

ONLINE ORDER SYSTEM APP FOR PHARMACEUTICALS

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Master of Science

DAFFODIL INTERNATIONAL UNIVERSITY

APPROVAL

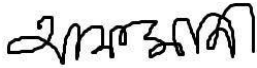
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ONLINE ORDER SYSTEM APP FOR PHARMACEUTICALS

This Project report is submitted as a partial requirement for obtaining of the Masters of
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ABSTRACT

The rapid advancement of digital technology has significantly transformed the healthcare and pharmaceutical industries. This thesis presents the development of an "Online Order System App for Pharmaceuticals," specifically tailored for Beacon Pharmaceuticals, to streamline and enhance operational efficiency. The app serves as a centralized platform for field medical information officers (MIOs) to manage essential tasks, including ordering products for customers and patients, accessing product pricing and offer details, and generating invoices.

Furthermore, the system incorporates delivery tracking features, enabling real-time updates on order statuses. To support pharmaceutical sales and marketing efforts, the app facilitates the submission of doctor visit reports and doctor prescription (RX) reports, ensuring seamless communication and record-keeping. Additionally, the inclusion of sales target and achievement tracking provides MIOs and management with a comprehensive overview of performance metrics.

By integrating these functionalities, the proposed app addresses challenges such as manual data entry, fragmented communication, and inefficiencies in order management. The study also highlights the design process, implementation strategies, and the potential impact of this system on operational workflows. Ultimately, this research underscores the value of digital solutions in optimizing pharmaceutical operations and enhancing customer satisfaction.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Pharmaceutical products are critical for maintaining and improving health, and their efficient distribution is essential for ensuring patient well-being. Beacon Pharmaceuticals, a leader in providing pharmaceutical solutions, faces challenges in adapting its order management processes to meet the needs of its customers and field medical information officers (MIOs). Traditional order placement methods, such as phone calls, handwritten records, and spreadsheets, are time-consuming, prone to errors, and lack the transparency required in today's fast-paced environment.

This thesis introduces an online order system application designed for Beacon Pharmaceuticals. The app allows MIOs to place orders for their customers and patients with ease, providing features like real-time product prices, customer-specific discounts, stock availability, and order tracking. It also enables the submission of essential reports, such as doctor visit summaries and prescription (RX) records, streamlining communication between MIOs, management, and the supply chain.

Built on Android technology, the application ensures a user-friendly interface, seamless functionality, and efficient integration of features. By automating manual processes and improving accuracy, the app addresses the limitations of traditional systems, enhancing operational efficiency and customer satisfaction. This solution not only modernizes Beacon Pharmaceuticals' order management process but also establishes the company as a leader in adopting technology-driven innovations in the pharmaceutical industry.

1.2 Motivation

The motivation for designing this application stems from the persistent inefficiencies and limitations of the current manual ordering system in the pharmaceutical industry. In its existing form, the ordering process relies heavily on traditional methods such as verbal communication, handwritten documentation, or email exchanges. These methods are not only time-consuming but also prone to human error, which can result in order inaccuracies, delays, and mismanagement of inventory. This situation is particularly challenging during peak periods when field medical information officers (MIOs) are required to manage a high volume of orders under tight deadlines.

For MIOs, the lack of a streamlined system means spending excessive time on repetitive tasks, such as confirming product availability, calculating customer-specific discounts, and manually tracking the status of each order. These delays in order processing can lead to dissatisfaction among customers, as timely access to pharmaceutical products is often critical for patient care. Errors in stock reports or delays in delivery further compound the issue, creating bottlenecks that disrupt the supply chain and negatively impact the reputation of pharmaceutical companies.

From the customer's perspective, the absence of a centralized ordering system creates significant challenges. Customers often face a lack of transparency regarding product pricing, including applicable discounts or promotional offers. Additionally, uncertainty about stock availability and delivery timelines leaves them with little confidence in the reliability of the service. These issues contribute to frustration, reduced trust, and, in some cases, the loss of loyal customers to competitors who may offer more efficient solutions.

To better understand the scope of these challenges, a survey was conducted among MIOs and customers associated with Beacon Pharmaceuticals. The survey highlighted several common pain points:

MIOs expressed difficulty in managing large volumes of orders efficiently, especially when accurate stock and pricing information was unavailable.

Customers frequently reported dissatisfaction with the delays in delivery and the lack of clear communication regarding the status of their orders.

Both MIOs and customers emphasized the need for a system that provides real-time updates, ensures accurate order processing, and reduces dependency on manual interventions.

These findings underscore the urgency of implementing a solution that addresses the limitations of the existing manual system. A centralized, user-friendly application can resolve these issues by automating key processes, improving accuracy, and providing greater transparency for all stakeholders.

Moreover, the motivation for this application is reinforced by the broader shift towards digital solutions in various industries. As businesses increasingly adopt technology to enhance their operations, the pharmaceutical sector must also evolve to meet modern expectations. This includes embracing tools that facilitate seamless communication, reduce operational overhead, and improve overall efficiency.

By developing an online order system tailored for Beacon Pharmaceuticals, this project aims to create a transformative impact. The application will empower MIOs with tools to manage orders efficiently while providing customers with a reliable and transparent experience. It will not only address existing pain points but also position Beacon Pharmaceuticals as an industry leader in leveraging technology to meet the demands of a rapidly changing market.

1.3 Objectives

The primary objective of this project is to develop an Android application that bridges the gap between MIOs, customers, and Beacon Pharmaceuticals. The app aims to:

- Enable MIOs to place orders for customers/patients quickly and accurately.
- Provide real-time product information, including prices, discounts, and stock availability.
- Streamline communication between MIOs, the management, and delivery teams.
- Offer features for tracking order deliveries, managing invoices, and monitoring sales targets.
- Allow MIOs to submit doctor visit reports and prescription/RX reports conveniently.
- Ensure a user-friendly interface that caters to all categories of users, regardless of technical expertise.

The app will be developed using Android Studio, a robust integrated development environment (IDE) specifically designed for Android development. With its advanced tools and seamless development capabilities, Android Studio will facilitate the creation of a reliable and scalable solution.

1.4 Expected Outcome

The expected outcome of this project is the successful development and deployment of an Android application that provides a comprehensive and user-friendly solution for Beacon Pharmaceuticals. This app will revolutionize the order management process, serving as a centralized platform for MIOs, customers, and the company's management team.

The application will empower MIOs by enabling them to place orders quickly and accurately, access real-time product information, and streamline their daily tasks. With features such as real-time stock updates, customer-specific discounts, and order tracking, MIOs will be better equipped to meet customer needs efficiently. The app will also allow MIOs to submit doctor visit reports and prescription (RX) records effortlessly, ensuring timely communication with the management team and improving overall workflow.

Customers will benefit significantly from the enhanced ordering experience provided by the app. They will have access to transparent pricing, detailed invoices, and timely delivery of pharmaceutical products. Real-time updates on order status and delivery tracking will ensure a reliable and trustworthy experience, addressing many of the common frustrations associated with traditional ordering systems.

The implementation of this app is expected to greatly improve operational efficiency at Beacon Pharmaceuticals. By automating manual processes, reducing errors, and enhancing communication across departments, the app will optimize resource utilization and minimize delays. This will not only save time and reduce costs but also contribute to increased customer

satisfaction and loyalty.

