



**INSTITUTE FOR ADVANCED COMPUTING AND
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“Parwah360”

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Submitted By:

Group No: 25

Roll No.	Name of Student
252050	Mahak Singhal
252105	Tina Baid

Mrs. Monika Sindhikar
Project Guide

Mr. Prashant Deshpande
Centre Coordinator

ABSTRACT

Parwah360 is a hospital management system designed to streamline and digitalize healthcare operations by offering an all-encompassing platform for managing patients, doctors, appointments, payments, and prescriptions. The term “**Parwah**” signifies care, and “**360**” implies completeness from all angles—together representing Care from All Angles.

This system enables seamless interaction between patients, doctors, and administrative users through a secure and scalable web-based interface. Patients can register, book appointments, access prescriptions, and make payments online. Doctors can manage their profiles, view appointments, and issue prescriptions. Administrators can oversee system-wide operations including managing doctors, specializations, and appointment statuses.

The backend is built using a microservices architecture, with Spring Boot and .NET handling services such as authentication, patient and doctor management, appointments, prescription, and payments. The system ensures data integrity and relational consistency via an optimized ER model, supporting real-time updates and secure transactions. Technologies like Hibernate ORM are used for database operations, and JWT-based security is implemented.

ACKNOWLEDGEMENT

I take this occasion to thank God, almighty for blessing us with his grace and taking our endeavor to a successful culmination. I extend my heartfelt thanks to our esteemed guide, Mrs. Monika Sindhikar for providing me with the right guidance and advice at the crucial juncture and showing me the right way. I sincerely thank our respected Centre Co Ordinator, Mr. Prashant Deshpande, for allowing us to use the available facilities. I would also like to thank the other faculty members at this occasion. Last but not least, I would like to thank my friends and family for the support and encouragement they have given me during our work.

Tina Baid (250241220206)

Mahak Singhal (250241220102)

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1. INTRODUCTION

In today's fast-paced healthcare environment, the need for a reliable, efficient, and secure hospital management system is more critical than ever. Manual record-keeping and scattered data often lead to delays, inefficiencies, and errors in patient care. To address these challenges, Parwah360 has been developed as a centralized digital platform that manages all core hospital operations—from patient registration to appointment booking, prescription handling, and payment processing.

Parwah360 stands for “**care from all angles**”, combining modern technology with healthcare needs to deliver a smooth, role-based experience for patients, doctors, and administrators. The system ensures that each user can perform their tasks efficiently through a web-based interface backed by a microservices architecture using Spring Boot and .NET. It offers robust database design with Hibernate ORM, secure authentication with JWT, and complete data flow tracking for optimized hospital workflows. With this system, hospitals can enhance service quality, reduce manual workloads, and deliver better care through automation

1. Patient Role

A patient in the Parwah360 system is a registered user seeking medical consultations and healthcare services. Patients can search for doctors, book appointments, make payments, and view prescriptions. Their primary goal is to access timely medical care, manage their health records, and communicate effectively with doctors.

❖ Responsibilities

- Profile Management

- Register as a patient and create a personal profile with details like name, age, gender, weight, and contact information.
- Update medical history, allergies, previous treatments, and other relevant health details.
- Change profile settings such as email, password, and contact details.

- Appointment Booking & Management

- Search for doctors by specialization, fees, availability, and location.
- Book appointments for a preferred date and time.
- Track appointment status (Pending, Accepted, Rejected).
- Cancel or reschedule appointments when needed.

- Payment & Billing

- Make secure payments for confirmed appointments through the integrated payment gateway.
- View and download payment receipts for completed transactions.

- Prescription & Medical Records

- View prescriptions uploaded by doctors after consultations.
- Download and store prescription documents for future use.

- Notifications & Updates

- Receive alerts about appointment confirmations, cancellations, and payment statuses.

- Get reminders for upcoming appointments and health checkups.
- Access Level:
 - Limited to personal appointments, payments, and prescriptions.
 - Cannot access or modify other patients' records or system settings.

2. Doctor Role

A doctor in the Parwah360 system is a registered medical professional who provides consultations, diagnoses, and treatment plans. Doctors manage their schedules, accept or reject appointments, and upload prescriptions. Their goal is to deliver accurate medical advice, maintain patient records, and provide quality healthcare services.

❖ Responsibilities

- Profile Management
 - Register as a doctor and create a professional profile with name, specialization, qualifications, experience, and consultation fee.
 - Upload a profile image and update personal or professional details when required.
- Appointment Handling
 - View appointment requests from patients.
 - Accept or reject appointments based on availability.
 - Update appointment details such as date, time, and status.
- Prescription Management
 - Upload prescriptions for patients after consultation.
 - Include details on diagnosis, medicines, dosages, and special instructions.
- Patient Records Access
 - View patient history to make informed medical decisions.
 - Maintain records of consultations and treatments provided.

- Notifications & Communication

- Receive notifications for new appointment requests.
- Communicate with patients regarding appointment changes or treatment instructions.

- Access Level:

- Full access to assigned patient appointments and related medical records.
- Cannot alter system configurations or access other doctors' patient records

1.1 Purpose

The purpose of Parwah360 is to provide a comprehensive and efficient hospital management platform that facilitates seamless interaction between patients, doctors, receptionists, and administrators.

The system aims to simplify and automate key hospital operations such as appointment booking, patient record management, payment processing, and prescription handling.

By integrating these processes into a single platform, Parwah360 ensures improved patient care, streamlined workflows for medical staff, and enhanced operational efficiency for hospital administration.

1.2 Scope

The scope of Parwah360 includes the design, development, and deployment of a full-stack, microservices-based hospital management system that provides user management for patients, doctors, receptionists, and admins with role-based access control; appointment management allowing patients to book appointments and doctors to accept, reject, or reschedule them; payment processing for confirmed appointments integrated with secure payment gateways; prescription management enabling doctors to upload and patients to download treatment prescriptions; specialization management for categorizing doctors based on their medical expertise; patient history and records to support accurate diagnosis and treatment planning; and secure authentication and authorization using JWT and role-based permissions to ensure data privacy. The system will be accessible via a web-based interface, developed using React for the frontend and Spring Boot/.NET microservices for the backend, ensuring scalability, modularity, and ease of maintenance, and is designed to serve small to large hospitals, clinics, and healthcare institutions looking to digitize and automate their operations.

1.3 Objective of Parwah360

The objectives of Parwah360 outline the key goals the system aims to achieve, guiding its design, development, and deployment. These objectives ensure that the platform meets the

needs of all stakeholders—patients, doctors, receptionists, and administrators—while enhancing hospital efficiency and patient care.

- Efficient Appointment Management
- Enable quick and hassle-free appointment booking, approval, and scheduling.
- Minimize double-booking and reduce patient waiting times.
- Streamlined Patient Record Management
- Maintain comprehensive medical histories, prescriptions, and treatment details for each patient.
- Provide doctors with easy access to relevant patient data during consultations.
- Secure and Convenient Payment Processing.
- Integrate with reliable payment gateways to ensure safe, transparent, and quick transactions.
- Generate and store payment receipts for record-keeping.
- Specialization-based Doctor Search.
- Allow patients to find doctors based on expertise, availability, and consultation fees.
- Effective Prescription Management.
- Enable doctors to upload prescriptions linked to specific appointments.
- Allow patients to download and store prescriptions for future reference.
- Role-based Access Control & Security.
- Implement robust authentication and authorization to protect sensitive data.
- Ensure each role has appropriate permissions to perform its responsibilities.
- Improved Communication Between Stakeholders.
- Facilitate secure and direct communication between patients and doctors.
- Provide timely notifications and reminders for appointments, payments, and prescriptions.
- Scalable and Maintainable Architecture.
- Use microservices to allow modular development, easy updates, and system scalability.

1.4 Functionalities Provided by Parwah360

1. User Management

- User Registration and Login:
- Patients, Doctors, Receptionists, and Admins can register and log in to the system.
- Secure authentication and authorization using JWT and role-based permissions.
- Profile Management:
- Users can update their personal details such as name, email, phone number, password, and profile image.
- Doctors can update professional details such as qualifications, specialization, and consultation fees.
- Role-Based Access Control:
- Admin can assign roles and permissions.
- Each role can access only the functionalities relevant to its responsibilities.

