

MediCure – Online Pharmacy

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Abstract

The Online Pharmacy platform is developed to improve the accessibility and efficiency of medication management in a digital format. It offers a simple and intuitive interface for users to order medicines, maintain prescription records, and monitor their deliveries in real-time. Specially designed to support the needs of elderly individuals, patients with long-term health conditions, and those residing in remote locations, the platform aims to enhance health outcomes and convenience. Key functionalities include automated reminders for refills, secure digital storage of prescriptions, and strong data protection mechanisms. Future updates will incorporate teleconsultation services and advanced health analytics, empowering users with remote healthcare access and personalized insights. With its emphasis on innovation, security, and user-centric design, Online Pharmacy aspires to redefine standards in the digital healthcare domain.

Keywords: Online Pharmacy, Digital Healthcare, Medication Management, Prescription Records, Real-time Delivery Tracking, Elderly Care, Chronic Conditions, Remote Healthcare Access, Automated Refill Reminders, Secure Prescription Storage, Data Protection, Teleconsultation, Health Analytics, Personalized Health Insights, User-centric Design, Healthcare Innovation

1. INTRODUCTION

The healthcare industry is evolving rapidly, with digital transformation playing a crucial role in improving accessibility and efficiency. In today's fast-paced world, people often face challenges in obtaining essential medicines due to various factors such as limited availability, long waiting times at pharmacies, and mobility constraints. Online Pharmacy aims to bridge this gap by providing a seamless and efficient online pharmacy and medication management system, ensuring that users can access medicines with just a few clicks.

With the rise of e-commerce and digital health services, online pharmacy platforms have gained significant traction. However, many existing solutions lack essential features such as secure prescription verification, real-time order tracking, and automated medication reminders. Online Pharmacy is designed to address these limitations by offering a comprehensive, user-friendly, and secure platform for medicine procurement and management.

One of the major challenges in traditional medicine purchasing is the inconvenience faced by elderly individuals and people with chronic illnesses. Many patients struggle to visit pharmacies regularly, leading to missed doses and health complications. Online Pharmacy provides an easy-to-use mobile application that allows users to order medicines, set reminders for dosages, and track deliveries in real time, ensuring uninterrupted access to essential medications.

Another critical concern in the pharmaceutical sector is the sale of counterfeit or expired medicines. Many unregulated online platforms sell unauthorized drugs, posing a serious health risk to consumers. Online Pharmacy ensures the authenticity of medicines by collaborating with verified pharmacies and implementing a robust prescription verification system, guaranteeing that users receive only safe and certified medications.

The platform also integrates secure payment gateways, allowing users to make hassle-free transactions while ensuring data privacy and security. Additionally, the incorporation of AI-powered recommendations helps users choose the right medications based on their medical history and previous prescriptions. The system is designed to be scalable and adaptable, with future enhancements including teleconsultation services and AI-driven health analytics.

Online Pharmacy is not just a medicine delivery platform; it is a holistic healthcare solution aimed at improving medication adherence, reducing healthcare costs, and enhancing overall patient well-being. By leveraging modern technology, the platform aspires to make healthcare more accessible, efficient, and reliable for everyone.

With its user-friendly interface, advanced security measures, and a strong focus on convenience, Online Pharmacy is set to revolutionize the way people manage their medications. It serves as a step towards a more digitized and patient-centric healthcare ecosystem, ensuring that quality medicines are just a tap away.

1.1.Aim & Scope of Work

1.1.1. Aim of the Proposed System is:

The aim of Online Pharmacy is to develop a secure, efficient, and user-friendly online pharmacy platform that enables users to order medicines, manage prescriptions, and receive timely medication reminders, ensuring seamless access to essential healthcare services.

Key Objectives:

1. To provide an online platform for ordering medicines conveniently from verified pharmacies.
2. To enable users to upload and verify prescriptions for secure medication procurement.
3. To implement real-time order tracking for better transparency and user experience.
4. To integrate a secure payment gateway for hassle-free transactions.
5. To offer automated medication refill reminders to ensure adherence to prescriptions.
6. To maintain a centralized and encrypted database for secure user information storage.
7. To provide AI-powered medicine recommendations based on user history and prescriptions.
8. To facilitate seamless communication between users and pharmacies for efficient order management.
9. To ensure regulatory compliance and prevent the sale of counterfeit or expired medicines.
10. To develop a scalable and adaptable system with future integration of teleconsultation and health analytics.

1.1.2. Scope of Work:

The Online Pharmacy project focuses on developing an online pharmacy and medication management system that enhances accessibility, security, and efficiency in medicine procurement. The system is designed to cater to a wide range of users, including patients, caregivers, healthcare providers, and pharmacies. The scope of work includes the following key aspects:

- **User Registration & Authentication**
- Users can sign up and log in securely using authentication mechanisms.

- Profile management for storing personal details, prescriptions, and medical history.
- **Medicine Search & Ordering**
- A smart search feature allows users to browse and order medicines based on brand, composition, or category.
- Filtering options for generic substitutes and availability status.
- **Prescription Upload & Verification**
- Users can upload prescriptions for medicines that require authorization.
- Verification by registered pharmacists to ensure compliance with medical regulations.
- **Secure Payment Gateway Integration**
- Support for multiple payment options, including credit/debit cards, UPI, and digital wallets.
- Secure transactions with data encryption to prevent fraud.
- **Real-Time Order Tracking & Notifications**
- Live tracking of orders from processing to delivery.
- SMS/Email/App notifications for order updates, delivery estimates, and refill reminders.
- **Medication Reminder System**
- Automated alerts for daily dosages and prescription refills.
- Customizable notifications for different users (patients, caregivers, elderly individuals).
- **Admin & Pharmacy Management**
- Pharmacies can manage stock, update medicine availability, and process orders.
- Admin panel for monitoring transactions, user activity, and compliance checks.
- **Security & Data Privacy**
- Encryption of user data to ensure privacy and prevent unauthorized access.
- Compliance with medical data protection regulations.
- **AI-Based Recommendations (*Future Scope*)**
- Personalized suggestions for medicines based on past purchases and prescriptions.
- AI-driven analytics to identify trends and predict medicine demand.
- **Future Enhancements**
- Teleconsultation integration to connect users with doctors for e-prescriptions.
- IoT-based smart pill dispensers for automated medication tracking and adherence.

The Online Pharmacy platform is designed to be scalable, secure, and user-centric, ensuring a seamless experience in managing medications while improving healthcare accessibility.

2. Literature Survey

2.1. Literature Survey

The rapid advancement of healthcare technology and digital solutions has significantly transformed the way people access medications and manage prescriptions. Traditional pharmacy models often involve long queues, limited availability, and accessibility challenges, especially for elderly individuals and people in remote areas. Online pharmacy platforms aim to bridge this gap by offering on-demand medicine delivery, prescription management, and automated reminders. This literature survey explores existing solutions, their limitations, and how MediCure enhances the online pharmacy experience.

