

**A REPORT
ON
SALES ENQUIRY AND ORDER APPROVAL
MOBILE APP**

Submitted by,
Dhanyamraju Lakshmi Sathwika - 20211CSE0501

Under the guidance of,
Ms.Tintu Vijayan

in partial fulfillment for the award of the degree of

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At



PRESIDENCY UNIVERSITY

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PRESIDENCY UNIVERSITY

PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the Internship report “**Sales enquiry and order approval mobile app**” being submitted by “Dhanyamraju Lakshmi Sathwika” bearing roll number “20211CSE0501” in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a bonafide work carried out under my supervision.

Ms. Tintu Vijayan
Assistant professor
PSCS
Presidency University

Dr. Asif Mohammed H B
Assistant professor & HOD
PSCS
Presidency University

Dr. MYDHILI NAIR
Associate Dean
PSCS
Presidency University

Dr. SAMEERUDDIN KHAN
Pro-Vice Chancellor - Engineering
Dean –PSCS / PSIS
Presidency University

PRESIDENCY UNIVERSITY

PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

DECLARATION

I hereby declare that the work, which is being presented in the report entitled “**Sales enquiry and order approval mobile app**” in partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering**, is a record of my own investigations carried under the guidance of **Tintu Vijayan, Assistant Professor, Presidency School of Computer Science and Engineering, Presidency University, Bengaluru.**

I have not submitted the matter presented in this report anywhere for the award of any other Degree.

Dhanyamraju Lakshmi Sathwika
20211CSE0501

INTERNSHIP COMPLETION CERTIFICATE



EQUAX SOFTWARE LABS

LLP Reg. No. AAI-4820

Phone: 80-40980862

Email: contact@equaxsoftwarelabs.com

Web: www.equaxsoftwarelabs.com

TO WHOM THIS MAY CONCERN

This is to certify that **Ms. Dhanyamraju Lakshmi Sathwika** has successfully completed her internship at **Equax Software Labs LLP**. She has worked with us for 3 months from 27th January 2025, to 30th April 2025, where she worked as Associate Software Engineer Intern, and helped with improving our mobile applications.

We found Ms. **Dhanyamraju Lakshmi Sathwika** is very hardworking and diligent with her assignments. We wish her great success in her future endeavors.

Yours sincerely,

For Equax Software Labs LLP

(Authorized Signatory)



EQUAX SOFTWARE LABS LLP

Registered Office: No.214, Plot No.2, Sheshasai, Riverside Estate, Doddabele, Kengeri, Bengaluru - 560 060, Karnataka

Administrative Office: No 145/5A, 1st Floor, Coconut Avenue Road, Opp. Silver Valley Collage, Malleswaram, Bengaluru - 560 003, Karnataka

ABSTRACT

The purpose of the undertaking is to change the current web application Sales Enquiry & Order Approval System into a mobile app to facilitate an easy approval process for on-the-go approvers. The mobile application, which is developed using the Flutter framework, has a user-friendly interface, real-time notifications, and secure authentication. The application enables approvers to review pending sales inquiries, approve or reject orders and provide remarks, entirely on their mobile devices. The system ensures faster decision making, improved communication, and increased productivity. This report discusses the objectives, methodology, implementation, and outcomes of the project, along with the difference made by the mobile application in sales efficiency and user satisfaction.

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CHAPTER-1

INTRODUCTION

1.1 Background

In today's fast-paced world of business, timely and well-informed decisions are a prerequisite to maintaining a competitive edge. Sales inquiry and order approval systems are the indispensable parts of one's sales workflow, enabling businesses to respond quickly to customer needs. Instead, they enable sales teams to inquire, track status, and ensure approval from the right person. Old web-based systems often fail to fulfill the requirements of a mobile-driven workforce.

Existing web-based sales inquiry & order approval systems are working but only for the desktop. Approvers, who are on the move frequently, are delayed by the mobile-unfriendly solution in processing the approvals. They miss important updates because there are no real-time notifications, and the web-based interface is so cumbersome that it is nearly impossible to use from a smartphone. Thus, decision-making is delayed and an opportunity is lost, along with a bad user experience.

The transformation is from a web-based system to mobile applications. This is supplemented by the fact that there is high demand for mobility and convenience. Mobile applications have significant advantages over the traditional web-based system, such as speedier access, offline functionality, and better user engagement. With the rise of cross-platform development frameworks like Flutter, it has now become easier to develop high-performance applications for multiple platforms using a single source code. This project aims at converting what is presently a web-based system into a mobile application, thus providing a seamless and very efficient solution for approvers.

1.2 Problem Statement

The online Sales Enquiry and Order Approval system is a way of bottlenecking approvers while on the go. Communication and processes are affected, so there are delays in getting feedback. Hence, an approver tends to miss their vital notification because of the lack of appropriate and real-time notifications, besides the interface of the site being optimized to be accessed by mobile phones, resulting in a poor user experience. This has great implications to many businesses such as those listed below:

- **Delayed Approvals:** Since approvers away from their desks cannot get on the system, their approval processes would suffer delays.
- **Missed Updates:** When notifications are not streamlined, approvers may miss critical updates, and with that go chances of sales.
- **Poor User Experience:** The computer syntax is ill-adapted to mobile devices, complicating navigation and use of the system for approvers using their smartphones.

To this end, the project aims to develop a mobile application that eases the approval process for timely decisions and effective communication between approvers and the sales team. The mobile app would be user-friendly and provide real-time notifications and secure authentication so that approvers can use their mobile phones to review pending sales enquiries, approve or reject orders, and comment.

1.3 Objectives

The main objectives of the project are:

- 1. Creating a Mobile-Friendly Solution:** Improved redesign of the existing web-based Sales Enquiry & Order Approval system into a mobile app to be used on both iOS and Android devices.
- 2. Ensuring Smooth Review and Decision-Making:** Provide approvers with a seamless and intuitive interface for reviewing pending sales enquiries, approving or rejecting orders, and providing remarks.
- 3. Implementing Real-Time Notifications:** Create real-time notifications for approvers to keep them updated on the flow for faster communication.
- 4. Create a Simple and User-Friendly Interface:** Design a clean and intuitive user interface that enhances usability and improves the value proposition for users.
- 5. Integrate Secure Authentication and Access Control:** Build secured authentication mechanisms such that only authorized users will be able to access the application and its data.

1.4 Scope of the Project

The scope of the project will cover the transformation of the existing web-based Sales Enquiry & Order Approval system into a mobile app developed with the Flutter framework. This application is meant for the approval authorities only. Approvers can review sales enquiries, approve or reject sales orders, and provide comments or feedback from their devices.

The application is at its infancy stage of development, and compatibility with iOS and Android platforms will be ensured later.

The office will provide a database and an API which can help integrate the mobile application with the existing web-based system.

The database will maintain all basically related sales enquiry and order data, and the interface of the API will allow the communication of the mobile app with the backend system for the fetching of data and submitting of approvals. Such integration ensures that always the new mobile app is in sync with the existing system so that officers can enjoy a seamless experience.