Furthermore, the application is designed to be scalable, allowing it to adapt to future needs and accommodate new features or functionalities as required. By leveraging Android technology, the app ensures a robust and secure environment, capable of handling large volumes of data and transactions while maintaining high performance.

This project aims to position Beacon Pharmaceuticals as a pioneer in adopting innovative technology within the pharmaceutical industry. The successful implementation of the app will strengthen the company's market reputation as a forward-thinking organization committed to improving customer experiences and operational excellence.

Beyond its immediate impact on Beacon Pharmaceuticals, this project is expected to serve as a model for future advancements in pharmaceutical order management systems. The lessons learned, methodologies applied, and technological frameworks utilized in this project will provide valuable insights for similar initiatives across the industry.

In conclusion, the development of this Android application will deliver a transformative solution that empowers MIOs, enhances customer satisfaction, and drives operational efficiency. It will support Beacon Pharmaceuticals' growth objectives while demonstrating the potential of technology to address industry-specific challenges effectively.

CHAPTER 2: BACKGROUND

2.1 Background

Bangladesh has been undergoing rapid technological advancements, with daily updates improving its digital infrastructure. The country has seen a rise in education levels, with more individuals becoming tech-savvy, particularly with the growing accessibility of smartphones and computers. The government's vision of a "Digital Bangladesh" is centered on the belief that technology can improve productivity, communication, and overall progress. As a result, the widespread use of smartphones has made it easier for people to perform a wide range of tasks online, such as shopping, banking, and business management, saving time, money, and labor.

In the pharmaceutical industry, where accuracy and speed are essential, the traditional order management system in Bangladesh has often been slow and prone to errors. Field Medical Information Officers (MIOs), who play a critical role in placing orders on behalf of customers, have typically relied on manual systems such as handwritten notes or SMS messages to collect and submit orders. While these methods have been functional, they are inefficient, error-prone, and not scalable to meet the growing demands of the industry.

The need for a digital transformation in the pharmaceutical sector is clear. Implementing an online order system for Beacon Pharmaceuticals will not only enhance operational efficiency but will also align with the country's goals of a Digital Bangladesh, leveraging technology to streamline operations and improve service delivery in the pharmaceutical industry.

2.2 Proposed Solution

This project proposes the development of an Android-based mobile application tailored specifically for Beacon Pharmaceuticals. The primary purpose of the app is to streamline the process of order collection, management, and delivery tracking for MIOs, enhancing their ability to serve customers effectively and efficiently. The app will provide real-time information on product prices, discounts, stock availability, and customer-specific details, all within a user-friendly interface.

The application will offer key functionalities, including:

- Order Placement: MIOs will be able to place orders quickly and accurately through the app, eliminating the inefficiencies of manual systems.
- Real-Time Data: The app will provide up-to-date product information, including pricing, stock availability, and customer discounts.
- Order Tracking: MIOs and customers will be able to track orders from placement to delivery.

- Report Submission: MIOs can submit doctor visit reports and prescription records directly through the app, simplifying documentation and communication.
- Sales Monitoring: MIOs will have access to sales targets and performance tracking to ensure goals are met.

This solution aims to improve operational efficiency, reduce errors, and enhance the customer experience by providing a reliable, transparent, and accessible order management system.

2.3 Scope of the Problems

The current manual order management system in place at Beacon Pharmaceuticals presents several issues that hinder operational efficiency and customer satisfaction:

- Time-Consuming Processes: MIOs spend a significant amount of time manually recording orders, which delays the process and affects response times.
- Inaccuracies and Errors: Handwritten records or SMS-based orders are prone to human error, leading to incorrect orders, missed items, or inaccurate invoices.
- Lack of Transparency: MIOs and customers often have limited visibility into product availability, pricing changes, or order progress, which can lead to frustration and dissatisfaction.
- Limited Communication: Without a centralized system, communication between MIOs, management, and the supply chain is inefficient, leading to delays in order fulfillment and stock updates.
- Reporting Inefficiencies: Submitting doctor visit reports or prescription data is a manual process, leading to delays in processing and tracking.

The scope of these problems extends across the entire order management lifecycle, from order placement to delivery, affecting both operational processes and customer satisfaction.

2.4 Challenges

While the development and implementation of an Android application for order management will address many of the inefficiencies in the current system, there are several challenges that may arise during the project:

- User Adoption: MIOs who are accustomed to manual processes may face a learning curve when transitioning to the new system. Ensuring smooth adoption and training is essential.
- Integration with Existing Systems: The app must be able to integrate seamlessly with Beacon Pharmaceuticals' existing systems, such as inventory management and customer databases, to ensure accurate data flow.
- Data Security: The app will handle sensitive customer and product data, so ensuring robust security measures to protect this information is crucial.
- Device Compatibility: Ensuring that the app is compatible with a wide range of Android devices with varying specifications and operating systems will be a challenge.
- Network Issues: In regions with inconsistent internet connectivity, the app must function reliably offline or provide features that allow data syncing once a stable connection is available.

Addressing these challenges will require careful planning, user testing, and iterative development to ensure the solution is both effective and scalable.

CHAPTER 3: SOFTWARE REQUIREMENT SPECIFICATION

3.1. Purpose

This document outlines the requirements for an Android-based application for Beacon Pharmaceuticals. The app aims to streamline the order management process, enabling MIOs to place orders, track deliveries, and access product information efficiently. It will improve operational efficiency, reduce errors, and enhance customer satisfaction.

3.2. Scope

The app will enable MIOs to efficiently place orders for customers, access real-time product details such as pricing, discounts, and stock availability, and track orders throughout the entire delivery process. It will also allow them to submit doctor visit reports and prescription details while providing tools to monitor their sales performance and track progress toward targets. Designed with MIOs in mind, the app will enhance their productivity and facilitate seamless communication with both management and the supply chain.

3.3. Functional Requirements

The application will provide secure authentication for MIOs, granting access to features based on their specific roles. It will enable MIOs to place orders for pharmaceutical products on behalf of customers, ensuring quick and accurate order submissions. The app will display real-time product information, including pricing, discounts, and stock availability. Additionally, MIOs will be able to track the status of orders from placement through to delivery, with real-time updates provided at each stage. The app will also allow MIOs to submit doctor visit reports and prescription records seamlessly. Furthermore, the application will include features for monitoring sales performance, tracking progress towards sales targets, and sending notifications for order updates and other critical alerts.

3.3.1 Login

FR1	Login
Description	Registered users shall be able to log in to Security using their credentials, and the application should implement secure authentication mechanisms.
Stakeholder	Organization Active Employee, Admin

Table: 3.3.1.1: Login Functional Requirement

3.3.2 Product Browsing

FR2	Do Ordering
Description	The app shall categorize products into various categories, TP, MRP, and sell pricing to facilitate easy navigation for users who can do product browsing.
Stakeholder	Active Employee

Table: 3.3.2.1: Product Browsing Functional Requirement

3.3.3 Customer Browsing

FR3	Do Ordering
Description	The app shall territory- or area-wise customer-categorize every active user of MIO who can do orders for their already assigned customer browsing.
Stakeholder	Active Employee

Table: 3.3.2.1: Customer Browsing Functional Requirement

3.3.4 Cart Management

FR2	Add Cart Items
Description	Users should be able to add products to their specific customers shopping carts, and the app should update the cart in real time.
Stakeholder	Active Employee

Table: 3.3.4.1: Cart Management Functional Requirement

3.4 Requirement Collection and Analysis

The success of this project relies on the thorough collection and analysis of requirements from various sources. Understanding the needs of the Field Medical Information Officers (MIOs), customers, and Beacon Pharmaceuticals' management was critical to ensuring the app meets its

intended purpose.

