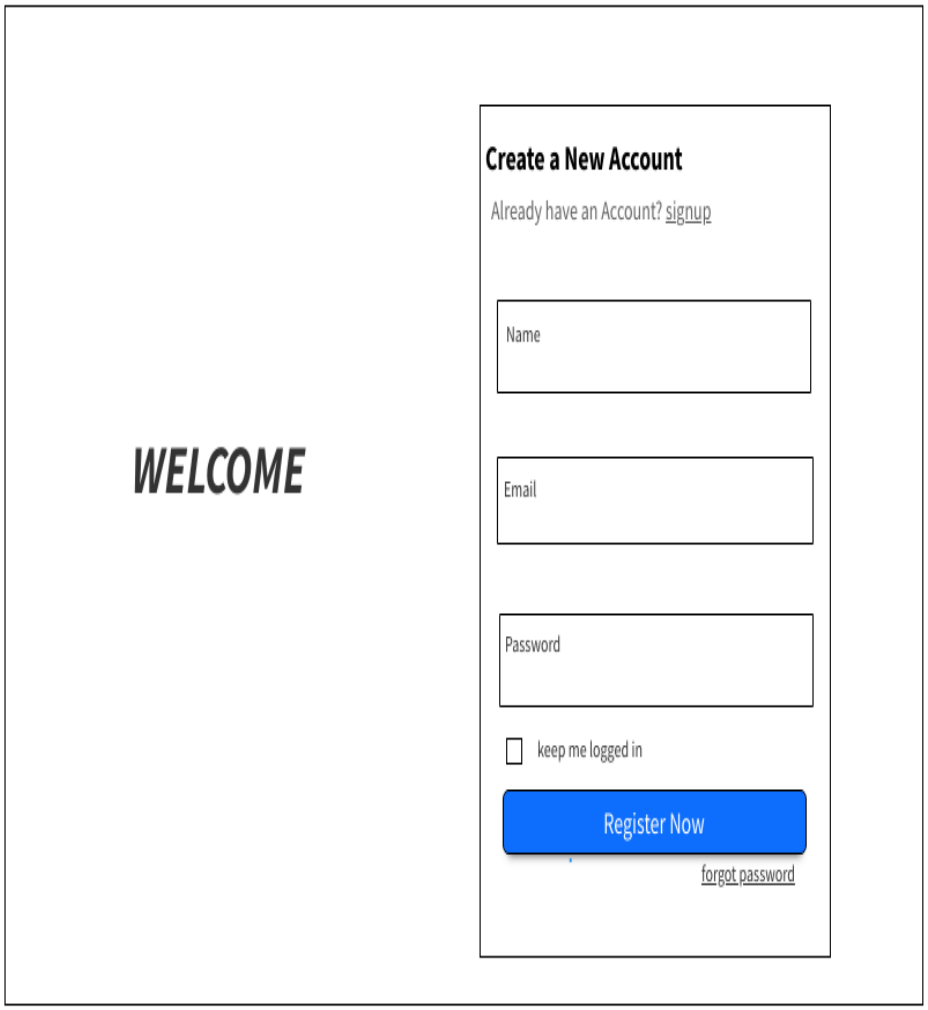



Figure 4.16: Registration page

### 4.9.14 Add Tests

The hospital administrator page empowers administrators to effortlessly incorporate new lab tests into the system. This feature facilitates the seamless addition of crucial information including test names, associated details such as categories and equipment requirements, and supplementary information such as testing methodologies. By providing a user-friendly interface and comprehensive input fields, the administrator page ensures efficient management and organization within the hospital's diagnostic services.

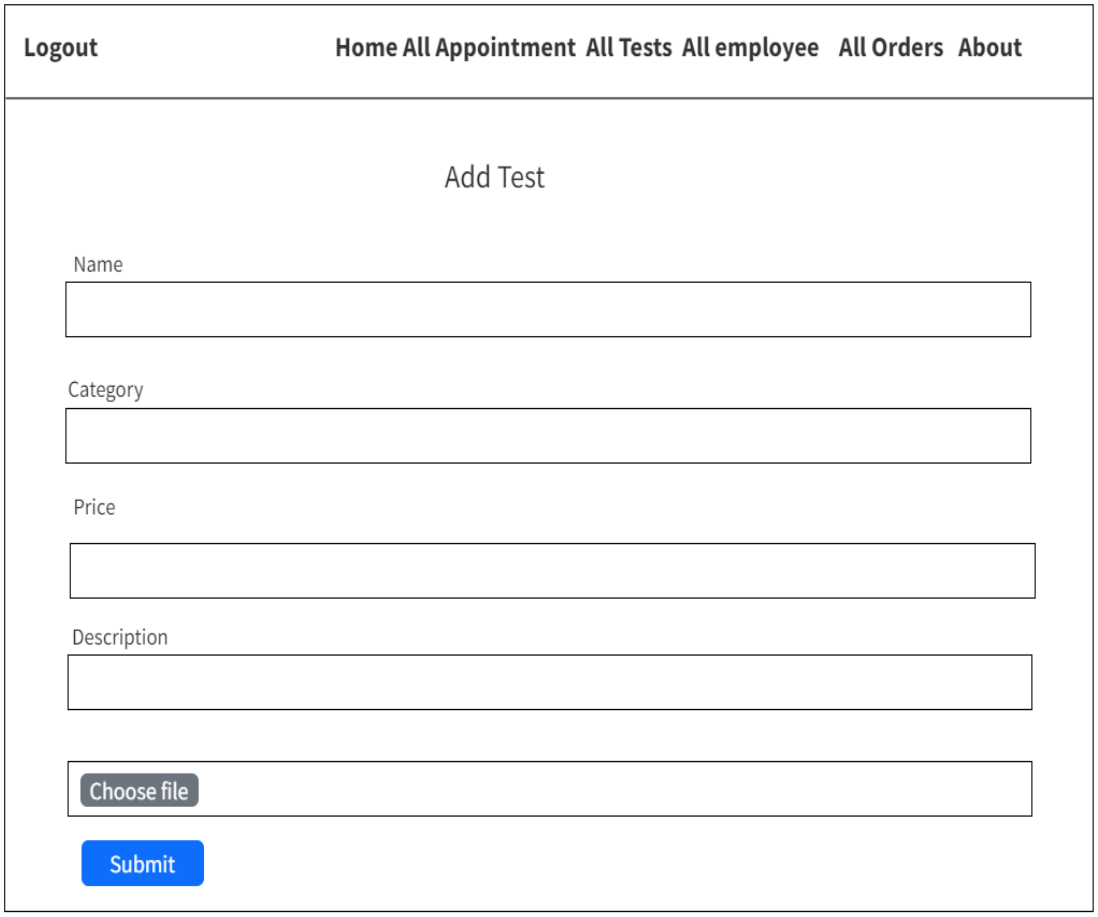



Figure 4.17: Add Tests

### 4.9.15 List of Available Tests

The Available Tests page offers a comprehensive inventory of all available medical tests within the hospital's diagnostic facilities. Patients and healthcare providers can browse through a diverse range of tests, including blood tests, imaging scans, pathology assessments, and specialized screenings.


Figure 4.18: All Tests

### 4.9.16 Appointment page

The hospital administrator page facilitates the addition of bookings through a user-friendly interface. Administrators can efficiently input appointment details, such as patient information, doctor prescribed test, date, and time, streamlining the process of managing appointments within the hospital system.

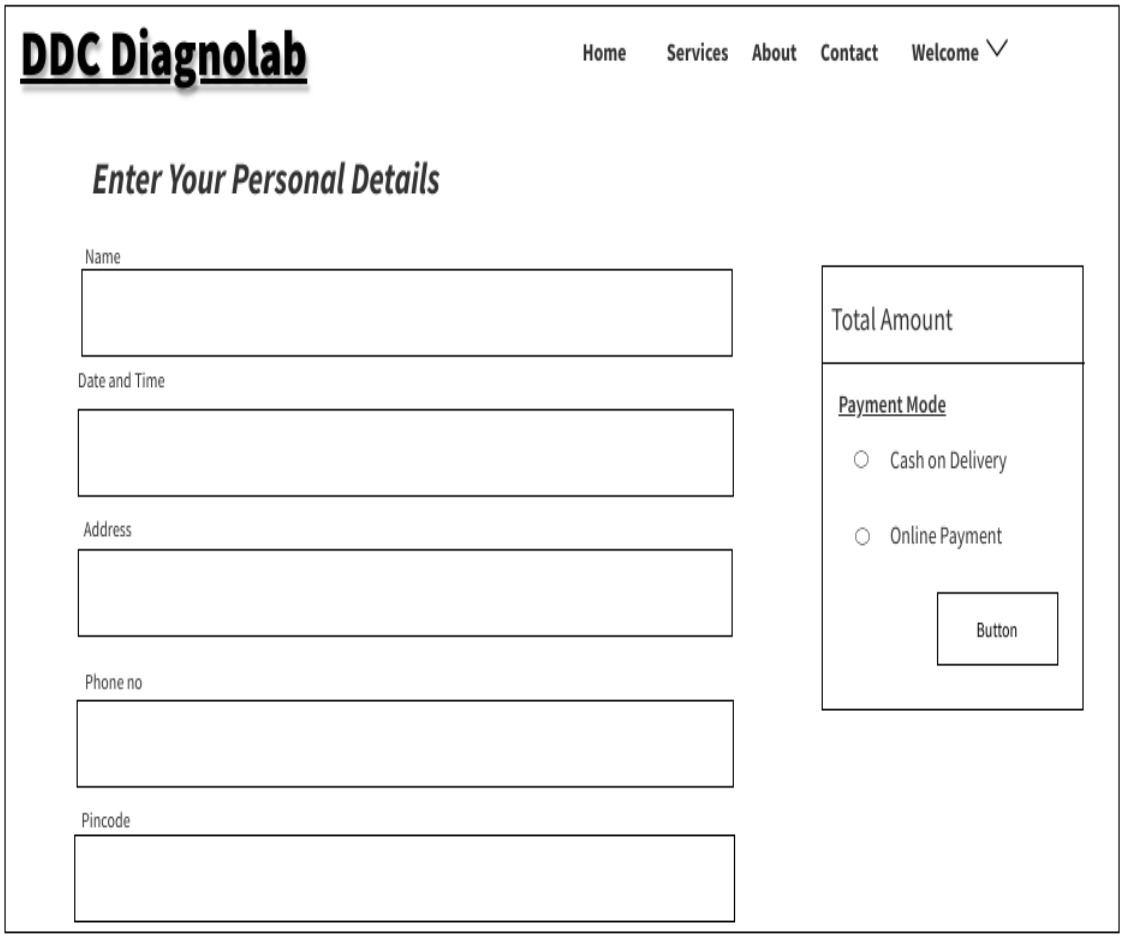



Figure 4.19: Appointment page

### 4.9.17 All Orders

The doctor page provides functionality for doctors to view their scheduled appointments. This feature allows doctors to access relevant details such as patient information and appointment time facilitating efficient management of their appointment schedule within the hospital system

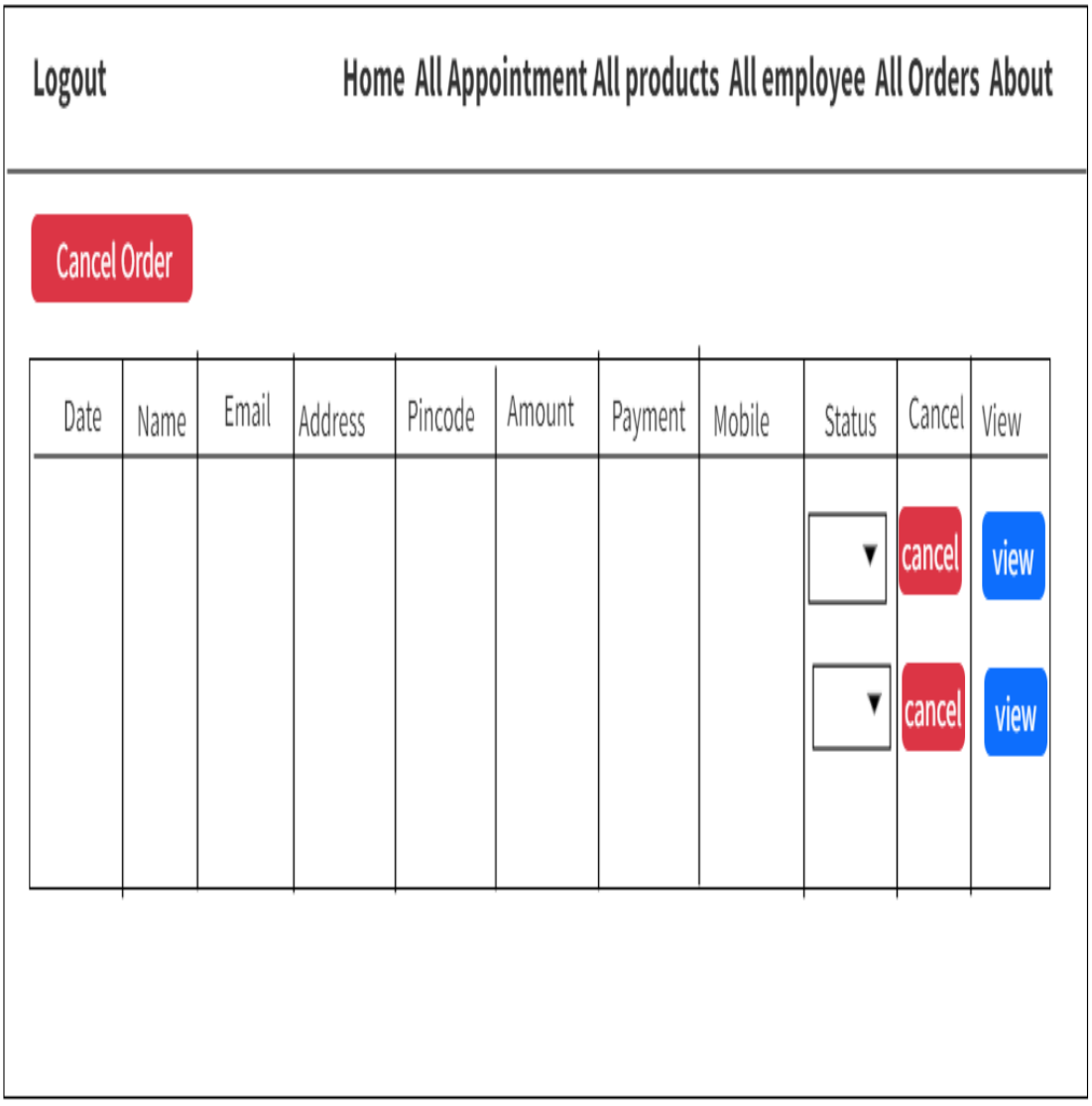



Figure 4.20: All Orders

### 4.9.18 Add Result

The Add Test Results functionality empowers authorized hospital employees to input and update test results into the hospital's digital system. This feature ensures timely and accurate recording of patient data, including diagnostic test outcomes, laboratory findings, and medical interpretations. Through a secure interface, employees can efficiently input test results, ensuring accessibility to healthcare providers for timely patient care decisions.

