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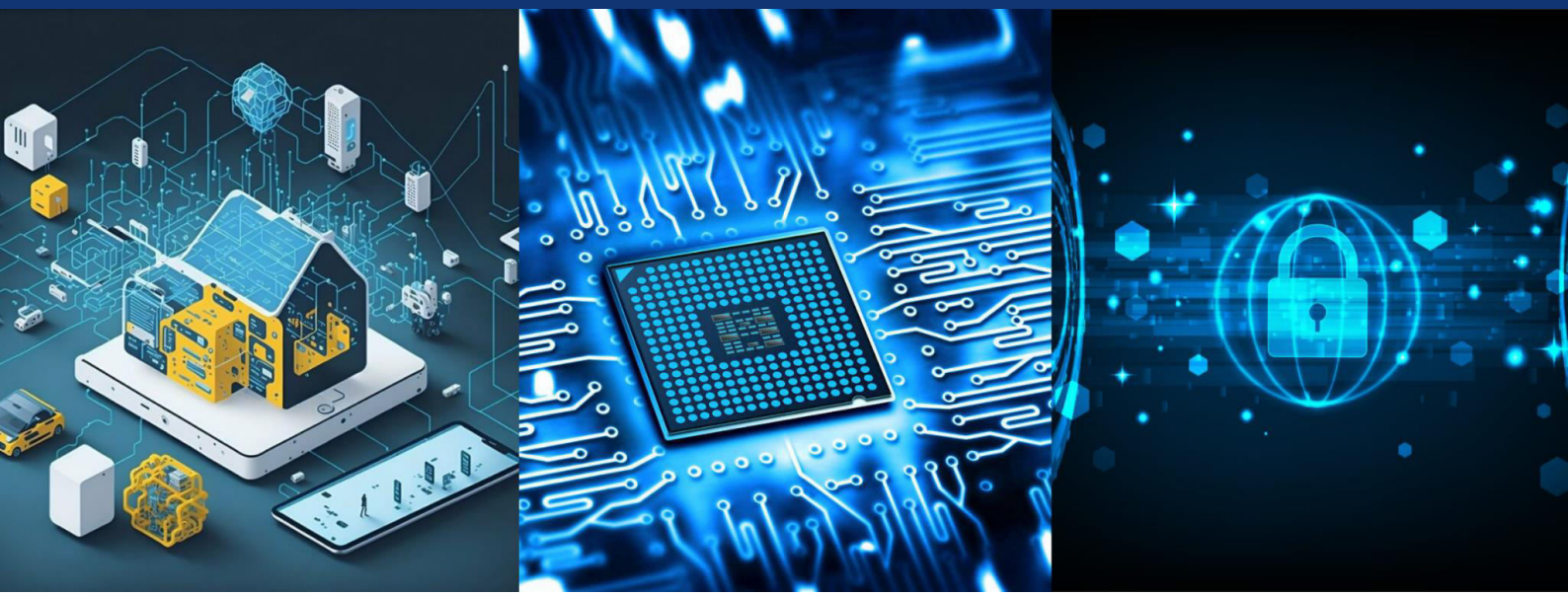