Requirements were gathered through multiple methods, including stakeholder interviews, online research, and the analysis of similar applications in the pharmaceutical and order management sectors. These processes provided valuable insights into the key functionalities and features that needed to be incorporated into the application.

Feedback from stakeholders highlighted the need for real-time product price updates, customer-specific discounts, stock visibility, and seamless order placement. Research on other apps emphasized the importance of user-friendly interfaces, secure data handling, and robust reporting features. These inputs were systematically analyzed to identify the most suitable requirements for the design and development of the system.

The iterative approach to requirement collection ensured that all critical aspects were captured and aligned with the project goals. This comprehensive understanding laid a strong foundation for the subsequent phases of modeling, design, and development.

3.5 Literature survey

3.5.1 Survey of Owners

As we asked our participants what their comments about our app were, 40% were satisfied, 50% were very satisfied, and 10% were not satisfied.

3.5.2 Survey of Users

As we asked our participants what their comments about our app were, 32% were satisfied, 56% were very satisfied, and 12% were not satisfied.

3.6 Use Case Diagram

The use case diagram for my pharmaceutical online order system illustrates the interactions between the system and its users, primarily focusing on the roles of MIOs (Field Medical Information Officers), Sales Admin, and Customers/Patients. MIOs have use cases for placing orders, submitting doctor visit reports and prescriptions, and checking order statuses. They can also access sales achievement reports. The system allows MIO to place orders by selecting products, entering customer details, and generating invoices.

Sales Admins manage use cases for overseeing sales targets, viewing performance reports, and updating product information such as pricing and stock levels.

Customers/Patients receive orders placed by MIOs and may interact with the system to track delivery status. The diagram captures how these users interact with the system's key functionalities, ensuring smooth communication and data flow throughout the process.

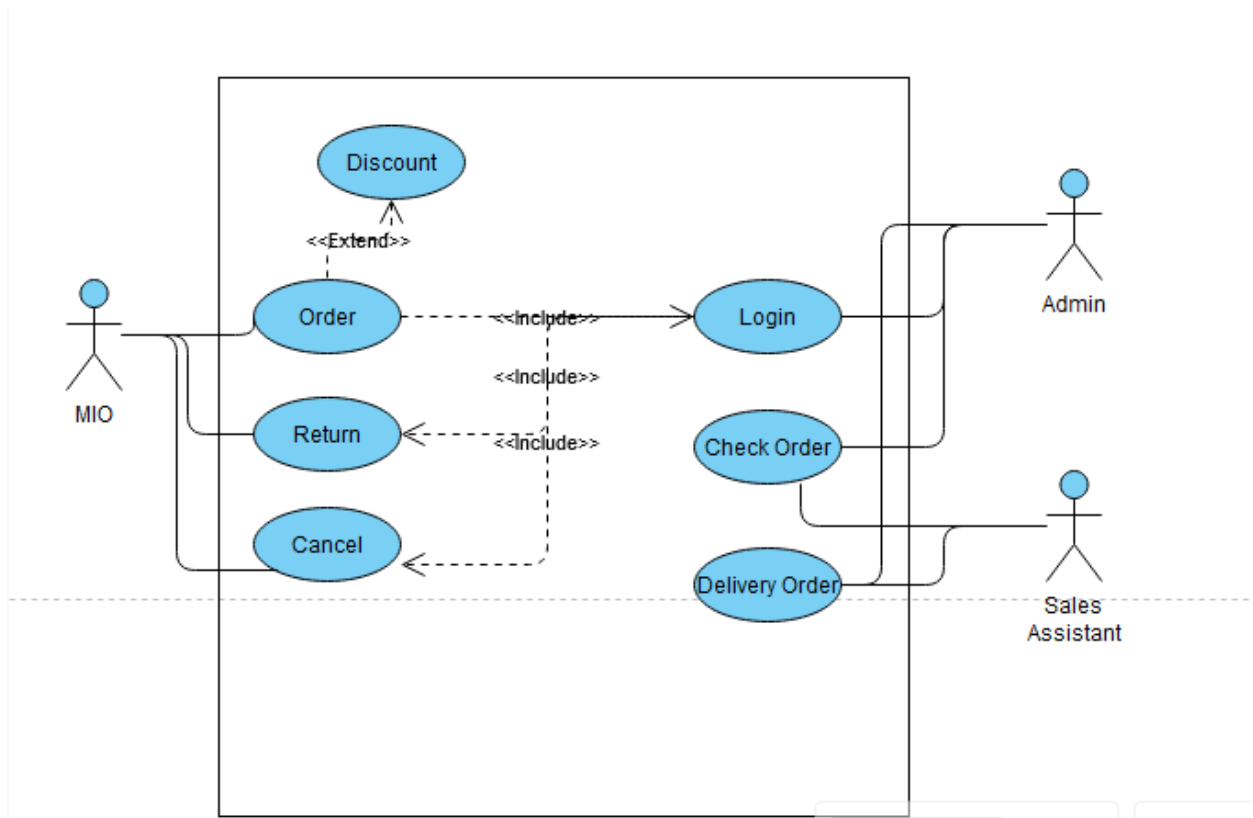


Figure: 3.6.1 Use Case Diagram

3.7 Data Flow Diagram

The Data Flow Diagram for the pharmaceutical order management app illustrates how data flows between various processes, external entities, and the database. The system includes key processes such as login validation, order management, stock checking, report submission, performance tracking, and admin management. Each process ensures data validation, secure storage, and proper interaction between the users and the system. This structure guarantees efficient data handling and seamless communication across all stakeholders.