The projects will majorly focus on:

- **Frontend Development:** Design and develop the UI for the mobile app using Flutter.
- **Backend Integration:** Integrate the mobile app with the existing web-based system using the provided API.
- **Real-Time Notifications:** Develop real-time notifications using Firebase Cloud Messaging.
- **Authentication and Security:** Secure user data with authentication mechanisms, ensuring access control.

CHAPTER-2

LITERATURE SURVEY

2.1 Mobile App Development Evolution

Mobile app development's evolution experienced major transformations due to changes in technology and the expectations of the user. Early mobile app development focused on native platforms: that is, two separate codebases were required for an app to work in iOS and Android. This painstaking methodology resulted in double costs for development work since programmers would have to simultaneously maintain two different versions of the same app. However, the advent of cross-platform environments like Flutter, React Native, and Xamarin geared the tide into opening a new dimension altogether. This development allows programmers to create apps for multiple platforms with one design.

The popularity of cross-platform frameworks has only grown, as they have greatly contributed to decreased development times and costs while achieving performance almost on par with native apps. Due to its feature set, Flutter has become the most prominent framework, with hot reload being the most enticing. This option allows changes made to the UI to be witnessed in real time without requiring an application restart. The development time is drastically reduced, increasing developer efficiency. Flutter uses the Skia rendering engine, which allows for seamless performance at 60FPS and is perfect for high-performance apps.

Another driver behind the cross-platform framework rise has been the demand for mobile apps in industries such as healthcare, finance, and e-commerce.

There has been a slow but definite realization among businesses about the importance of mobile applications for customer engagement, streamlining operations, and improving efficiency on a bigger scale. This option has induced yet another shift from native development to cross-platform solutions for the mobile app development industry, with Flutter being the torchbearer in this regard.[1]

2.2 Mobile App Marketing and User Engagement

Mobile app marketing has considerably changed over the years, now emphasizing data-driven strategies and personalized user experiences. In the early marketing stages of mobile apps, the practice was predominantly oriented toward ASO and in-app advertisement. Now, however, the app market is saturated and businesses can no longer rely on existing marketing strategies. They have begun to innovate on using the more sophisticated marketing strategies to attract and retain users.

Another avenue for improving user engagement and retention is real-time notifications. Studies have shown that push notifications increase user engagement by keeping them informed about updates, promotional offers, and other forms of relevant information. For example, Gupta and Verma (2021) demonstrated that applications configured for real-time notifications retain 25% more users compared to those not configured in that fashion. Real-time notifications work wonders in sales enquiry and order approval systems because they notify approvers immediately about pending enquiries and therefore reduce delays and improve decision-making.

Apart from that, it is also user experience, which makes an important, if not primary, concern in mobile app marketing.

A well-designed user interface (UI) will increase user engagement by making it easier to navigate the app. According to Wang et al. (2022), the simplicity and usability of mobile apps will retain most of their users in the long term; simple, clean, and intuitive interfaces persuade users to stay for the long haul. This is especially important in sales enquiry and order approval systems where approvers need to review orders quickly before approving them without unnecessary complexity.[2]

2.3 The Flutter Framework

Flutter is one of the most preferred frameworks for cross-platform mobile app development due to its maintainability with Google. Features such as Hot Reload and Widget-Based Architecture are its main features, and they have made Flutter famous amongst app developers. Hot Reload lets developers see changes to the user interface in real time without restarting the application. This minimizes downtime and significantly speeds up development. Hot Reload is particularly important for iterative development, where the developer can test various design orientations, make changes, and quickly verify or fix problems.

The widget architecture distinguishes Flutter from other frameworks in another way. Flutter apps are composed of widgets that combine to make powerful and highly customizable user interfaces. This architecture makes UI development easier, offering flexible customization, high-performance rendering, and responsive UI. According to Kumar and Sharma (2023), the widget-based architecture must be one of the significant reasons many developers are accepting Flutter, allowing them to create high-performance applications with lesser effort.

Another noteworthy point is Flutter's performance. The Skia rendering engine fuels the framework to keep animations smooth at 60 FPS even on the lowest-end devices. This suits Flutter for high-performance apps where speed and responsiveness are paramount, like sales inquiry and order approval systems. They develop with Flutter's single codebase to preserve almost native performance for the iOS, Android, and web platforms.

A further assurance of Flutter's scalability and maintainability comes from the major companies that have embraced it: Google, Alibaba, and BMW. All these companies have adopted Flutter to build and take to market high-performance apps fully meeting the demands of their users, which is proof of the framework's capabilities when working on highly complex and large-scale programs.[3]

2.4 Mobile-Based Approval Systems

Mobile-based approval systems are gaining popularity in enterprise workflow automation. They improve decision-making speed, team communication, and efficiency, according to Gupta et al. (2020), who suggest that with mobile approval systems, almost the entire approval time is reduced as mobile approvers can review requests and approve requests from anywhere.

Real-time notifications are one more benefit of mobile-based approval systems. These notifications enable approvers to receive prompt alerts on pending requests, eliminating delays and improving workflow productivity. Kumar et al. (2023) found that organizations adopting mobile-based approval systems have reduced approval time by 30% compared to those functioning via traditional web systems.

Another important advantage of mobile approval systems is their easy-to-use interface. Generally, mobile applications are fairly intuitive and user-friendly, allowing approvers to operate the system and complete their tasks in a fairly straightforward manner. This is crucial specifically in the case of sales enquiry and orders approval systems, where approvers have to hastily carry out their reviews and approve orders without any room for needless complexity.

The successful integration of mobile-based approval systems with existing enterprise systems is another crucial aspect of their success. By utilizing APIs and various integration tools, these systems connect easily to existing databases and workflows, thus ensuring that all data stay synced and up-to-date. This integration thus minimizes the need to enforce drastic changes on the existing infrastructure, thus cutting down development time and costs.[4]

CHAPTER-3

RESEARCH GAPS OF EXISTING METHODS

During the early stages of my internship project, I dove into researching various methods and tools that companies use to manage sales inquiries and order approvals. Traditionally, many businesses rely on spreadsheets, manual paperwork, or generic CRM systems to handle their sales processes.

3.1 Limitations and Lack of Real-Time Communication

While these approaches are common, they come with a host of limitations that reveal significant gaps in both research and implementation. One of the biggest issues with current methods is the lack of real-time communication and updates among the departments involved in sales and order approvals. In manual systems, approvals can get held up because they depend on physical documents or disconnected communication tools, which leads to inefficiencies and unhappy customers. Another major shortcoming is the lack of a centralized and automated way to track approvals. Many existing systems don't offer an easy-to-use interface for monitoring the status of orders or sending alerts for pending approvals.

This can create confusion and delays, especially when dealing with a large number of orders. Additionally, traditional tools often lack the customization and scalability needed to adapt to different business models.