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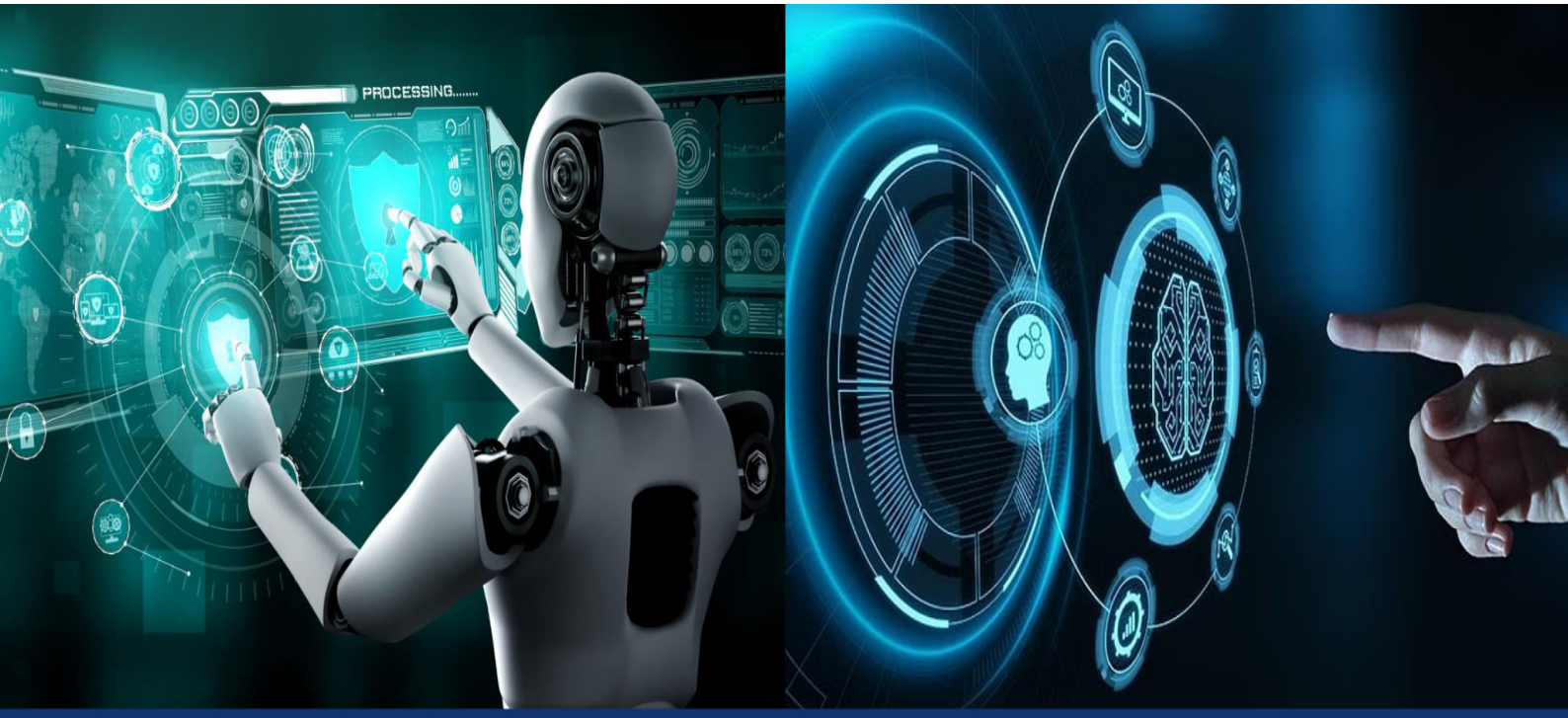

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Menu2Go - A Mobile App for Seamless Food Pre-Ordering & Services

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ABSTRACT: Traditional food ordering methods in cafes, restaurants, and food trucks often lead to long wait times, order errors, and inefficient service, especially during peak hours. Menu2Go addresses these challenges by introducing a mobile-first, location-aware food ordering platform designed to streamline the process for both customers and restaurant owners. Inspired by progressive notification systems, Menu2Go leverages real-time updates, adaptive user prompts, and secure payment integration to ensure a smooth ordering experience. Built using React Native, Firebase Firestore, and Firebase Cloud Messaging (FCM), the application offers a lightweight, cross-platform solution that enables customers to browse menus, place orders, and receive timely notifications about order status. By combining modern mobile technologies with geo-aware features, Menu2Go enhances operational efficiency, minimizes manual intervention, and delivers a convenient and structured alternative to traditional food ordering systems.