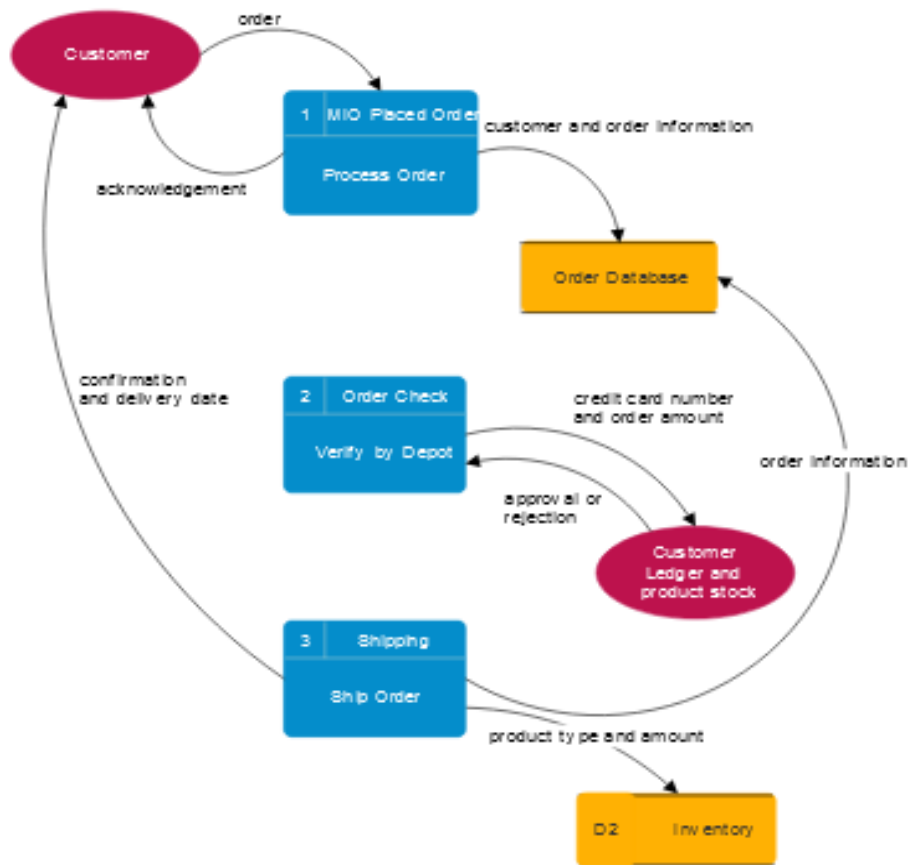


Figure: 3.7.1 Data Flow Diagram

3.8 ER Diagram

The ER diagram for my pharmaceutical online order system illustrates the relationships between key entities. MIOs (Field Medical Information Officers) place orders on behalf of customers, with details such as product information, quantities, and delivery tracked in the order entity. Products, which include information like names, prices, and stock levels, are linked to orders. Sales Admin manages sales targets, achievements, and product data. Additionally, doctor visits and prescription reports submitted by MIOs are associated with orders. These relationships help ensure efficient order processing, delivery tracking, and access to reports.

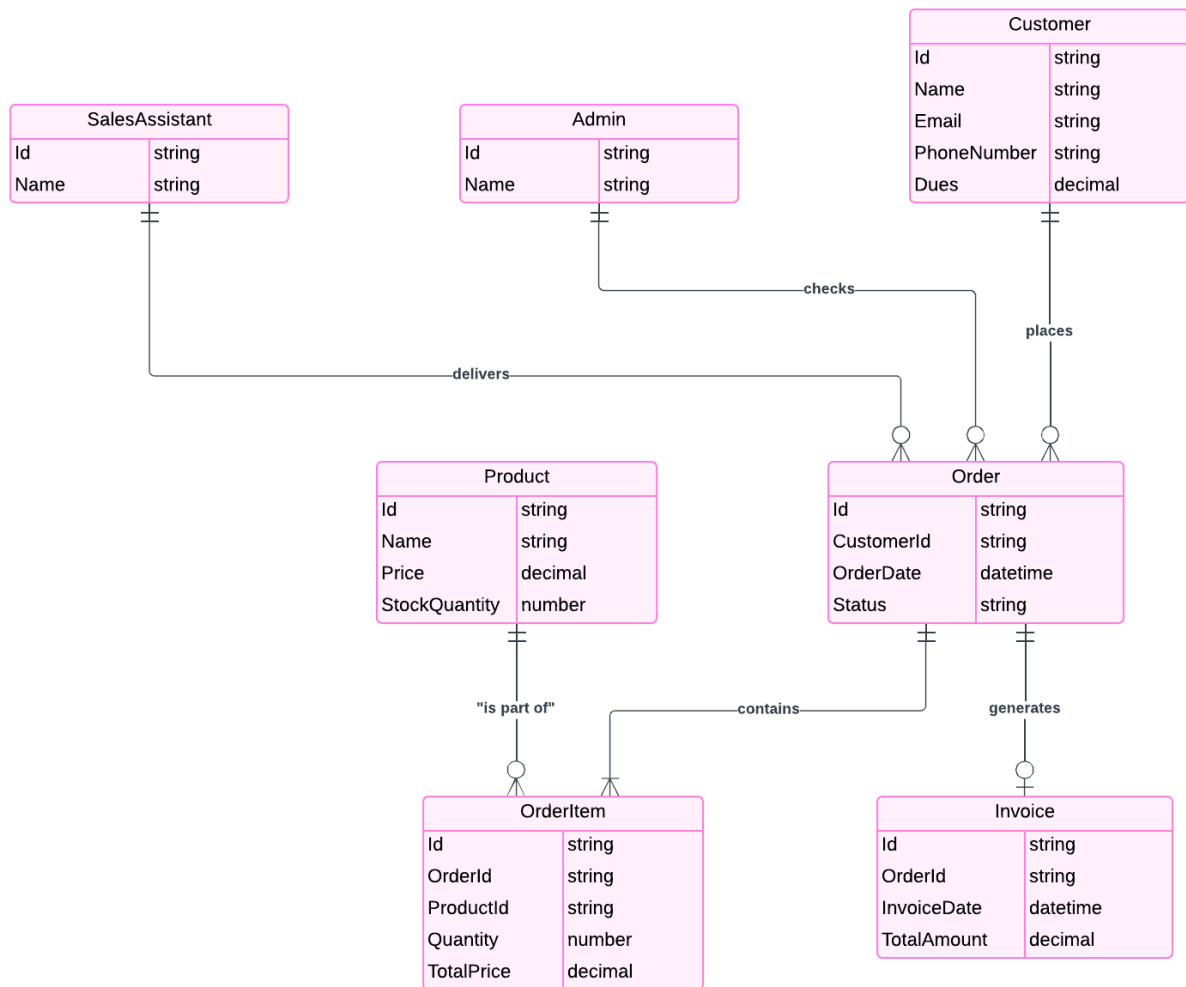


Figure: 3.8.1 ER Diagram

3.9. Non-Functional Requirements

The application will prioritize usability with an intuitive design, ensuring that MIOs of varying technical expertise can easily navigate the system. It will perform efficiently, with quick response times for tasks such as placing orders and tracking deliveries, even under heavy use. The app will be reliable, maintaining high availability with minimal downtime, and include secure data handling to protect user privacy through encryption. It will be designed to scale with the growth of the user base and data, accommodating future expansions without compromising performance. The system will be compatible with Android devices running version 13.0 or higher and built with a modular structure to allow for easy updates and maintenance.

3.10 System Requirements

There some software requirements which we used for developing my project.

3.10.1 Hardware Requirements

Processor dual core CPU with 1.5 GHz of speed

RAM 8 GB

Storage 50 GB of free storage

Internet 1 Mbps

Android OS Smartphone

3.10.2 Software Requirements

Operating System: Android 6.0 (Marshmallow) or higher

Development Environment: Android Studio

Programming Language: Java or Kotlin

Database: MySQL, Oracle

Internet Connectivity: Required for real-time processing and data synchronization

API: RESTful API for backend integration

CHAPTER 4: DESIGN SPECIFICATION

The front-end design of the pharmaceutical order management application is focused on delivering a user-friendly and intuitive interface for all users, including field medical information officers (MIOs), customers, and administrators. The goal is to create an efficient interaction layer between the users and the system while maintaining simplicity and accessibility. The front end of the application is developed using modern design principles, ensuring compatibility with Android devices.

4.1 Front-End Design

I can discuss front-end design for the user (MIO) site. Beacon Pharmaceuticals active mio can only allow for order placement for using this app.