Many organizations struggle to modify off-the-shelf software to fit their specific workflows without incurring hefty costs or needing technical expertise. Security and data redundancy are also areas that often get overlooked. Conventional systems don't always guarantee data consistency, proper backups, or user-specific access controls, which can put sensitive business information at risk. Finally, many existing tools fall short in terms of mobile compatibility and offline functionality, which are crucial for field teams or remote workers. This limitation hinders decision-makers from reviewing or approving orders on the go, ultimately affecting the business's agility.

These gaps clearly highlight the need for a modern, cloud-integrated mobile application that simplifies inquiry handling, automates approvals, provides real-time visibility, and is scalable, secure, and user-friendly - leading to the development of our custom solution using Flutter and Firebase.

CHAPTER-4

PROPOSED METHODOLOGY

4.1 Project Planning

The project was broken into stages to be developed in a structured and orderly manner. The stages identified include the following:

1. **Research and Analysis:** This phase encompassed doing a full literature review, analyzing the existing web-based Sales Enquiry & Order Approval system, and recognizing the requirements of the mobile app.
2. **Design:** This is the phase where the system architecture and the user interface were designed alongside the selection of the technology stack.
3. **Development:** Developing the mobile app with the development of a pleasant user interface and integration of real-time notifications using the Flutter framework.
4. **Testing:** The testing process would efficaciously comprise of unit testing, integration testing, as well as user acceptance testing to monitor and evaluate the functionality performance of the app.
5. **Deployment:** The deployment of the app to the app stores, together with forward documentation and end-user training.

A detailed time schedule was developed throughout the creation to make sure that all phases were accomplished in time, mounting important milestones for presenting outputs at the time of the system design, core features development, and final testing.

4.2 Requirements Analysis

User requirements for the mobile app were established through discussions with stakeholders and end-users. The following requirements were identified:

Functional Requirements:

- User Authentication:** The app must enable users to log in securely using credentials.
- Sales Enquiry Review:** Approvers shall be able to list sales enquiries pending and view the details thereof.
- Order Approval or Rejection:** Approvers shall be able to approve or reject orders and submit remarks.
- Real-Time Notifications:** The app should send real-time notifications to approvers when a new sales enquiry is submitted or there is an update in the sales order status.
- Historical Data Access:** Approvers shall be able to view historical sales enquiries and approvals.

Non-Functional Requirements:

- Performance:** The app must exhibit smooth performance at all times and shall never become sluggish even while running on lower-end devices.
- Security:** The app must authenticate and secure digital identities and stored data to protect user information.
- Usability:** An easy-to-use app with a simple, intuitive user interface that users will have no problem navigating through.
- Cross-Platform Compatibility:** The app should support

operation on iOS device and Android device.

User stories were created to capture the needs and expectations of approvers. For example:

- As an approver, I want to receive real-time notifications when a new sales enquiry is submitted so that I can review it promptly.
- As an approver, I want to approve or reject orders from my mobile device so that I can make decisions on the go.

4.3 System Design

The system architecture was drafted with infirm Scalability, performance, and security. The components in following were identified:

1.Frontend: The mobile app frontend was developed in Flutter for approvers to review sales enquiries, approve/reject orders, and view historical data.

2.Backend: This serves as the backend for this web-based system. It contains the database with sales enquiry and order data and provides APIs for the mobile app to interact with.

3.API Layer: The API layer acts as the manifestation of the frontend and backend, i.e., it allows the front-end mobile app to retrieve pending sales enquiries, submit approvals or rejections, and download historical data.

4.Real-Time Notification: This is a real-time notification system implemented by Firebase Cloud Messaging (FCM) to temp notify approvers of a pending sales enquiry submission or an order status update.

A system architecture diagram was created to illustrate the interaction between these components. The diagram shows how the mobile app

communicates with the backend via the API layer and how real-time notifications are sent using FCM

4.4 Technology Stack

Following mobile app development technologies were selected:

- Flutter:** The frontend was developed using Flutter, a cross-platform framework capable of providing high-performance apps for iOS and Android.
- Firebase:** Firebase triggered real-time notifications by means of Firebase Cloud Messaging and user authentications via Firebase Authentication.
- REST APIs:** REST APIs are used to bridge the gap between the mobile platform and the existing web-based backend system. Using these APIs, the app retrieves data, submits approvals, and fetches historical data.
- Dart:** Dart is the programming language for Flutter development; it's applauded for being performant and easy to use.
- GitHub:** For version control, GitHub was used so that the development team could collaborate well and track the changes made unto the codebase.

4.5 Development Process

Development proceeded as per Agile methodologies with sprints and iterative testing. The development process included the following steps:

- **UI Design:** The user interface was created applying Flutter, with the focus on widget architecture. The overall design emphasized simplicity alongside cleanliness and ease of use.
- **Feature Development:** Basic features such as user authentication, reviewing sales enquiries, and order approvals were advanced through iterative sprints. Each sprint concentrated on a specific set of features.
- **API Integration:** The mobile application was integrated into the pre-existing backend system utilizing REST APIs. All functionalities of the APIs were thoroughly validated to ensure they were working properly and providing the needed data.
- **Real-Time Notifications:** Microsoft Firebase Cloud Messaging services were implemented for notifying the approvers in real-time. Notifications were verified for delivery speed and accurate visual representation within the application.
- **Version Control:** As a version control for the project, Git Hub was employed where regular commits and code reviews were conducted to maintain code quality.

4.6 Testing and Quality Assurance

The app went through extensive testing to ensure it is functional, performs well and is secure. The following types of testing were used:

- 1. Unit Testing:** Unit tests were written for each individual component of the app (for example, the user authentication module and the sales enquiry review module) to ensure that each individual component worked correctly in isolation.
- 2. Integration Testing:** Integration tests were conducted to ensure that all various components of the app were working together as one would expect, e. g. to ensure the app could retrieve data from the backend via API and display it in a properly formatted way in the UI.
- 3. User Acceptance Testing (UAT):** UAT was run on a group of app approvers to gather user comments about the usability and usability of the app. This feedback was used to make improvements to the app prior to its final release.
- 4. Performance Testing:** Performance testing was performed to ensure the app performed well in terms of performance on low - end devices; the performance tests focused on loading time of the app, response time and memory consumption.
- 5. Security Testing:** security testing included in App to ensure security of authentication and data management. Testing also includes finding vulnerabilities that could allow unauthorised access or data leakage.

4.7 Conclusion of Methodology

Methodology The methodology section outlines the structured and organized approach to the Development of the Sales Enquiry & Order Approval mobile app. It involved planning and development of the user interface, research, design, development, testing and deployment of the application. Stakeholder requirements were determined during the project study and recommendations were made regarding the system architecture to ensure scalability, performance and security. The development process was based on Agile techniques using regular sprints and iterative testing. The app underwent continuous testing to ensure functionality, performance and security and feedback from end-users was used to make changes before the final release. The methodology used ensured that the successful development of a mobile app which meets the needs of approvers and improves the efficiency of the sales enquiry and order approval process.

