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AI Powered Delivery Post Office Identification System

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Abstract— Postal services are still important in today's world, but many people find it hard to access them easily using mobile technology. This project introduces an AI-powered Android application developed using Kotlin, designed to help users quickly find nearby post offices, submit complaints, and get instant support through a chatbot. The app uses geo-mapping and the Gemini AI chatbot to provide real-time help and location tracking. It also includes an admin panel for managing user feedback and updating post office information. The main goal is to make postal services more user-friendly, accessible, and efficient by combining artificial intelligence and mobile technology. The app improves communication between users and the postal department while supporting smarter service delivery.

Keywords— AI-Powered Application, Gemini chatbot, Geo-Mapping, Android Development, Kotlin, Postal Services, Complaint Management, Location Tracking, Mobile Application and Smart Postal System.

I. INTRODUCTION

Postal services continue to play a vital role in daily life, especially in countries like India where a large population still depends on them for reliable communication and delivery. These services are not only used for sending personal letters and parcels but are also essential for receiving critical government communications, such as legal notices, pension information, exam hall tickets, Aadhaar-related documents, and bank-related posts. Despite advancements in digital communication, post offices remain a trusted and necessary part of the public service infrastructure. However, the growing demand for faster and more efficient services highlights some major challenges in the existing postal system. Many people, particularly in rural and semi-urban areas, face difficulties such as not knowing where the nearest post office is, how to contact them, or how to lodge a complaint. Users often have to physically visit a post office, stand in long queues, and wait for hours to get basic information or submit grievances. This not only wastes time but also creates dissatisfaction and reduces trust in the system. One of the main reasons behind these issues is the continued use of outdated, manual systems that are not user-friendly or technologically advanced. There is a lack of smart, digital platforms that can connect users to postal services in a quick and convenient manner. To overcome these problems, we have developed a smart and interactive Android application using the Kotlin programming language. This app is designed to make postal services more accessible and responsive by combining features like geo-location tracking**,** Google Maps integration**,** and real-time AI-based support**.** Users can search for post offices based on their location or by name, view detailed contact information, check opening hours, and use live maps for navigation. A key feature of the app is the Gemini AI-powered chatbot, which helps users by instantly answering their questions, guiding them through the app, and allowing them to interact without needing human support. In addition to user-facing features, the app also includes a robust admin panel that allows authorized postal staff to manage user complaints, update post office details, monitor interactions, and provide timely responses. This back-end system ensures that the app is always up-to-date and efficient. The overall goal of the project is to build a smart postal ecosystem that uses artificial intelligence and mobile technology to modernize traditional services. By doing so, the application improves the connection between users and postal departments, reduces manual work, speeds up service delivery, and supports the vision of Digital India. It provides a cost-effective and scalable solution that can be expanded to different regions, making it a strong step forward in transforming the public service sector through innovation and user-centric design.

II. EASE OF USE

[1] Simple User Interface: The app is designed with a simple and easy-to-understand interface, ensuring that users of all ages and technological experience levels can easily navigate it. The main screen presents a clean and organized layout with large, clear buttons and intuitive icons, so users don't feel overwhelmed or confused. Whether it's someone who is tech-savvy or someone who rarely uses smartphones, the design makes it easy for everyone to quickly understand how to use the app. There's no complicated process involved,

and each section of the app is easy to access, which enhances the overall user experience.

[2] Quick Access to Post Office Information: With the built-in GPS and Google Maps integration, users can find nearby post offices quickly and easily. The app detects the user's current location and shows them a list of post offices that are closest to them, complete with all the necessary details such as address, contact information, and hours of operation. Users can also get directions to their chosen post office using Google Maps, which eliminates the stress of having to search for directions elsewhere. This feature saves time and makes the process of finding and visiting a post office much more convenient.

[3] Smart Chatbot Support: The app includes an AI-powered chatbot that answers users' questions instantly, providing them with quick and accurate information whenever they need it. Whether users want to know about tracking services, filing complaints, or general postal queries, the chatbot is always available to help. This feature reduces the need for users to wait in long lines or spend time on hold while calling customer service. It offers 24/7 support, providing answers in real-time, and ensures that users can get the help they need without having to leave the app.

[4] Easy Search Function: The app comes with an easy search function that allows users to look up specific post offices based on their name, postal code, or location. This search feature makes it simple for users to find the right post office, even if they are in a different city or need to locate a specific branch. Instead of having to scroll through long lists or guess which post office to visit, users can simply enter the search criteria, and the app will provide a list of relevant results, saving them time and effort.