KEYWORDS: Menu Digitization; Mobile Food Ordering; Push Notifications; Firebase Firestore; Cart Management

I. INTRODUCTION

In today's fast-paced lifestyle, the traditional food ordering process in cafes, restaurants, and food trucks is increasingly seen as inefficient and inconvenient, often resulting in long queues, delayed service, and miscommunication between customers and staff. Conventional systems—based on manual order-taking or generic aggregator platforms—fail to provide real-time customization, control, or operational flexibility, especially for small to mid-scale food vendors. As mobile technology becomes more ubiquitous and consumer expectations shift toward seamless, digital-first experiences, the need for smart, responsive, and intuitive solutions becomes essential. Menu2Go is a mobile-first food ordering platform designed to bridge this gap by offering a geo-aware, real-time ordering system that streamlines the food ordering experience for both users and restaurant owners

Developed using React Native, Firebase Firestore, and Firebase Cloud Messaging (FCM), Menu2Go enables customers to browse menus, place orders, make secure payments, and receive live order status notifications. Inspired by adaptive frameworks like Ritriv, Menu2Go embraces real-time communication, intuitive UI, and scalable backend architecture to deliver a seamless and efficient dining solution without the limitations of conventional systems.

By redefining the food ordering process as a location-aware, secure, and user-friendly service, Menu2Go provides a modern solution that caters to the dynamic needs of urban consumers and food businesses alike.

II. LITERATURE WORK

Restaurant pre-ordering systems were explored by Sharma and Gupta [1], who proposed a digital platform to enable customers to place orders before arriving, thereby reducing wait times and enhancing operational efficiency. The study also examined adoption challenges and integration issues within existing restaurant systems. Jain and Verma [2] presented a web-based food ordering model, incorporating smartphone applications to simplify order placement and confirmation, with a focus on enhancing customer convenience and minimizing delays. Patel and Desai [3] introduced a smart food ordering system leveraging modern web and mobile technologies, which featured real-time order tracking, secure payment methods, and improved order accuracy. Their work also identified barriers in system integration and proposed future enhancements such as AI-driven suggestions. Roy and Mehta [4] designed a self-ordering system using

the Laravel MVC framework and integrated inventory control via the Min-Max method, streamlining restaurant workflows and reducing the need for waitstaff. Khan and Reddy [5] developed a digital ordering solution focused on automation and touch-based interaction to improve user experience and minimize errors, emphasizing scalability and system adaptability. Fernandes and Silva [6] implemented an online ordering system using PHP and MySQL tailored for small-scale operations like cafeterias and college canteens. Their findings showed reduced labor dependency and enhanced order management. Thomas and Choudhary [7] explored a web-based ordering framework built on PHP and Apache Server, incorporating real-time updates, efficient order tracking, and a user-friendly interface, while also addressing security and scalability concerns. Mukherjee and Iyer [8] conducted a comparative analysis of food delivery applications, highlighting the impact of interface design, order tracking, and payment integration on user satisfaction and app efficiency. Okonkwo and Adewale [9] proposed a Food Ordering System (FOS) specifically for a Nigerian university, aimed at digitalizing traditional processes, improving customer data handling, and enhancing information accessibility for restaurant staff. Finally, Sharma and Srinivasan [10] provided a conceptual overview of online food delivery applications, with special focus on Zomato's business model, user behavior, revenue strategies, SWOT analysis, and growth potential within the Indian market.

Objectives:
1. To analyze the drawbacks of existing food ordering systems and identify areas for improvement.
2. To develop a mobile-based food ordering system that enhances customer convenience and restaurant profitability.
3. To implement real-time tracking and push notifications to improve customer engagement.
4. To ensure secure and seamless transactions using Razorpay and backend technologies like Firebase and Node.js.

III. PROPOSED SYSTEM

1.User login/signup:
Users (customers and retailers) interact with the Menu2Go application to perform various actions. Retailers input restaurant-related data such as name, contact details, location (GPS-enabled), operating hours, and digital menus including item names, categories, images, prices, and availability. Customers, on the other hand, browse these listings and add selected items to their cart with delivery address and payment preferences.

2.Pre-processing and Validation of Data:
All user inputs are validated before being written to Firebase Firestore. Menu and restaurant entries are moderated through backend logic to prevent invalid or duplicate entries. Firebase Authentication ensures that only registered and approved retailers can add or modify restaurant and item data. Customer inputs are also verified for data completeness during checkout.

3.Real-Time Menu Fetching and Cart Management:
Customers can browse nearby or featured restaurants using the app's dynamic listing system. Once a restaurant is selected, the corresponding menu is fetched in real-time from Firestore. Items can be added to the cart, and the subtotal is dynamically updated. The cart data, tied to the authenticated user, is temporarily cached and stored in Firestore.