CHAPTER-5

OBJECTIVES

The main goal of my internship project was to create a mobile app that simplifies the Sales Enquiry and Order Approval process within a company. I aimed to develop a smart, efficient, and user-friendly solution that tackles the issues found in traditional manual systems by using modern technologies like Flutter for the frontend and Firebase for the backend. One of the driving forces behind this project was the need for real-time communication and smooth status tracking between different departments. In many organizations, sales inquiries and order approvals are often handled through spreadsheets, emails, or manual paperwork, which can lead to delays, miscommunication, and a loss of customer trust. This project sought to digitize and centralize the entire workflow, allowing for quicker decision-making and enhanced operational efficiency. Another important goal was to create a scalable and customizable system that could meet various organizational needs. Unlike standard CRM systems, which can be inflexible and expensive to modify, this application was designed to be adaptable and lightweight, giving businesses complete control over their approval workflows and data structures without needing extensive technical expertise. Data security and access control were also crucial aspects of this project. The application was designed with user-specific roles and permissions, ensuring that sensitive business information is only accessed and modified by authorized personnel. We effectively implemented this feature using Firebase Authentication and Firestore Security Rules. Moreover, we prioritized mobile accessibility and offline support, allowing managers and team members to approve or review orders on the go, even in areas with poor connectivity. The goal was to enhance the agility of the sales team and minimize bottlenecks. In summary, the objective was to deliver a modern, comprehensive solution that empowers businesses to manage sales inquiries and approvals more effectively.

CHAPTER-6

SYSTEM DESIGN & IMPLEMENTATION

The system architecture of the Sales Enquiry & Order Approval mobile app was designed to ensure scalability, performance, and security. The architecture consists of three main components: the frontend, the backend, and the API layer, which facilitate seamless communication between the mobile app and the existing web-based system.

Frontend

The frontend is all about the mobile app itself, crafted with Flutter to ensure it works seamlessly across different platforms. It serves as the user interface (UI) where approvers can easily review sales inquiries, decide whether to approve or reject orders, and check out historical data. We designed the UI with simplicity and usability in mind, making it a breeze for approvers to navigate through the app. Here are some of the standout features of the frontend:

- **Dashboard:** This is where you'll find a list of pending sales inquiries along with key details.
- **Enquiry Details Screen:** Here, you can dive into a detailed view of each inquiry.
- **Approval/Rejection Screen:** This feature lets approvers submit their decisions, complete with optional remarks.
- **History Screen:** A handy place to look back at past inquiries and approvals for reference.

Backend

Now, let's talk about the backend. It's the existing web-based system that takes care of the core business logic and data storage. This is where all the important sales inquiry and order data lives, including customer info, product details, and approval statuses. The backend also handles user authentication and authorization, making sure that only the right approvers can access the system.

API Layer

Moving on to the API Layer, this part acts as the connector between the frontend and backend. It allows the mobile app to communicate with the backend system through REST APIs. Here's what we've implemented:

- **Login API:** This one authenticates approvers and generates a secure token for future requests.
- **Get Pending Enquiries API:** It pulls up a list of pending sales inquiries.
- **Submit Approval/Rejection API:** This sends the approvers' decisions back to the backend.
- **Get Historical Data API:** It fetches past inquiries and approvals for review.

Real-Time Notifications

We also added real-time notifications using Firebase Cloud Messaging (FCM). Whenever a new sales inquiry comes in or an order status changes, the backend sends a notification straight to the approver's device via FCM. This way, approvers are kept in the loop with updates, helping to speed up the approval process.

Security

Lastly, security was a top priority in designing the system. We implemented several measures to ensure everything stays safe and secure.

- **Secure Authentication:** We implemented Firebase Authentication to guarantee a safe login experience and verify users effectively.
- **Data Encryption:** To protect sensitive information like user credentials and inquiry details, we ensured that all data was encrypted both during transmission and while stored.
- **Access Control:** With role-based access control, we made sure that only authorized approvers had access to certain features and data.

6.1 User Interface Design

The user interface (UI) design for the sales inquiry & order approval mobile app was one of the main project pillars because it directly impacts the user experience (UX). We tried to design a UI which is intuitive, user-friendly and visually compelling, in order to provide an effective way for sales people to review and approve sales inquiries quickly.

6.1.1 Design Principles

The UI design was guided by the following principles:

- **Simple:** The main design intent was to keep the interface clean and simple, keeping the features at the core so that approvers can quickly navigate the app without additional unnecessary information.
- **consistency:** consistent design elements, e. g. colour schemes, fonts and button styles were used throughout the app to provide a consistent user experience.
- **Responsiveness:** The App was built to be fully responsive, which means it will look and work great on all types of devices (phones, tablets).
- **Accessibility:** accessibility measures (larger text size and color schemes that are more contrasty) were implemented in order to make the app accessible for users with visual impairments.

6.1.2 Wireframing and Prototyping

UI design of the Sales Enquiry & Order Approval mobile application was an important step of the project, as it directly impacts the user experience (UX). Ideally the goals were to create an interface that was intuitive, user friendly and visually appealing while creating an environment where approvers were able to review and process the sales enquiries rapidly.

They use wireframes and prototypes before going into development to get an idea of the layout and functionality of the app. We used Figma to make the wireframes as a guide to what the app should look like. The wireframes you see in the attached were:

- **Login screen:** an easy to use, secure login screen where approvers can type in their credentials.
- **Dashboard:** A centralized dashboard that shows the list of sales enquiries which are pending alongside the customer's name, products and enquiry status.
- **Enquiry Details Screen:** Views every sales enquiry with an in-depth view allowing approvers to look at all the relevant information before making a decision.
- **Approval/Rejection Screen:** This screen allows you to approve or reject an order (and optionally include a remarks field if you wish to provide feedback).
- **History Screen:** History screen displays previous sales enquiries and approved orders for easy monitoring of approver's decision making.

The prototypes were also exchanged with stakeholders and end-users for feedback which was used in the final design.

6.1.3 Flutter Widgets

Flutter widget-based architecture was used to build a flexible, customizable user interface using widgets like ListView, Card, TextField, and Button to create the app's interface.

For example

- **ListView:** to display in the dashboard the list of pending sales enquiries.
- **Card:** Use to present each inquiry visually and in an ordered manner.
- **TextField:** For input fields (e. g. remarks field in the approval/rejection screen).
- **Button:** For actions that are done like accept or reject an order.

6.2.1 Notification Workflow

The notification workflow was put in place to ensure that Approvers get updated regularly:

- **Notification of New Enquiry:** When a new sales enquiry is submitted backend system sends notification to all the approved approvers via FCM with information like customer name and product details.
- **Order Status Update:** When an order is approved or rejected, a notification is sent to the sales team detailing the order's status.
- **Custom Notifications:** A custom notification can be used by approvers to receive reminders or follow-up alerts on ongoing enquiries.

Prototypes were then presented to stakeholders and end-users for feedback and this was incorporated into the final design.