- Figure 4.1.1 Login Screen of app
- Figure 4.1.2 Login Another Device Reset Screen of app
- Figure 4.1.3 Home Screen of app
- Figure 4.1.4 Customer Screen of app
- Figure 4.1.5 Product Screen of app
- Figure 4.1.6 Order Screen of app
- Figure 4.1.7 Order Cockpit Screen Depot User
- Figure 4.1.8 Order History Screen of app

4.1.1 Login Screen

The users can log in after entering the valid employee ID and password. After a successful login, a user can be logged in on this home screen of the app.

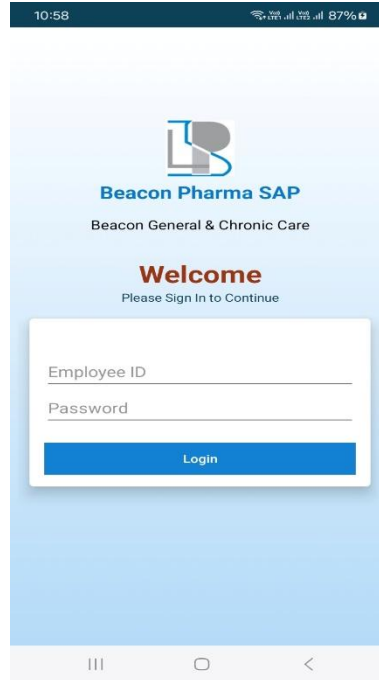


Figure 4.1.1 Login Screen

4.1.2 Login Another Device Reset Screen

If the user can already use this app on another phone, the user can log in on this device by entering the employee ID and joining date.

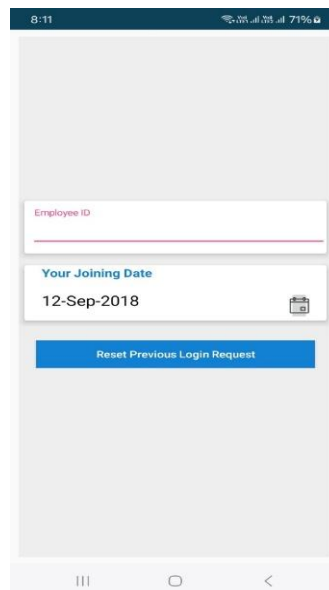


Figure 4.1.2 Login Another Device Reset Screen

4.1.3 Home Screen

On this screen, after a successful login, the user can browse their assigned customers products, product stock, and doctor list and will place an order.

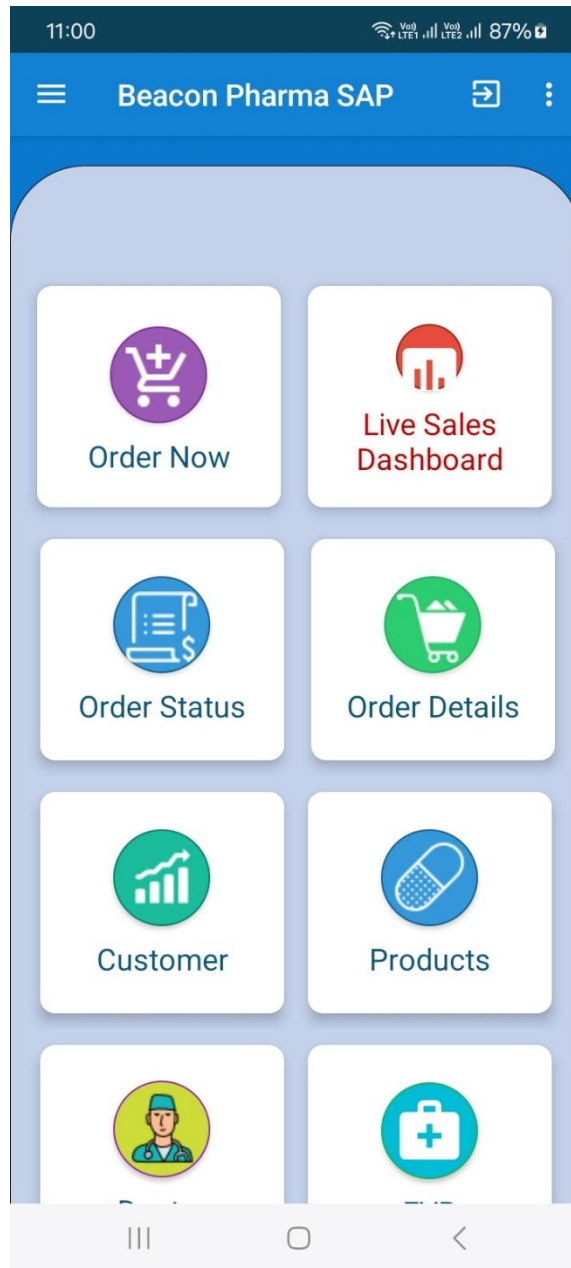


Figure 4.1.2 Home Screen

4.1.4 Customer Screen

On this screen, the user (MIO) can view the details of the customers already assigned to them.

4.1.5 Product Screen

On this screen, the user (MIO) can view the details of the product assigned to them.