2.2. Existing System

The current pharmacy system operates through traditional retail pharmacies and hospital dispensaries, wh-

ere patients must visit physical stores to purchase medicines. While online pharmacies have emerged, they still face challenges in security, efficiency, and user convenience. The following aspects highlight the limitations of the existing medicine procurement system:

- **Manual Medicine Purchase Process**
- Patients need to physically visit pharmacies to buy medicines, causing inconvenience, especially for the elderly and those in remote areas.
- Limited availability of medicines in local stores often forces users to visit multiple pharmacies.
- Emergency medication procurement is difficult due to store timings and stock shortages.
- **Lack of Proper Prescription Management**
- In traditional setups, prescriptions are mostly paper-based, leading to loss, misplacement, or misinterpretation of doctors' instructions.
- Online platforms require users to upload prescriptions, but verification is slow and often manual, delaying medicine delivery.
- **Security & Privacy Risks**
- Many online pharmacy platforms store sensitive user data (personal details, medical history) on remote servers without strong encryption, making them vulnerable to cyber threats.
- Weak authentication methods, like simple passwords, expose users to identity theft and unauthorized access.
- Lack of biometric authentication makes it easier for fraudsters to misuse prescriptions.
- **No Real-Time Order Tracking**
- Many e-pharmacies do not offer real-time tracking, leaving users uncertain about the delivery status of their medicines.
- Delays in medicine delivery can be critical, especially for patients with chronic conditions.
- **Risk of Counterfeit Medicines**
- Some online pharmacies do not properly regulate suppliers, leading to the sale of counterfeit, sub-standard, or expired medicines.
- Patients may receive incorrect or substitute drugs, causing serious health risks.
- **Lack of Medication Adherence Support**
- Traditional systems do not offer automated medication reminders, which is crucial for elderly patients and those with chronic illnesses.
- Patients often forget to take their medicines or miss refills, affecting treatment effectiveness.
- **Payment & Compliance Issues**
- Some online pharmacies have unsecured payment gateways, increasing the risk of fraud and financial theft.
- Many platforms do not strictly comply with government regulations, leading to illegal sales of restricted medicines.

3. Methodology

3.1. Methodology

The development of Online Pharmacy follows a structured approach using the Incremental Model of the System Development Life Cycle (SDLC). This model allows for gradual implementation and continuous improvements, ensuring flexibility, scalability, and efficiency in system development.

- **Requirement Analysis**
- Identifying key features such as medicine ordering, prescription verification, user authentication, payment integration, and delivery tracking.
- Analysing existing systems to understand limitations and how Online Pharmacy can improve upon them.
- Defining security protocols to protect user data and prevent unauthorized access.
- **System Design**
- Architecture Design: Creating a blueprint for the system, including the frontend (user interface), backend (database, APIs), and security layers.
- Database Design: Using MySQL to store user information, prescriptions, medicine inventory, and order details securely.
- Security Integration: Implementing Advanced Encryption Standard (AES) for data security and biometric authentication for verification.
- **Incremental Development & Implementation**
- The system is built in phases, each focusing on key features:
- Phase 1: User registration, authentication, and profile management.
- Phase 2: Medicine catalogue, search, and prescription upload.
- Phase 3: Secure payment integration and order tracking.
- Phase 4: AI-based medicine recommendations and automated medication reminders.
- Phase 5: Final security testing and system deployment.
- **Testing & Security Measures**
- Unit Testing: Testing individual modules to ensure they function correctly.
- Integration Testing: Ensuring seamless interaction between different modules.
- Security Testing: Implementing encryption techniques and penetration testing to prevent data breaches and cyber threats.
- **Deployment & Maintenance**
- Deploying Online Pharmacy on a secure cloud-based platform for high availability.
- Regular updates to enhance features, optimize performance, and fix vulnerabilities.
- Continuous monitoring of system security and user feedback-driven improvements.

The Incremental Model ensures a structured, flexible, and secure development process for Online Pharmacy. By integrating encryption, AI-based recommendations, biometric authentication, and real-time tracking, the system aims to revolutionize online medicine procurement while maintaining high security and efficiency.

3.2. Techniques Developed

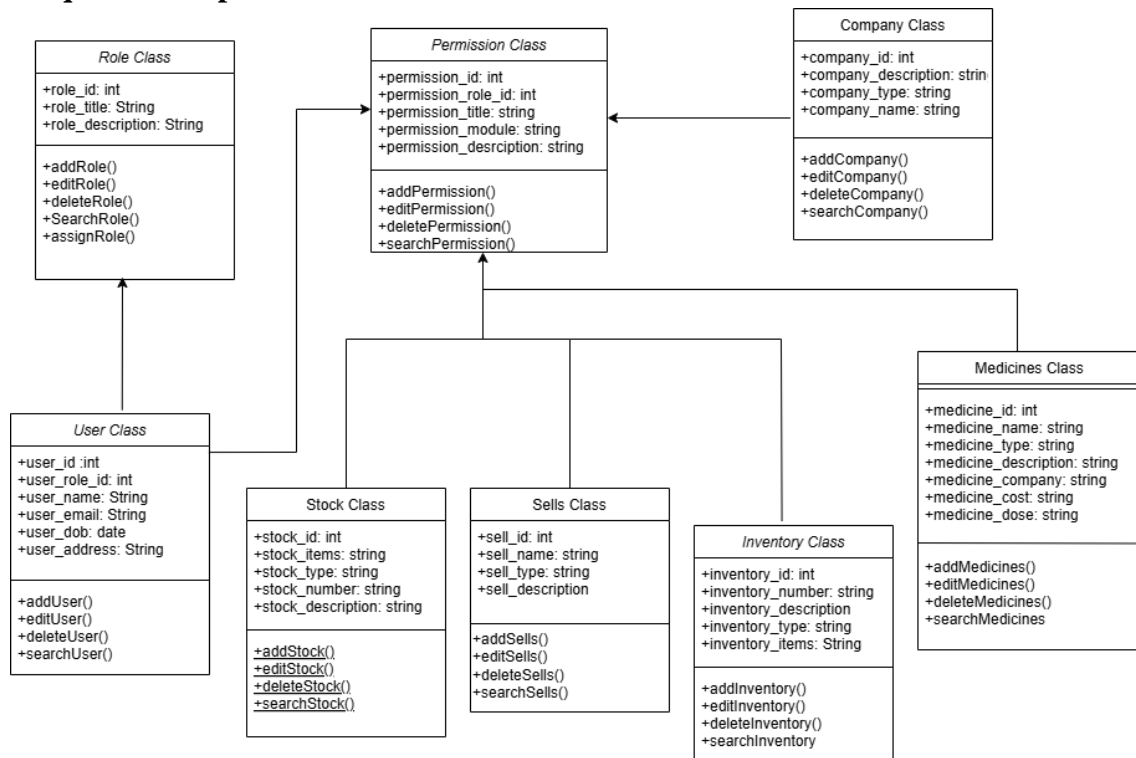


Fig. 3.2.1. Class Diagram

Online Pharmacy class diagram describes the structure of a pharmacy management system classes, their attributes, operations and the relationships among objects. The main classes of the Online Pharmacy are Pharmacy, Medicines, Stocks, Company, Inventory, Sells

Classes of Online Pharmacy Class Diagram:

- **Pharmacy Class:** Manage all the operations of pharmacy
- **Medicines Class:** Manage all the operations of medicines
- **Stocks Class:** Manage all the operations of stocks
- **Company Class:** Manage all the operations of company
- **Inventory Class:** Manages all the operations of inventory
- **Sells Class:** Manages all the operations of Sells

Classes and their attributes of Online Pharmacy Class Diagram:

- **Pharmacy Attributes:** pharmacy_id, pharmacy_medicine_id, pharmacy_name, pharmacy_type, pharmacy_description, pharmacy_address
- **Medicine Attributes:** medicine_id, medicine_name, medicine_company, medicine_composition, medicine_cost, medicine_type, medicine_dose, medicine_description
- **Stocks Attributes:** stock_id, stock_items, stock_number, stock_type, stock_description
- **Company Attributes:** company_id, company_name, company_type, company_description, company_address
- **Inventory Attributes:** inventory_id, inventory_items, inventory_number, inventory_type, inventory_description
- **Sells Attributes:** sell_id, sell_name, sell_type, sell_description

Classes and the methods of Online Pharmacy Class Diagram:

- **Pharmacy Methods:** addPharmacy(), editPharmacy(), deletePharmacy(), updatePharmacy(), savePharmacy(), searchPharmacy()
- **Medicines Methods:** addMedicines(), editMedicines(), deleteMedicines(), updateMedicines(), saveMedicines(), searchMedicines()
- **Stocks Methods:** addStocks(), editStocks(), deleteStocks(), deleteStocks(), updateStocks(), saveStocks(), searchStocks()
- **Company Methods:** addCompany(), editCompany(), deleteCompany(), updateCompany(), saveCompany(), searchCompany()
- **Inventory Methods:** addInventory(), editInventory(), deleteInventory(), updateInventory(), saveInventory(), searchInventory()
- **Sells Methods:** addSells(), editSells(), deleteSells(), updateSells(), saveSells(), searchSells()

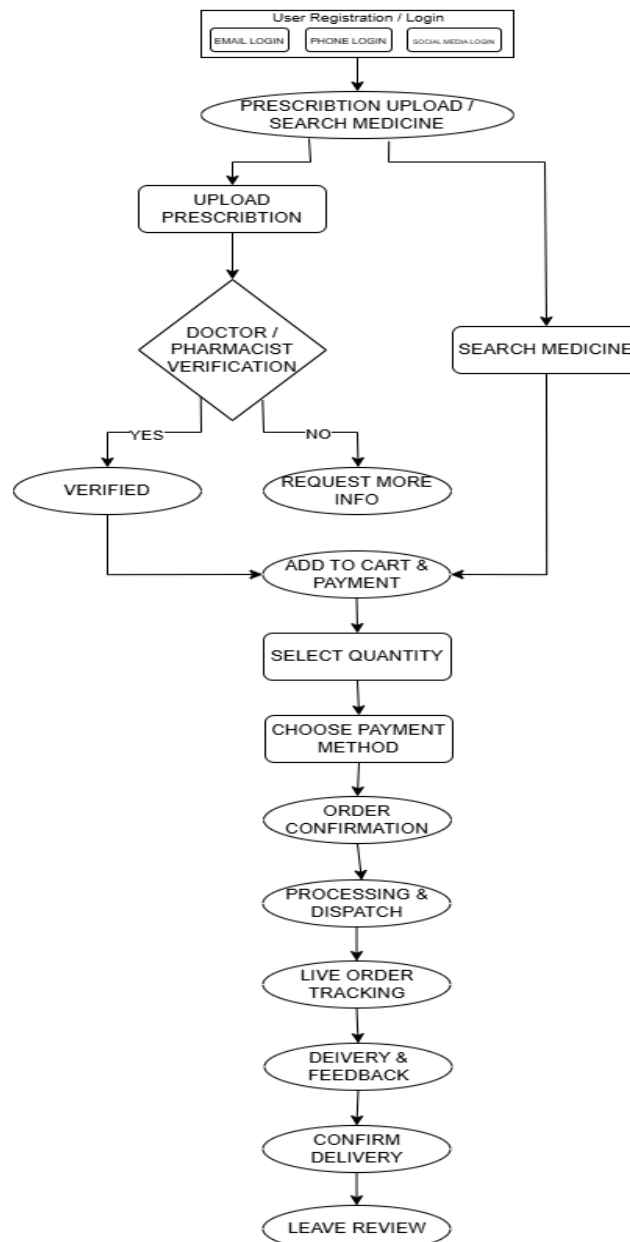


Fig. 3.2.2. Flowchart

- **User Registration / Login**
- New users register, and existing users log in using secure authentication (biometric/password).
- **Search Medicine or Upload Prescription**
- Users can search for medicines directly or upload a doctor's prescription for verification.
- **Prescription Verification**
- The system uses AI-based validation or sends it to a licensed pharmacist for approval.
- **Prescription Approval Check**
- If approved, the user proceeds to checkout.
- If not approved, the system requests a valid prescription.
- **Add to Cart & Secure Payment**
- Users select medicines and complete secure transactions via UPI, card, or net banking.
- **Order Confirmation & Tracking**
- The system confirms the order and provides real-time tracking updates.
- **Delivery at Doorstep**
- The medicine is delivered securely with biometric verification (if required).
- **Medication Reminders & User Feedback**
- Automated reminders for medicine intake are sent to ensure adherence.
- Users can provide feedback for service improvement

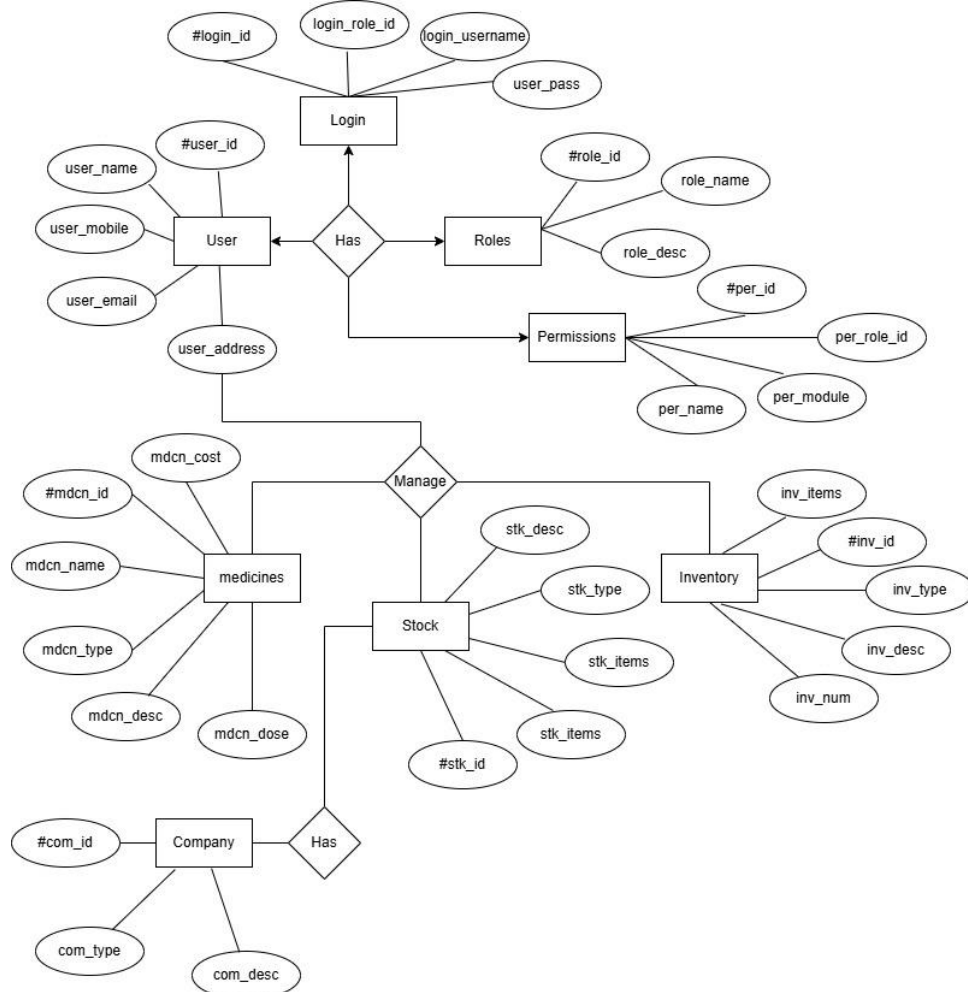


Fig. 3.2.3. ER Diagram

An Entity-Relationship (ER) Diagram helps visualize the database structure of Online Pharmacy, showing how different entities interact with each other.