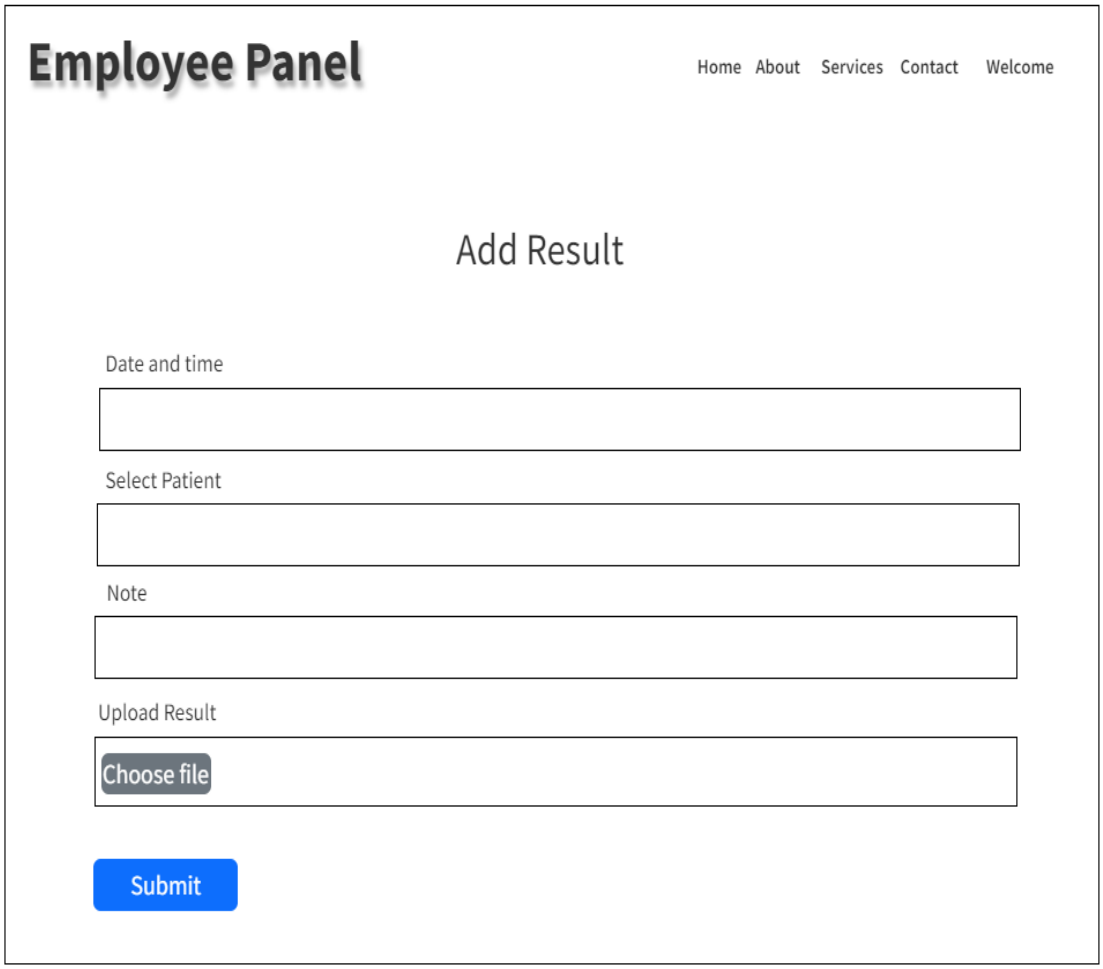



Figure 4.21: Add Result

### 4.9.19 Pharmacy Login Page

The pharmacy login page provides pharmacists and authorized personnel secure access to the hospital's pharmacy management system. It serves as the entry point for users to log in using unique credentials, ensuring confidentiality and data security.

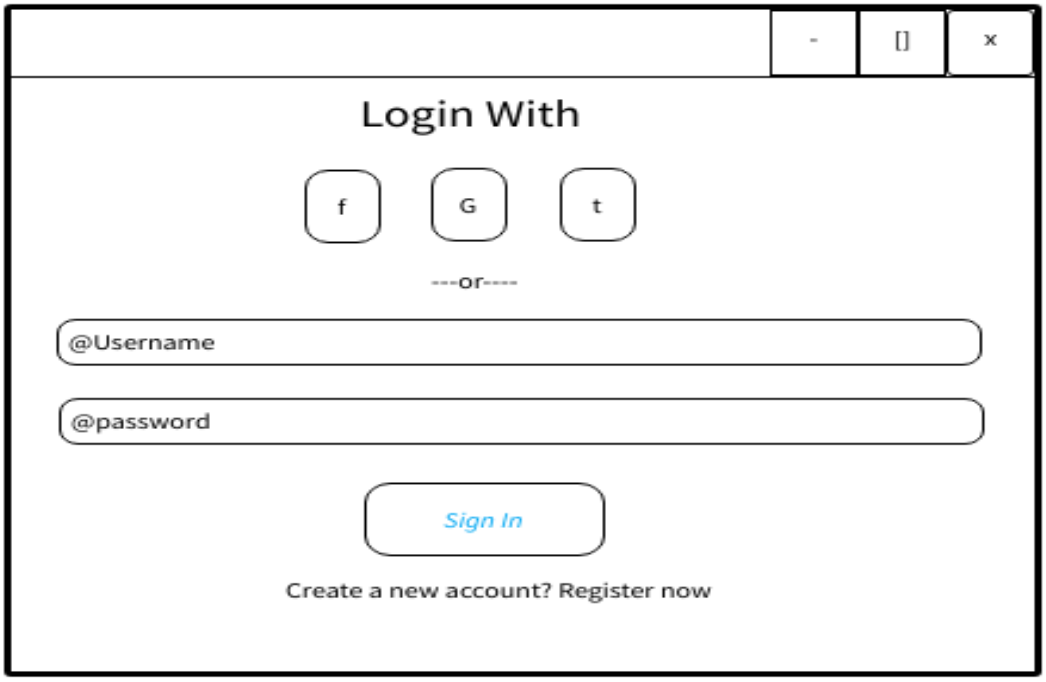



Figure 4.22: Login Page

### 4.9.20 Add Medicine Page

The hospital administrator page facilitates the smooth integration of new medicines into the system. This functionality empowers administrators to input vital details such as medicine names, associated information including drug categories and dosage guidelines, and supplementary data such as contraindications and side effects. By offering a user-friendly interface and comprehensive input fields, the administrator page ensures efficient management and organization within the hospital's pharmaceutical services.


Figure 4.23: Add Medicine Page

### 4.9.21 View Medicine Page

The User page provides a feature for administrators to access and view information about Medicine within the system. This functionality includes details such as patient names, contact information, and other pertinent data. By offering a centralized interface, administrators can efficiently oversee and manage the list of Medicine in the system, contributing to effective hms administration.


Figure 4.24: View Medicine Page

### 4.9.22 Pharmacist Prescription Page

The prescription addition feature enables pharmacists to input prescribed medications into the hospital's digital system. This functionality allows pharmacists to accurately record the details of each prescription, including the medication name, dosage, frequency, and duration. Pharmacists can also input any additional instructions provided by healthcare providers, such as special administration guidelines or potential interactions with other medications.

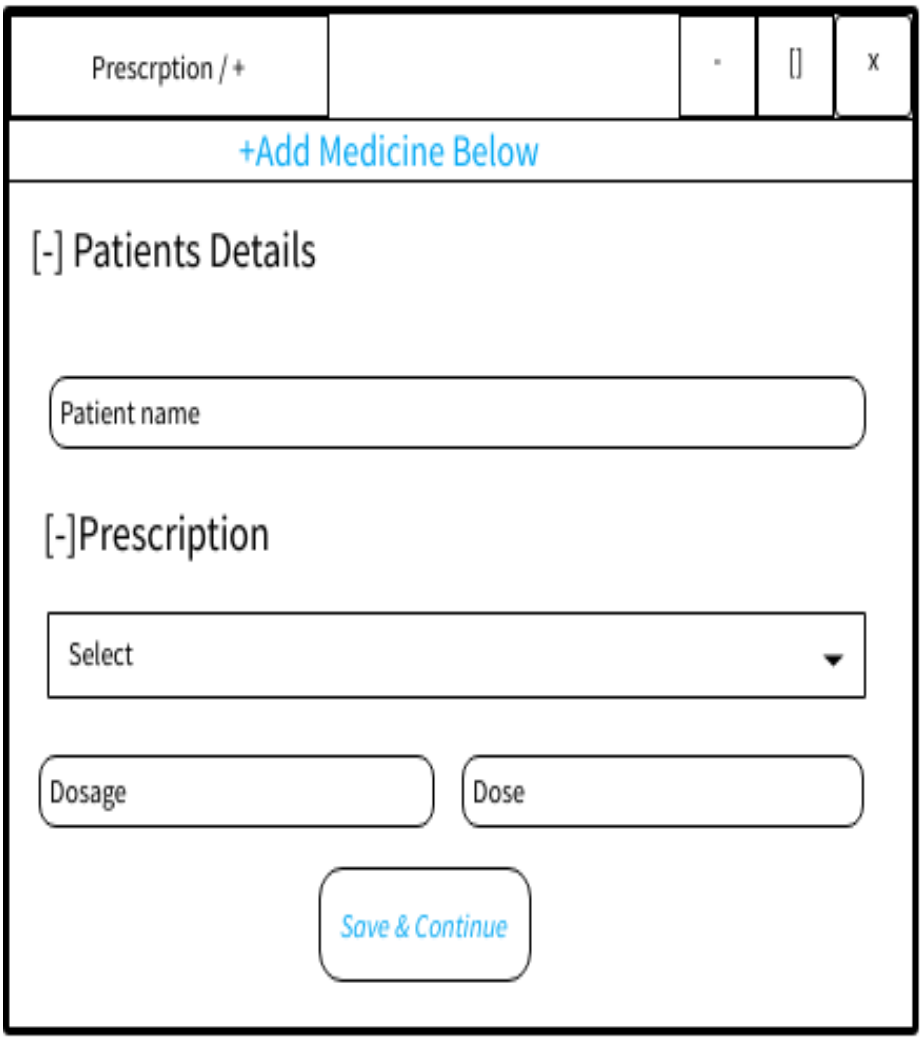



Figure 4.25: Pharmacist Prescription Page

### 4.9.23 Bill Page

The billing page serves as a central hub for managing financial transactions and patient billing within the hospital's digital platform. It provides comprehensive functionalities for generating, reviewing, and processing bills for healthcare services rendered to patients. Patients, administrative staff, and billing departments can access the billing page to view detailed breakdowns of charges, including medical procedures, medications, laboratory tests, and other associated costs.