4.Order Placement and Notification Dispatch:
When a customer places an order, the system records it in Firestore and simultaneously triggers a real-time push notification to the associated retailer using Firebase Cloud Messaging (FCM). This includes the ordered items, customer contact details, and delivery preferences.

5.Order Status Updates and Live Communication:
Retailers receive the new order and update its status (e.g., "Preparing," "Ready," "Out for Delivery"). These updates are sent to customers in real-time using FCM push notifications. Optional real-time messaging or status boards may be integrated for communication between the retailer and customer.

6.Payment Handling and Order Confirmation:
Orders can be paid online via Razorpay or selected for cash on delivery. For online payments, the system validates the transaction using Razorpay APIs and stores a secure payment reference. Once confirmed, the order is locked for processing, and a confirmation message is pushed to the user.

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7.Order Tracking, History, and Feedback:
Users can track current and past orders under their profile. Each order includes status logs, timestamped actions, payment method, and restaurant details. After delivery, users are prompted to rate and review the restaurant, which is stored for analytics and restaurant quality metrics.

8.Admin & Retailer Dashboard Management:
Retailers have access to a dashboard where they can add, edit, or remove restaurant and menu data. They can also view order history, pending orders, and revenue summaries. Admin-level users (superusers) can approve new retailers, moderate content, and access analytics related to app usage and transaction history.

9.Offline Accessibility and Data Syncing:
Menu2Go's architecture supports offline caching of menu data and cart entries using service workers. In the event of connectivity loss, users can still browse menus and access cached items. All actions are synchronized with Firestore once the user reconnects, ensuring continuity in the user experience.