2.Appointment Management

- Patients can search for doctors based on specialization, availability, and fees.
- Patients can book appointments for preferred dates and times.
- Doctors can accept, reject, or reschedule appointments.
- Receptionists can schedule and manage appointments for walk-in patients.
- Appointment status tracking (Pending, Accepted, Rejected) Sales Management.

3. Payment Management

- Secure payment processing for confirmed appointments via integrated payment gateway.
- Payment status updates linked to specific appointments.
- Downloadable payment receipts for patient records.
- Admin can view and manage payment history.

4. Prescription Management

- Doctors can upload prescriptions linked to completed appointments.
- Prescriptions can include diagnosis, medication, and dosage details.
- Patients can view and download prescriptions for future use.

5. Specialization Management

- Admin can add, update, or delete medical specializations.
- Doctors can be assigned to one or more specializations.
- Patients can search doctors based on specialization.

6. Patient Records Management

- Doctors can view a patient's medical history for better diagnosis.
- Centralized record of consultations, treatments, and prescriptions.
- Secure storage of patient data to comply with privacy regulations.

7. Notifications and Alerts

- Automatic notifications for appointment confirmations, cancellations, and payment updates.
- Reminders for upcoming appointments.
- Alerts for new prescriptions uploaded by doctors.

8. Security and Access Control

- Secure login and token-based authentication using JWT.
- Data encryption for sensitive patient and payment information.
- Session management to prevent unauthorized access.

2. SOFTWARE REQUIREMENT SPECIFICATION

The functional requirements for Inventory Sell-Mart outline the specific features and capabilities that the system must provide to meet the needs of its users. These requirements are essential for guiding the development process and ensuring that the final product aligns with the business objectives.

2.1 Functional Requirements for Inventory Sell-Mart

1. User Management

- User Registration:
 - The system shall allow Patients, Doctors, Receptionists, and Admins to create accounts by providing personal and/or professional details.
 - User Authentication:
 - The system shall authenticate users using JWT tokens for secure login.
- Role-Based Access Control:
 - The system shall provide different permissions for Admin, Doctor, Patient, and Receptionist roles.
- Profile Management:
 - Users shall be able to view and update their profiles, including personal details and passwords.

2. Appointment Management

- Search and Booking:

- Patients shall be able to search for doctors by specialization, fees, and availability.
- Patients shall be able to book appointments for preferred dates and times.
- Approval and Status Updates:
 - Doctors shall be able to accept, reject, or reschedule appointments.
 - Receptionists shall be able to schedule and update appointments.
- Tracking:
 - Patients shall be able to view appointment status (Pending, Accepted, Rejected).

3. Payment Management

- The system shall integrate with a secure payment gateway for processing appointment fees.
- Payment status shall be linked to the appointment record.
- Patients shall be able to download payment receipts.
- Admin shall have access to all payment records.

4. Prescription Management

- Doctors shall be able to upload prescriptions for completed appointments.
- Prescriptions shall include diagnosis, medication details, and dosage instructions.
- Patients shall be able to download and store prescriptions.

5. Specialization Management

- Admin shall be able to add, update, and delete specializations.
- Doctors shall be linked to one or more specializations.

- Patients shall be able to search for doctors by specialization.

6. Patient Records Management

- The system shall maintain complete medical records for each patient.
- Doctors shall have access to patient history during consultations.

7. Notifications

- The system shall send notifications for appointment status changes, payment confirmations, and new prescriptions.
- Patients shall receive reminders for upcoming appointments.

8. Security

- The system shall enforce secure authentication and authorization for all users.
- Sensitive information shall be encrypted to ensure data privacy.

2.2 Non-Functional Requirements for Parwah360

1. Performance

- The system shall respond to user requests within 2 seconds under normal load.
- The system shall support at least 500 concurrent users.

2. Reliability

- The system shall have an uptime of at least 99.5% per year.
- The system shall handle unexpected failures without losing critical data.

3. Usability

- The system shall have a user-friendly, intuitive interface.
- The platform shall be responsive and accessible on desktop and mobile devices.

4. Scalability

- The system architecture shall support adding more modules or microservices without affecting existing functionality.
-

5. Maintainability

- The codebase shall follow modular design principles for easier updates.
- All APIs shall be documented for developer reference.

6. Security

- The system shall use HTTPS for secure communication.
- JWT tokens shall be used for session management.
- Passwords shall be stored using hashing algorithms (e.g., BCrypt).

• **Other Requirements:**

Hardware and Network Interfaces:

Back-end Server Configuration:

- Intel Pentium-IV Processor
- 8 GB RAM

Front-end Client Configuration:

- AMD Ryzen 5 Processor
- 128 MB SDRAM
- 10 GB Hard Disk Drive
- 104 Keys Keyboard
- PS/2 Mouse with pad

Software Interfaces:

Software configuration for back-end Services:

- .NET 8 Framework
- ASP.NET Core Web API (Microservices Architecture)
- Entity Framework Core (ORM)
- Razorpay Payment Gateway Integration
- MySQL Database
- Visual Studio 2022 / JetBrains Rider

Software configuration for front-end Services:

- ReactJS, Redux
- HTML, CSS, JavaScript
- Bootstrap
- Visual Studio Code

3. DIAGRAMS

3.1 Entity Relationship Diagram:

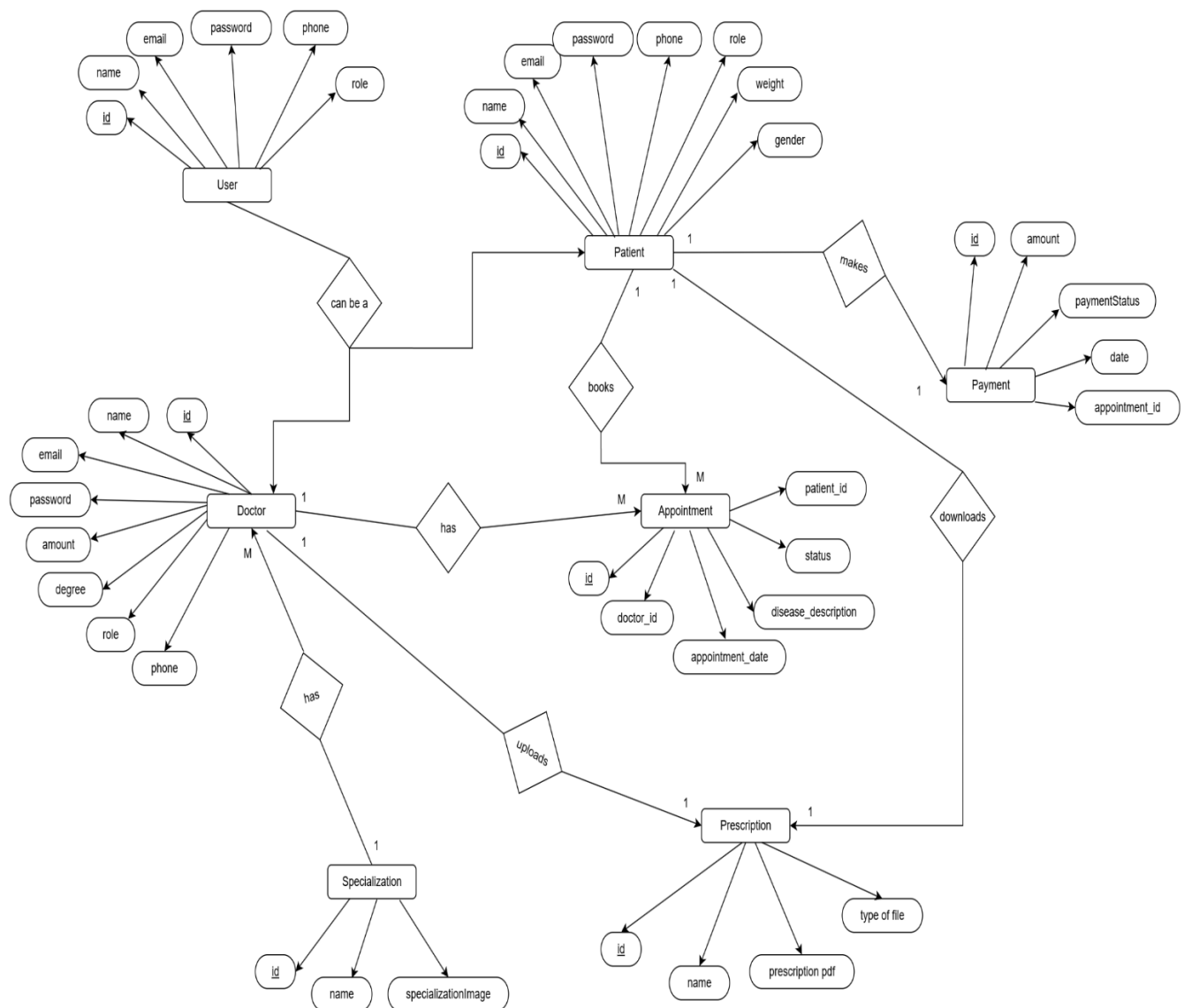


Fig. ER Diagram for Inventory Sell-Mart

3.2 Use Case Diagram:

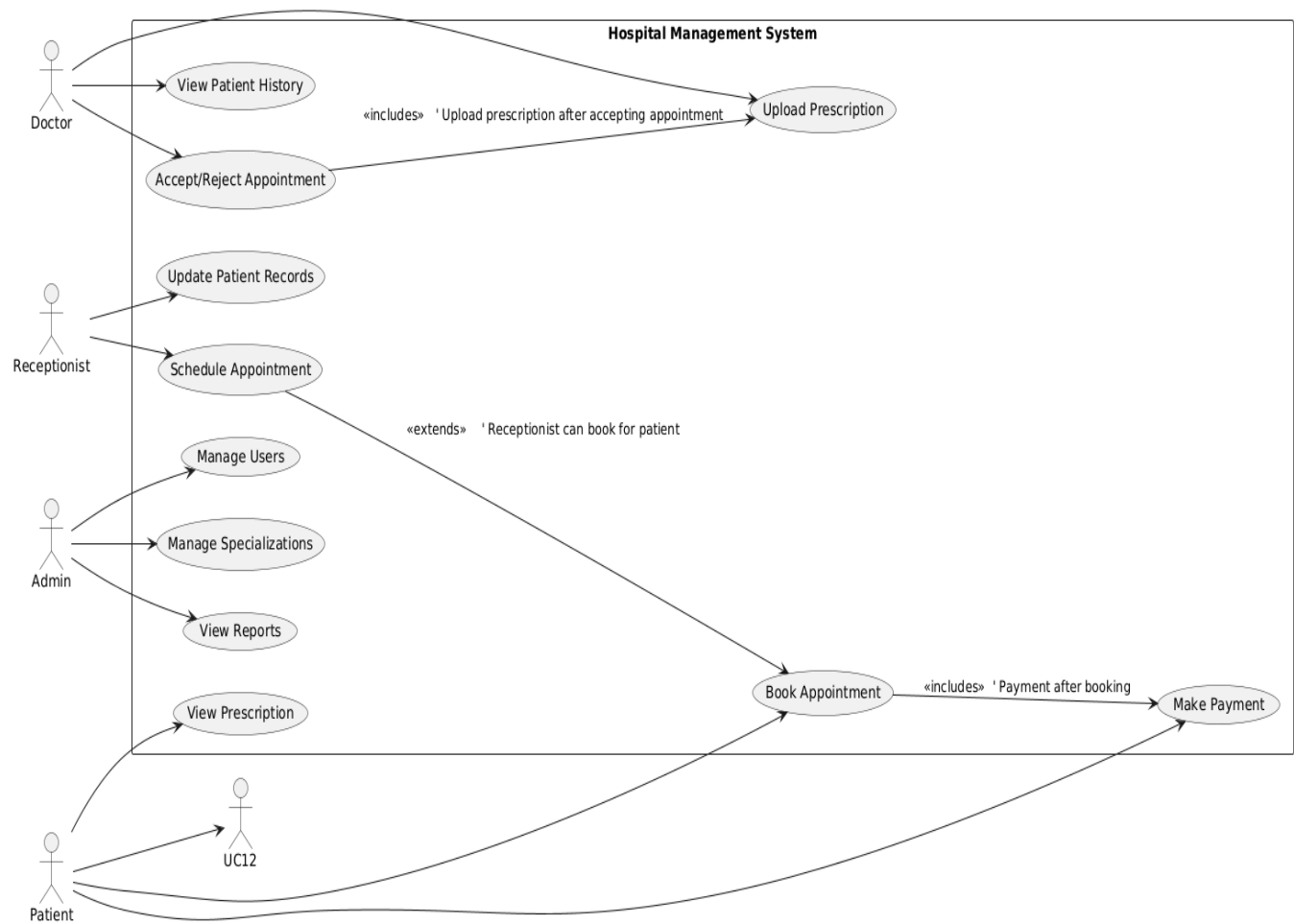
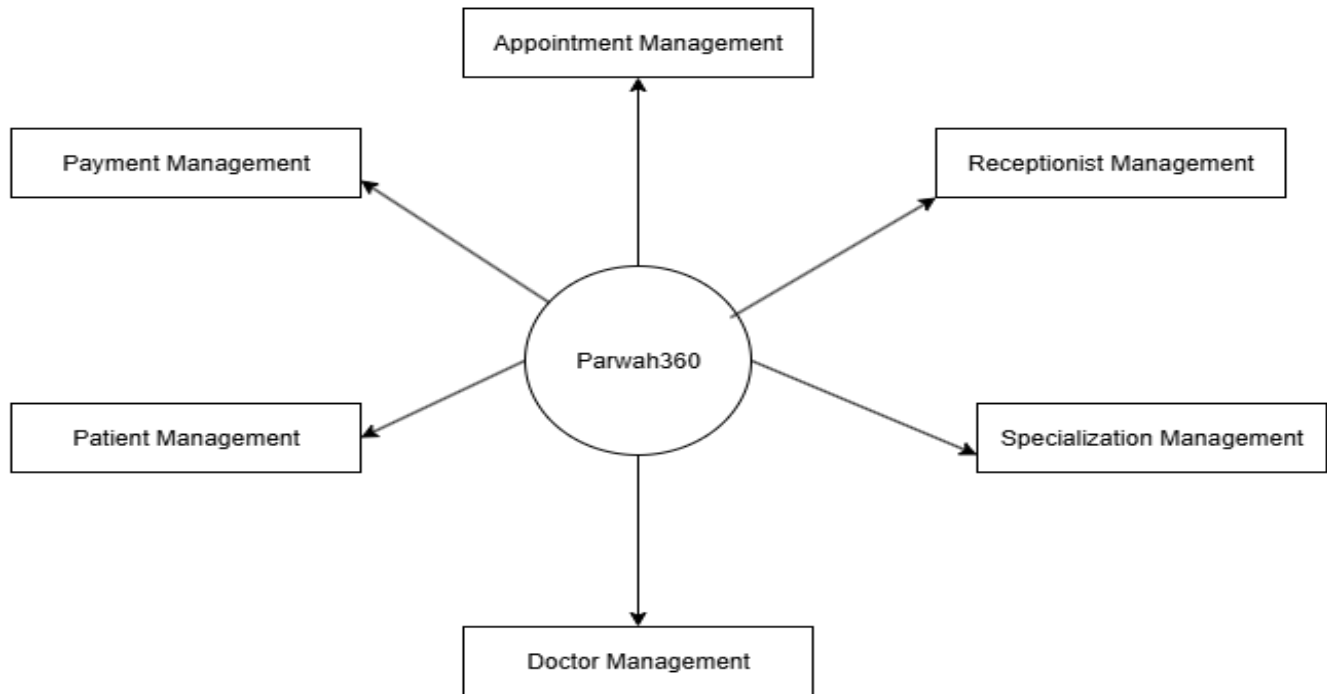