6.2.2 User Experience Enhancements

To make the user experience even better, we rolled out a few key features:

- **In-App Notifications:** Now, notifications pop up right within the app, so approvers can easily see them without having to switch screens.
- **Click Actions:** These notifications are clickable, letting approvers jump straight to the relevant enquiry or order with just a tap.
- **Notification Settings:** Approvers have the flexibility to tailor their notification preferences, choosing which types of alerts they want to receive or mute.

6.3 Backend Integration

We've integrated the mobile app with our existing web-based backend system to ensure everything runs smoothly and data stays in sync. This was accomplished using REST APIs, which act as the link between the app and the backend.

6.3.1 API Design

We designed and implemented several APIs to support the app's features:

- **Login API:** This one authenticates approvers and provides a secure token for future API calls.
- **Get Pending Enquiries API:** It fetches a list of pending sales enquiries from the backend database.
- **Submit Approval/Rejection API:** This allows approvers to send their decisions (approve or reject) back to the backend, along with any optional comments.
- **Get Historical Data API:** It retrieves past sales enquiries and approvals for approvers to review.

6.3.2 Data Synchronization

Data synchronization posed a significant challenge during the integration process. To keep the app updated with the latest information, we employed several strategies:

- **Polling:** The app regularly checks in with the backend for updates, ensuring that the list of pending inquiries is always fresh.
- **Real-Time Updates:** Alongside polling, the app also listens for real-time updates from the backend, making sure that any changes—like new inquiries or status updates—are instantly reflected in the app.

6.3.3 Error Handling

We put robust error handling mechanisms in place to ensure the app can smoothly deal with issues like network failures or API errors. For instance:

- **Retry Mechanism:** If an API call doesn't go through, the app automatically tries the request again after a brief pause.
- **User Feedback:** If an error occurs, approvers receive a friendly message, guiding them on what to do next—whether that's retrying the request or reaching out for support.

6.4 Authentication and Security

Security was a top priority when developing the mobile app. We took several measures to protect user data and ensure the app functions safely.

6.5 Challenges Faced

During the implementation phase, we faced a few challenges, including:

- **Platform Compatibility:** Making sure the app runs smoothly on both iOS and Android devices took a lot of careful testing and optimization.
- **Performance Optimization:** To ensure smooth performance, especially on lower-end devices, we had to optimize the app's code and cut down on unnecessary resource usage.
- **Real-Time Notification Latency:** Reducing latency in real-time notifications required us to fine-tune the FCM configuration and backend integration.

We tackled these challenges through iterative testing, working closely with stakeholders, and making the most of Flutter's powerful development tools.

CHAPTER-7

TIMELINE FOR EXECUTION OF PROJECT (GANTT CHART)

Phase	Tasks	Timeline
Phase 1: Research & Planning	Requirement analysis, tech stack finalization	Week 1-2
Phase 2: UI/UX Design	Design wireframes & prototypes in Figma	Week 3-4
Phase 3: API & Database Setup	Integrate backend APIs, database testing	Week 5-6
Phase 4: App Development	Build mobile app using Flutter	Week 7-9
Phase 5: Testing & Debugging	Functional testing, bug fixes	Week 10-11
Phase 6: Deployment & Review	Final review, deployment, documentation	Week 12

CHAPTER-8

OUTCOMES

The successful rollout of the Sales Enquiry and Order Approval System led to some pretty impressive results, both on the technical side and in terms of functionality. One of the standout achievements was the development of a centralized digital platform that made handling sales enquiries and their approvals much more efficient. Thanks to this system, we were able to cut down on the manual work involved in order tracking and significantly speed up our response times to customer enquiries.

On the technical front, we integrated Firebase Firestore as our backend, which allowed for real-time data synchronization across all parts of the application. This meant users could see updated statuses, notifications, and approvals right away, making the whole workflow much more efficient. Using SQL (or Firestore queries) ensured that we could retrieve and update records like pending and approved orders quickly and accurately. Plus, with a solid database design, we kept our data integrity, accuracy, and scalability in check.

The mobile app, built with Flutter, offered a user-friendly interface that made it easy to navigate through different sections like the home page, approved orders list, pending orders, and user profiles. Features like order status updates with Accept and Reject buttons, along with comments, really boosted user engagement and made the decision-making process clearer.

Another big win was the enhanced collaboration between departments, like sales and approvals. The clear order categorization and instant notifications meant that no requests slipped through the cracks or got delayed. Additionally, the system created a structured audit trail of all user actions, which helped maintain accountability and improved decision-making analysis.

All in all, this project not only sharpened my technical skills in frontend development, backend integration, and database management, but it also delivered a real-time solution that can easily be scaled for any organization looking to go digital.

CHAPTER-9

RESULTS AND DISCUSSIONS

9.1 Performance Evaluation

We took a close look at how the Sales Enquiry & Order Approval mobile app performs, focusing on key aspects like speed, responsiveness, and resource usage. Our aim was to make sure the app offers a seamless and efficient experience for users, even on devices that aren't top-of-the-line.

9.1.1 Speed and Responsiveness

To assess the app's speed and responsiveness, we tested it under various conditions, including different network speeds and device specifications.

Here's what we found:

- **App Launch Time:** Most devices see the app launch in under 2 seconds, allowing approvers to quickly get into the system when they need to.
- **Enquiry Loading Time:** The list of pending sales enquiries pops up in under 3 seconds, even when pulling data from the backend through REST APIs.
- **Approval Submission Time:** Approvers can submit their decisions (approve or reject) in less than 1 second, thanks to the app's streamlined API calls and effective data management.

These findings show that the app delivers a speedy and responsive experience, empowering approvers to make quick decisions without any hold-ups.

9.1.2 Resource Usage

We also evaluated the app's resource usage to ensure it runs smoothly on devices with limited memory and processing power. Here are the metrics we analyzed:

- **Memory Consumption:** The app typically uses between 50-70 MB of RAM, making it lightweight and perfect for low-end devices.
- **Battery Usage:** The app is easy on battery life, showing no significant drain during extended use.
- **Network Usage:** We optimized the app's network usage to keep data consumption low, ensuring it performs well even on slower or less stable networks.

These results suggest that the app is highly efficient in terms of resource usage, making it accessible to a broad range of users.

CHAPTER-10

CONCLUSION

The Sales Enquiry & Order Approval Mobile App project marks a major leap in upgrading the old web-based approval system into a sleek, mobile-friendly solution. By utilizing the Flutter framework, this project tackled the shortcomings of the previous system, giving approvers a smooth, efficient, and user-friendly platform to review and handle sales enquiries. With features like real-time notifications, secure authentication, and compatibility across different platforms, the app has greatly enhanced the approval process, resulting in quicker decision-making, better communication, and a boost in productivity.

10.1 Key Achievements

The project hit several key milestones, including:

1. **Mobile Transformation:** We successfully turned the old web-based system into a mobile app, allowing approvers the freedom to review and approve orders from anywhere, at any time.
2. **Real-Time Notifications:** Thanks to the integration of Firebase Cloud Messaging (FCM), approvers now get instant updates on new sales enquiries and changes in order status, which cuts down on delays and boosts responsiveness.
3. **User-Friendly Interface:** The app features an intuitive and visually appealing design, focusing on simplicity and usability, so approvers can easily navigate the system.
4. **Secure Authentication** We implemented strong security measures, including Firebase Authentication and data encryption, to safeguard user data and ensure secure access to the app.