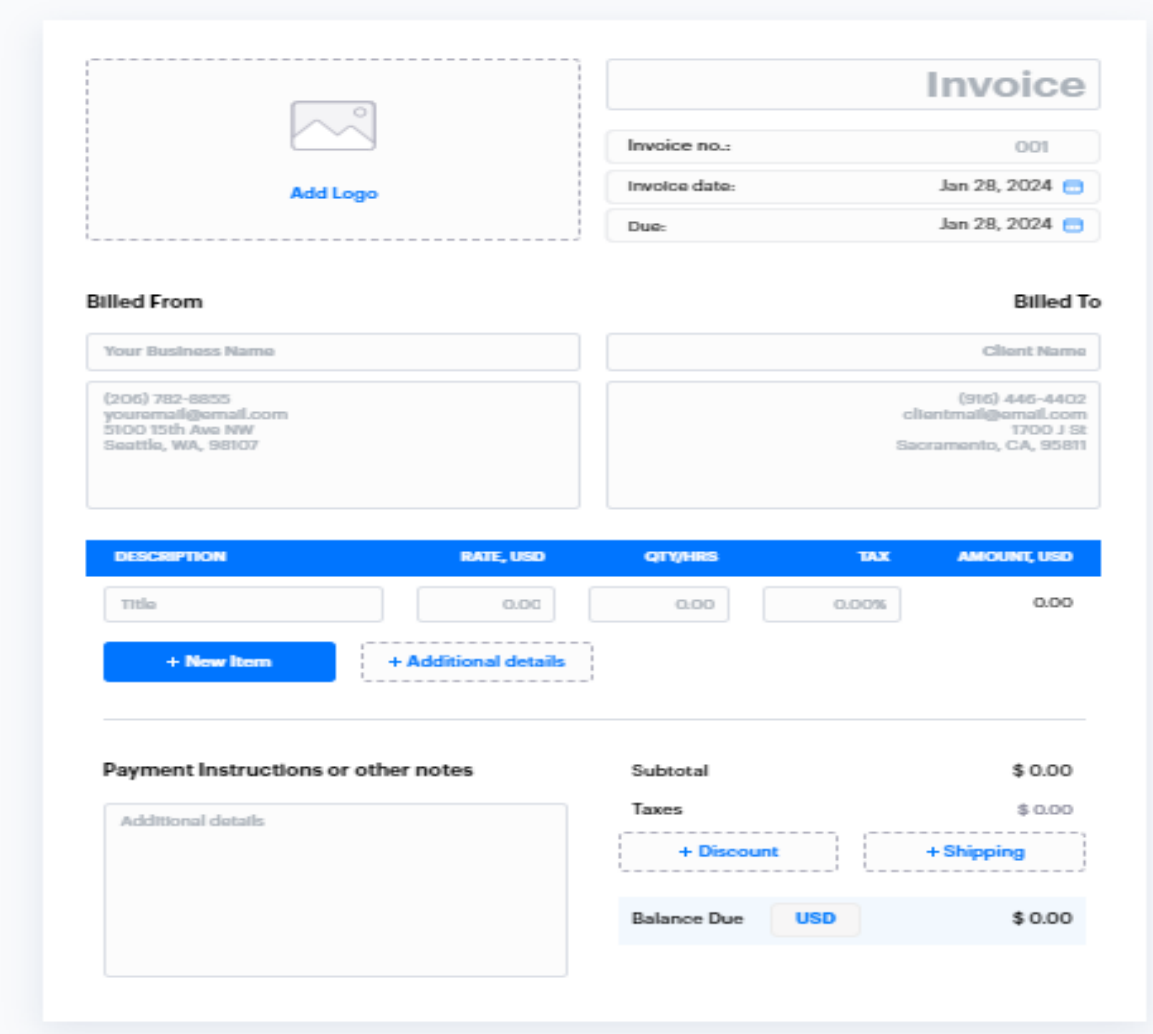
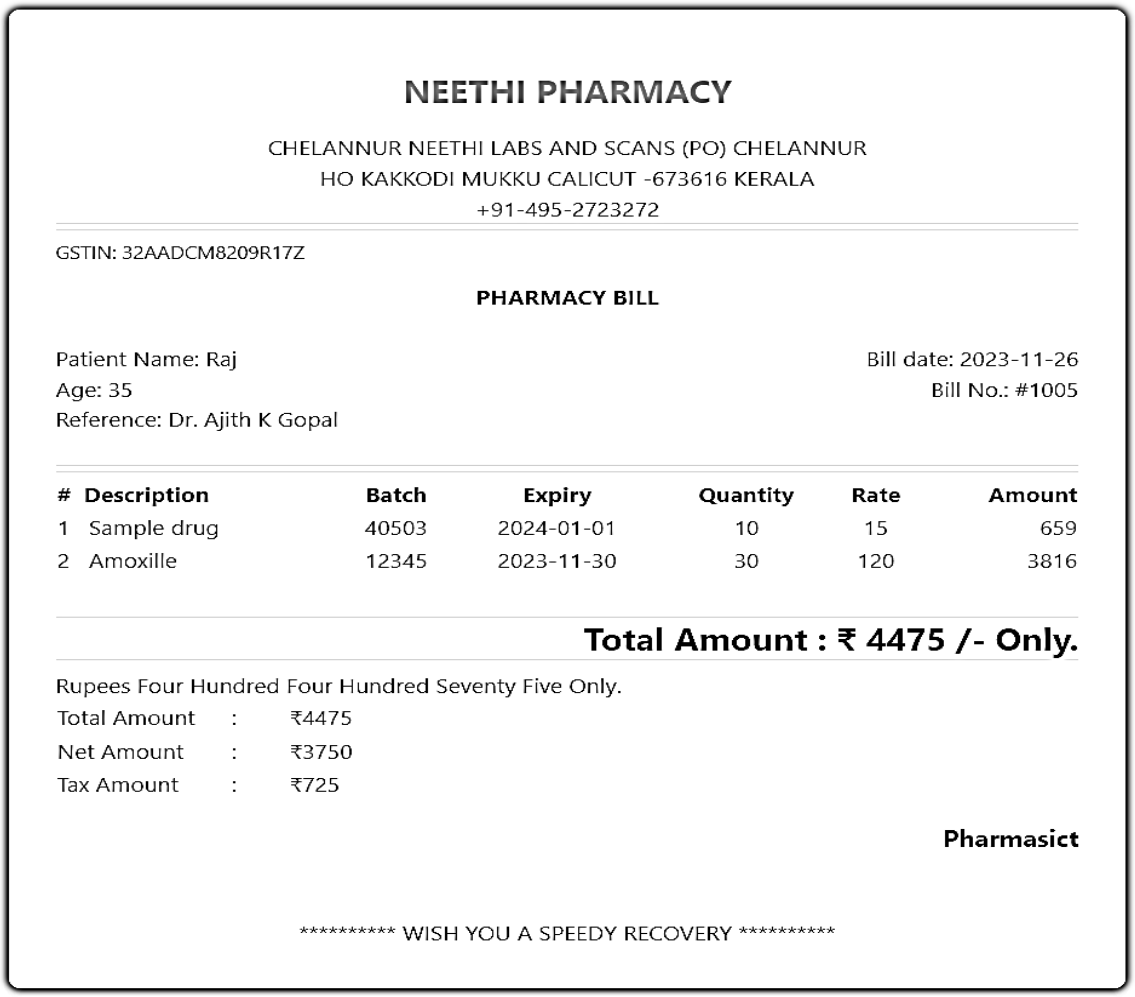



Figure 4.26: Add Bill Page

### 4.9.24 Receipt

The receipt generated by the hospital's billing system serves as a formal acknowledgment of payment for healthcare services rendered. It includes essential details such as the patient's name, date of service, itemized list of charges, payment amount, and payment method.



**NEETHI PHARMACY**

CHELANNUR NEETHI LABS AND SCANS (PO) CHELANNUR
HO KAKKODI MUKKU CALICUT -673616 KERALA
+91-495-2723272

GSTIN: 32AADCM8209R17Z

**PHARMACY BILL**

Patient Name: Raj
Age: 35
Reference: Dr. Ajith K Gopal

Bill date: 2023-11-26
Bill No.: #1005

| # | Description | Batch | Expiry | Quantity | Rate | Amount |
|---|---|---|---|---|---|---|
| 1 | Sample drug | 40503 | 2024-01-01 | 10 | 15 | 659 |
| 2 | Amoxille | 12345 | 2023-11-30 | 30 | 120 | 3816 |

**Total Amount : ₹ 4475 /- Only.**

Rupees Four Hundred Four Hundred Seventy Five Only.

Total Amount : ₹4475
Net Amount : ₹3750
Tax Amount : ₹725

**Pharmasict**

********** WISH YOU A SPEEDY RECOVERY **********

Figure 4.27: Receipt

# Chapter 5

# TESTING AND IMPLEMENTATION

## 5.1 Testing

### 5.1.1 Test Case-1

| No. | Date | Action | Expected Result | Actual Result | Pass? |
|---|---|---|---|---|---|
| 1 | 02-02-2024 | Admin Login | Admin should login to the page | Admin can login to the system | Yes |
| 2 | 04-02-2024 | Add and manage doctor | Admin should be able to add doctor | Registration, update and delete doctor | Yes |
| 3 | 06-02-2024 | Add and manage staff | Admin should be able to add staff | Registration, update and removal of staff | Yes |
| 4 | 08-02-2024 | Patient Registration | Patient should register to the system | Patient can access to the system | Yes |
| 5 | 11-02-2024 | View Patient list | Admin can view Patient list | Admin can view Patient list | Yes |

Table 5.1: Test case-1

### 5.1.2 Test Case-2

| No. | Date | Action | Expected Result | Actual Result | Pass? |
|---|---|---|---|---|---|
| 6 | 14-02-2024 | Profiles | Users have profiles | Profile mangement | Yes |
| 7 | 17-02-2024 | View and update doctor | Doctor can update their profile | Doctor can update their profile | Yes |
| 8 | 20-02-2024 | View and update staff | Staff can update their profile | Staff can update their profile | Yes |
| 9 | 23-02-2024 | Add and manage patient | Patient can add another patient | Add another patient on existing patient profile | Yes |
| 10 | 25-02-2024 | Profile updation | Admin can view Patient list | Patient can update their profile | Yes |

Table 5.2: Test case-2

### 5.1.3 Test Case-3

| No. | Date | Action | Expected Result | Actual Result | Pass? |
|---|---|---|---|---|---|
| 11 | 26-02-2024 | Booking appointment | Patient should take a appointment | Patient should take a appointment | Yes |
| 12 | 28-02-2024 | Patient view prescription | User & Doctor can view prescription | User & Doctor can view prescription | Yes |
| 13 | 02-03-2024 | Prescription | Doctor can add prescription | Doctor can add prescription | Yes |
| 14 | 04-03-2024 | Lab login | Users should login to the page | Users can login to the system | Yes |
| 15 | 08-03-2024 | Add and manage test | Admin should be able to add tests | Admin can add, update and delete tests | Yes |

Table 5.3: Test case-3

### 5.1.4 Test Case-4

| No. | Date | Action | Expected Result | Actual Result | Pass? |
|---|---|---|---|---|---|
| 16 | 12-03-2024 | Book Test | User or Staff can Book Test | User or Staff can Book Test | Yes |
| 17 | 16-03-2024 | Status Management | List,Approve test &update status | View test Status | Yes |
| 18 | 21-03-2024 | Status Management | Sample collection & check status | user can view test Status | Yes |
| 19 | 26-03-2024 | Result Publish | Staff Publish Result | Staff Publish Result | Yes |
| 20 | 29-03-2024 | Pharmacy login | Users should login to the page | Users can login to the system | Yes |

Table 5.4: Test case-4

### 5.1.5 Test Case-5

| No. | Date | Action | Expected Result | Actual Result | Pass? |
|---|---|---|---|---|---|
| 21 | 31-03-2024 | Add& manage Pharmacist | Admin can add and manage Pharmacist | Admin can add and manage Pharmacist | Yes |
| 22 | 01-04-2024 | Add and manage Suppliers | Admin can add and manage Suppliers | Admin can add and manage Suppliers | Yes |
| 23 | 02-04-2024 | Add and manage Medicine | Admin can add and manage Medicine | Admin can add and manage Medicine | Yes |
| 24 | 03-04-2024 | Billing | Pharmacist make billing process | Generate bill and make receipt | Yes |
| 25 | 05-04-2024 | Medicine History | Pharmacist can view the Billing History | Pharmacist can view the Billing History | Yes |

Table 5.5: Test case-5

## 5.2 Implementation

The implementation phase of the Hospital Management System comprises three vital components: Laboratory Management, Pharmacy Operations, and the Online Doctor Booking System. Through the seamless integration of these elements, the implementation phase aims to optimize hospital workflow and improve patient care outcomes. Following thorough testing, the subsequent crucial step involves translating the system design into a fully operational and functional application tailored specifically for pharmacy operations.

1. **Setting Up the Development Environment:** Install a local server environment (XAMPP, WAMP, or MAMP) to run PHP, Apache, and MySQL. Configure the server and database.

2. **Database Design:** Design the database schema using MySQL or any other preferred database management system. Create tables for storing data like medicines, tests, appointments, users, prescriptions etc.

3. **Backend Development:**

   Create PHP scripts for Connecting to the database. Implementing CRUD (Create, Read, Update, Delete) operations for managing medications, patients, prescriptions, and inventory. Implement user authentication and authorization for staff access control.

4. **Frontend Development:**

   (a) Develop user interfaces using HTML, CSS, and PHP:

      i. **Dashboard:** Display key hospital metrics, alerts, and summaries.

      ii. **Medication Management:** Allow CRUD operations for medications (add, edit, delete).

      iii. **Patient Records:** Capture and manage patient information and prescriptions.

      iv. **Inventory Control:** Track and manage stock levels, orders and suppliers.

v. **Laboratory Control:** Track and manage tests, appointments and staffs.

vi. **Doctor Booking:** Track and manage appointments,doctors and staffs.

5. **Security Measures:** Implement security measures to prevent vulnerabilities Sanitize user inputs to prevent SQL injection attacks. Apply user authentication using sessions or tokens. Enforce secure password storage (hashing).

6. **Testing:** Perform testing to ensure functionality and reliability Unit testing for individual functions and features. Integration testing to check how different modules interact. User acceptance testing (UAT) involving potential end-users.

7. **Deployment:** Deploy the system on your local server or web hosting service Transfer the PHP files, ensuring necessary configurations are in place. Import the database structure and data.

8. **Maintenance and Upgrades:** Regularly maintain the system Update for security patches and performance enhancements.Address user feedback and feature requests.

9. **Compliance and Regulatory Adherence:** Ensure compliance with relevant regulations and standards concerning patient data and healthcare.

10. **User Training and Support:** Provide documentation and training materials for end-users (users , ,doctors, staff).Offer technical support for any issues encountered during system usage.

# Chapter 6

# RESULT AND DISCUSSION

In this project, to introduce a centralized computerized system to streamline and optimize the management of hospital operations in **CHELANNUR NEETHI LABS AND SCANS (PO) Chelannur HO Kakkodi Mukku, Kozhikode.**The objectives were to enhance inventory control, improve prescription management, and automate various administrative tasks.

To accomplish these goals, we adopted an agile methodology for software development. This approach enabled us to iteratively design and implement a user-friendly web-based platform tailored to the specific needs of hospital. Planning was a fundamental aspect at every development stage, ensuring each sprint progressed smoothly according to established protocols.

Thorough testing was conducted throughout the development lifecycle to validate functionality and ensure a high standard of performance and reliability in the system. The purpose of this Hospital Management System project is to improve the maintenance and manipulation of the doctor appointments, tests, drugs in the medicals. The hospital management system will be used to minimize the time and resource by maintaining the details of the drug , tests systemically so that the data can be used in possible quickest time.

# Chapter 7

# CONCLUSION

In conclusion, the implementation phase of the Hospital Management System encompasses three essential components: Laboratory Management, Pharmacy Operations, and the Online Doctor Booking System. By integrating these vital elements seamlessly, the implementation phase aims to streamline hospital operations, enhance efficiency, and ultimately improve patient care delivery. Through the successful execution of this phase, hospitals can optimize workflow processes, ensure better coordination among departments, and provide patients with convenient access to healthcare services. This holistic approach underscores the significance of an integrated Hospital Management System in facilitating comprehensive and effective healthcare management.