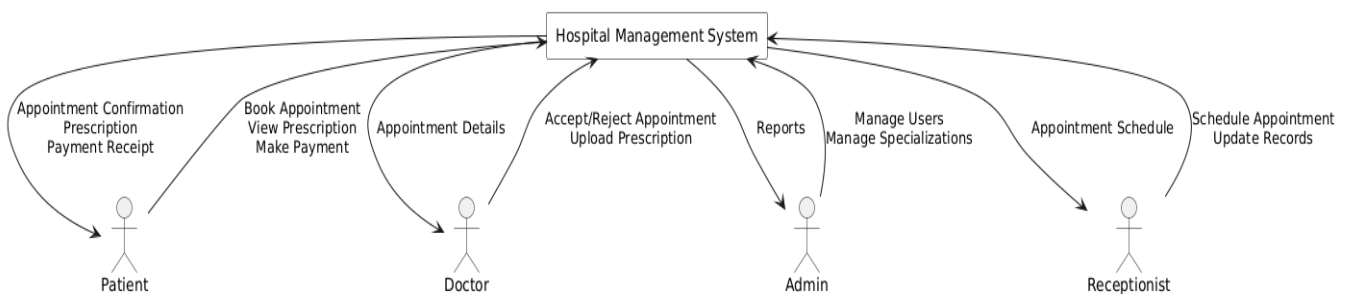
Fig. Use Case Diagram for Inventory Sell-Mart

3.3 Data Flow Diagram:

DFD Level 0:

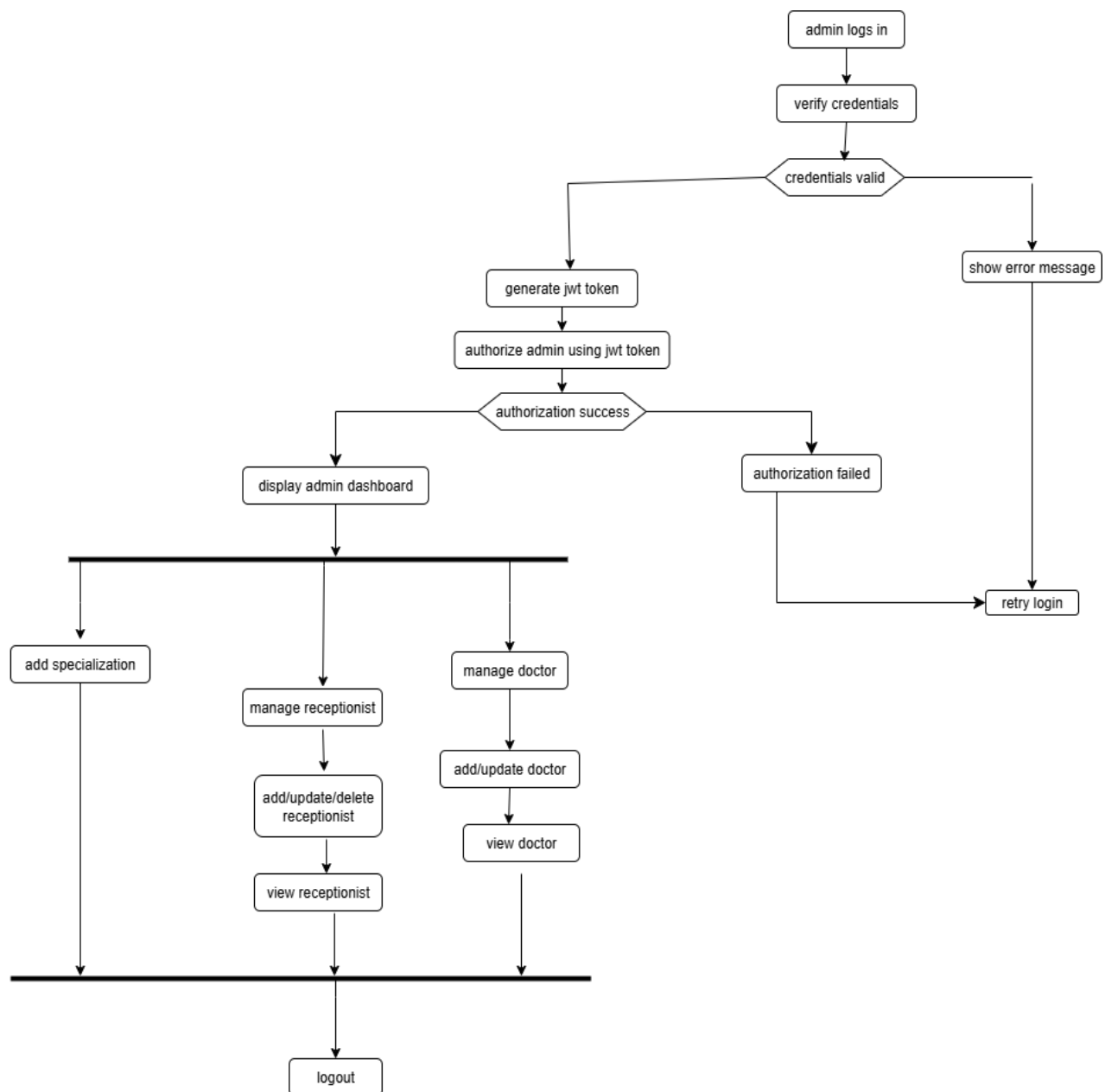


DFD level 1 :