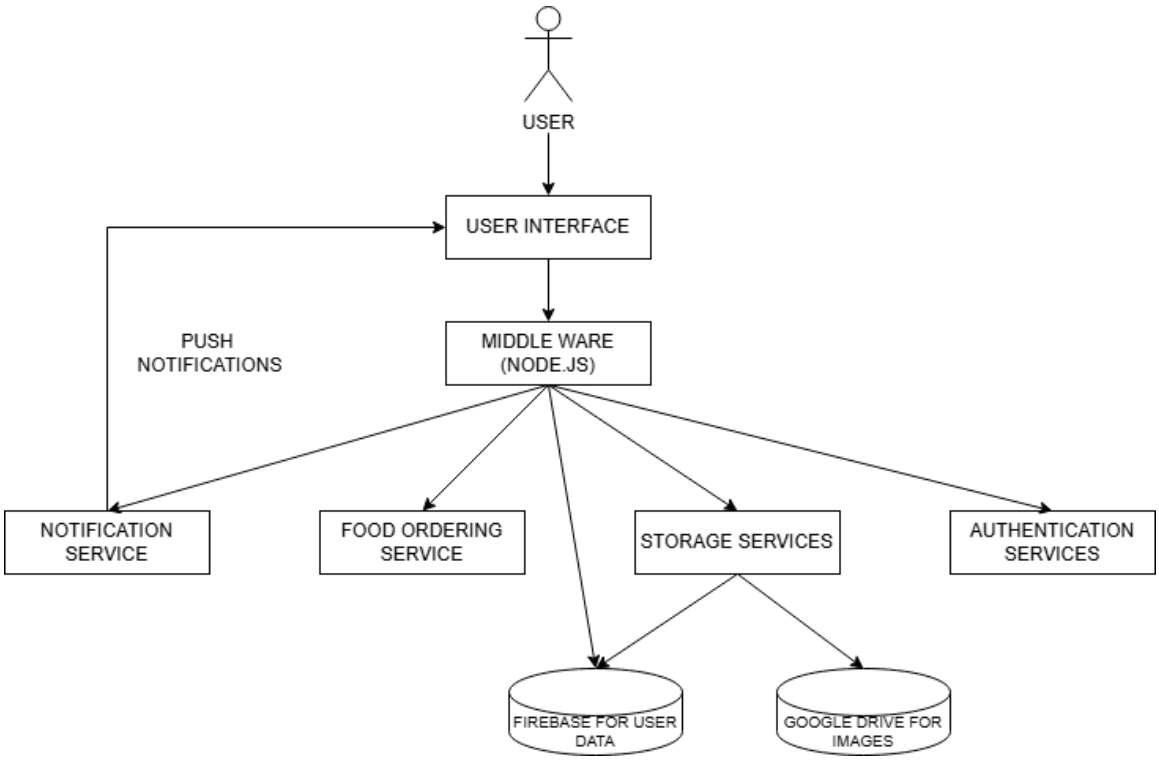

Fig 1. SYSTEM ARCHITECTURE

IV. METHODOLOGY

Menu2Go is developed using a modular, mobile-first architecture designed for real-time performance, scalability, and offline accessibility. The frontend is built with React Native and Expo, featuring clean UI components and form handling using React Hook Form. All user inputs—from restaurant details to food orders—are validated through structured schemas to ensure data accuracy.

The backend is powered by Node.js and Express, integrated with Firebase services for authentication, Firestore database, and Firebase Cloud Messaging (FCM). Orders are stored in real time, and push notifications are sent to retailers when an order is placed. Razorpay handles online payments, and transactions are securely logged in Firestore.Retailers and admins manage data through dedicated dashboards. Offline support is enabled through caching,

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allowing users to access menus and orders without internet. Notifications and app state are synced upon reconnection. The system enforces role-based access and logs all activities for security and transparency.

Designed for future scalability, Menu2Go's backend and cloud functions can scale with user demand, making it a robust, efficient, and user-centric food ordering solution.