[5] Complaint Submission: Submitting complaints and feedback is a straightforward process thanks to the app's easy-to-use complaint submission form. Users can quickly fill out their concerns or suggestions directly through the app, without having to visit the post office in person. The form is simple, with clearly defined fields, allowing users to describe their issue and submit it in just a few taps. This feature allows postal authorities to quickly receive feedback from customers, which can be acted upon to improve services, all while saving time for users who would otherwise have to make a physical trip to file a complaint.

[6] Map Integration: One of the standout features of the app is the integration of Google Maps, which provides accurate and reliable directions to users. Whether a user is visiting a post office for the first time or navigating unfamiliar areas, the app ensures they can find their way without difficulty. By using Google Maps, the app helps users avoid getting lost and enables them to reach their destination in the quickest and most efficient way possible. The app offers turn-by-turn navigation and real-time traffic information, so users can always choose the best route available.

[7] Admin Panel Simplicity: The admin panel of the app is designed with simplicity in mind, allowing postal staff to manage the system efficiently without needing technical expertise. Administrators can easily update post office information, review and respond to complaints, and manage user feedback. The intuitive design of the admin panel ensures that staff can quickly access the necessary data, make updates, and keep the system running smoothly. This reduces the learning curve for postal workers and helps them handle tasks more effectively, making the entire operation more efficient.

[8] Language Clarity: The app uses simple, clear language throughout, making it accessible for users of all backgrounds. Every instruction, button label, and message is written in basic, easy-to-understand English, which ensures that even non-technical users can easily comprehend how to use the app. By avoiding jargon and complex terminology, the app caters to a wide audience, including those who might not be familiar with technology. This clarity in language makes the app much more user-friendly and eliminates confusion, allowing everyone to have a smooth experience.

[9] Mobile-Friendly Design: Since the app is specifically built for Android devices, it runs efficiently on a wide range of smartphones, including older models with limited resources. The app is optimized to use minimal storage and battery power, ensuring that it performs smoothly without slowing down the device. Whether users have the latest phone or an older model, they can still enjoy a seamless experience. The mobile-friendly design ensures that the app is accessible to as many users as possible, and its lightweight performance allows it to run smoothly even on lower-end smartphones.

[10] Time-Saving Features: The app is designed to help users save time in several ways. Whether it's finding a post office, getting directions, or asking questions through the chatbot, the app allows users to complete tasks in just a few clicks. Gone are the days of waiting in long lines or spending time looking for information on other websites. All the necessary details are available within the app, allowing users to quickly find what they need and move on with their day. The time-saving features make the app efficient and convenient, giving users more time to focus on other important tasks.

III. METHODOLOGY

3.1 Flowchart (User Portal)

- **Start:** The system begins its operation.
- **Enter to the app:** The user visits the app.
- **Have an account?**: The system checks if the user already has an account:
    - If No, the user goes to the Signup step.
    - If Yes, the user proceeds to the Login step.
- **Signup**:
    - The user fills out the required information in a form.
    - After completing the form, they click Submit**.**
    - The system then sends them back to the login step.
- **Login**:
    - The user enters their user email and password.

- The system checks if the user email and password are valid:
  - If No, the user returns to the Enter username and password step.
  - If Yes, the user is successfully logged into the system.

- **Home Screen**: Once logged in, the user can access various features:
  - **Profile**: View name, email, phone number and password and logout button.
  - **View post offices**: See nearest post offices on a map; tap an office to call, navigation and view details.
  - **Report**: Submit a new complaints.
  - **View post**: Access links to third-party apps or services.
  - **Chat**: Ask questions via the Gemini AI chatbot.
  - **Search offices**: Enter a post office name(Andhra Pradesh, Telangana and Karnataka only) to see its post office name, taluka and district.
- **Logout / End**: The process concludes.