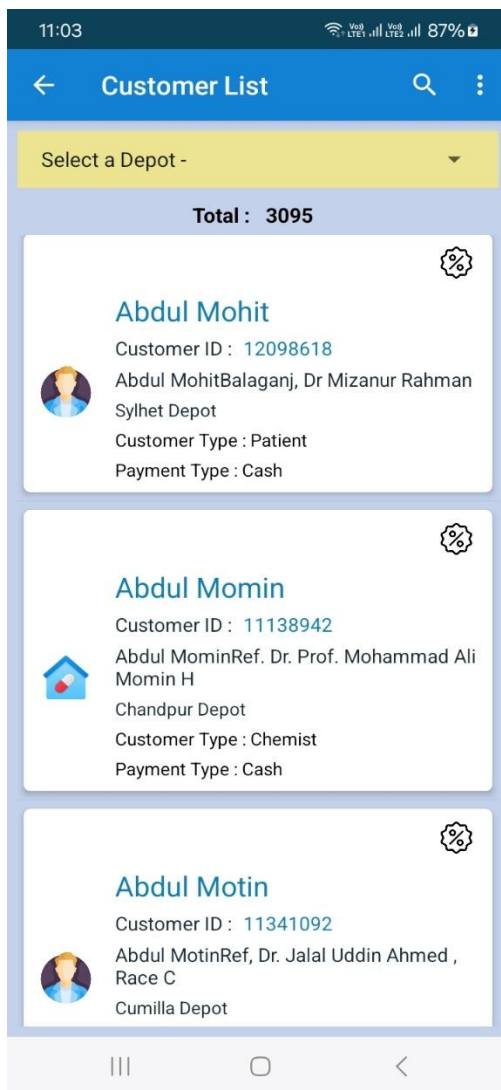


Figure 4.1.4 Customer Screen

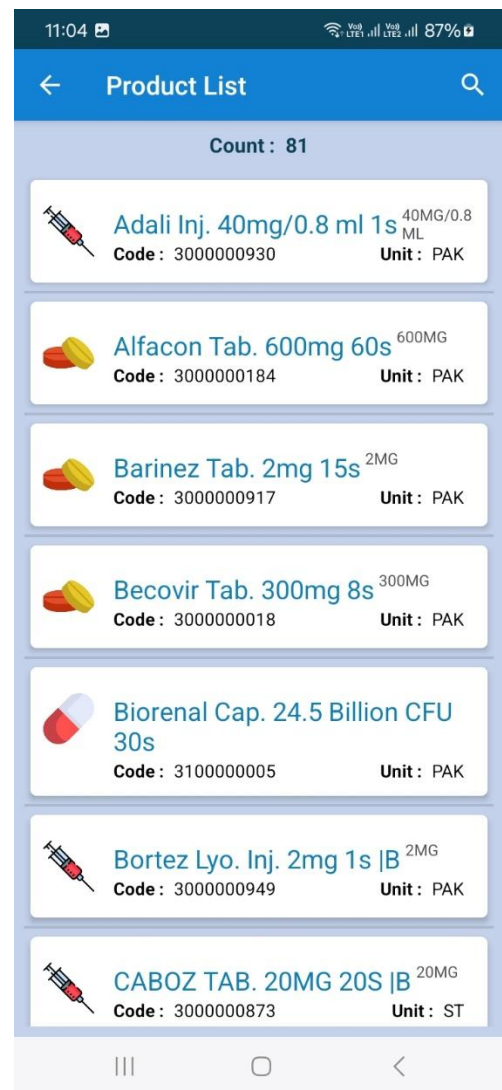


Figure 4.1.5 Product Screen

4.1.6 Order Screen

On this screen, the MIO can place an order for a specific customer by selecting the delivery date and time. They can also add delivery notes, choose the payment mode, select products, and then either save the order as a draft or submit it for delivery.

11:06 87%

Aj Jaber Pharmacy ORDER STATUS

Delivery Date :
17-01-2025 11:04 AM
☒ Shop ☐ Others

Notes (optional)

☒ Cash ☐ Credit

Add Order +

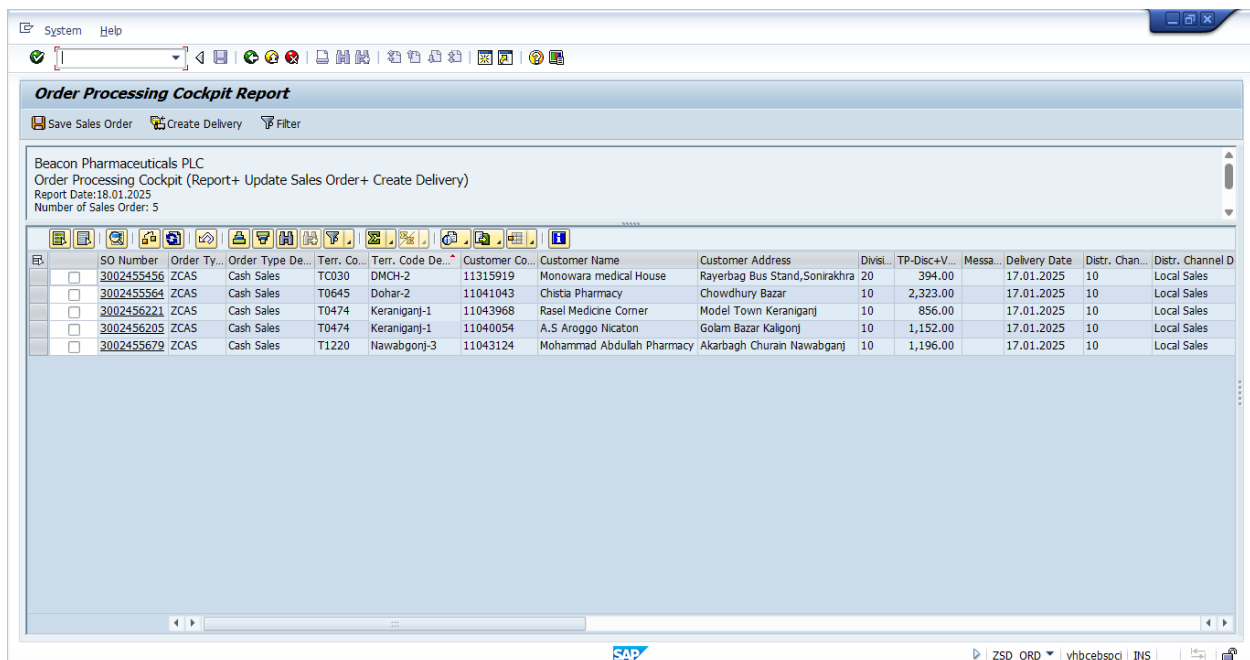
Items Name	Quantity	Price
Caviral Tab. 0.5mg 30s	2	₹2158.8
Eposis Inj. 5000IU 1s	1	₹1624.06
Pegin Inj. 180mcg/0.5 ml 1s	6	₹50685.6
Oliver Tab. 150mg 56s	2	₹1259.38
Imruza Tab. 25mg 30s	6	₹1619.16
Bortez Lyo. Inj. 2mg 1s IB	5	₹51720
Total Amount :		₹109067

Save **Submit Now**

Figure 4.1.6 Order Screen

4.1.7 Order Cockpit Screen Depot User

Submitted orders are first inserted into the Oracle database and then transferred to the SAP S/4HANA Cloud database. Beacon has recently launched SAP, the world's most valuable and standard ERP system. Once an MIO submits an order, it is verified by the depot, invoiced, and processed for delivery. The sales assistant ensures the product is delivered to the respective customer.



Order Processing Cockpit Report

Beacon Pharmaceuticals PLC
Order Processing Cockpit (Report+ Update Sales Order+ Create Delivery)
Report Date:18.01.2025
Number of Sales Order: 5

SO Number	Order Ty...	Order Type De...	Terr. Co...	Terr. Code De...	Customer Co...	Customer Name	Customer Address	Divisi...	TP-Disc+V...	Messa...	Delivery Date	Distr. Chan...	Distr. Channel D
3002455456	ZCAS	Cash Sales	TC030	DMCH-2	11315919	Monowara medical House	Rayerbag Bus Stand, Sonirakhra	20	394.00		17.01.2025	10	Local Sales
3002455564	ZCAS	Cash Sales	T0645	Dohar-2	11041043	Chista Pharmacy	Chowdhury Bazar	10	2,323.00		17.01.2025	10	Local Sales
3002456221	ZCAS	Cash Sales	T0474	Keraniganj-1	11043968	Rasel Medicine Corner	Model Town Keraniganj	10	856.00		17.01.2025	10	Local Sales
3002456205	ZCAS	Cash Sales	T0474	Keraniganj-1	11040054	A.S Arogo Nicator	Golam Bazar Kaligonj	10	1,152.00		17.01.2025	10	Local Sales
3002455679	ZCAS	Cash Sales	T1220	Nawabgonj-3	11043124	Mohammad Abdullah Pharmacy	Akarbagh Churain Nawabgonj	10	1,196.00		17.01.2025	10	Local Sales

Figure 4.1.7 Order Cockpit for Depot User

4.1.8 Order History Screen

On this screen, the user can view the details of placed orders, including the total payable amount, invoice status (complete or incomplete), and live delivery tracking.