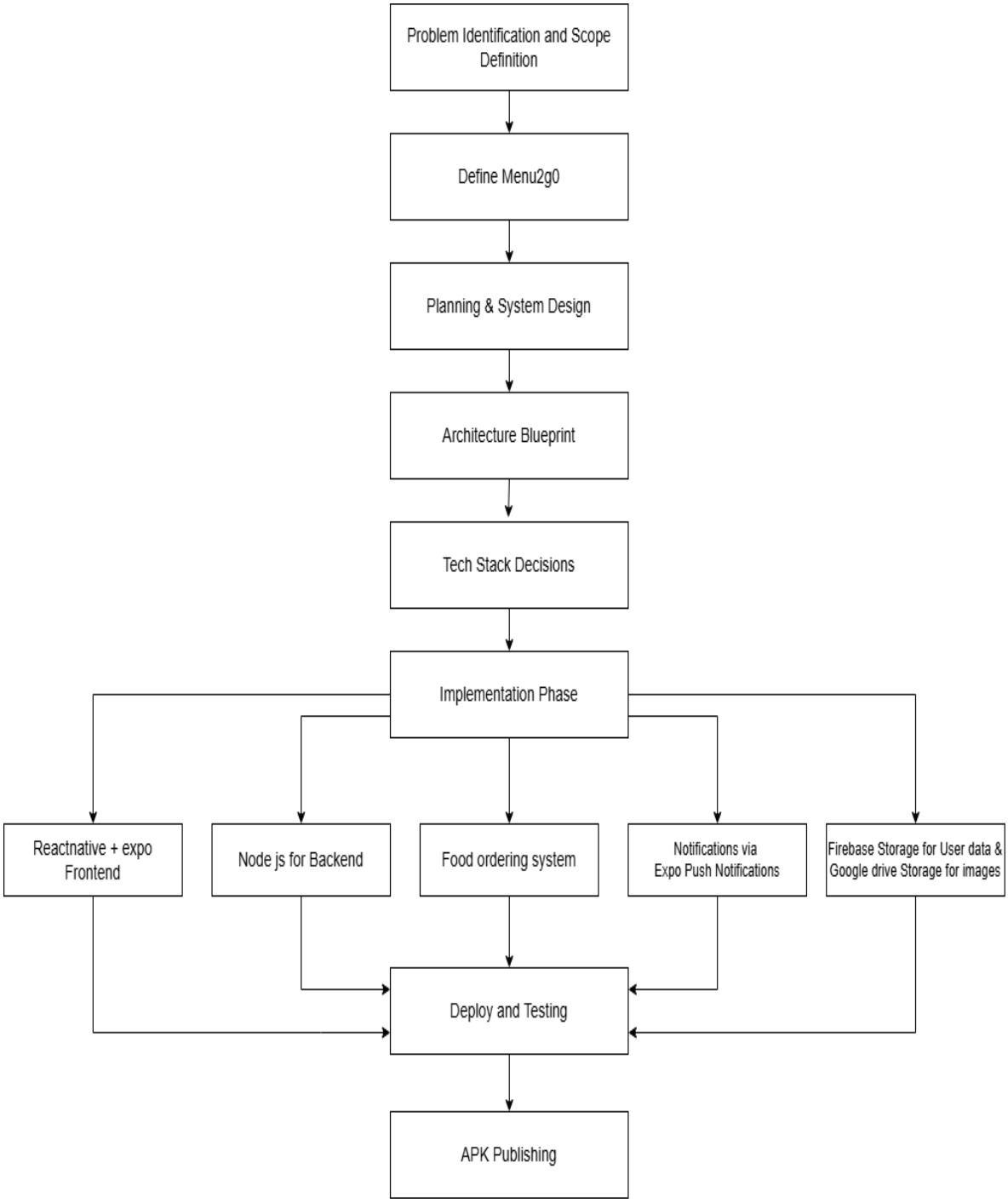

Fig 2. METHODOLOGY

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V. RESULTS

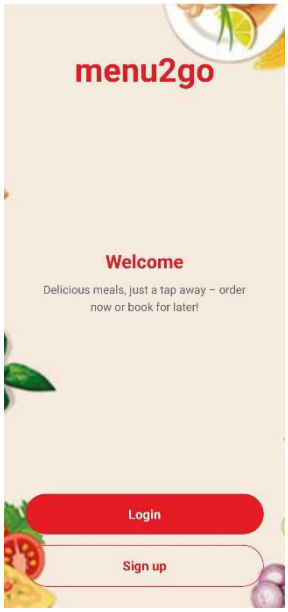

Fig 3. Landing page

Fig 4. Home Screen

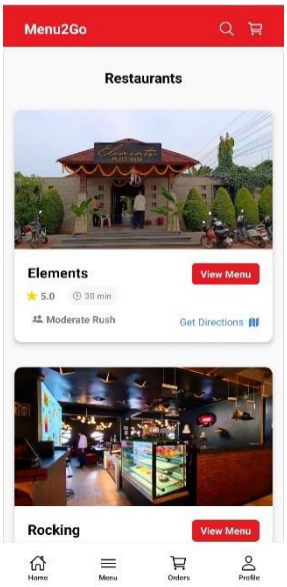

Fig 5. Restaurants Screen

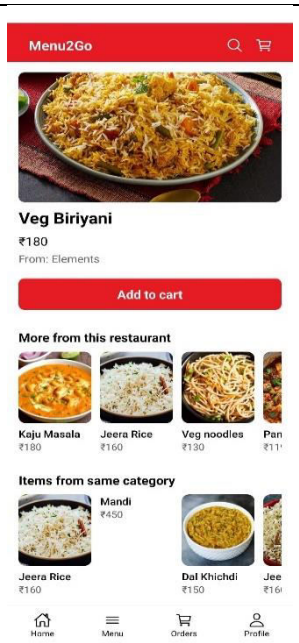

Fig 6. Menu Item Screen

The Menu2Go mobile application delivers a smooth and intuitive food ordering experience through its well-structured and visually appealing user interface. The **Landing Page** serves as the entry point to the app, welcoming users with a clean design and offering two primary actions: Login for returning users and Sign Up for new users, ensuring a secure and personalized experience. Upon successful login, users are directed to the **Home Screen**, which displays a greeting message, a search bar to find specific dishes or restaurants, promotional banners for offers, and quick-access food categories such as Bread, Gravy, and Rice, enabling users to explore options effortlessly. The **Restaurants Screen** lists all available restaurants with appealing images, names, and "View More" options, allowing users to navigate into each restaurant's detailed menu. This screen supports discovery and helps users make informed choices based on restaurant appearance and offerings. Finally, the **Menu Item Screen** showcases individual dishes with a large image, item name, restaurant name, price, and an "Add to cart" button. It also suggests similar items from the same restaurant or category, enhancing the user's decision-making process. This consistent and thoughtful design across all pages ensures an engaging, efficient, and delightful user experience from browsing to checkout.