Entities and Relationships

1. User (Patient/Customer)

- Attributes: User_ID (PK), Name, Email, Phone, Address, Password, Biometric_ID
- Relationship:
 - Orders medicine
 - Uploads prescription

2. Doctor

- Attributes: Doctor_ID (PK), Name, Specialization, License_No, Contact, Email
- Relationship:
 - Prescribes medicine for users

3. Prescription

- Attributes: Prescription_ID (PK), User_ID (FK), Doctor_ID (FK), Medicine_List, Date_Issued, Status
- Relationship:
 - Belongs to a user
 - Verified by admin

4. Medicine

- Attributes: Medicine_ID (PK), Name, Description, Price, Stock_Quantity, Expiry_Date
- Relationship:
 - Ordered by user
 - Managed by admin

5. Order

- Attributes: Order_ID (PK), User_ID (FK), Total_Amount, Payment_Status, Order_Status, Tracking_ID
- Relationship:
 - Contains medicines
 - Tracked by delivery system

6. Payment

- Attributes: Payment_ID (PK), Order_ID (FK), User_ID (FK), Payment_Method, Transaction_ID, Payment_Status
- Relationship:
 - Linked to an order

7. Admin (Pharmacist)

- Attributes: Admin_ID (PK), Name, Email, Phone, Role
- Relationship:
 - Verifies prescriptions
 - Manages medicine inventory

8. Delivery System

- Attributes: Tracking_ID (PK), Order_ID (FK), Delivery_Status, Estimated_Time, Delivery_Person
- Relationship:
 - Delivers medicine to users

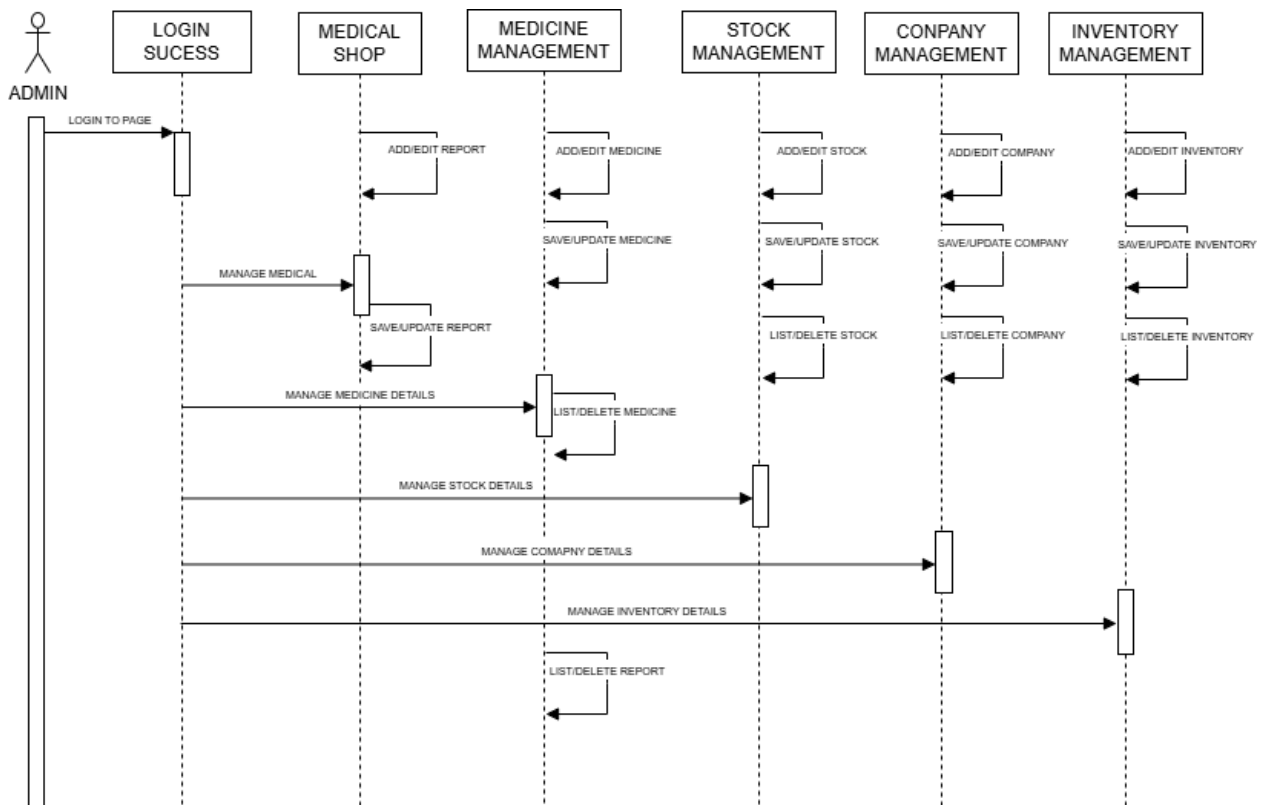


Fig. 3.2.4. Sequence Diagram

A sequence diagram illustrates the interaction between various system components in a step-by-step order of execution. Below is the sequence of operations in Online Pharmacy:

Actors & Components Involved

1. User (Patient) – Initiates medicine order
2. System (Online Pharmacy App) – Manages user interactions
3. Pharmacist/Admin – Verifies prescription and processes orders
4. Payment Gateway – Handles transactions
5. Delivery System – Manages dispatch and tracking

Process Flow in the Sequence Diagram

1. User logs in / registers
2. User uploads prescription or searches for medicine
3. System verifies the prescription
4. Admin (Pharmacist) approves or rejects the prescription
5. User adds medicine to cart and proceeds to payment
6. Payment is processed via the payment gateway
7. Order is confirmed, and tracking details are provided
8. Delivery system updates the order status
9. Medicine is delivered to the user
10. User receives medicine and provides feedback