Moreover, by leveraging advanced technology and systematic processes, hospitals can adapt to evolving healthcare needs and stay ahead in delivering high-quality care. This underscores the pivotal role of the implementation phase in shaping the success and effectiveness of Hospital Management Systems.

## 7.1 Future Work

All this work is currently performed manually by the receptionist and other operational staff, resulting in a significant amount of paperwork that needs to be managed. Doctors often struggle to recall various medications available for diagnosis, sometimes missing

better alternatives due to memory constraints. Due to limited time and resources, this project focuses primarily on the main activities of a Hospital Management System, with attention to ensuring efficiency and user-friendliness.

Most of the analysis and interpretations in this report are based on secondary data obtained, which may contain inherent mistakes and errors. Despite efforts to minimize them, there may still be typing and compilation errors present in the report. Additionally, the tasks specified in the project were not well-defined, particularly regarding validations. However, extensive efforts were made to ensure the software's reliability. Nonetheless, the ultimate aim of the project remains unchanged, and its high level of user-friendliness makes it suitable for all personnel.

## 7.2 Reference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7. https://datatables.net/examples/styling/bootstrap4
8. https://www.javatpoint.com
9. http://www.tizag.com/phpT/
10. https://www.killerphp.com/
11. https://www.Copilot.ai/
12. https://www.youtube.com/watch?v=OK_JCtrrv-c
13. https://www.youtube.com/watch?v=6EukZDFE_Zg
14. https://www.youtube.com/watch?v=BUCiSSyIGGU
15. https://www.youtube.com/watch?v=JJmcL1N2KQs
16. https://chat.openai.com/
17. https://www.blackbox.ai/

## 7.3 Screenshots

### 7.3.1 Admin Login Page

The hospital login page provides authorized personnel secure access to the hospital's digital platform. It serves as the gateway for administrators, healthcare providers, and staff to log in using unique credentials, ensuring confidentiality and data security. Through a user-friendly interface, the login page enhances authentication processes, safeguarding sensitive information and enabling seamless navigation of the hospital's digital systems.

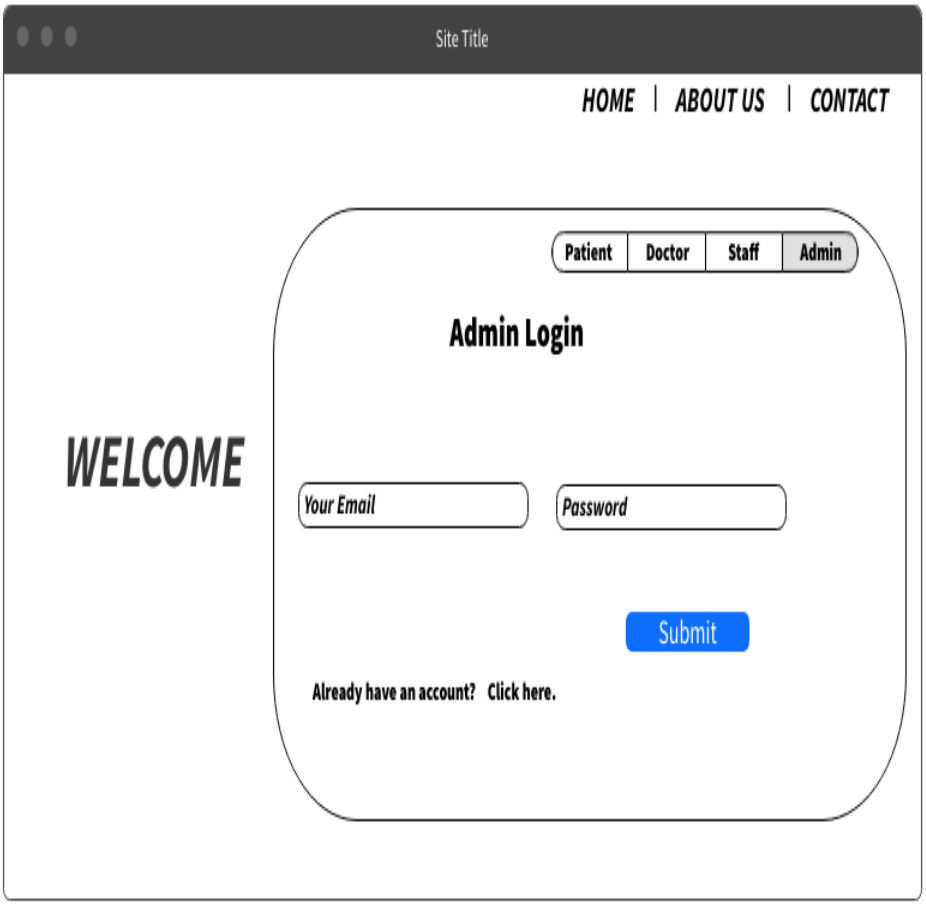


Figure 7.1: Login Page

### 7.3.2 Registration page

The hospital administrator page allows administrators to register new patients within the system. This functionality includes capturing essential patient details such as personal information and contact details. By providing this capability, administrators can efficiently add and maintain accurate records for each patient in the hospital system.

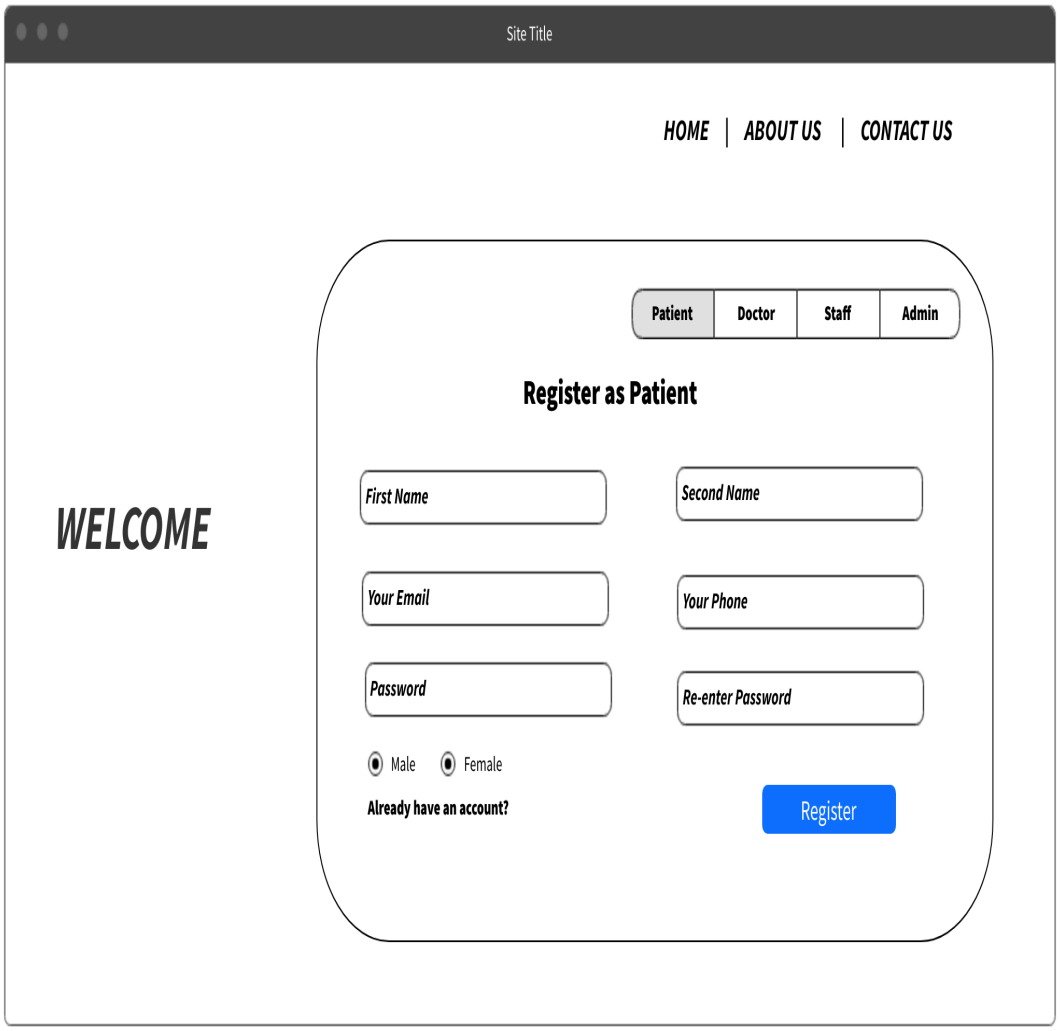


Figure 7.2: Registration page

### 7.3.3 Admin Dashboard

The Admin homepage for system is a central hub for overseeing and managing the entire system. This page is designed for providing a comprehensive dashboard that allows the Admin to perform various responsibilities seamlessly.

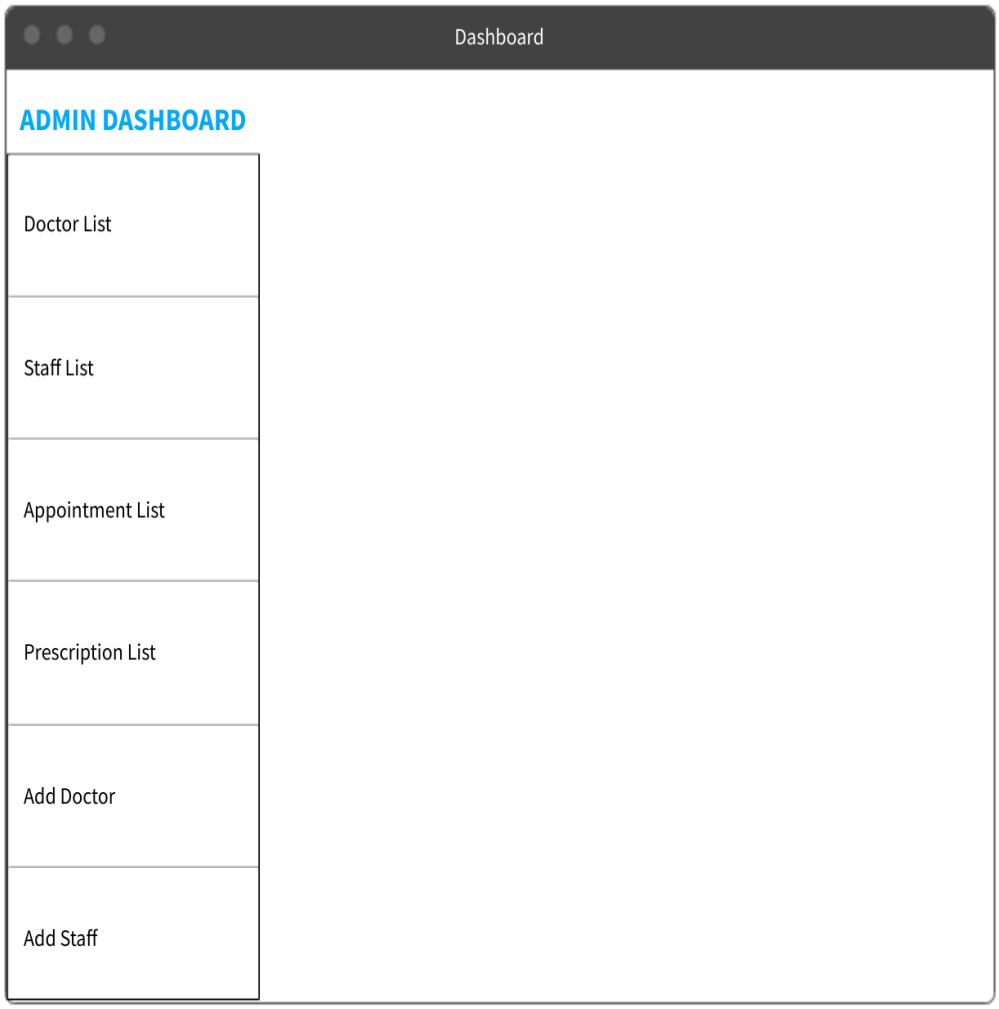


Figure 7.3: Admin Dashboard

### 7.3.4 Admin Add Doctor

The hospital administrator page facilitates the addition of doctors to the system. Administrators can input essential details such as doctor's name, specialization, contact information, and other relevant data. This functionality streamlines the process of on boarding new doctors, ensuring that the system maintains an up-to-date and comprehensive record of hms personnel.

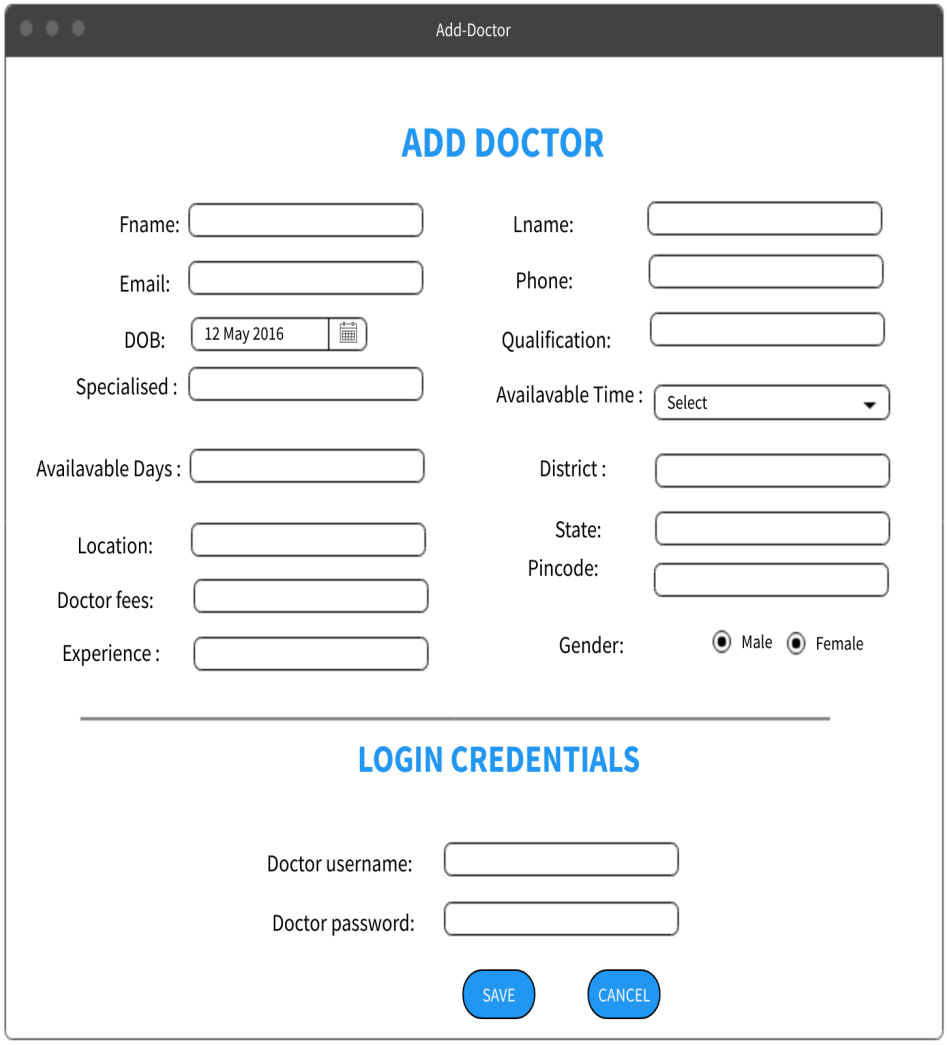


Figure 7.4: Add Doctor Page

### 7.3.5 Admin can view doctor

The admin page allows administrators to view information about doctors within the system. This functionality provides a comprehensive overview of the registered doctors, including details such as their names, specialties, contact information, and any other relevant data. The page serves as a centralized interface for administrators to access and manage the list of doctors in the system, facilitating efficient oversight.