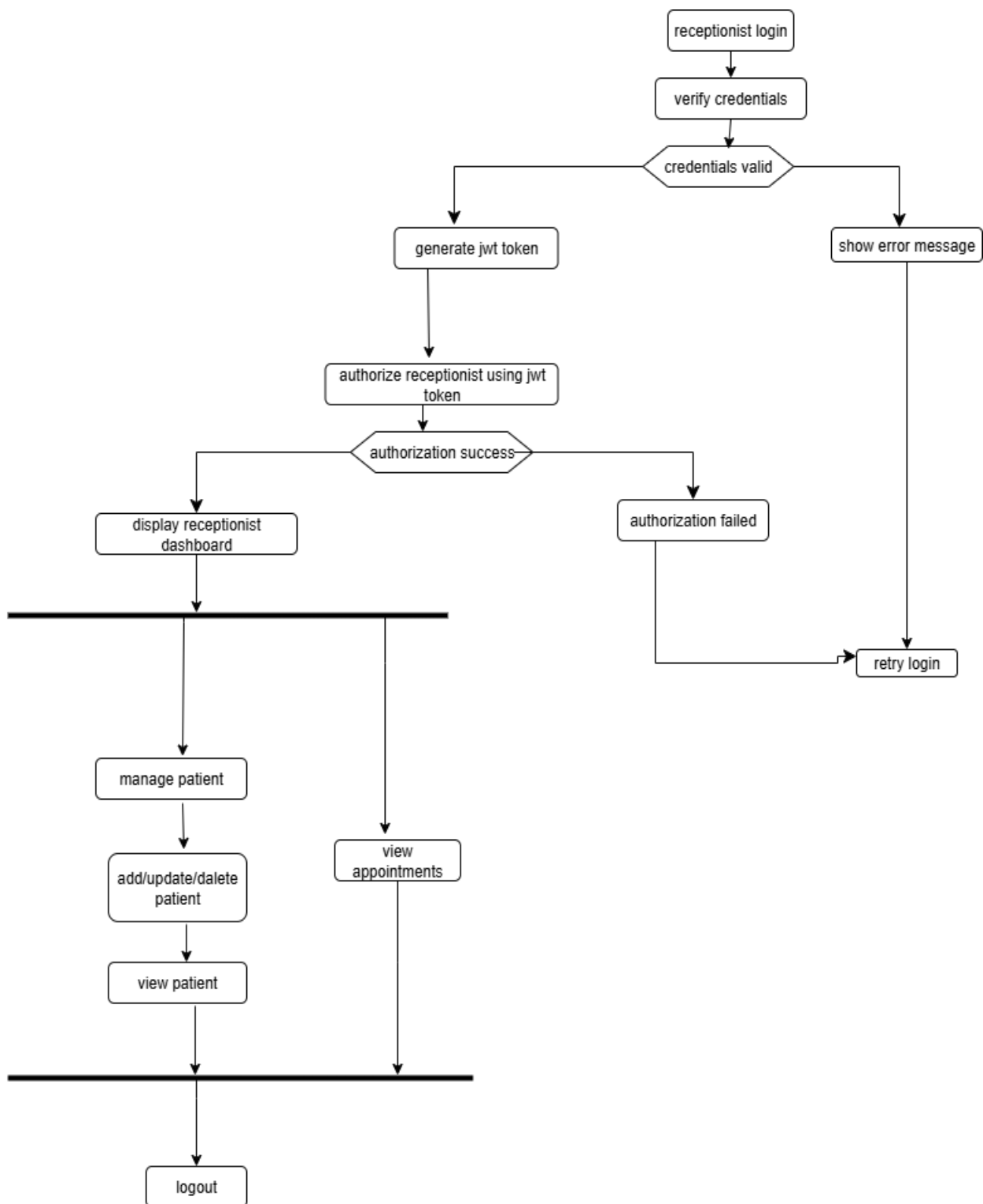


3.4 Activity Diagram :

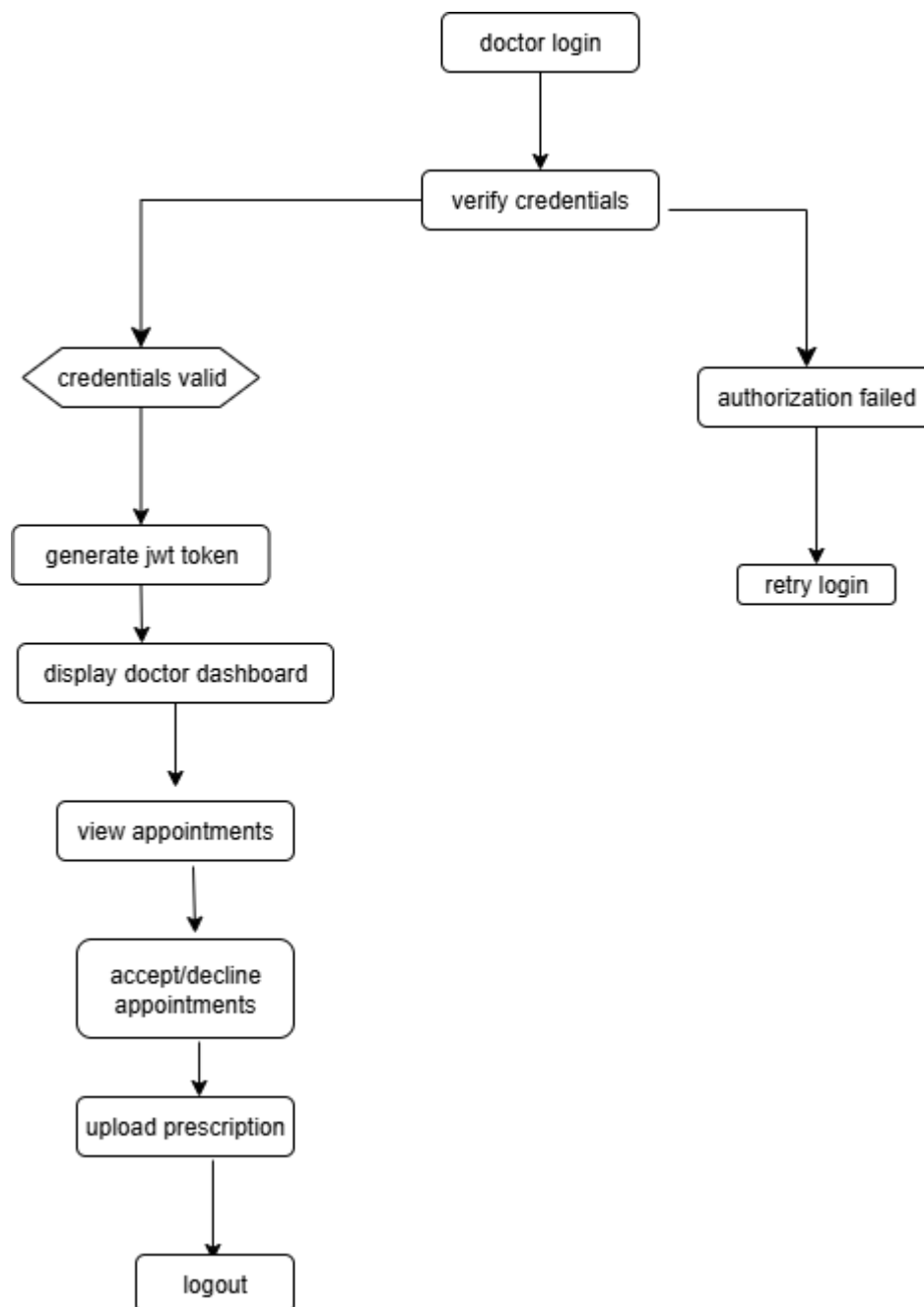
1. Admin Activity Diagram



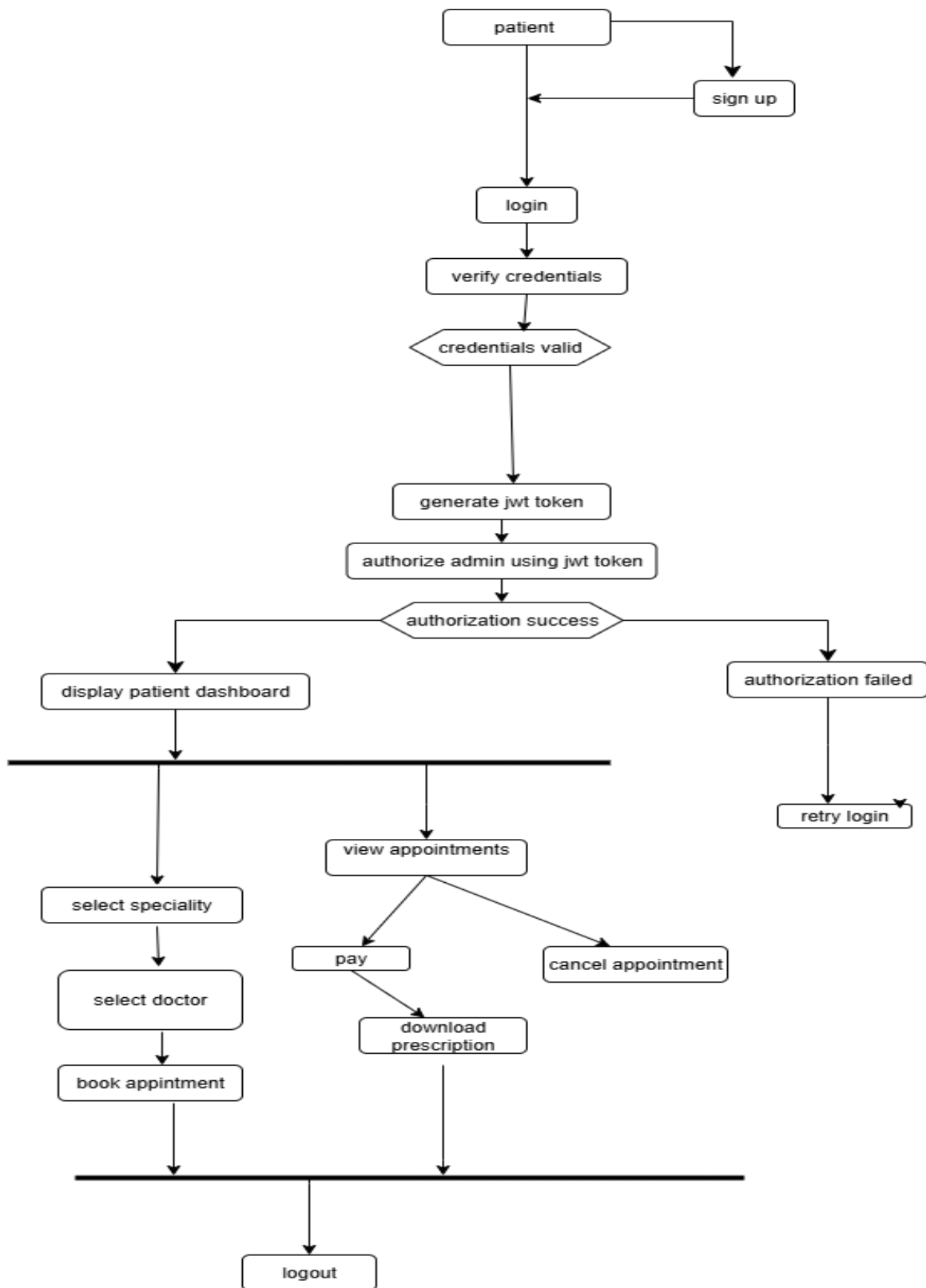
2. Receptionist Activity Diagram:



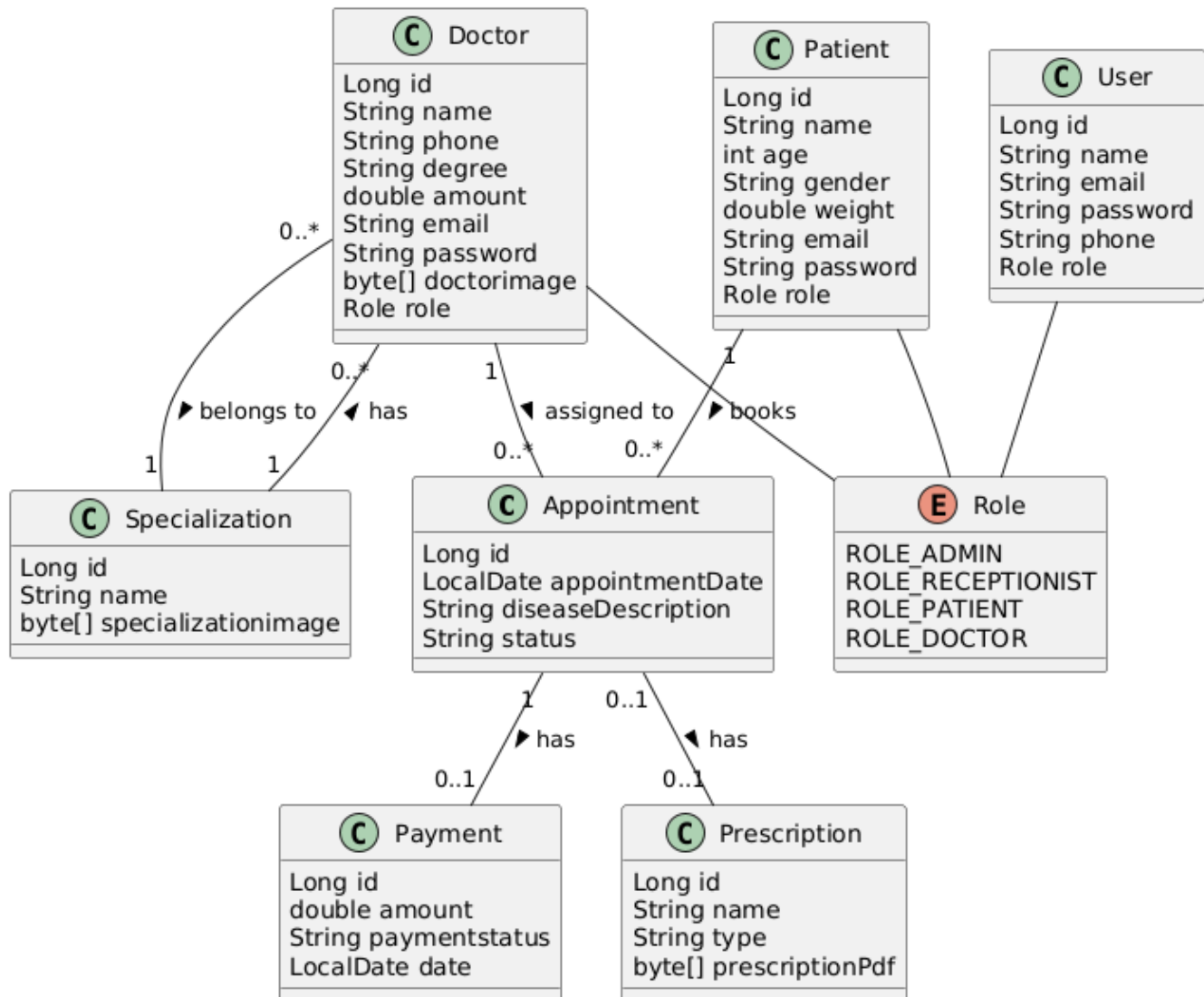
3. Doctor Activity Diagram



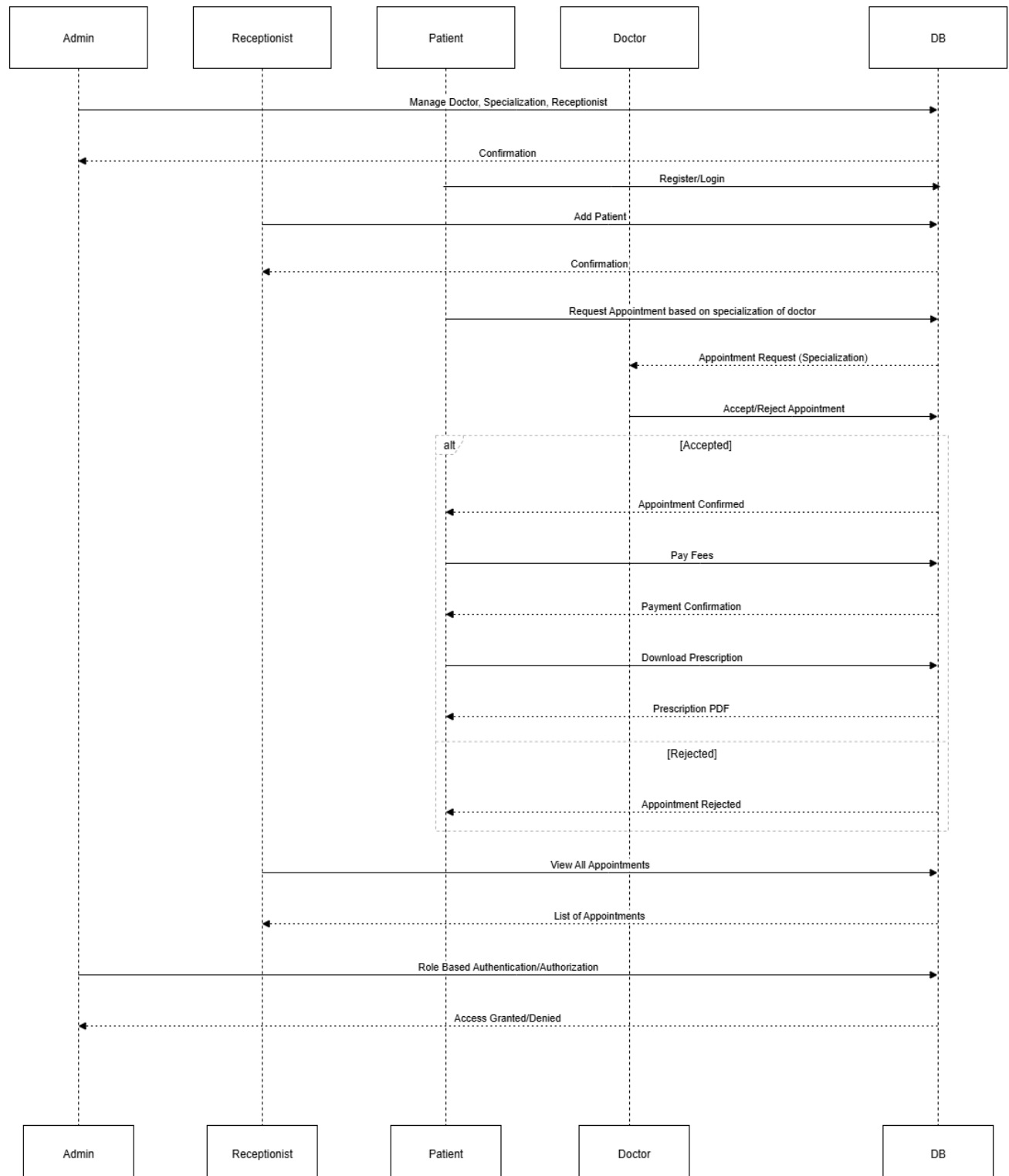
4.patient Activity Diagram



3.5 Class Diagram:

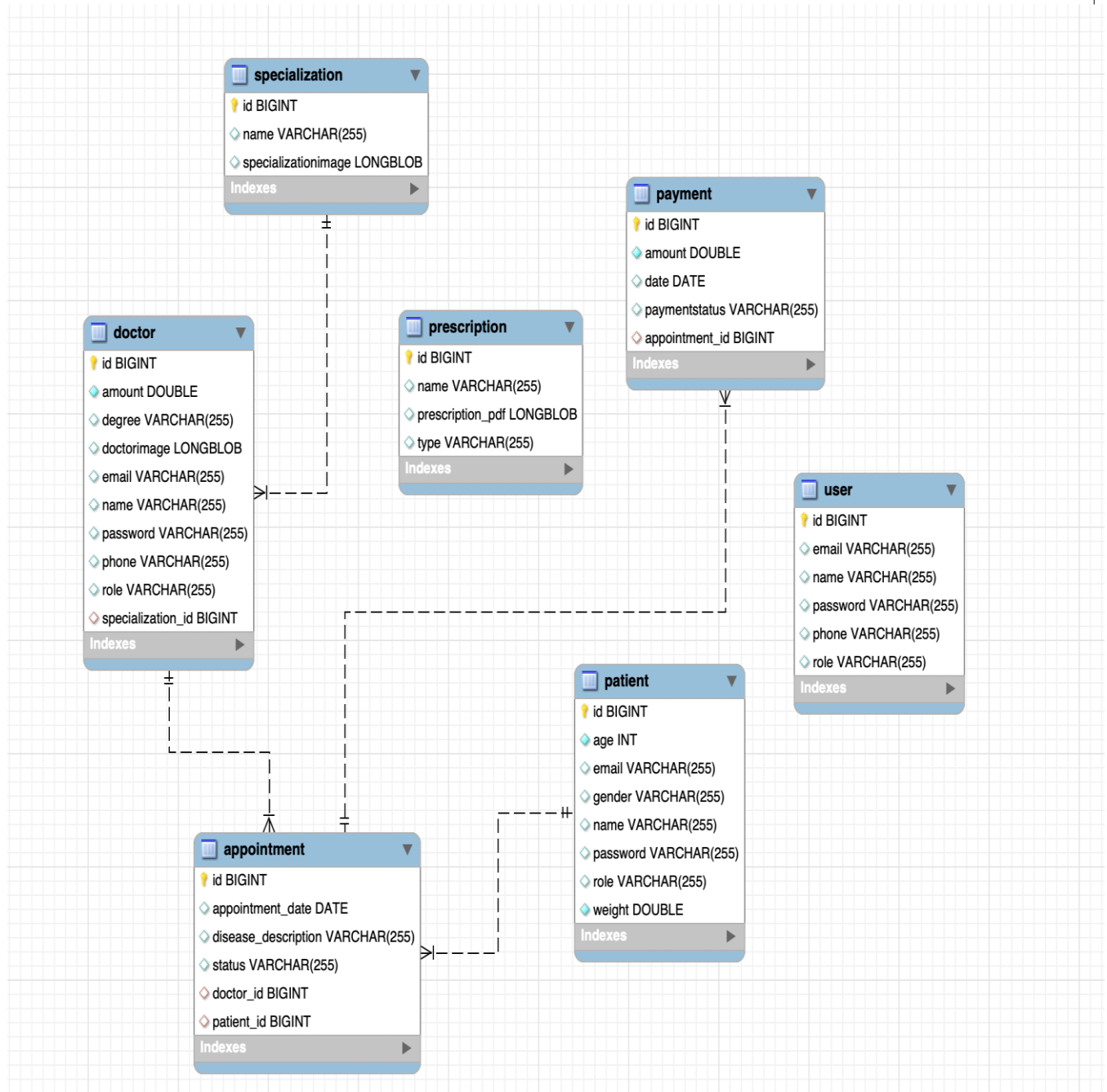


3.6 Sequence Diagram



4. DATABASE DESIGN

4.1 Design:



4.2 Tables:

The following table structures depict the database design.

```
mysql> desc appointment;
```

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	auto_increment
appointment_date	date	YES		NULL	
disease_description	varchar(255)	YES		NULL	
status	varchar(255)	YES		NULL	
doctor_id	bigint	YES	MUL	NULL	
patient_id	bigint	YES	MUL	NULL	

6 rows in set (0.05 sec)

Table 1: Appointment

```
mysql> desc doctor;
```

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	auto_increment
amount	double	NO		NULL	
degree	varchar(255)	YES		NULL	
doctorimage	longblob	YES		NULL	
email	varchar(255)	YES		NULL	
name	varchar(255)	YES		NULL	
password	varchar(255)	YES		NULL	
phone	varchar(255)	YES		NULL	
role	varchar(255)	YES		NULL	
specialization_id	bigint	YES	MUL	NULL	

10 rows in set (0.01 sec)

Table 2: Doctor

```
mysql> desc patient;
```

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	auto_increment
age	int	NO		NULL	
email	varchar(255)	YES		NULL	
gender	varchar(255)	YES		NULL	
name	varchar(255)	YES		NULL	
password	varchar(255)	YES		NULL	
role	varchar(255)	YES		NULL	
weight	double	NO		NULL	

8 rows in set (0.00 sec)

Table 3: patient

```
mysql> desc payment;
```

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	auto_increment
amount	double	NO		NULL	
date	date	YES		NULL	
paymentstatus	varchar(255)	YES		NULL	
appointment_id	bigint	YES	MUL	NULL	

5 rows in set (0.01 sec)

Table 4: payment

```
mysql> desc prescription;
```

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	auto_increment
name	varchar(255)	YES		NULL	
prescription_pdf	longblob	YES		NULL	
type	varchar(255)	YES		NULL	

4 rows in set (0.07 sec)

Table 5: Prescription

```
mysql> desc specialization;
```

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	auto_increment
name	varchar(255)	YES		NULL	
specializationimage	longblob	YES		NULL	

3 rows in set (0.01 sec)