4. Implementation

4.1. GUI of project with Descriptions

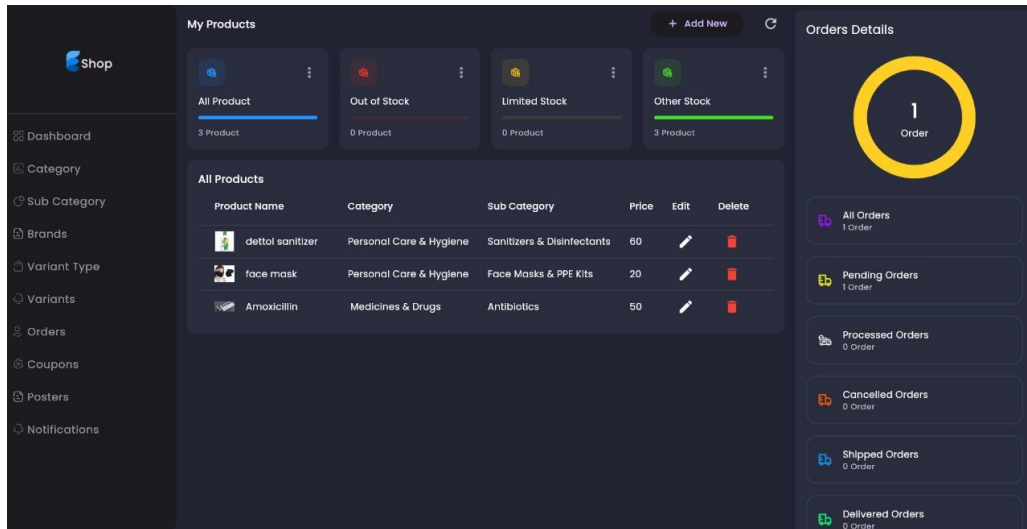


Fig. 4.1.1. DASHBOARD

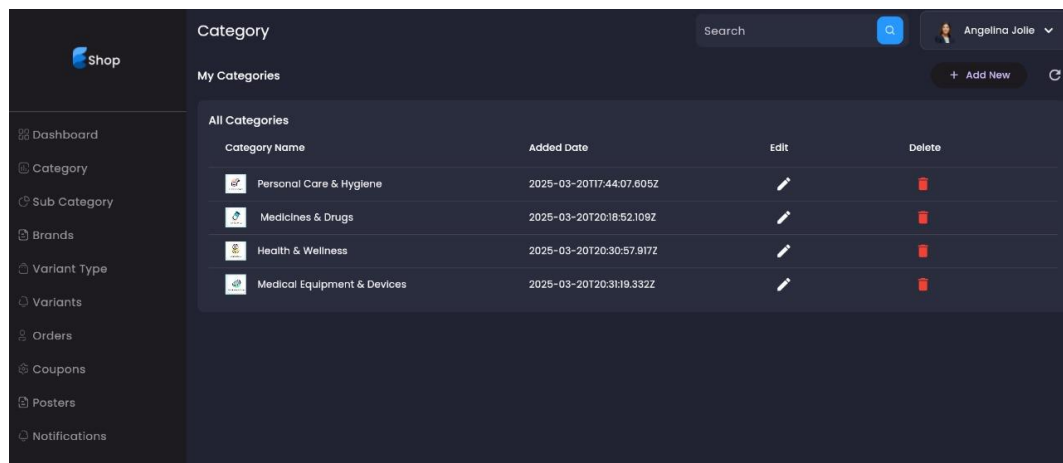


Fig. 4.1.2. CATEGORY

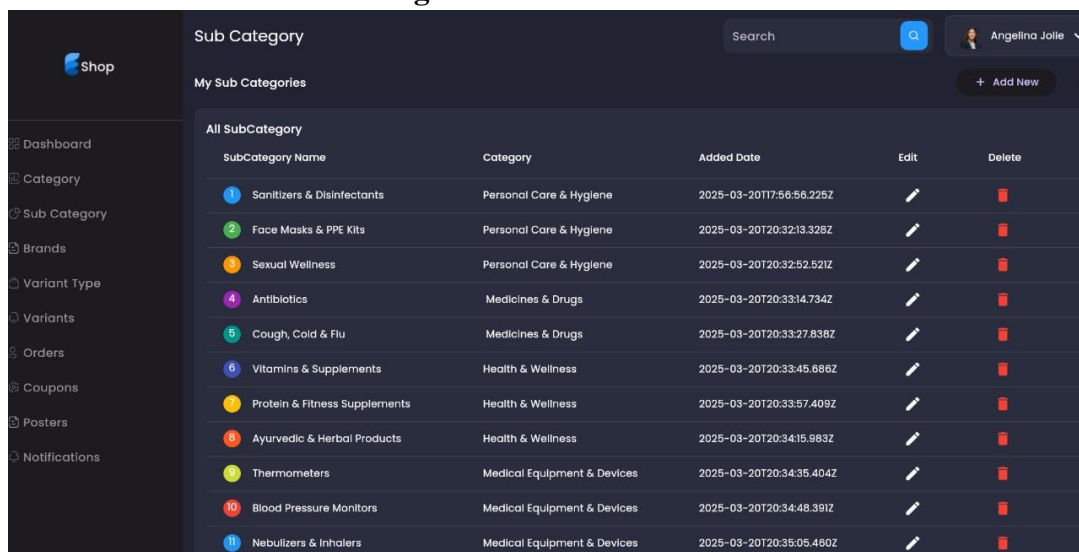
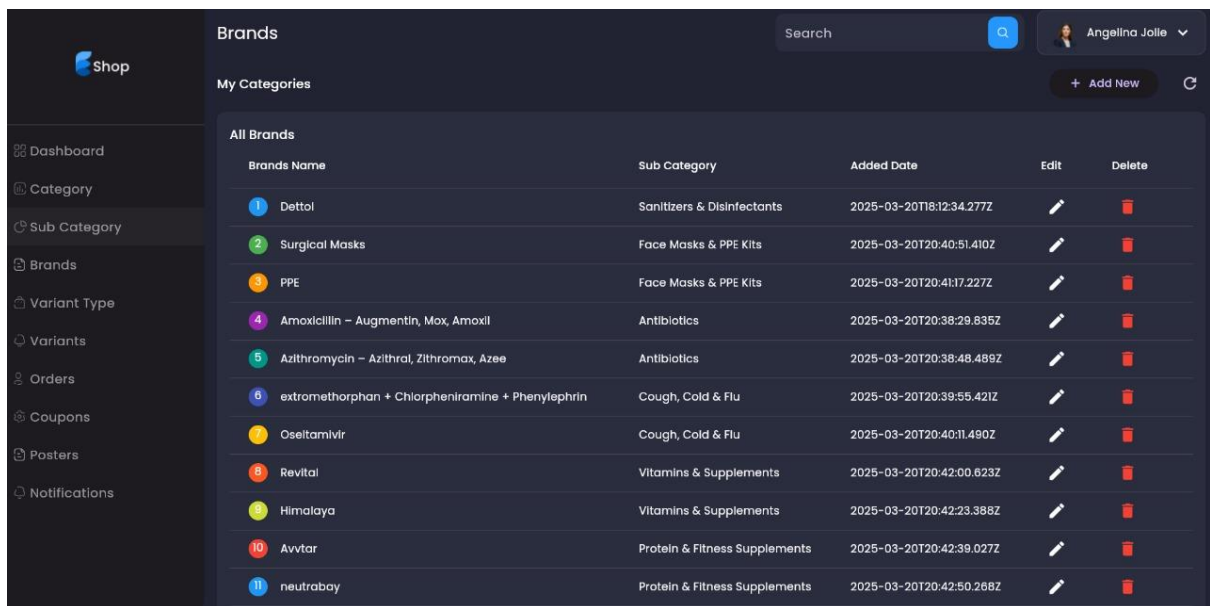