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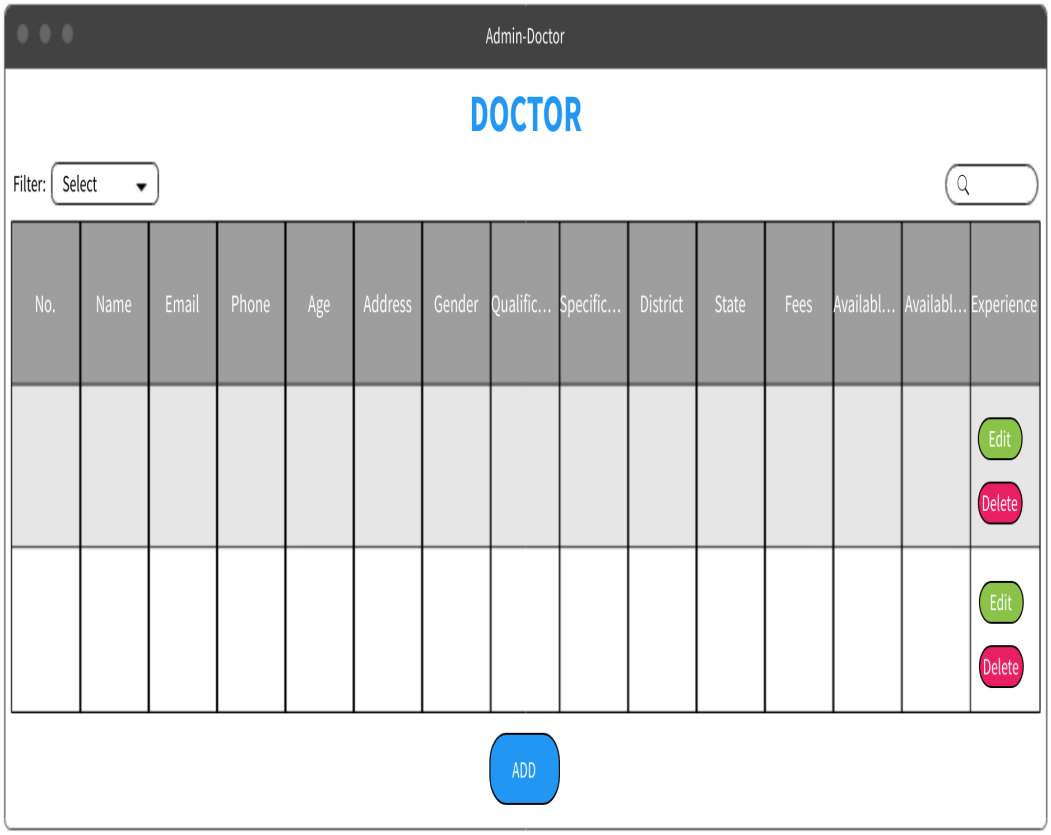



Figure 7.5: Admin can view doctor

### 7.3.6 Admin Add Staff

The hospital administrator page facilitates the addition of Staff to the system. Administrators can input essential details such as Staff's name, contact information, and other relevant data. This functionality streamlines the process of on boarding new Staff, ensuring that the system maintains an up-to-date and comprehensive record of hms personnel.

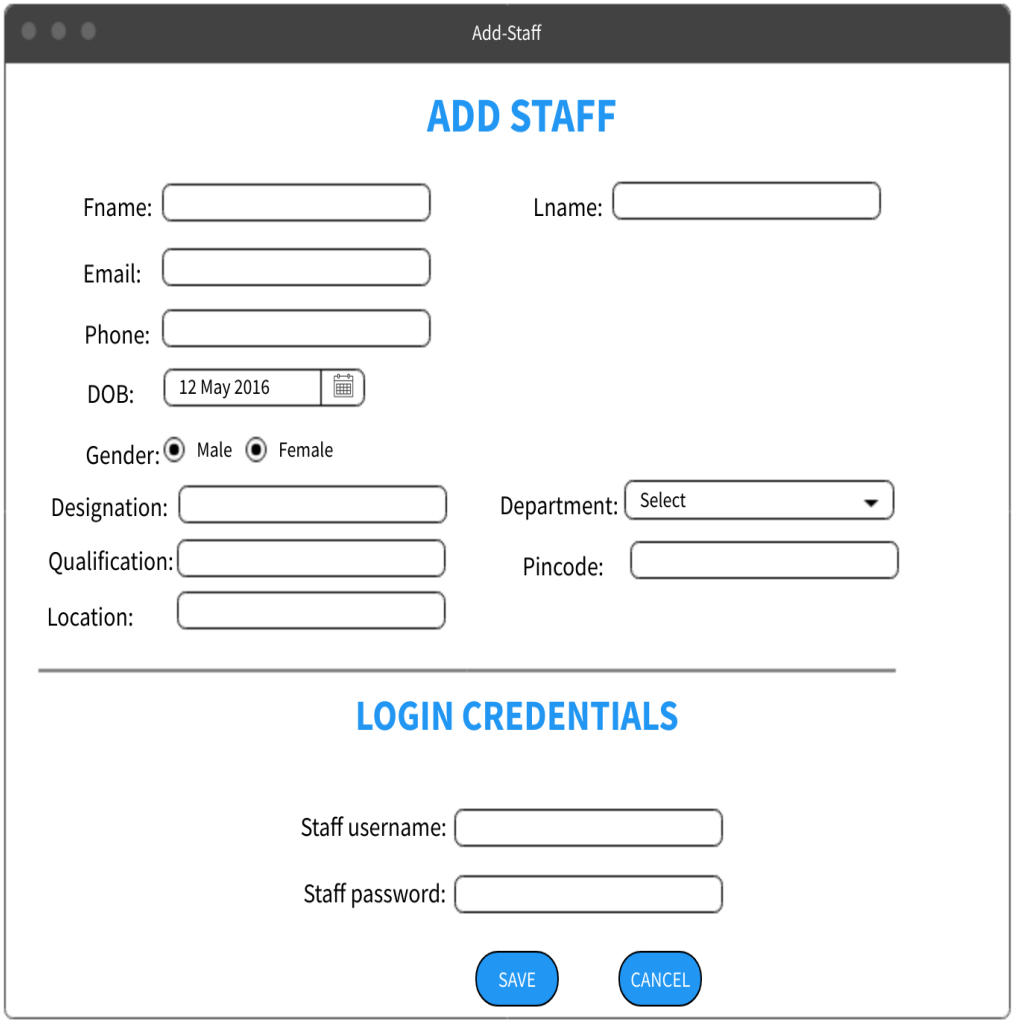



Figure 7.6: Add Staff Page

### 7.3.7 View Staff Page

The admin page provides a feature for administrators to access and view information about staff within the system. This functionality includes details such as patient names, contact information, and other pertinent data. By offering a centralized interface, administrators can efficiently oversee and manage the list of staff in the system, contributing to effective hms administration.

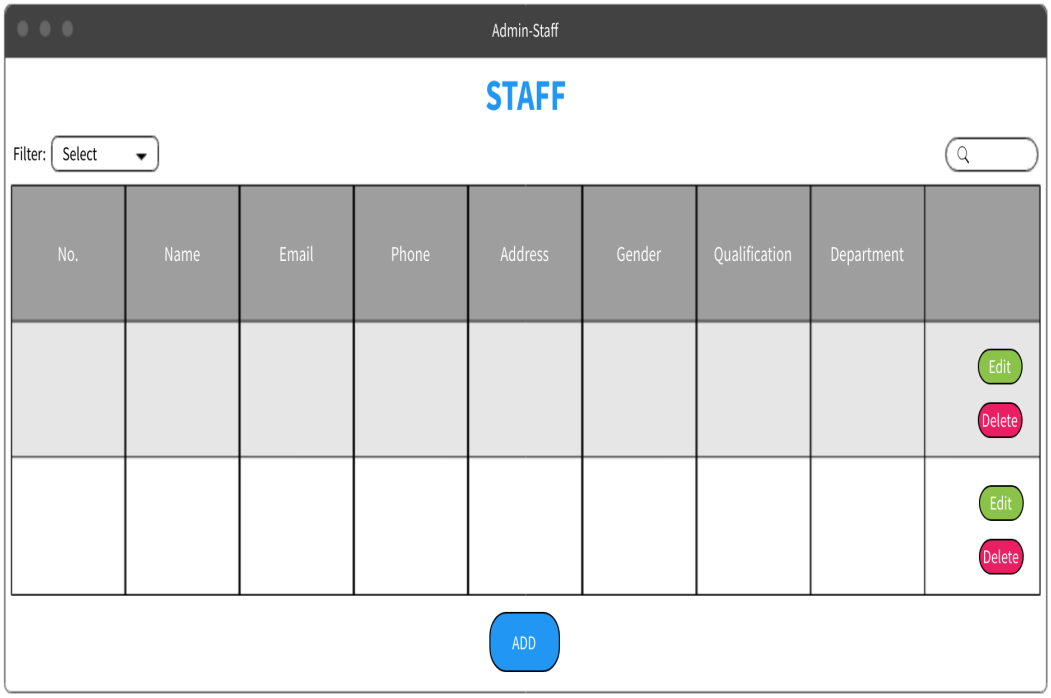



Figure 7.7: View Staff Page

### 7.3.8 Online and Offline Appointment page

The Appointment page facilitates the addition of bookings through a userfriendly interface. User can efficiently input appointment details, such as patient information, doctor selection, date, and time, streamlining the process of managing appointments within the hospital system..

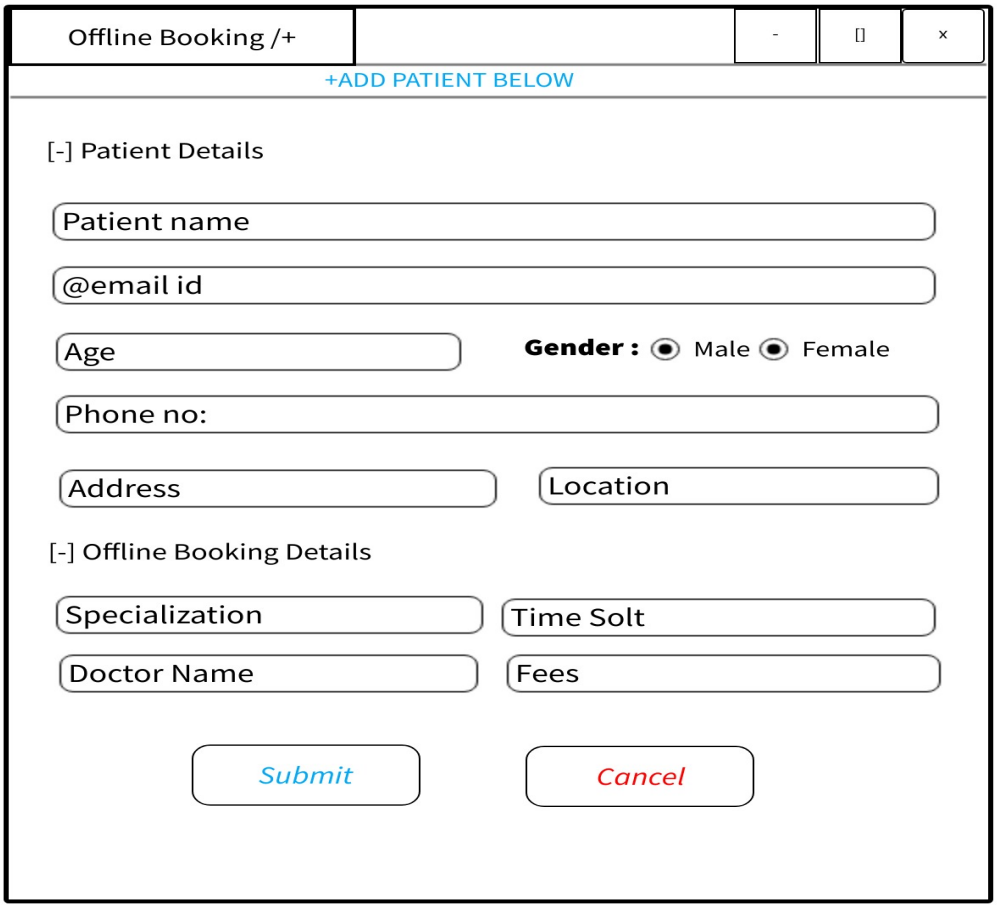



Figure 7.8: Appointment page

### 7.3.9 All Appointment

The hospital administrator page empowers administrators to effectively manage appointments within the system. This functionality includes the ability to view, edit, or cancel existing appointments, ensuring efficient coordination and organization of hms. Staff can utilize this page to oversee and optimize the appointment scheduling process for patients and doctors.