Table 6: Specialization

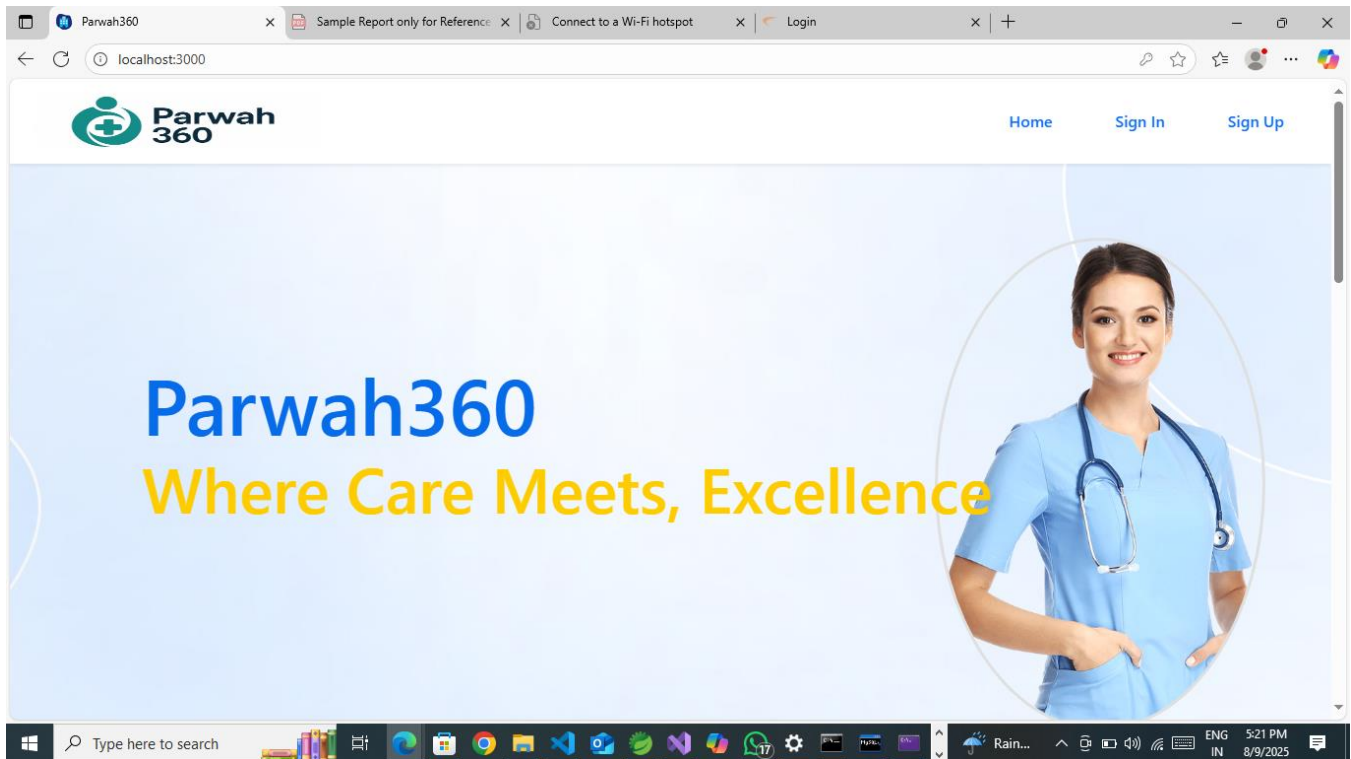
```
mysql> desc user;
```

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	auto_increment
email	varchar(255)	YES		NULL	
name	varchar(255)	YES		NULL	
password	varchar(255)	YES		NULL	
phone	varchar(255)	YES		NULL	
role	varchar(255)	YES		NULL	

6 rows in set (0.01 sec)

Table 7: user

5. Snapshots



A screenshot of the Parwah360 registration form. The form is titled 'Register' in blue text. It contains the following fields: 'Name' (text input), 'Age' (text input), 'Gender' (dropdown menu), 'Weight (kg)' (text input), 'Email' (text input), 'Password' (text input with a toggle for visibility), and 'Confirm Password' (text input with a toggle for visibility). A blue 'Register' button is located at the bottom of the form. The background of the page is light gray, and the Parwah360 logo and navigation links are visible at the top.

The screenshot displays the Parwah360 Admin dashboard. The top navigation bar is blue with the 'PARWAH 360' logo on the left, and 'Admin User' and 'Logout' buttons on the right. A left sidebar menu contains links for 'Add Speciality', 'Update Specialization', 'Add Doctor', 'Add Receptionist', 'View Doctors', and 'View Receptionist'. The main content area features a light gray box titled 'Add New Speciality' with the following fields: 'SPECIALITY NAME' (text input with placeholder 'Enter speciality'), 'IMAGE' (file upload area with 'Choose File' button and 'No file chosen' text), and a blue 'SUBMIT' button. The browser's address bar shows 'localhost:3000/admin'. The Windows taskbar at the bottom includes a search bar and various application icons.

The screenshot shows the Parwah360 login page. The top navigation bar is white with the Parwah360 logo on the left and 'Home', 'Sign In', and 'Sign Up' links on the right. The main content area has a light gray background with a central white box titled 'Login'. Inside this box are the following elements: an 'Email:' label and input field containing 'admin@gmail.com'; a 'Password:' label and input field with masked characters and a toggle icon; a reCAPTCHA widget with the text 'I'm not a robot' and a 'reCAPTCHA' logo; a blue 'Login' button; and a link 'Don't have an account? Register here'. The browser's address bar shows 'localhost:3000/login'. The Windows taskbar at the bottom is identical to the one in the first screenshot.

The screenshot shows a web browser window with the URL `localhost:3000/admin/updateSpecialization`. The page has a purple header with the title "Update Specialization" and a "Back to Home" button. Below the header, there are two main sections: "Select Specialization" and "Update Details".

Select Specialization

Search specializations...

- Oncologist
ID: 1
- pediatrics
ID: 2

Update Details

Select a specialization from the list to update
Choose any specialization to modify its name and image

The Windows taskbar at the bottom shows the search bar, taskbar icons, and system tray with weather, network, and time information.

The screenshot shows a web browser window with the URL `localhost:3000/admin/viewReceptionist`. The page has a blue header with the title "PARWAH 360" and a "Logout" button. Below the header, there is a sidebar with navigation links and a main content area titled "View Receptionists".

Admin

- Add Speciality
- Update Specialization
- Add Doctor
- Add Receptionist
- View Doctors
- View Receptionist

View Receptionists

Search receptionists by name, email, or phone...

Showing 1 of 1 receptionists

RECEPTIONIST NAME	EMAIL	PHONE	ACTION
radha	radha@gmail.com	8798658935	EDIT DELETE

The Windows taskbar at the bottom shows the search bar, taskbar icons, and system tray with weather, network, and time information.

Parwah 360 Home Appointments Logout

✓ Your Appointments

Patient Name	Specialist	Phone	Date	Disease	Amount	Status	Payment	Action
Soumya Singh	Neurologist	9234567895	2025-08-07	headache	₹5000	DECLINED		
Priya Srivastava123	Dentist	9638527416	2025-08-07	sensitivity	₹3456	ACCEPTED	PAID	DOWNLOAD
Soumya Singh	Neurologist	9234567895	2025-08-10	migrane	₹5000	ACCEPTED	PAID	DOWNLOAD
Priya Srivastava123	Dentist	9638527416	2025-08-09					
Priya Srivastava123	Dentist	9638527416	2025-08-08					
Soumya Singh	Neurologist	9234567895	2025-08-09					

PARWAH360 Abhi Goel Logout

Add New Patient

PATIENT NAME Enter full name **AGE** Enter age

GENDER Select Gender **WEIGHT (KG)** Enter weight

EMAIL ADDRESS Enter email address **PHONE NUMBER** Enter 10-digit phone num.

PASSWORD Enter secure password

Add Patient

6. **CONCLUSION**

Parwah360 was conceptualized and developed to address the pressing challenges faced by hospitals in managing their day-to-day operations in an increasingly digital and fast-paced world. Traditional healthcare management systems—often dependent on manual processes or partially digital solutions—frequently struggle with fragmented data, delayed communication, and the lack of real-time coordination among different departments. These limitations can compromise both the efficiency of hospital staff and the quality of care delivered to patients.

To overcome these issues, Parwah360 introduces a unified, web-based platform that brings together all critical hospital functions under one roof. From patient registration, appointment booking, and electronic medical records to prescription handling, billing, and secure payment processing, the system streamlines workflows for patients, doctors, and administrators alike. Its role-based access control ensures that each stakeholder interacts only with the features and data relevant to their responsibilities, promoting both security and simplicity.

Technologically, Parwah360 stands on a strong foundation. It employs Spring Boot (Java) for backend services using STS4 IDE, .NET Core (C#) for specialized modules, and ReactJS for a responsive, user-friendly frontend. A Hibernate ORM-integrated MySQL database ensures reliable and efficient data management. Robust security measures, including JWT authentication and Spring Security, safeguard sensitive healthcare data. The adoption of a microservices architecture enhances scalability, modular development, and fault isolation, enabling the system to evolve alongside future healthcare requirements.

In essence, Parwah360 is not merely a software application—it is a strategic enabler for better healthcare management. It bridges the gap between technology and patient care, allowing hospitals to deliver on their commitment to efficiency, safety, and compassion. The platform truly lives up to its vision and name—“Care from all angles”—by transforming hospital management into a seamless, smart, and patient-focused experience that is ready to meet both current and future healthcare demands.

7. REFERENCES

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