5. **Backend Integration:** The app was smoothly integrated with the existing backend system using REST APIs, keeping all data synchronized and up-to-date.

10.2 Impact on Sales Efficiency

The app has made a significant difference in sales efficiency, and here's how:

- **Faster Approvals:** The average time to get approvals has dropped from 24 hours with the web-based system to just 2 hours with the mobile app. This means orders can be processed more quickly, leading to faster decision-making.
- **Improved Communication:** Thanks to real-time notifications, communication between approvers and the sales team has improved, which helps prevent missed updates and delays.
- **Increased Productivity:** The app's user-friendly mobile interface allows approvers to use their time more effectively, making the sales process smoother and more productive.
- **Business Benefits:** Overall, the app has led to higher sales, better customer satisfaction, and cost savings for the organization.

10.3 User Feedback

Feedback from approvers has been overwhelmingly positive, with an average satisfaction rating of 4.5 out of 5. Users have praised the app for its ease of use, real-time notifications, and mobile accessibility. They've also shared some great suggestions for future improvements, like adding offline functionality and advanced filtering options.

10.4 Limitations and Future Enhancements

Despite the app's many benefits, it does have some limitations, including:

- **Platform Dependency:** Right now, the app is only available on iOS and Android, which means users on other platforms can't access it.
- **Offline Functionality:** The app needs an active internet connection to work, which can be a hassle in areas with poor or no connectivity.
- **Scalability:** We haven't fully tested how well the app scales, so we may need to make additional optimizations as the number of users and sales inquiries increases.

To tackle these limitations and enhance the app's functionality, we're proposing the following future improvements:

1. **Offline Mode:** Create an offline mode so that approvers can review and handle inquiries even when they're not connected to the internet.
2. **Web Version:** Build a web version of the app using Flutter's web capabilities to make it more accessible to everyone.

3. **Advanced Filtering and Search:** Introduce advanced filtering and search features to help approvers quickly locate specific inquiries.
4. **AI-Powered Recommendations:** Add AI-driven recommendations to suggest whether to approve or reject requests based on past data.
5. **Enhanced Notification Settings** Offer more detailed control over notification settings to help reduce the flood of alerts.

10.5 Final Thoughts

The Sales Enquiry & Order Approval Mobile App project has shown just how mobile technology can enhance business processes and boost efficiency. By tackling the shortcomings of the current web-based system and giving approvers a sleek, mobile-friendly option, the app has brought real benefits to both the approvers and the organization. The success of this project highlights the effectiveness of cross-platform development frameworks like Flutter and underscores the importance of user-focused design in crafting impactful solutions. As we look ahead, the goal will be to address the app's limitations and roll out future improvements to enhance its functionality and user experience. With ongoing development and fine-tuning, this app could become an essential tool for sales teams, helping them respond more swiftly and effectively to customer needs and drive business growth.

10.6 Closing Statement

In wrapping things up, the Sales Enquiry & Order Approval Mobile App project has successfully met its goals by turning the old web-based system into a mobile-friendly platform. This shift has not only boosted sales efficiency but also significantly improved the user experience. The success of the app underscores how vital it is to harness modern technologies to tackle real-world issues and provide valuable solutions. As companies keep moving towards digital transformation, initiatives like this will be key in fostering innovation and securing long-term success.

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APPENDIX-A

PSUEDOCODE

```
import 'package:flutter/material.dart';
import 'package:firebase_core/firebase_core.dart';
import 'firebase_options.dart';
import 'first_page.dart';
import 'login_page.dart';
import 'home_page.dart';
import 'parts_page.dart';
import 'parts_details.dart';
import 'cost_sheet.dart';
import 'ar_page.dart';
import 'logout_page.dart';
import 'notification_page.dart';

void main() async {
  WidgetsFlutterBinding.ensureInitialized();
  await Firebase.initializeApp(
    options: DefaultFirebaseOptions.currentPlatform,
  );
  runApp(MyApp());
}

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      title: 'Sales Enquiry Approval',
      initialRoute: '/',
      routes: {
        '/': (context) => FirstPage(),
      }
    );
  }
}
```

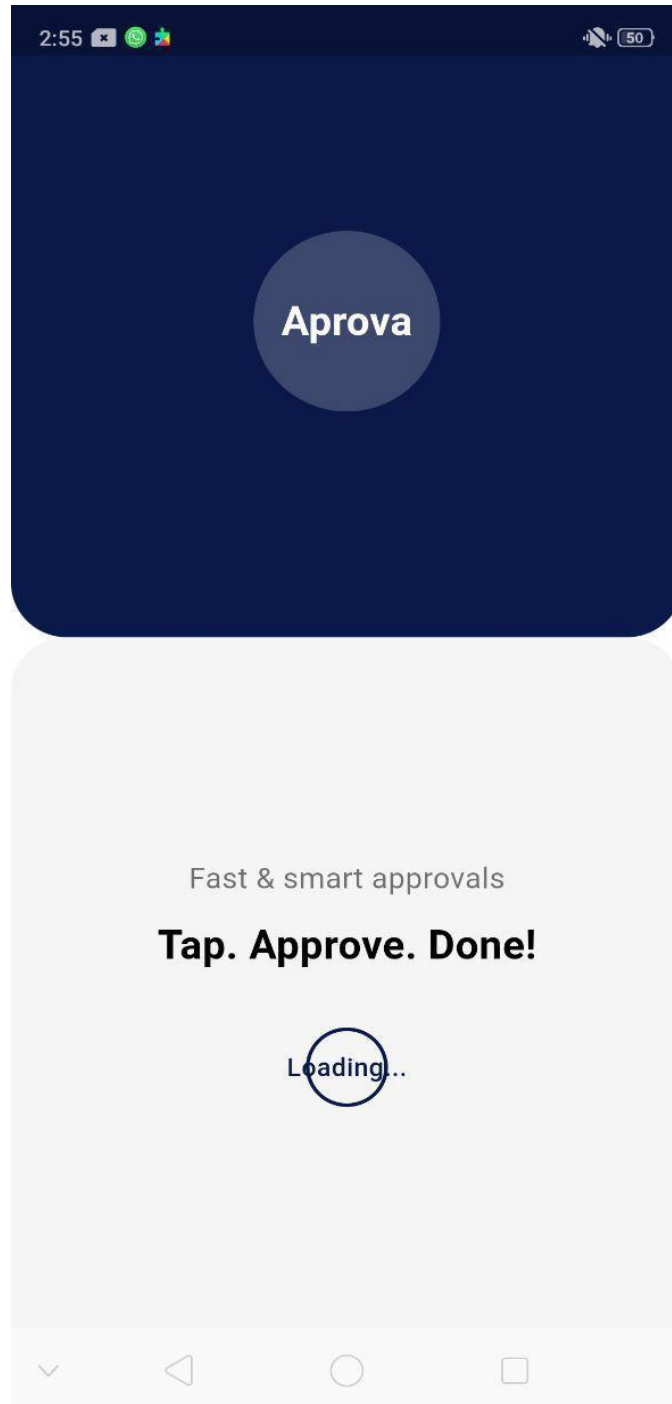
```
    '/login': (context) => LoginPage(),
    '/home': (context) => HomePage(),
    '/parts': (context) => PartsPage(),
    '/parts_details': (context) => PartsDetails(part: 'A'),
    '/cost_sheet': (context) => CostSheetPage(),
    '/ar': (context) => ARPage(),
    '/logout': (context) => LogoutPage(),

    '/notifications': (context) => NotificationPage(),
  },
);
}
}
```