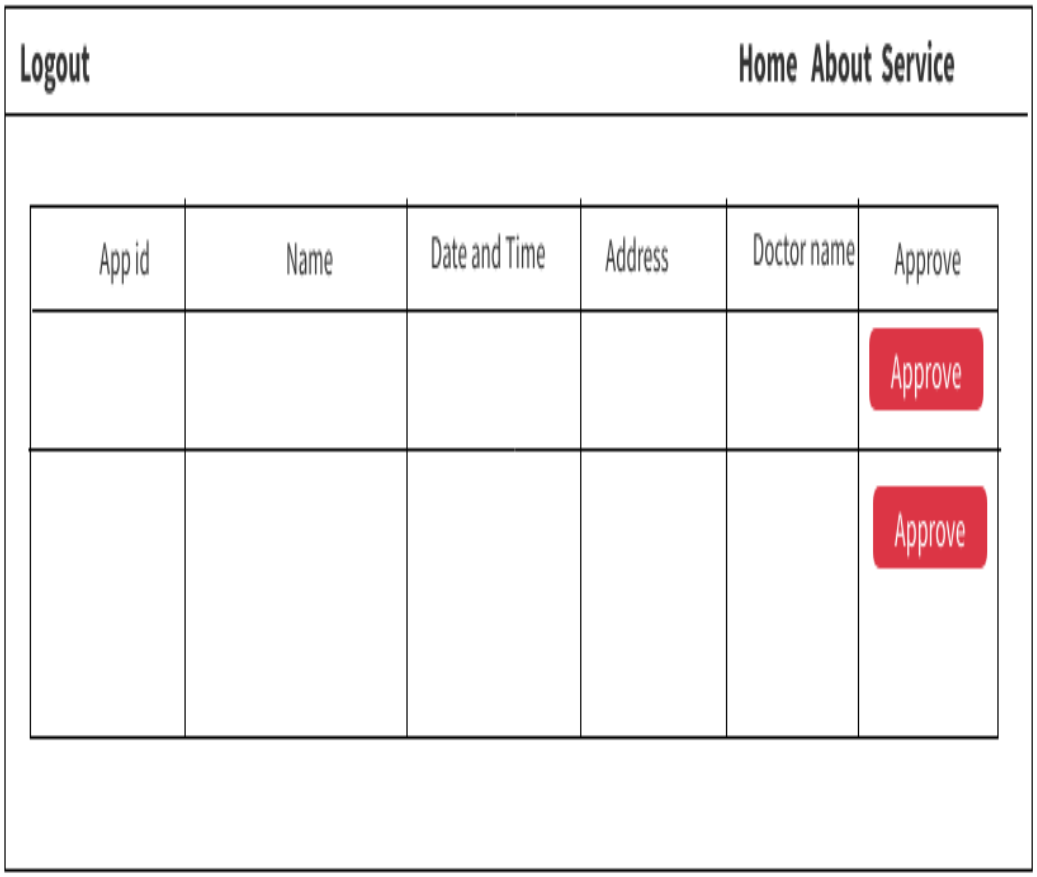



Figure 7.9: All Appointment

### 7.3.10 Doctor Prescription Page

The doctor page facilitates the addition of new Prescription to the system. Doctors can input essential details about a patient's current health status, diagnoses, prescribed medications, and other relevant information. This functionality ensures that the system maintains up-to-date and comprehensive records, allowing healthcare providers to deliver accurate and informed medical care..

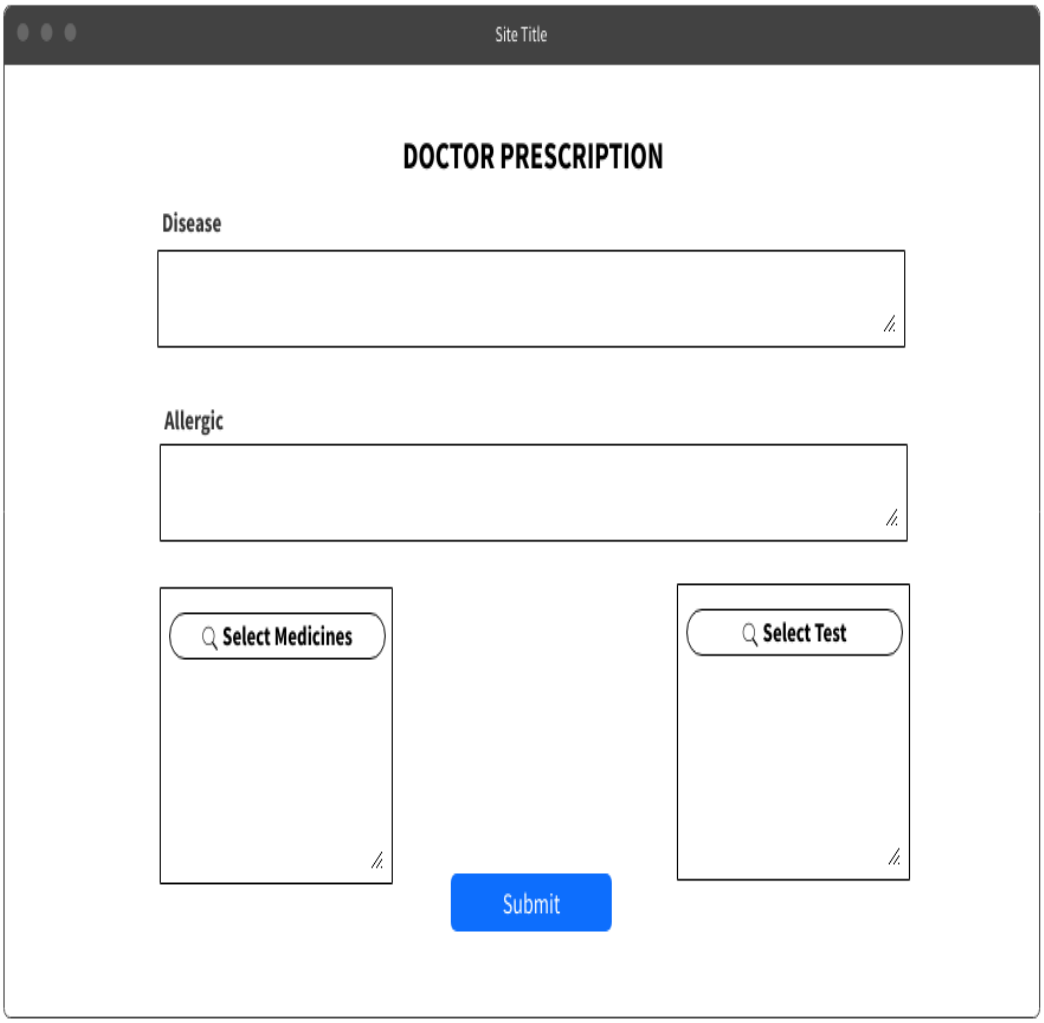



Figure 7.10: Doctor Prescription Page

### 7.3.11 Laboratory Login page

The laboratory login page serves as the gateway for authorized personnel, such as laboratory technicians and administrators, to access the hospital's laboratory information system (LIS) securely. It provides a secure authentication mechanism, ensuring that only authorized individuals can access sensitive patient data and perform laboratory-related tasks.


Figure 7.11: Login page

### 7.3.12 Laboratory Registration page

The laboratory registration page facilitates the registration process for new laboratories within the hospital's network. It serves as a centralized platform for laboratory administrators or managers to submit essential details and documentation required for registration.

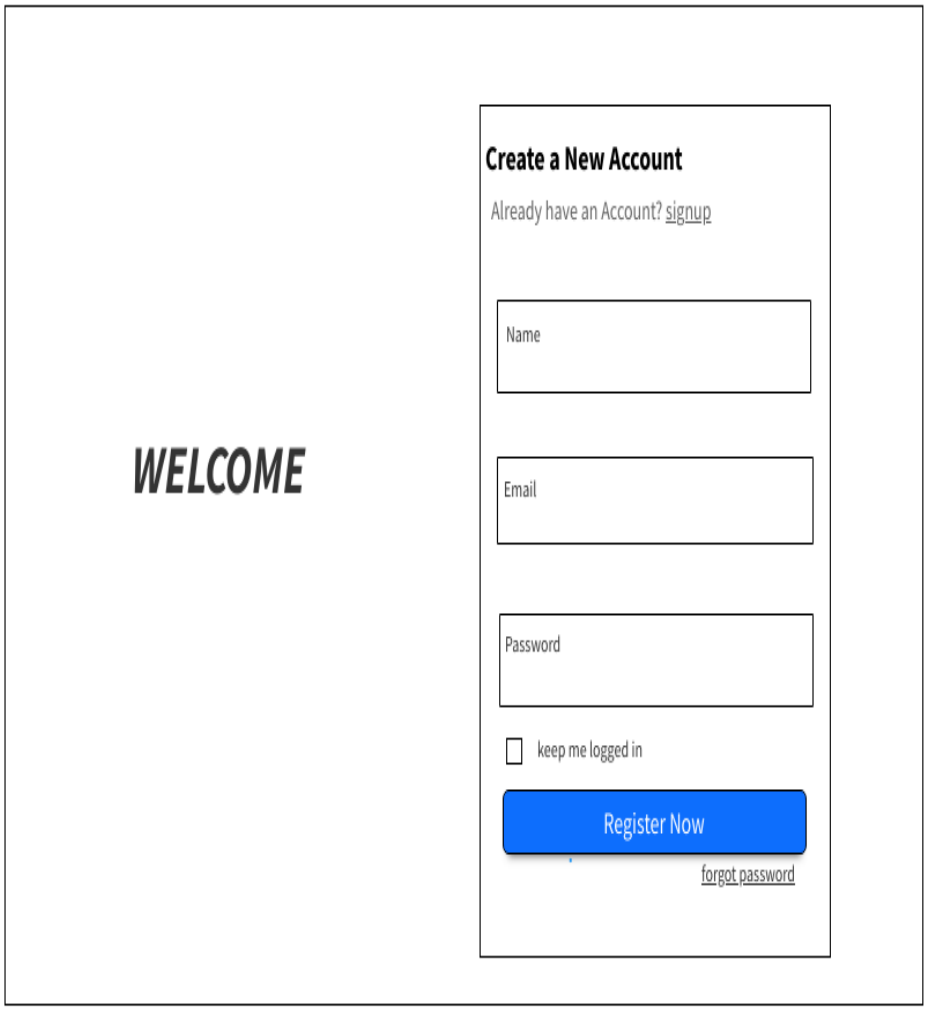



Figure 7.12: Registration page

### 7.3.13 Add Tests

The hospital administrator page empowers administrators to effortlessly incorporate new lab tests into the system. This feature facilitates the seamless addition of crucial information including test names, associated details such as categories and equipment requirements, and supplementary information such as testing methodologies. By providing a user-friendly interface and comprehensive input fields, the administrator page ensures efficient management and organization within the hospital's diagnostic services.

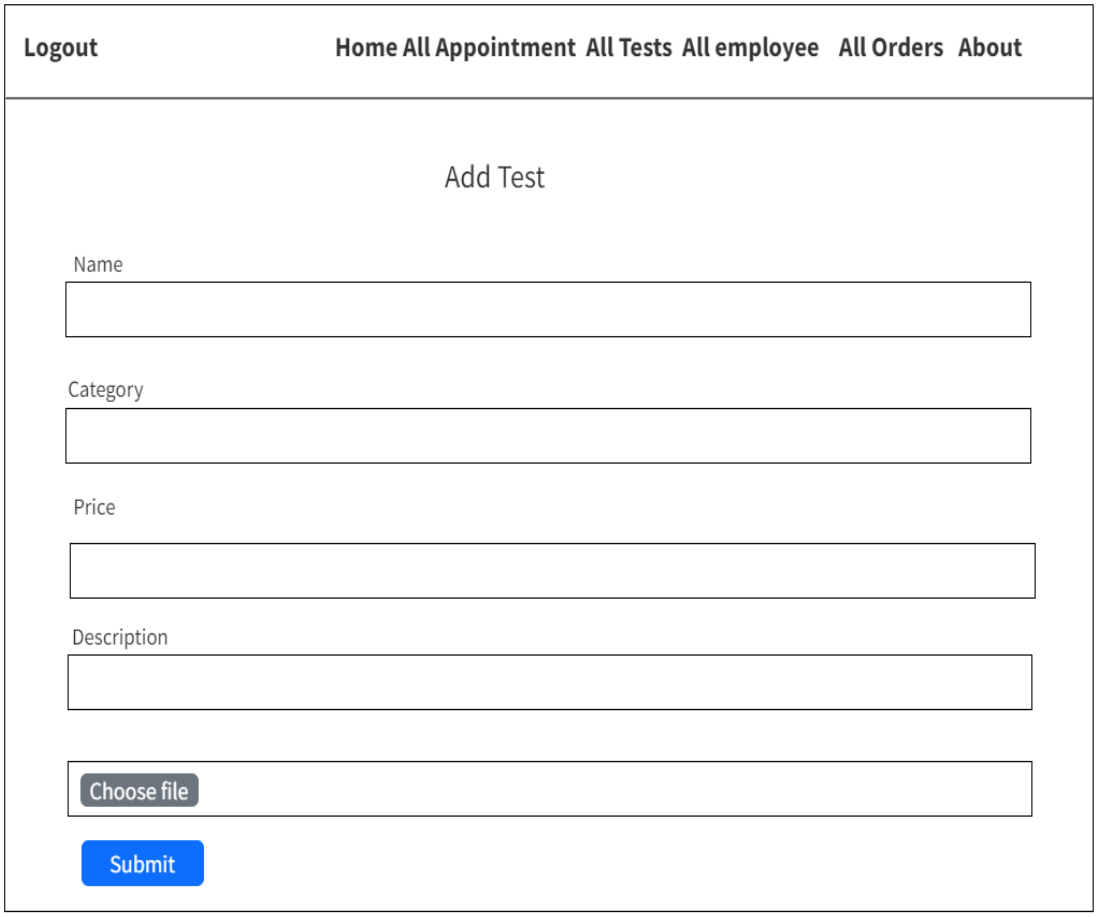



Figure 7.13: Add Tests

### 7.3.14 List of Available Tests

The Available Tests page offers a comprehensive inventory of all available medical tests within the hospital's diagnostic facilities. Patients and healthcare providers can browse through a diverse range of tests, including blood tests, imaging scans, pathology assessments, and specialized screenings.