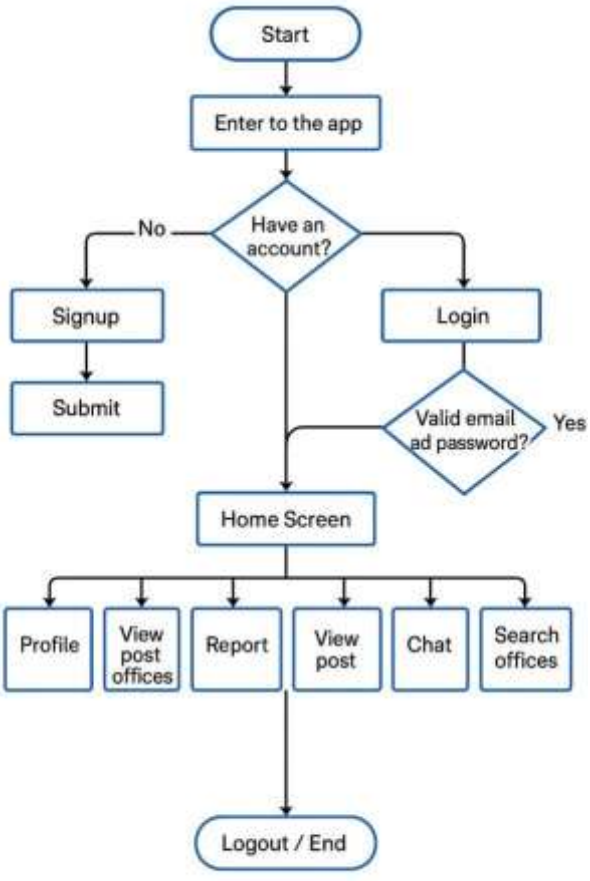

Fig 1. User Portal Flowchart

3.2 Flowchart (Admin Portal)

- **Start**: The process begins.
- **Login**: The user enters their login credentials, including their username and password.
- **Authenticate**: The system checks if the login credentials are correct:
  - If No: The user is sent back to the **Login** step. If they fail multiple times, the process ends.
  - If Yes: The user successfully logs into the system and moves to the next step.
- **Admin dashboard**: Admin can access multiple features:
  - **Add post offices**: Admin can add new post office details.
  - **View post offices**: Admin can view and manage existing post offices.
  - **Add post**: Admin can add third-party applications.
  - **View post**: Admin can view the third-party apps.
  - **Report**: Admin can view and reply to user complaints.
- **Logout / End**: The process finishes when the user completes all actions.

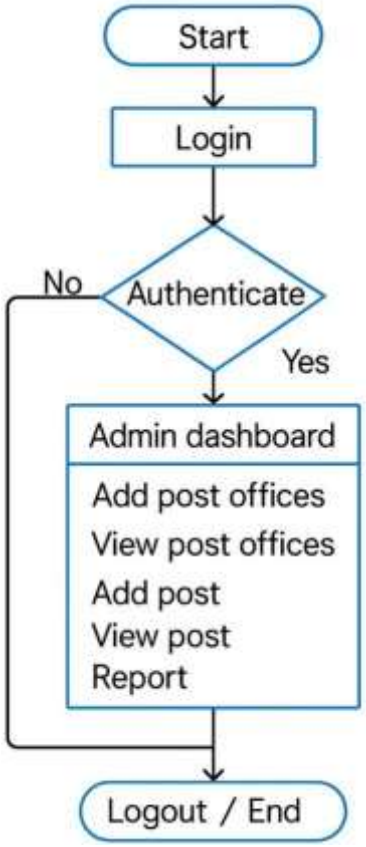

Fig 2. Admin Portal Flowchart

IV. SOFTWARE

The AI-Powered Delivery Post Office Identification app is built as a mobile application for Android. It is designed to help users find nearby post offices, get directions, raise complaints, and interact with a smart chatbot. The app uses modern tools to ensure accuracy, responsiveness, and ease of use.

4.1 Frontend (Mobile app):

- **Kotlin**: Used for developing the Android app, providing a smooth and responsive user experience.
- **XML**: Used for designing the layout and UI elements like forms, buttons, and menus.
- **Google Maps API**: Integrated to show nearby post offices, allow navigation, and display location-based information.
- **Gemini AI Chatbot**: Provides users with instant answers to queries related to post offices, services, and complaints.

4.2 Backend:

- **Firebase Realtime Database**: Used to store data such as user information, complaints, and post office details in real-time.
- **Firebase Authentication**: Ensures secure login and signup for users with minimal effort.

4.3 APIs:

- **Google Location Services API**: Detects the user's current location to help identify and navigate to the nearest post office automatically.

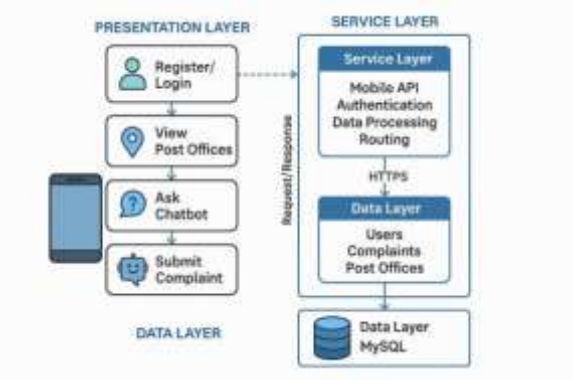

Fig. 3 Mobile App Development.