Fig. 4.1.3. SUB CATEGORY



Brands

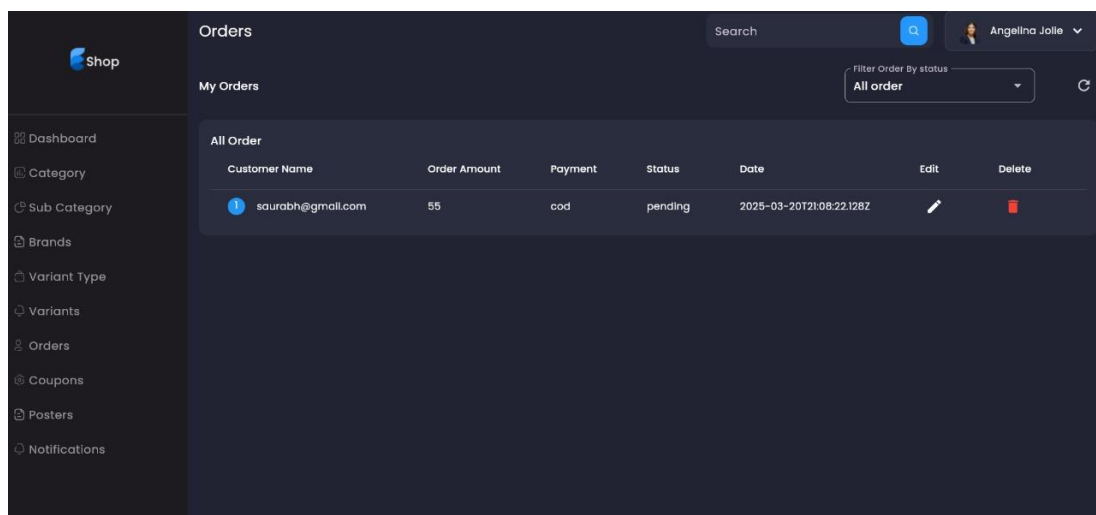
Search

My Categories

+ Add New

Brands Name	Sub Category	Added Date	Edit	Delete
1 Dettol	Sanitizers & Disinfectants	2025-03-20T18:12:34.277Z		
2 Surgical Masks	Face Masks & PPE Kits	2025-03-20T20:40:51.410Z		
3 PPE	Face Masks & PPE Kits	2025-03-20T20:41:17.227Z		
4 Amoxicillin - Augmentin, Mox, Amoxil	Antibiotics	2025-03-20T20:38:29.835Z		
5 Azithromycin - Azithral, Zithromax, Azee	Antibiotics	2025-03-20T20:38:48.489Z		
6 extromethorphan + Chlorpheniramine + Phenylephrin	Cough, Cold & Flu	2025-03-20T20:39:55.421Z		
7 Oseltamivir	Cough, Cold & Flu	2025-03-20T20:40:11.490Z		
8 Revital	Vitamins & Supplements	2025-03-20T20:42:00.823Z		
9 Himalaya	Vitamins & Supplements	2025-03-20T20:42:23.388Z		
10 Avvatar	Protein & Fitness Supplements	2025-03-20T20:42:39.027Z		
11 neutraboy	Protein & Fitness Supplements	2025-03-20T20:42:50.268Z		

Fig. 4.1.4. BRANDS



Orders

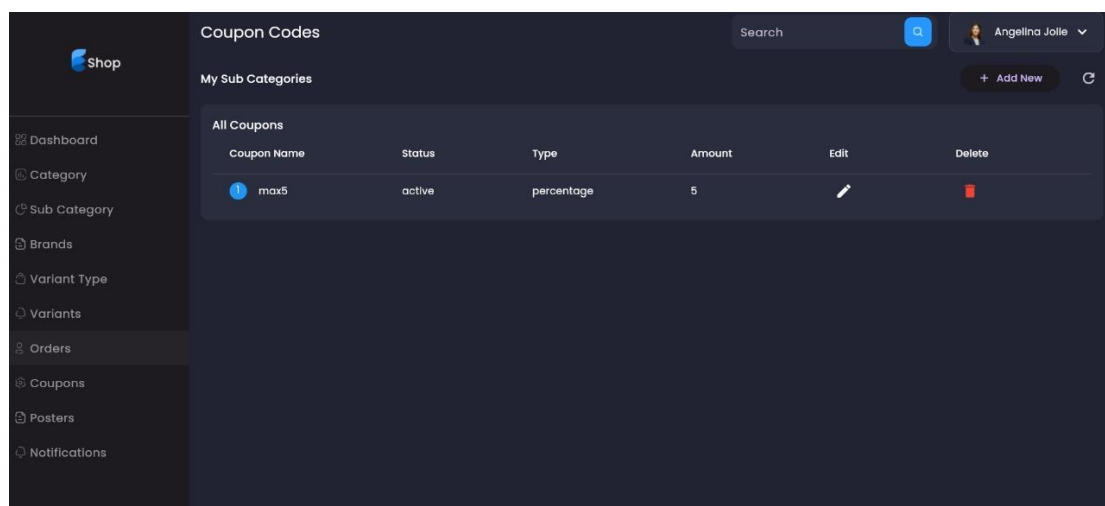
Search

My Orders

Filter Order By status: All order

Customer Name	Order Amount	Payment	Status	Date	Edit	Delete
1 saurabh@gmail.com	55	cod	pending	2025-03-20T21:08:22.128Z		