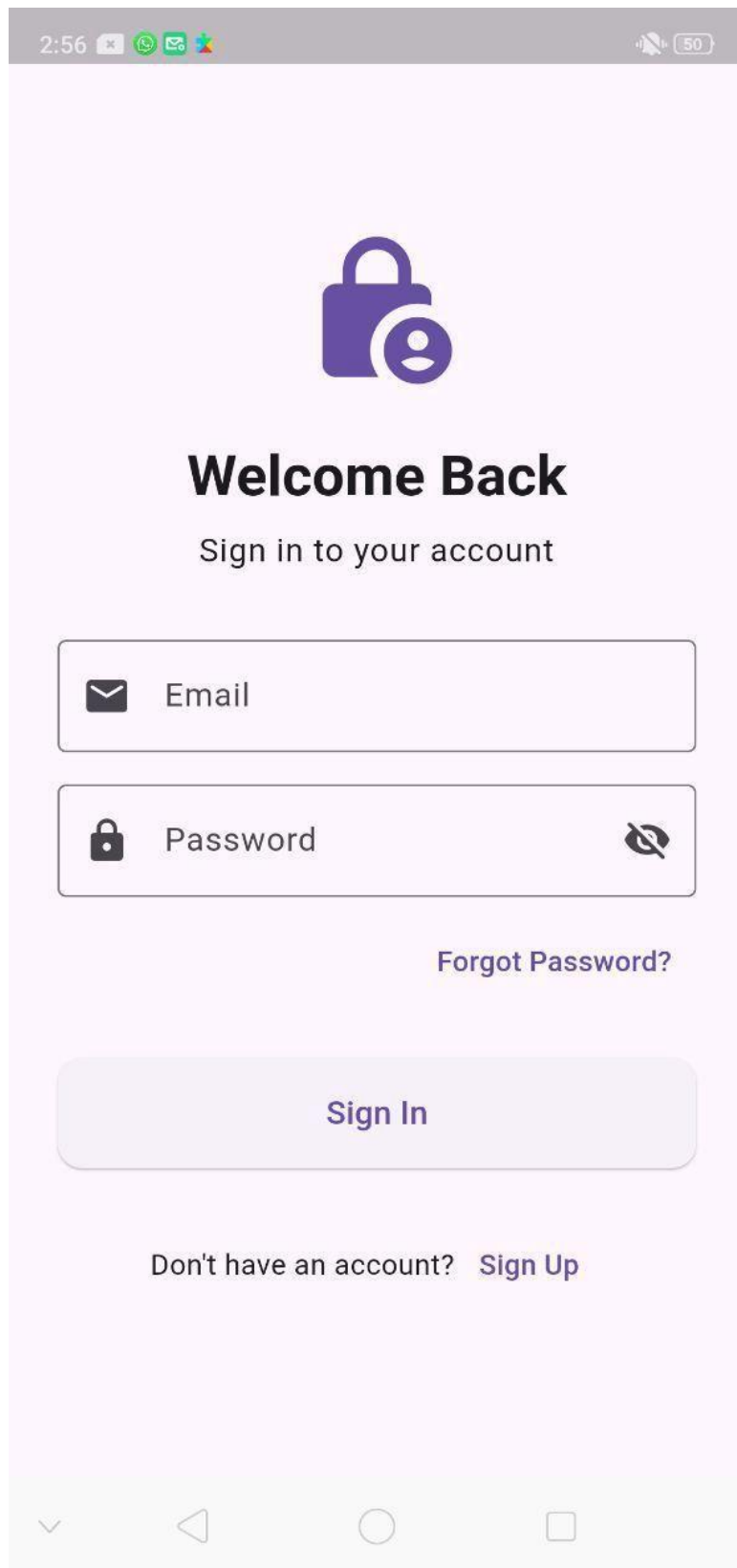
APPENDIX-B

SCREENSHOTS

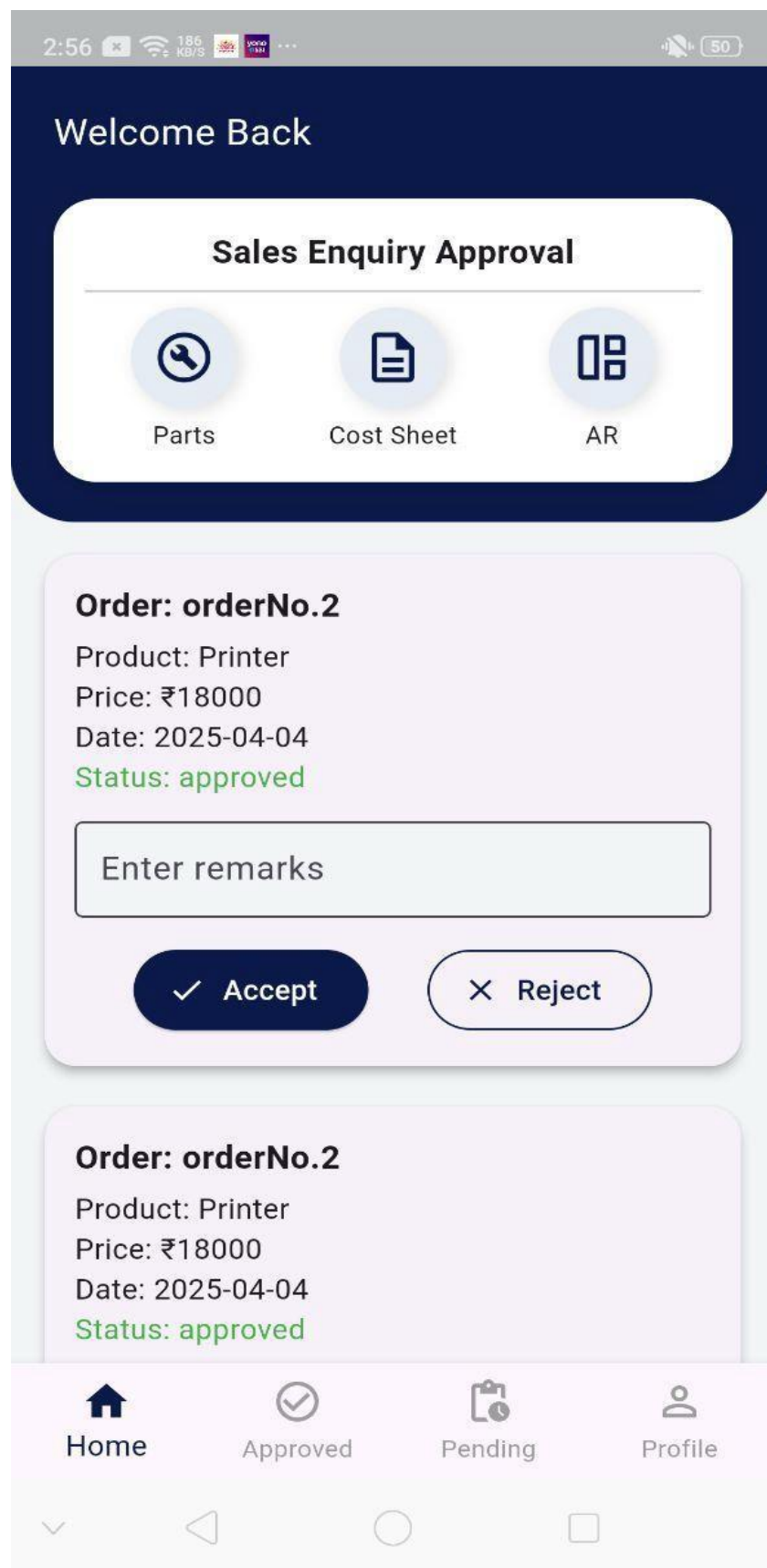
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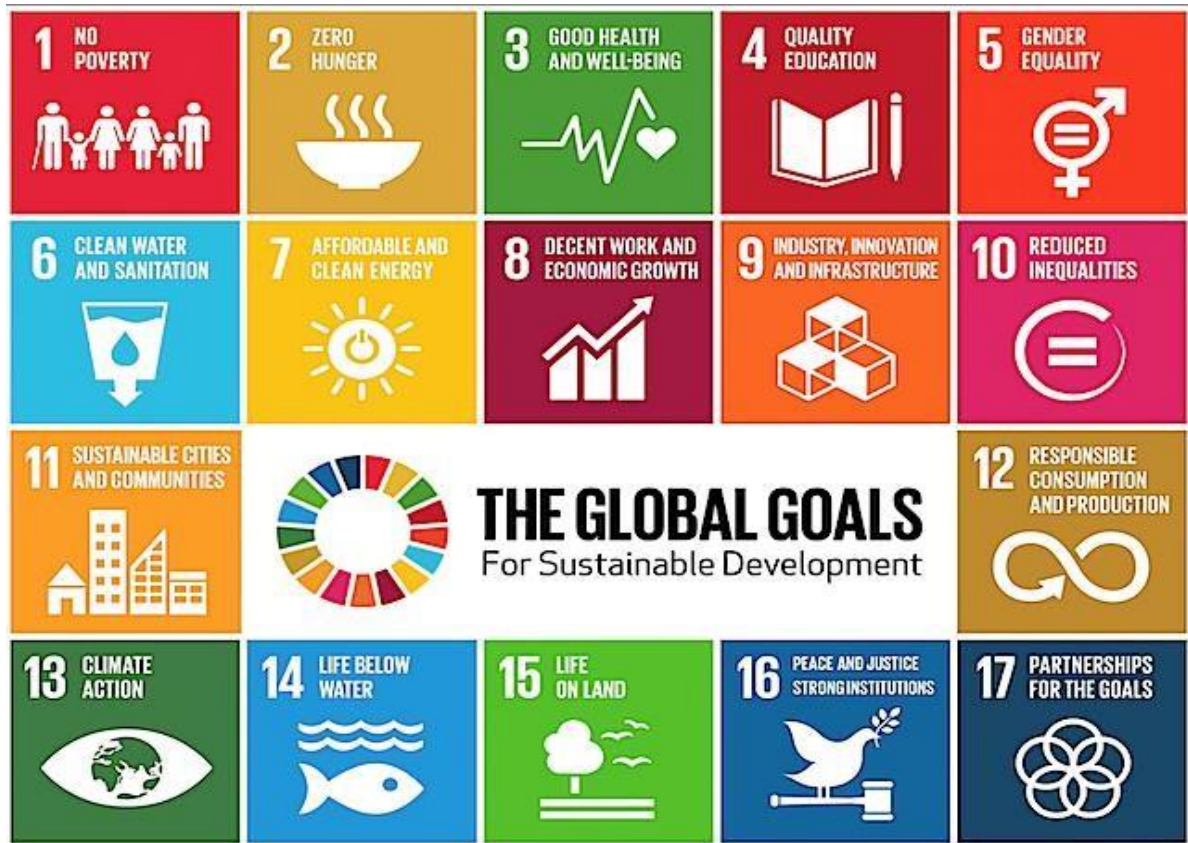


APPENDIX-C

ENCLOSURES

- 1. Journal publication/Conference Paper Presented Certificates of all students.**
- 2. Include certificate(s) of any Achievement/Award won in any project-related event.**
- 3. Similarity Index / Plagiarism Check report clearly showing the Percentage(%). No need for a page-wise explanation.**
- 4. Details of mapping the project with the Sustainable Development Goals(SDGs).**

SUSTAINABLE DEVELOPMENT GOALS



During my internship, I worked on the Sales Enquiry and Order Approval System, which plays a significant role in supporting several of the United Nations Sustainable Development Goals (SDGs). In particular, it aligns with SDG 9: Industry, Innovation, and Infrastructure, SDG 12: Responsible Consumption and Production, and SDG 8: Decent Work and Economic Growth.

When it comes to SDG 9 – Industry, Innovation, and Infrastructure, we tackled this by implementing a digital solution that revamps traditional sales processes. By swapping out outdated paper-based or spreadsheet systems for a sleek mobile app backed by a cloud infrastructure (Firebase), we're not just promoting innovation; we're also building a robust framework for the future. This shift to digital sales processes sets the stage for scalable industrial solutions that can easily adapt to changing business demands. For SDG 12 – Responsible Consumption and Production, our system enhances resource management and cuts down on unnecessary work duplication or miscommunication.

It ensures that every order is tracked, approved, or rejected with clear visibility, which helps avoid wasting time, effort, and materials. With real-time updates and transparent transaction records, we're fostering a more efficient and responsible approach to using company resources. As for SDG 8 – Decent Work and Economic Growth, the system boosts organizational efficiency in a big way. By automating repetitive administrative tasks, employees can dedicate their time to more meaningful work, which not only increases productivity but also job satisfaction.

The streamlined approval process reduces delays and speeds up decision-making, ultimately supporting business growth and operational excellence.

Through this project, I realized how even a straightforward automation system can align with and advance global development goals. It underscored the need for solutions that are not just technically proficient but also socially and environmentally conscious.

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