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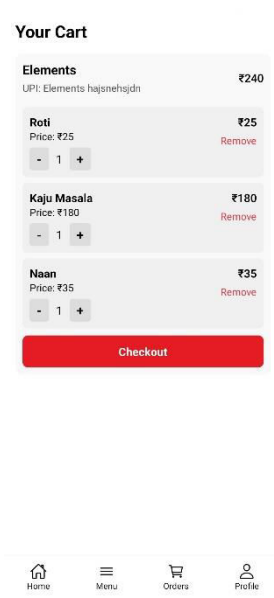

Fig 7. Cart Screen

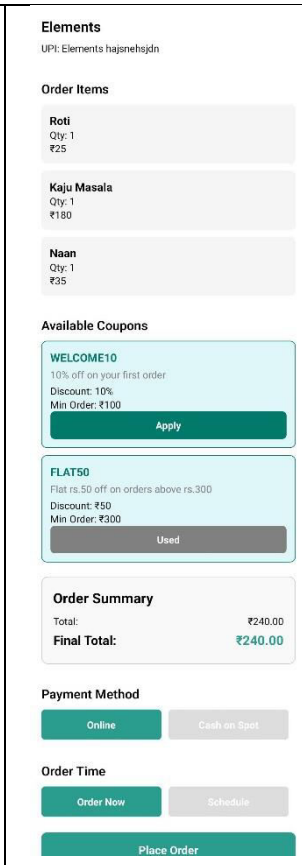

Fig 8. Checkout Screen

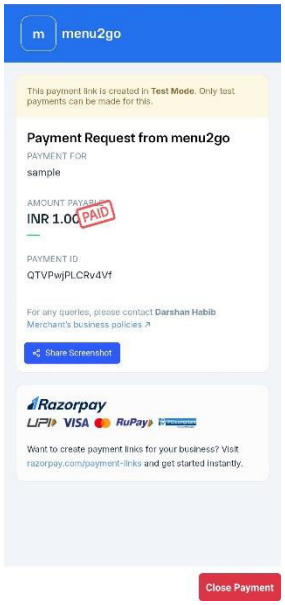

Fig 9. Payment Screen

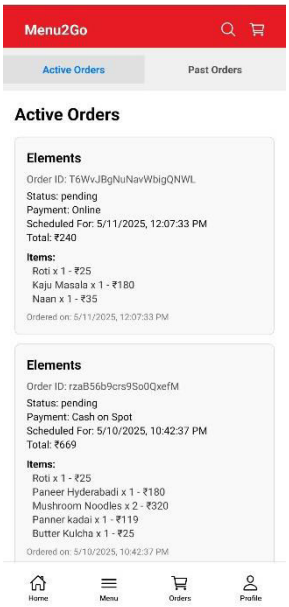

Fig 10. Orders Screen

The Menu2Go app ensures a seamless end-to-end ordering experience, as illustrated through the Cart, Checkout, Payment, and Orders screens. The **Cart Screen** (Fig 7) allows users to review selected items from a chosen restaurant, displaying each item's name, quantity, and price, along with a prominent "Checkout" button to proceed with the order. Once in the **Checkout Screen** (Fig 8), users can verify the restaurant name and order items, apply available coupons for discounts, choose between payment methods like "Online" or "Cash on Delivery," and select whether they want to order now or schedule it for later. This flexibility empowers users with greater control over their orders. On proceeding to the **Payment Screen** (Fig 9), users are presented with a secure interface powered by Razorpay, allowing them to complete their transaction using UPI, cards, or wallets, with a clear summary of the payment request. Finally, the **Orders Screen** (Fig 10) provides users with a structured overview of both active and past orders, detailing restaurant names, ordered items, payment method, order time, and status updates. Together, these screens exemplify how Menu2Go provides a reliable, user-friendly, and efficient flow from order placement to fulfillment, ensuring customer satisfaction at every stage.