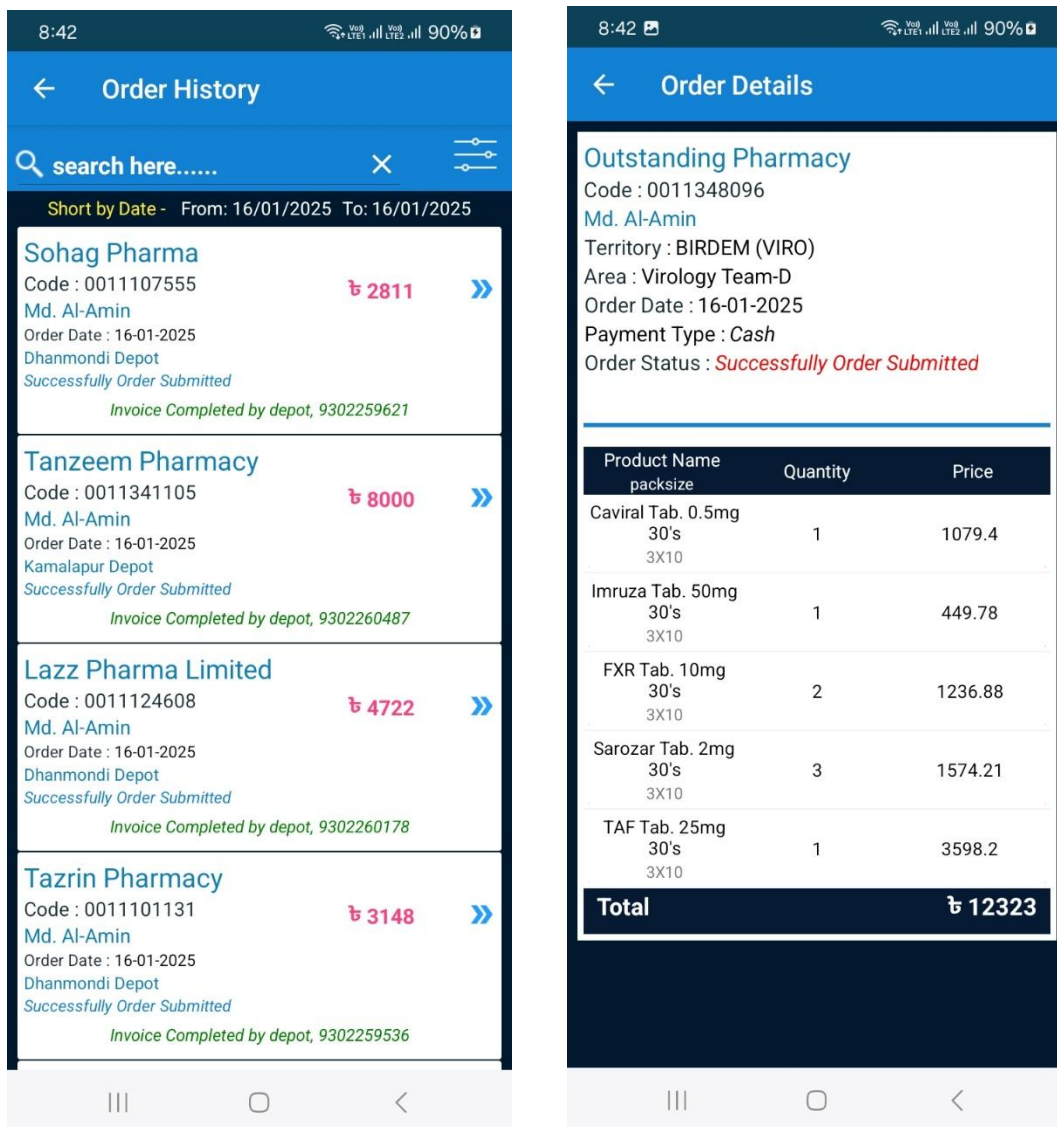


Figure 4.1.8 Order History Screen

4.1 Back-End Design

The back end of the application is developed to ensure robust and efficient processing of user inputs while managing core system functionality. Although the back-end is not visible to users, it acts as the backbone of the application, handling business logic, data processing, and interactions with the database.

The back end is built using PHP, a powerful server-side scripting language known for its versatility and compatibility. The application uses Oracle 19c Database as its data storage solution. Oracle 19c, a widely recognized and reliable relational database, is chosen for its high performance, scalability, and advanced security features.

This setup ensures seamless integration between the application logic and the database. Oracle 19c provides robust support for handling large volumes of data, enabling efficient storage and retrieval of information such as product inventories, order details, customer information, and reports. Its advanced features, such as multi-model data management and automated tools, further enhance the system's efficiency.

The combination of PHP and Oracle 19c Database creates a reliable and scalable back-end architecture, supporting the application in delivering secure, accurate, and responsive services to its users.

CHAPTER 5: IMPLEMENTATION AND TESTING

5.1 Front-End Design Implementation

Here I show the login page. This app does not have a registration page because this app is allowed only for Beacon Pharmaceuticals active employees. When an employee is active in our payroll system, then the backend system syncs the new active employee credentials. If the user entered a less secure user ID or password, then show a warning toast message. If the user ID is wrong or the password is wrong, then show an invalid user credentials or inactive user message. One user ID is allowing only one phone, so if anyone can try another phone, then show a warning message: 'Maybe you use another phone.'. If the user gives the correct employee ID and password, then they successfully log in to the app and access the main dashboard of the app.

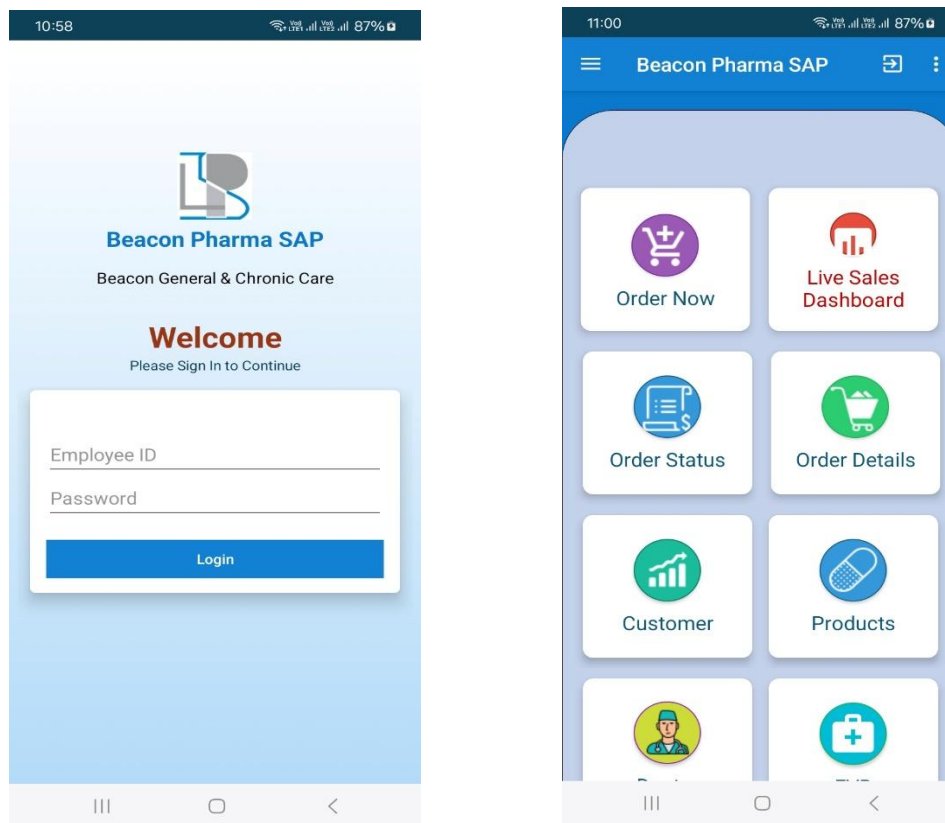


Figure: 5.1.1 Login Screen

The login screen allows active employees to enter their employee ID and password. The entered data is validated and stored in the Oracle database. Upon successful authentication, the employee gains access to the application's dashboard.