Fig. 4.1.5. ORDERS



Coupon Codes

Search

My Sub Categories

+ Add New

Coupon Name	Status	Type	Amount	Edit	Delete
1 max5	active	percentage	5		

Fig. 4.1.6. COUPONS

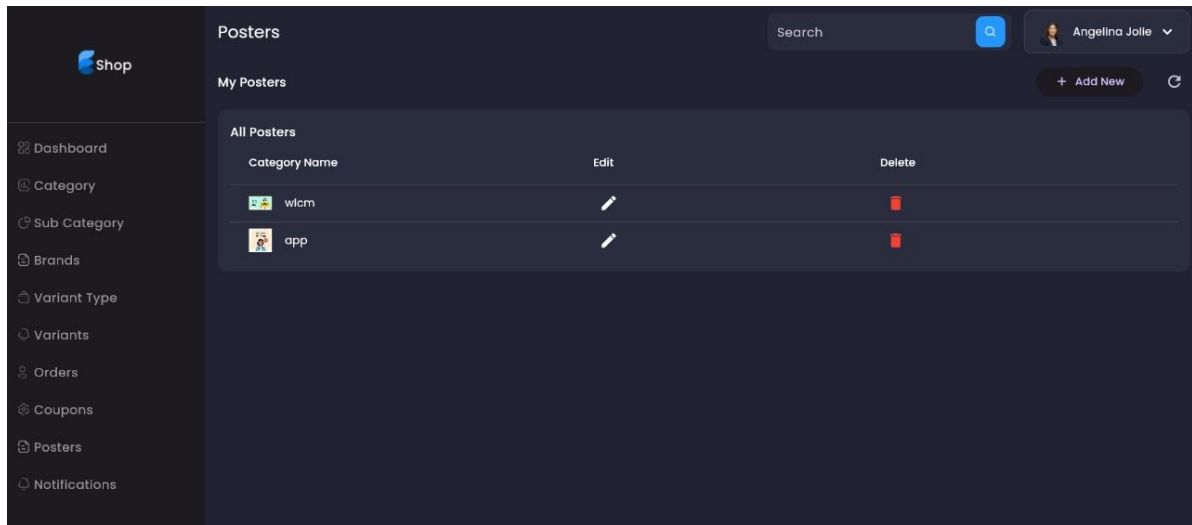


Fig. 4.1.7. POSTERS

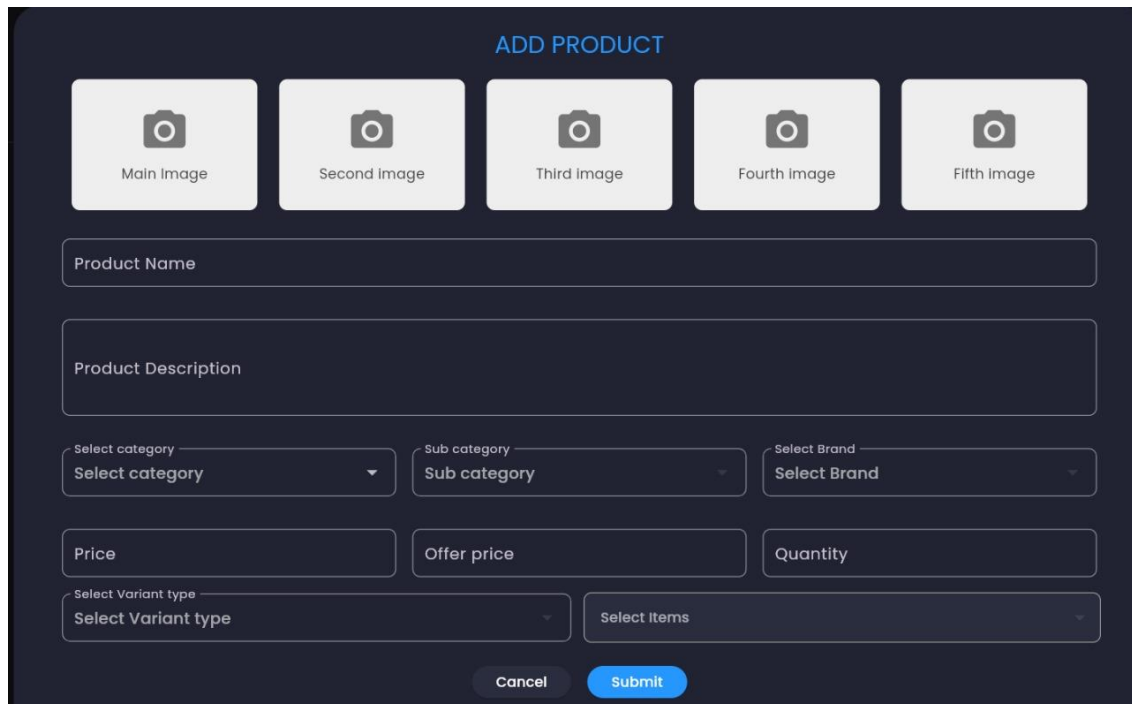


Fig. 4.1.8. ADD PRODUCTS

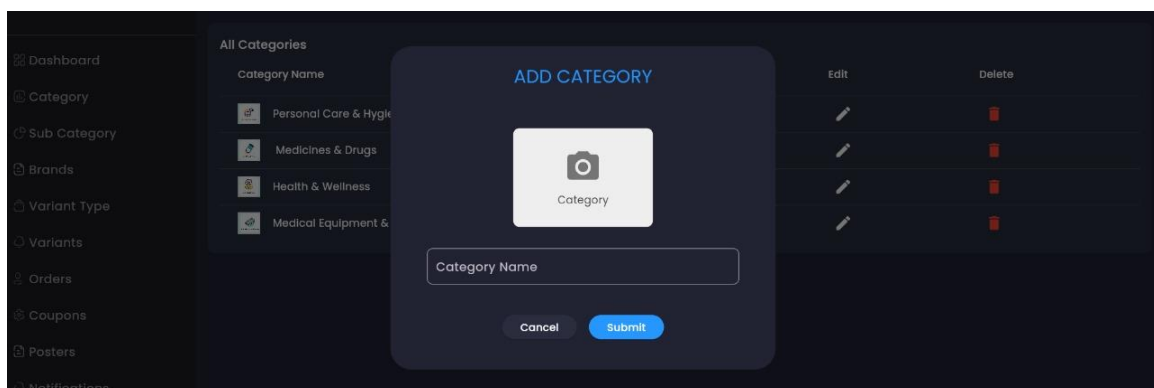


Fig. 4.1.9. ADD CATEGORY

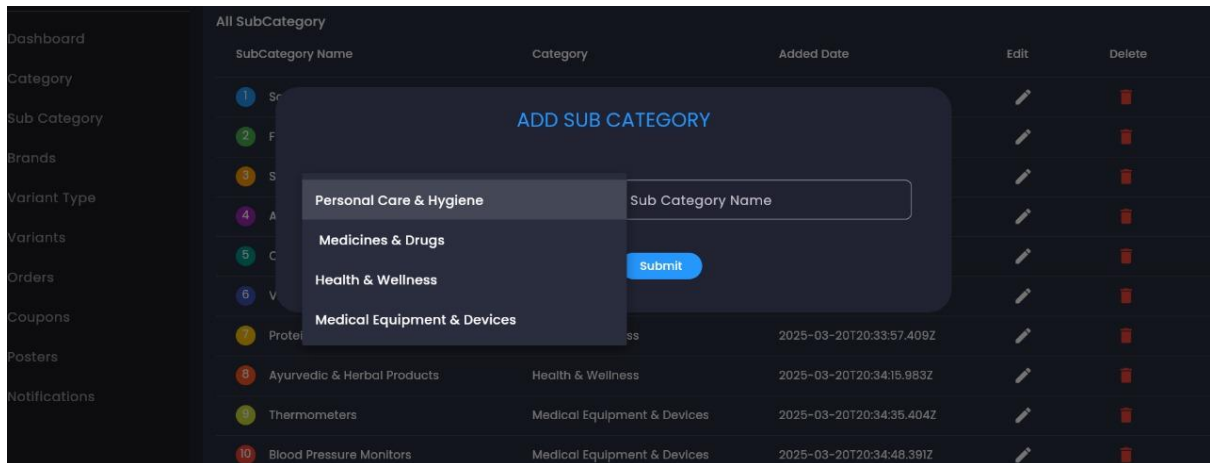


Fig. 4.1.10. ADD SUB CATEGORY

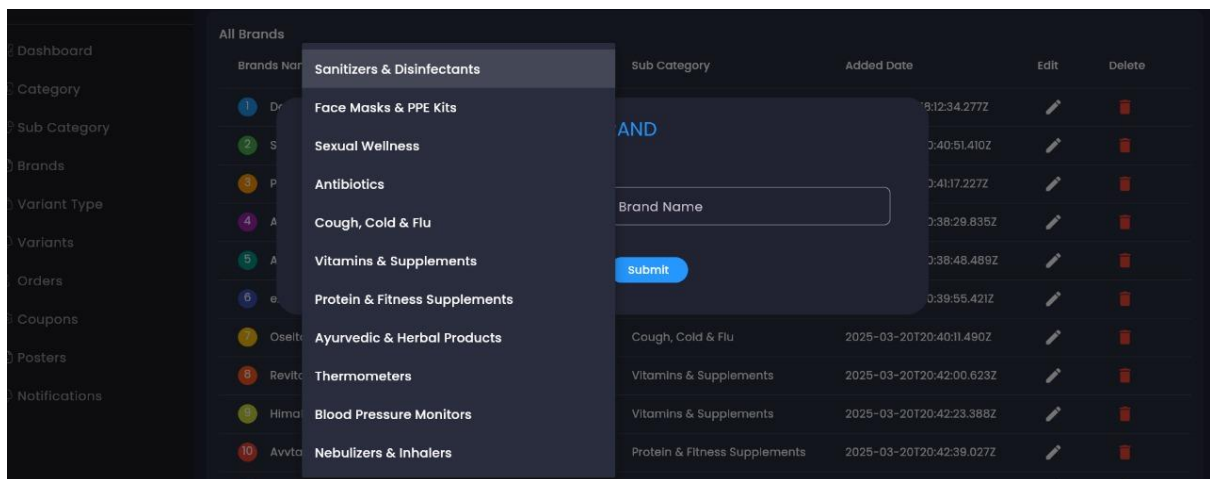


Fig. 4.1.11. ADD BRANDS

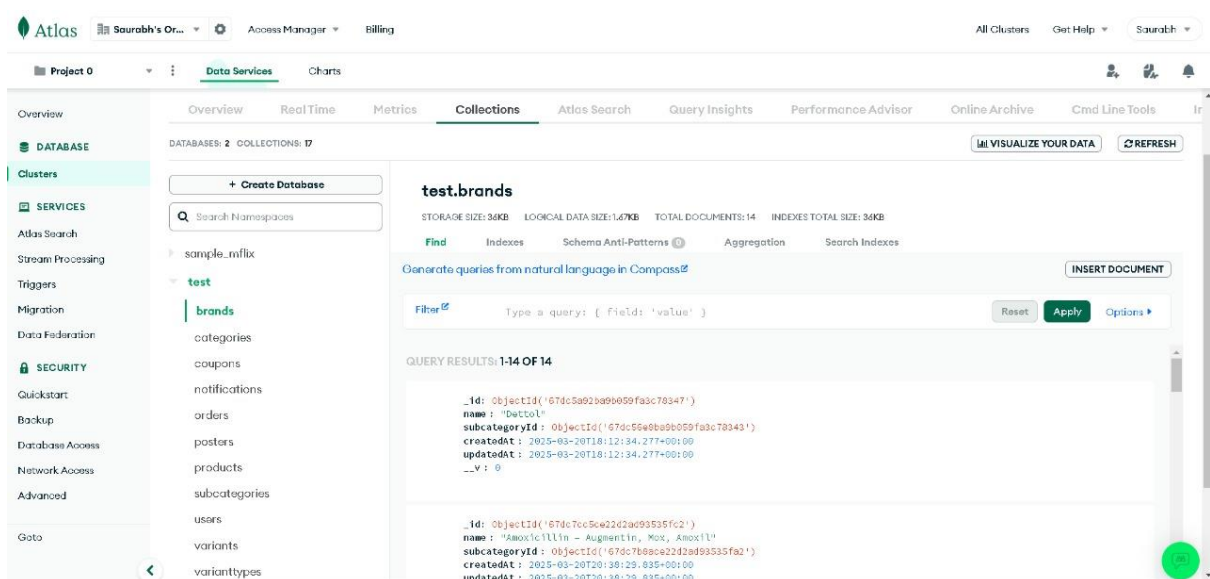
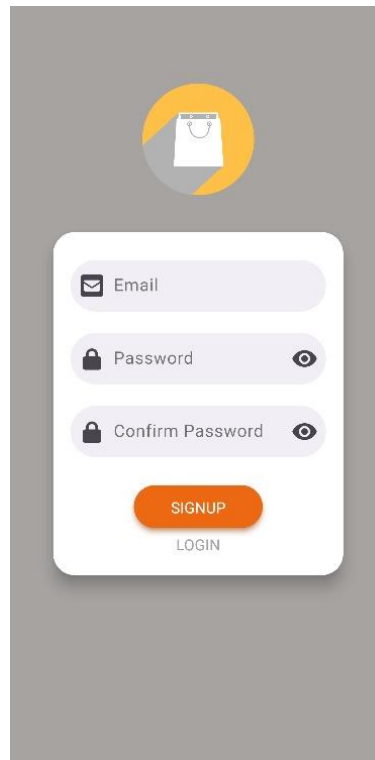
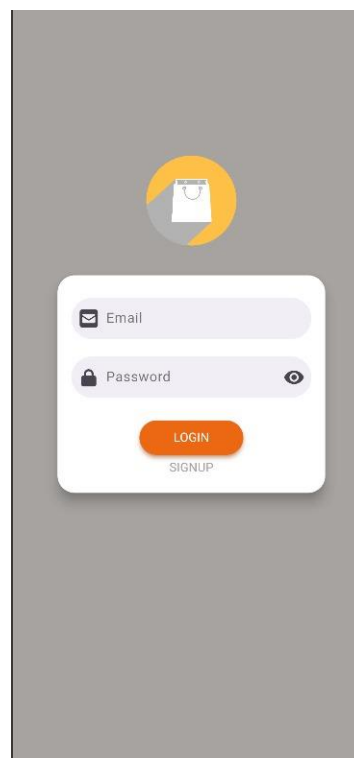


Fig. 4.1.12. MONGODB

A mobile application screen for the SIGNUP process. At the top, there is a circular icon with a shopping bag. Below it, a white card contains three input fields: 'Email' with an envelope icon, 'Password' with a lock icon and an eye icon for toggling visibility, and 'Confirm Password' with a lock icon and an eye icon. Below the input fields are two buttons: an orange 'SIGNUP' button and a grey 'LOGIN' button.**Fig. 4.1.13 SIGNUP**A mobile application screen for the LOGIN process. At the top, there is a circular icon with a shopping bag. Below it, a white card contains two input fields: 'Email' with an envelope icon and 'Password' with a lock icon and an eye icon. Below the input fields are two buttons: an orange 'LOGIN' button and a grey 'SIGNUP' button.**Fig. 4.1.14 LOGIN**

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1. Secure Online Medicine Delivery System

Author: Mohammad Waqar Bhat, Veerabhadrappe Sondekere Thippeswamy, Himanshu Bhushan, Kartik Shrivastava, Ashish Kumar Sahoo

Published: 28 August 2020