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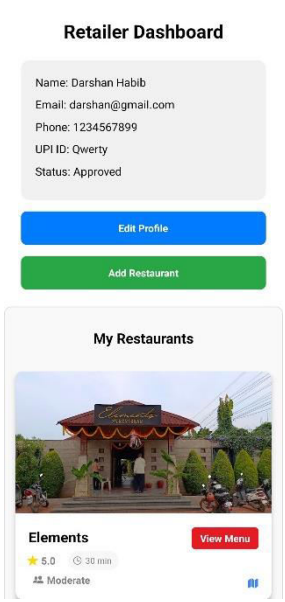

Fig 11. Retailer dashboard

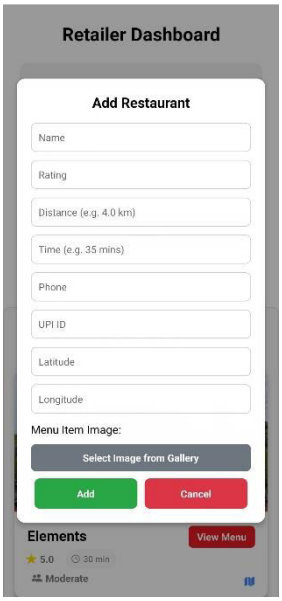

Fig 12. Restaurant Adding Model

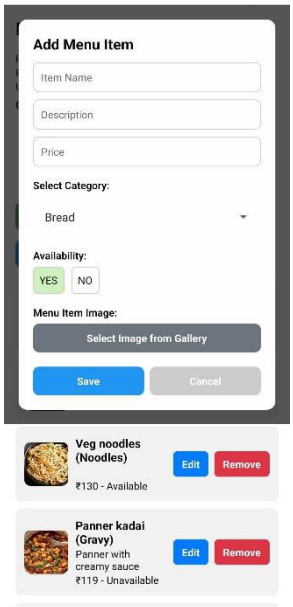

Fig 13. Menu Adding Model

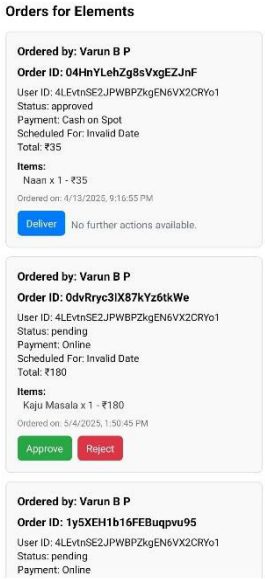

Fig 14. Orders Management

The Menu2Go application includes a comprehensive retailer module that allows restaurant owners to manage their profiles, add new restaurants and menu items, and monitor orders efficiently. The **Retailer Dashboard** (Fig 11) displays essential retailer information such as name, email, contact number, and UPI ID along with their approval status. It provides options to edit the profile and add new restaurants. Once the "Add Restaurant" button is clicked, a **Restaurant Adding Modal** (Fig 12) appears, allowing retailers to input details like restaurant name, image, phone number, location (latitude and longitude), and UPI ID, ensuring proper configuration for future orders and payments. After adding a restaurant, they can proceed to the **Menu Adding Modal** (Fig 13), where they can enter the dish name, price, category, and availability, and upload an image of the menu item. Each menu item listed under a restaurant comes with options to edit or delete. The **Orders Management** screen (Fig 14) provides a detailed breakdown of each order placed by users, including ordered items, total price, payment mode, and scheduled delivery time, with retailer-specific options to approve or reject orders if necessary. This backend module ensures that retailers have full control over their business operations within the app, making Menu2Go an effective and scalable solution for digital food delivery.

V. CONCLUSION

The proposed mobile-based food ordering system addresses the key limitations of traditional and third-party ordering platforms by enabling direct restaurant-to-customer interactions, reducing operational costs, and enhancing user experience. With features like real-time order tracking, intelligent recommendations, secure Razorpay payments, and push notifications, the system ensures a seamless and efficient ordering process. By leveraging powerful backend technologies like Firebase and Node.js, it provides robust data management, real-time updates, and scalable infrastructure. Overall, the system aims to offer a more personalized, secure, and convenient food ordering experience while empowering restaurants to manage operations independently and improve profitability.

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