5.2 Testing Implementation

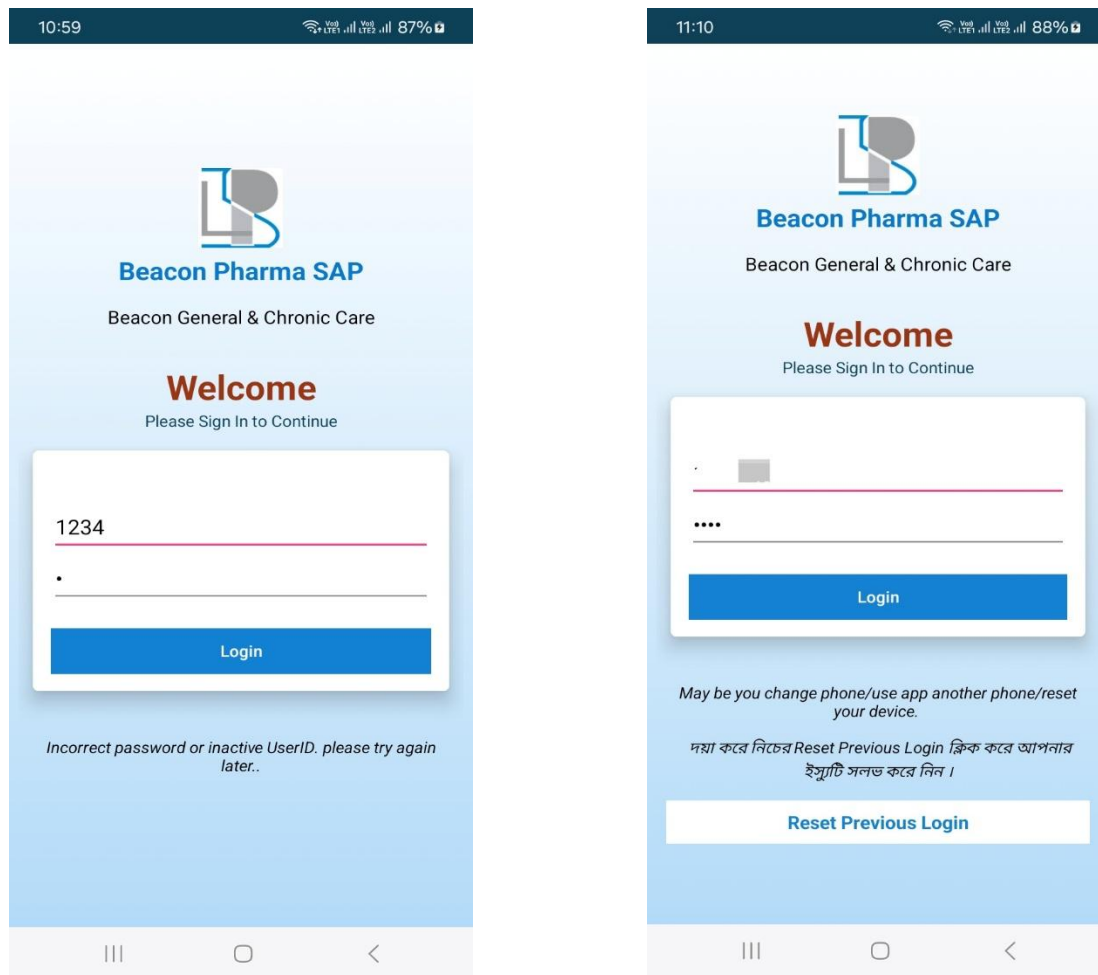


Figure: 5.2.1: Testing Implementation

If the user enters an invalid employee ID or password or if the employee ID is inactive, a warning message will be displayed indicating "Incorrect password or inactive UserID." If the user provides valid credentials but has already used the app on another phone, a message will appear stating, "Maybe you changed phones/used the app on another phone."

There are some various levels of testing will be performed during the development process.

- Unit Testing
- Integration Testing
- System Testing
- Acceptance Testing

5.3.1 Unit Testing

Unit testing will be carried out on individual components of the app, such as the login functionality, order placement, and product information retrieval. Each unit will be tested in isolation to verify its correctness and functionality before integration into the complete system.

5.3.2 Integration Testing

After unit testing, integration testing will be performed to ensure that the different modules of the application work together seamlessly. This includes testing the interaction between the user interface, database, and backend systems, ensuring data flows correctly between components.

5.3.3 System Testing

System testing will verify the complete and integrated system's functionality. This phase will include testing the app on multiple devices to ensure compatibility, checking the performance under different conditions, and validating that all features work together as intended.

5.4.4 Acceptance Testing

Acceptance testing will be conducted to ensure that the app meets the business and user requirements. This will involve real-world testing by stakeholders, such as MIOs, to confirm the app's usability, functionality, and performance in a production-like environment before final deployment.

CHAPTER 6: CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

The development of the online order system app for Beacon Pharmaceuticals represents a significant step forward in modernizing the pharmaceutical order and supply process. By transitioning from traditional, manual methods of order collection to a streamlined, technology-driven system, the app has addressed critical inefficiencies such as delays, errors, and lack of transparency. The implementation of features like real-time product availability, order tracking, and report submissions has not only enhanced operational efficiency but also improved user satisfaction among MIOs and customers.

The app's performance in initial testing demonstrates its potential to revolutionize order management within the pharmaceutical industry. However, the success of the system depends on continuous user feedback, regular updates, and proper training for MIOs to fully leverage its capabilities. This project highlights the importance of integrating technology into traditional industries to improve workflow and customer experiences.

6.2 Scope for Further Developments

While the app fulfills its primary objectives, there are opportunities for further enhancements to increase its value and utility:

- Cross-Platform Compatibility: Expanding the app to support iOS devices in addition to Android for broader accessibility.
- AI-Powered Insights: Implementing AI-based analytics to provide predictive insights on customer demands, sales trends, and inventory management.
- Multi-Language Support: Adding support for multiple languages to make the app more accessible for a diverse user base.
- Offline Mode: Introducing an offline mode that allows MIOs to record orders and synchronize them with the server once connectivity is restored.
- Enhanced Security: Incorporating advanced security features like two-factor authentication and biometric login for improved user safety.
- Customer Integration: Developing a customer-facing portal for direct order placement and real-time updates, reducing reliance on intermediaries.

These enhancements would not only expand the app's functionality but also align it with evolving technological advancements and user expectations, ensuring its relevance and effectiveness in the future.

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