Figure 7.14: All Tests

### 7.3.15 Appointment page

The hospital administrator page facilitates the addition of bookings through a user-friendly interface. Administrators can efficiently input appointment details, such as patient information, doctor prescribed test, date, and time, streamlining the process of managing appointments within the hospital system.

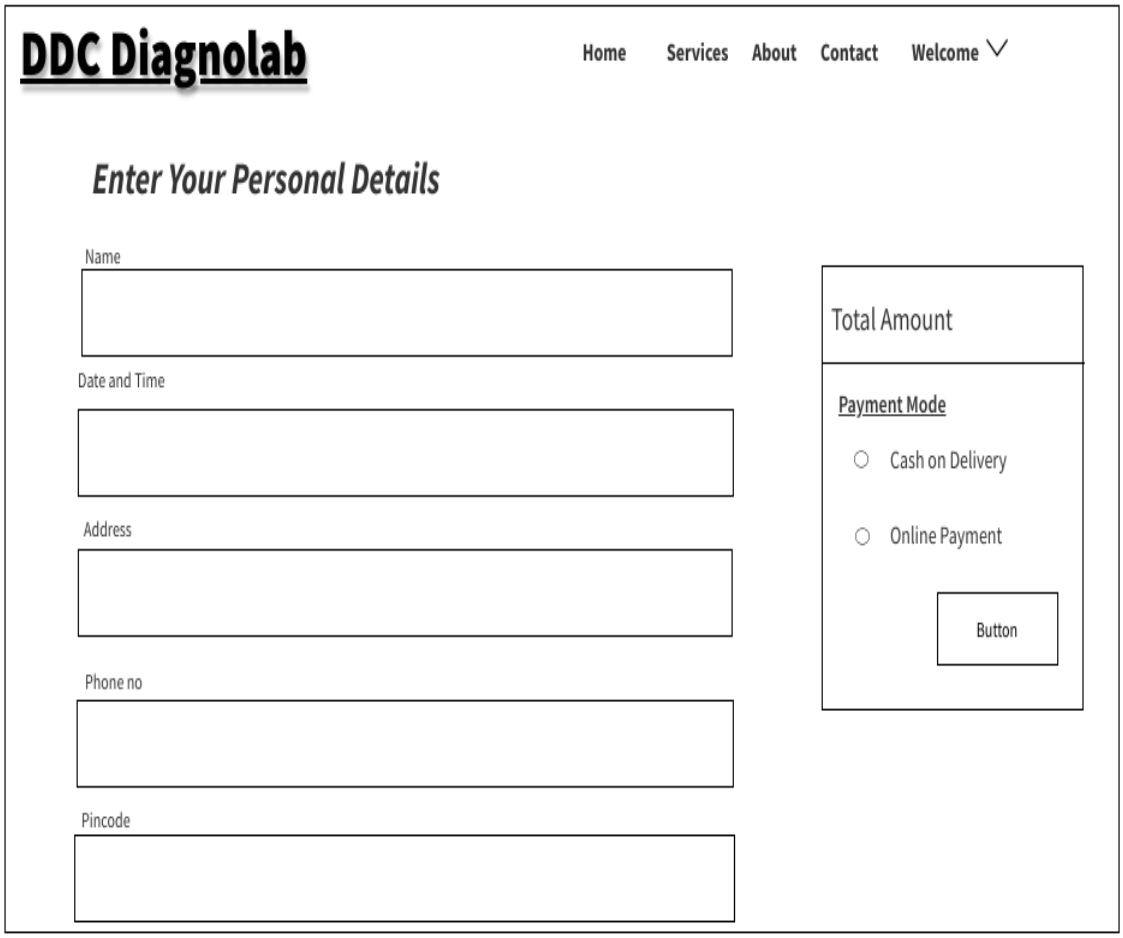



Figure 7.15: Appointment page

### 7.3.16 All Orders

The doctor page provides functionality for doctors to view their scheduled appointments. This feature allows doctors to access relevant details such as patient information and appointment time facilitating efficient management of their appointment schedule within the hospital system

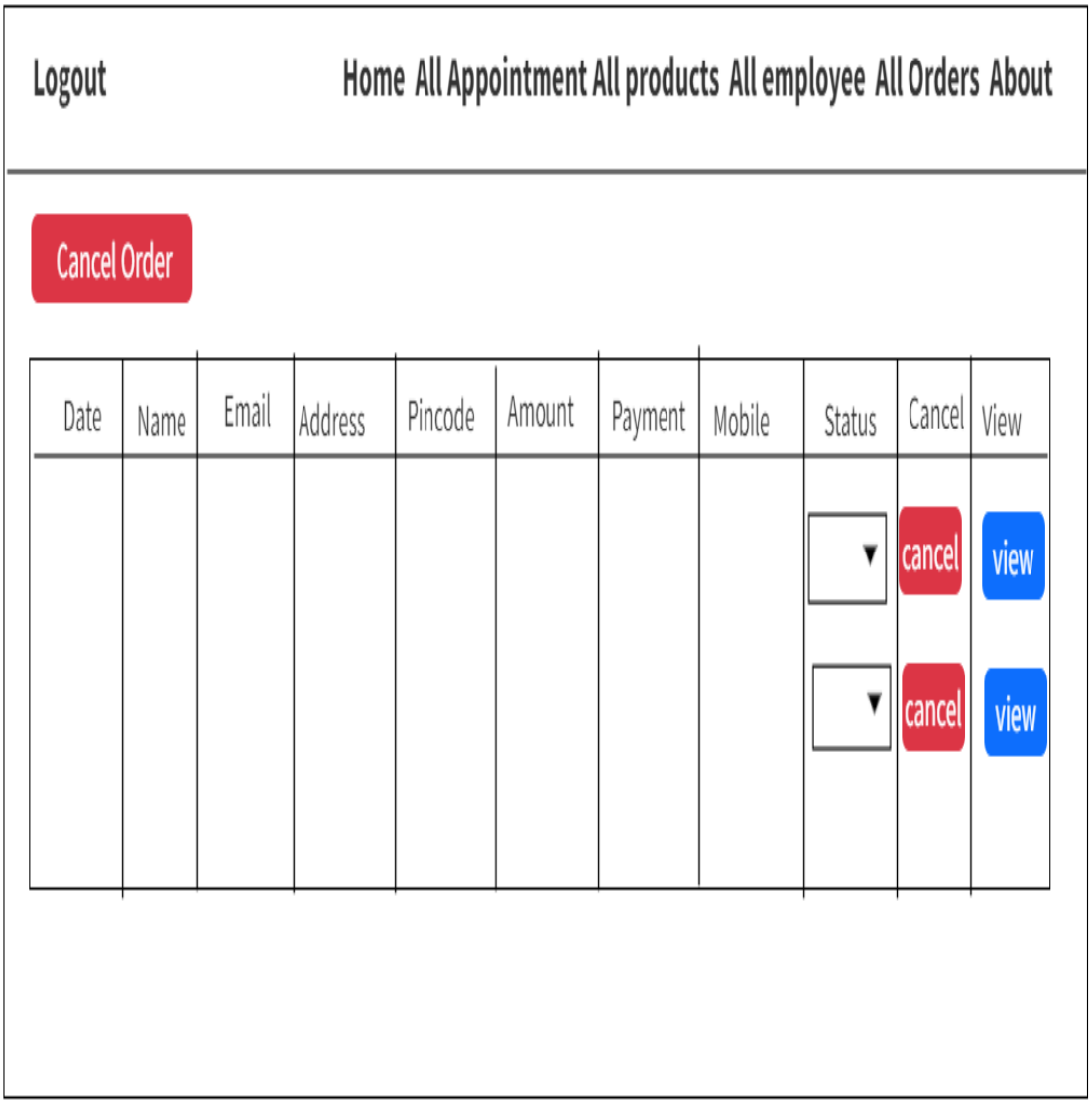



Figure 7.16: All Orders

### 7.3.17 Add Result

The Add Test Results functionality empowers authorized hospital employees to input and update test results into the hospital's digital system. This feature ensures timely and accurate recording of patient data, including diagnostic test outcomes, laboratory findings, and medical interpretations. Through a secure interface, employees can efficiently input test results, ensuring accessibility to healthcare providers for timely patient care decisions.

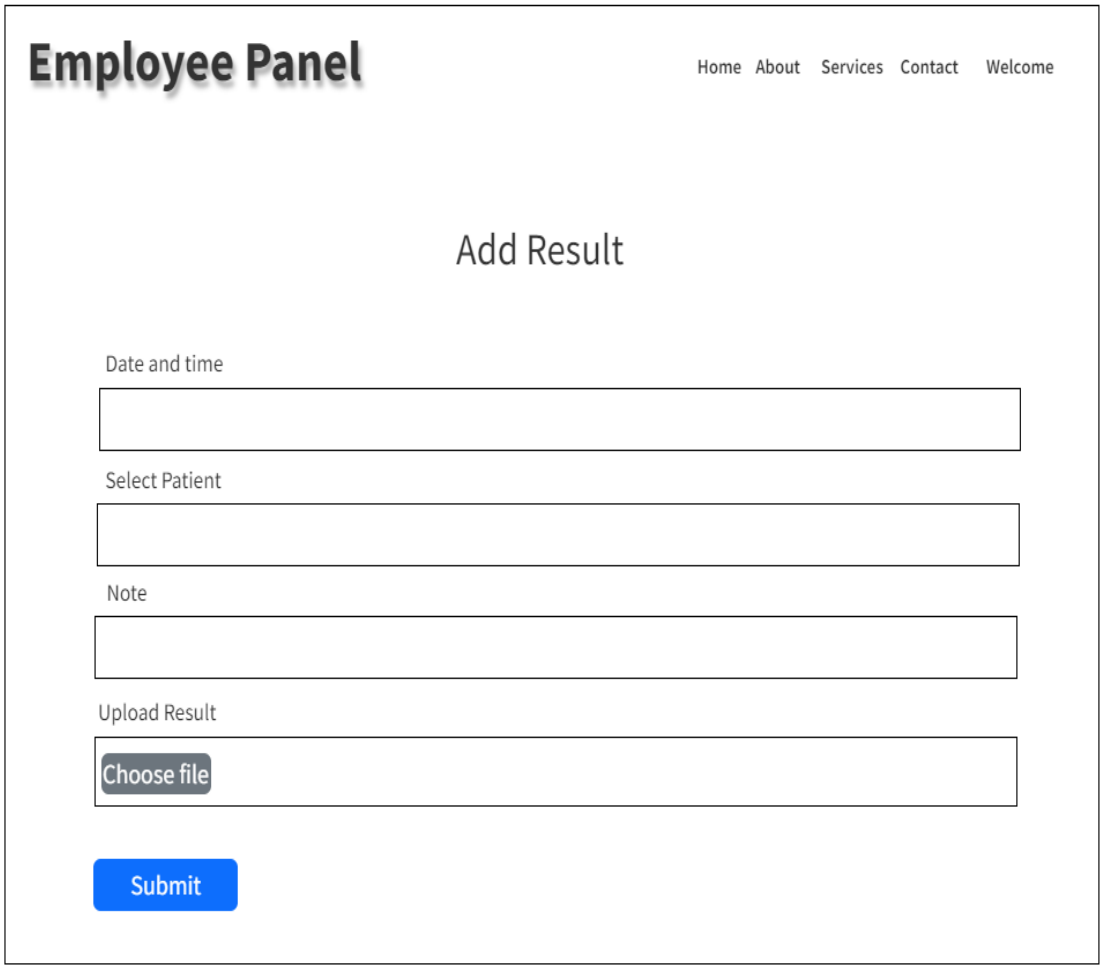



Figure 7.17: Add Result

### 7.3.18 Pharmacy Login Page

The pharmacy login page provides pharmacists and authorized personnel secure access to the hospital's pharmacy management system. It serves as the entry point for users to log in using unique credentials, ensuring confidentiality and data security.

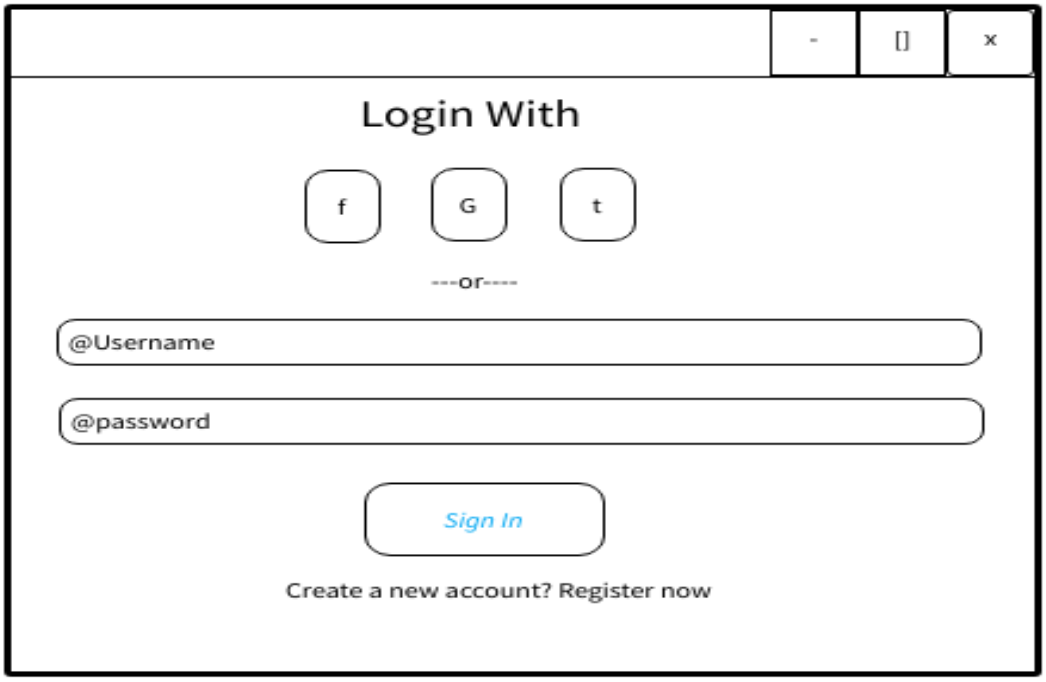



Figure 7.18: Login Page

### 7.3.19 Add Medicine Page

The hospital administrator page facilitates the smooth integration of new medicines into the system. This functionality empowers administrators to input vital details such as medicine names, associated information including drug categories and dosage guidelines, and supplementary data such as contraindications and side effects. By offering a user-friendly interface and comprehensive input fields, the administrator page ensures efficient management and organization within the hospital's pharmaceutical services.