The objective of this study is to design and implement a secure home delivery system for medicines, ensuring accurate patient medical disbursement and controlled inventory management. Current telecare medicine delivery systems store user data on remote servers but face security threats like identity theft, password guessing, and insider attacks. To address these concerns, the proposed system enhances security by securing demographic information and implementing biometric authentication. Additionally, Advanced Encryption Standard (AES) is applied to protect user data before storing it in a MySQL database. The system aims to create a smart, secure, and reliable online medicine delivery platform, with applications in e-commerce vendors like Practo, 1mg, and Netmeds. Biometric verification at the client's end ensures secure order authentication and prevents unauthorized access.

2. Online Pharmacy Management System

Author: Mohd. Ahsan

Published: 10 May 2022

Pharmacy practices have evolved to include drug distribution, regulation, and sales, with community and hospital pharmacies playing key roles. In India, weak enforcement of pharmaceutical laws affects community pharmacies, while hospitals follow stricter regulations. An Online Pharmacy Management System using the Incremental SDLC Model can improve medicine distribution, regulation, and communication. This system ensures secure transactions, prevents counterfeit drugs, and enhances pharmacy management, leading to better monitoring and control of pharmaceutical practices.

3. Online Medical Booking Store — A Brief Study

Author: Anjali Gupta, Raghuveer Sachan, Juhi Singh, Amisha Singh

Published: 23 December 2023

The study explores the rise of online medicine shopping, highlighting its impact on consumer behavior and the healthcare industry. It examines the advantages and disadvantages of purchasing medicines online, while also offering important considerations for safe online shopping, thereby promoting both e-commerce and m-commerce in the pharmaceutical sector.

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