V. RESULTS & DISCUSSION

The AI-Powered Delivery Post Office Identification app successfully met its goals by making it much easier for users to find post offices, get directions, and submit complaints—all from their Android devices. In tests, users were able to locate nearby branches in seconds, receive instant chatbot answers to common questions, and file feedback without visiting a post office. Administrators found the system streamlined their workflow: they could add or update office details and respond to reports quickly. Overall, the app reduced wait times, improved user satisfaction, and demonstrated that combining geo-mapping with AI chatbots can greatly enhance the efficiency and convenience of public postal services.

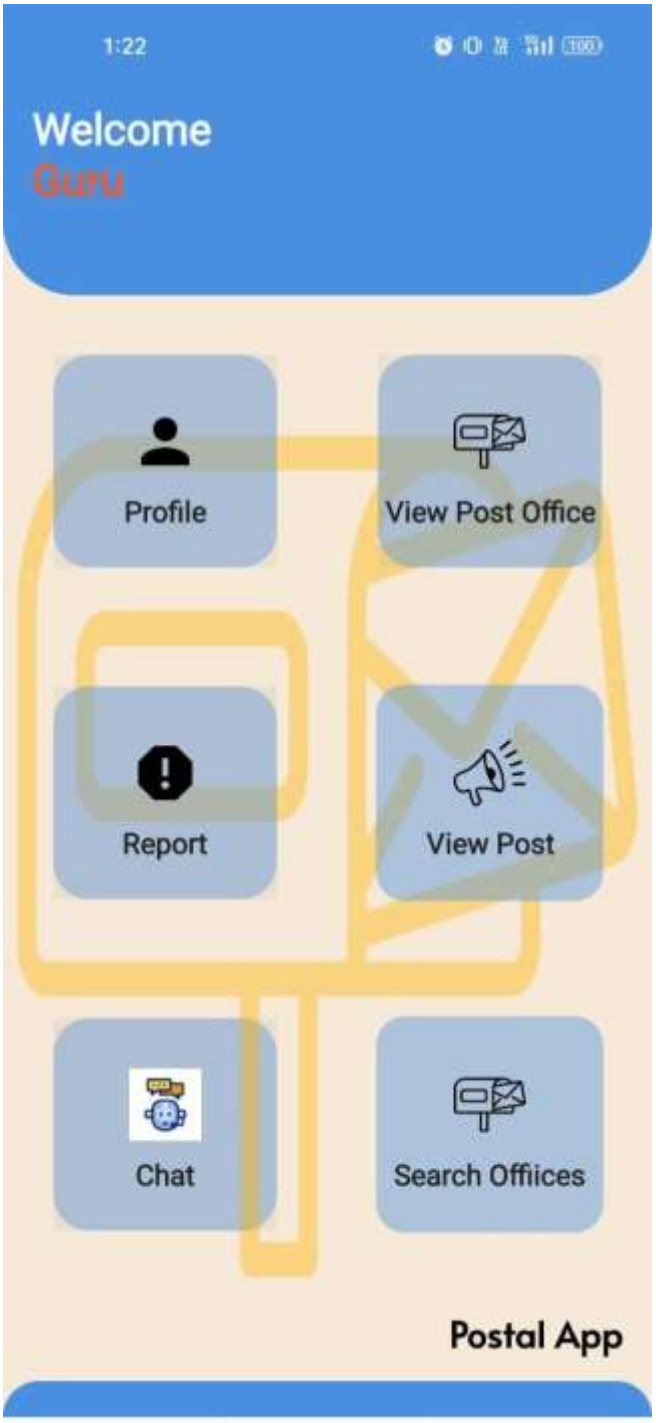

Fig 4. User Portal

Fig 5. Admin Portal

VI. Future Work

- Add real-time parcel tracking so users can follow their packages from dispatch to delivery.
- Implement push notifications for complaint updates, new office openings, and service changes.
- Support multiple languages to make the app accessible to more users.
- Develop an offline mode that caches post office data and allows complaint submission without internet.
- Create an admin analytics dashboard to display trends in complaints and user feedback.
- Expand coverage to all states and integrate with other courier services.
- Enhance the AI chatbot with more training data for deeper, context-aware conversations.

VII. Conclusion

The AI-powered Post Office Identification System makes it easier for users to find nearby post offices, get accurate directions, and access services like complaint registration and chatbot support. With a simple design and useful features like map integration, search by location, and admin management tools, the app helps save time and improves the overall user experience. It is a practical solution that supports better communication between the public and postal services. In the future, more languages and advanced chatbot features can be added to make it even more helpful. This system is a step toward modernizing traditional postal services.

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