Figure 7.19: Add Medicine Page

### 7.3.20 View Medicine Page

The User page provides a feature for administrators to access and view information about Medicine within the system. This functionality includes details such as patient names, contact information, and other pertinent data. By offering a centralized interface, administrators can efficiently oversee and manage the list of Medicine in the system, contributing to effective hms administration.


Figure 7.20: View Medicine Page

### 7.3.21 Pharmacist Prescription Page

The prescription addition feature enables pharmacists to input prescribed medications into the hospital's digital system. This functionality allows pharmacists to accurately record the details of each prescription, including the medication name, dosage, frequency, and duration. Pharmacists can also input any additional instructions provided by healthcare providers, such as special administration guidelines or potential interactions with other medications.

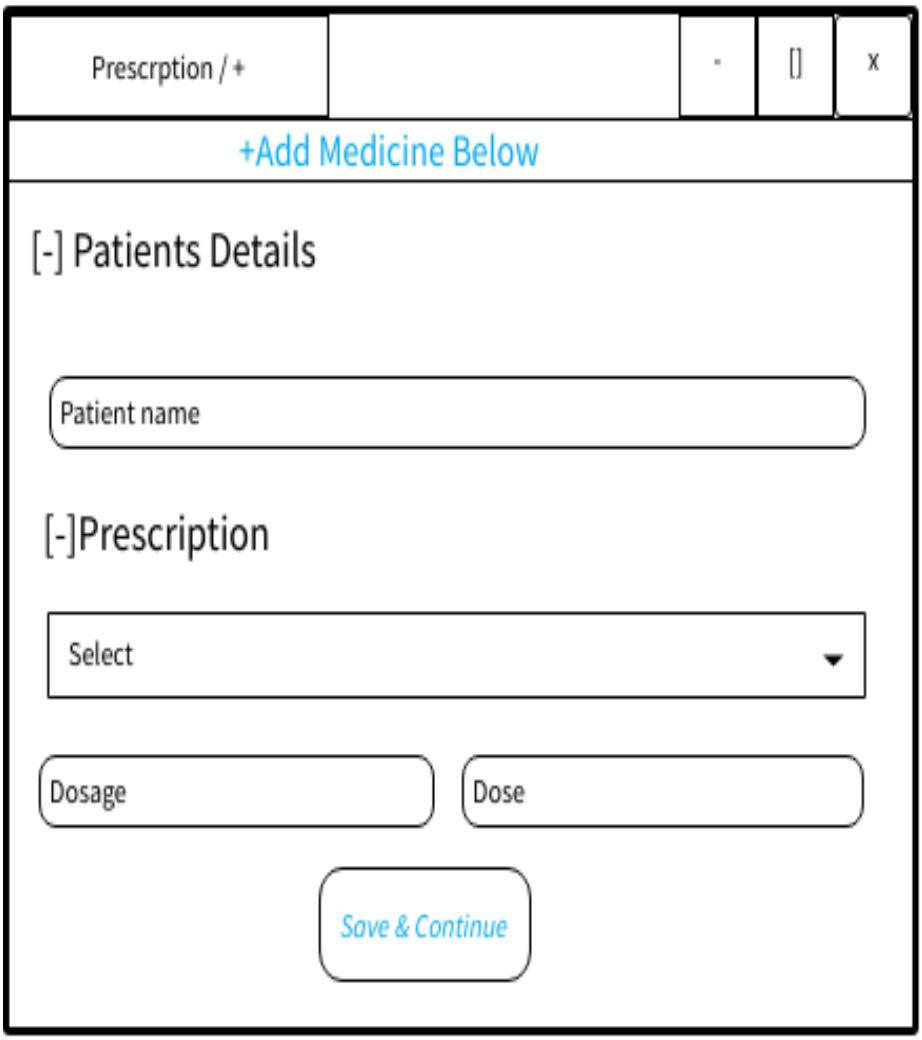



Figure 7.21: Pharmacist Prescription Page

### 7.3.22 Bill Page

The billing page serves as a central hub for managing financial transactions and patient billing within the hospital's digital platform. It provides comprehensive functionalities for generating, reviewing, and processing bills for healthcare services rendered to patients. Patients, administrative staff, and billing departments can access the billing page to view detailed breakdowns of charges, including medical procedures, medications, laboratory tests, and other associated costs.

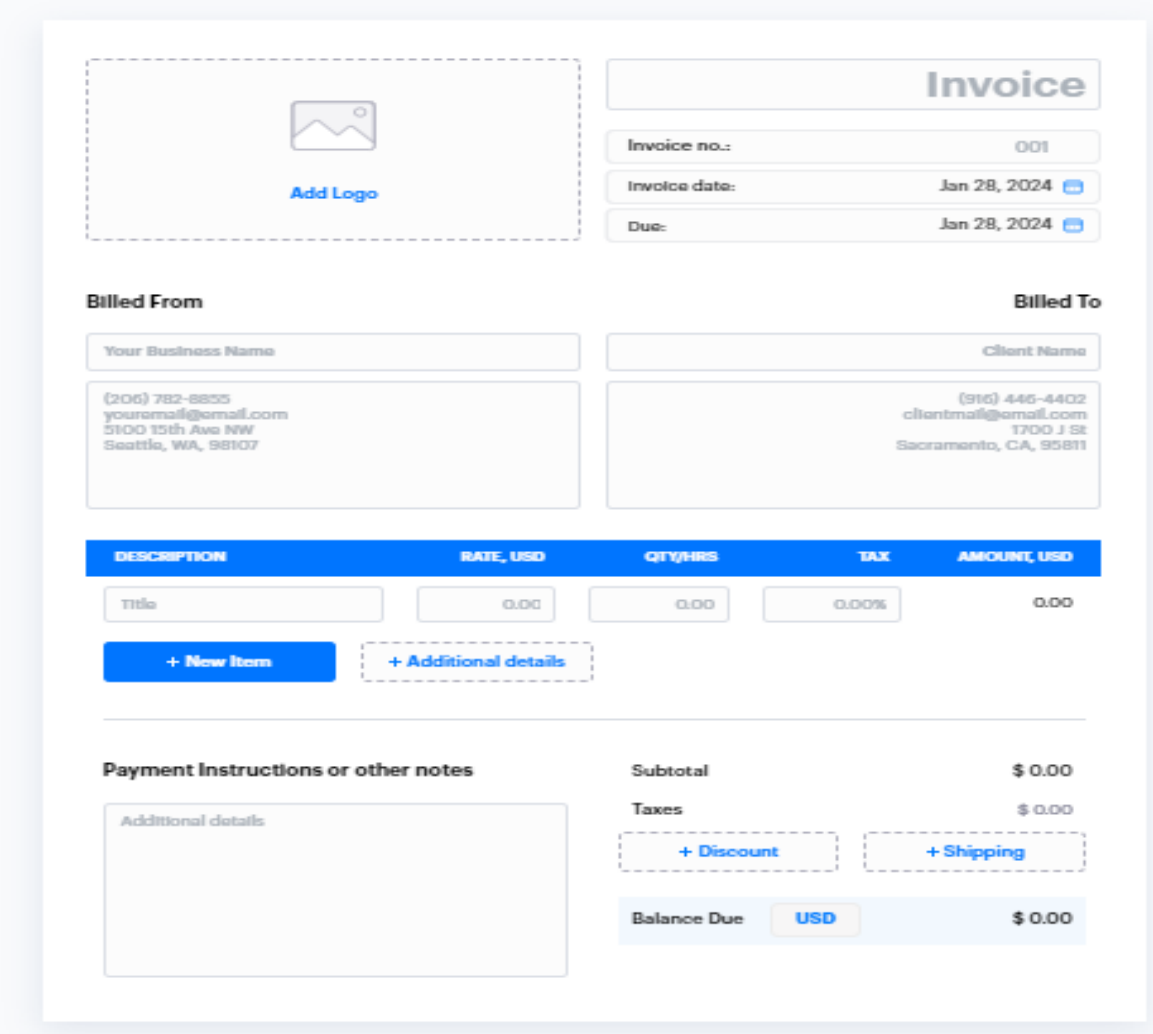
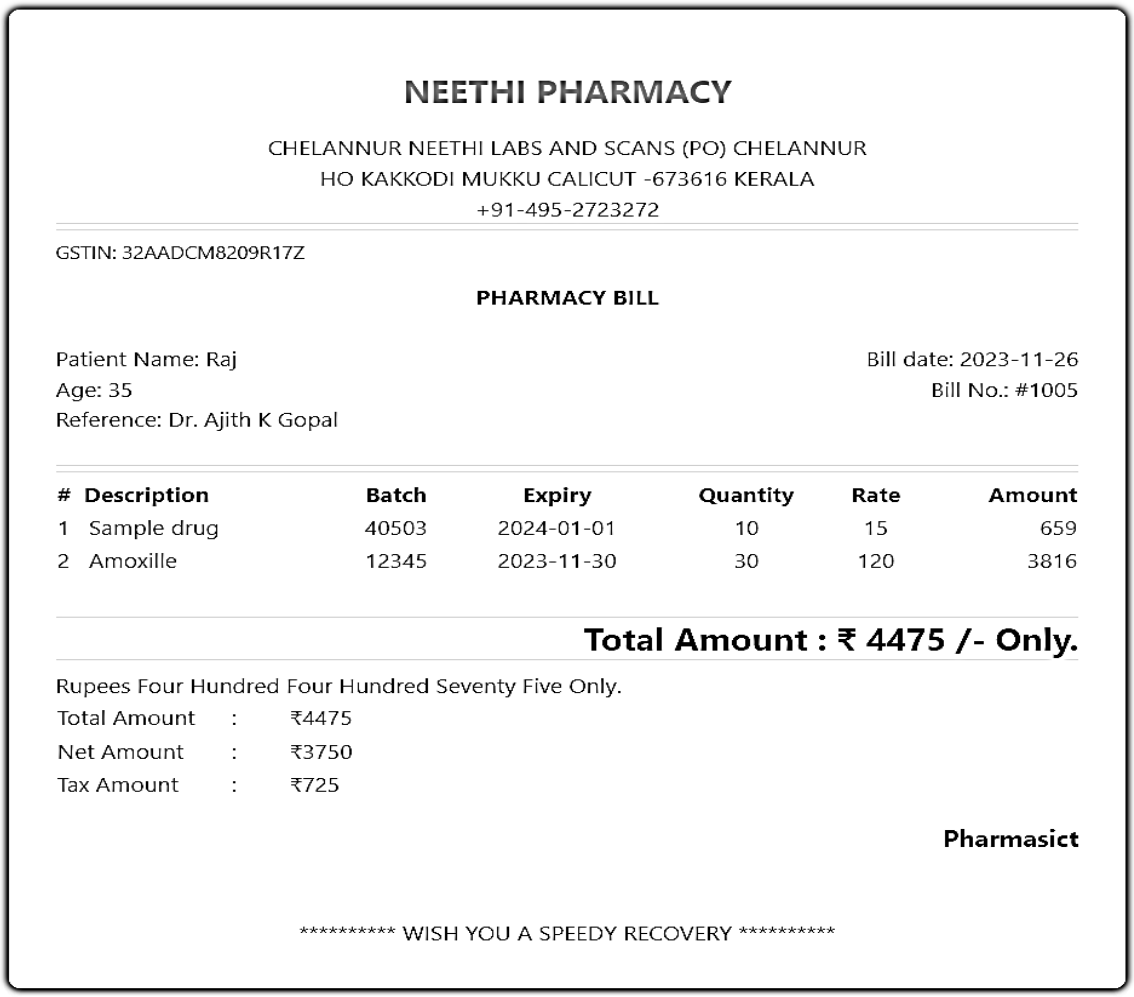



Figure 7.22: Add Bill Page

### 7.3.23 Receipt

The receipt generated by the hospital's billing system serves as a formal acknowledgment of payment for healthcare services rendered. It includes essential details such as the patient's name, date of service, itemized list of charges, payment amount, and payment method.



**NEETHI PHARMACY**

CHELANNUR NEETHI LABS AND SCANS (PO) CHELANNUR
HO KAKKODI MUKKU CALICUT -673616 KERALA
+91-495-2723272

GSTIN: 32AADCM8209R17Z

**PHARMACY BILL**

Patient Name: Raj
Age: 35
Reference: Dr. Ajith K Gopal

Bill date: 2023-11-26
Bill No.: #1005

| # | Description | Batch | Expiry | Quantity | Rate | Amount |
|---|---|---|---|---|---|---|
| 1 | Sample drug | 40503 | 2024-01-01 | 10 | 15 | 659 |
| 2 | Amoxille | 12345 | 2023-11-30 | 30 | 120 | 3816 |

**Total Amount : ₹ 4475 /- Only.**

Rupees Four Hundred Four Hundred Seventy Five Only.

Total Amount : ₹4475
Net Amount : ₹3750
Tax Amount : ₹725

**Pharmasict**

********** WISH YOU A SPEEDY RECOVERY **********

Figure 7.23: Receipt