CSBB352: Theory of App Development

Report of App development project

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Semester: 6th Sem

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Table of content

Motivation

Delhi's vibrant cultural landscape hosts numerous events daily, yet many fail to reach their full potential due to limited visibility. For residents in peripheral areas like NIT Delhi, the conventional approach of physically exploring central Delhi for restaurants and events is impractical and inefficient.

The current digital ecosystem compounds this challenge through fragmentation. Potential attendees must navigate multiple platforms—Google searches, Eventbrite listings, and specialized websites—creating a cumbersome discovery process that often results in missed opportunities for both organizers and participants.

LOCOMO addresses these challenges by consolidating dispersed information into a single, intuitive platform. Our applicatiocn bridges the geographical divide between Delhi's outskirts and its cultural core, providing comprehensive details on events including precise location data, descriptions, schedules, and logistical information.

Through this unified approach, we enable events to achieve greater attendance while allowing residents throughout the Delhi NCR region to effortlessly engage with the city's offerings regardless of their physical location. LOCOMO transforms how urban experiences are discovered, making Delhi's cultural richness more accessible to all.

Problem Statement:

Despite Delhi's rich and diverse cultural scene, event discovery remains inefficient and fragmented, especially for residents in peripheral areas such as NIT Delhi. The absence of a centralized platform forces users to rely on multiple sources—ranging from web searches to event-specific websites—leading to missed opportunities and under-attended events. This geographical and digital disconnect limits access to the city's cultural and social experiences. There is a need for an integrated, user-friendly application that consolidates event information and makes urban engagement seamless, regardless of one's location within the Delhi NCR region.

Introduction

The LOCOMO (Local Commuter) App is a modern mobile application designed to provide users with a comprehensive solution for local food delivery services. This report details the development process, requirements, implementation, and future scope of the LOCOMO App. Developed primarily using TypeScript with supporting technologies such as Kotlin, JavaScript, and Python, LOCOMO aims to create a seamless experience for users looking to order food from local restaurants.

About app development

App development is the process of creating software applications for mobile devices such as smartphones and tablets. Modern app development encompasses various stages including ideation, planning, design, development, testing, deployment, and maintenance. With the rise of smartphones and mobile technology, app development has become a crucial field in software engineering.

The process typically involves:

Requirement Analysis: Understanding user needs and defining functionalities
Design Phase: Creating wireframes, mockups, and user interfaces
Development: Coding and implementing the application's features
Testing: Ensuring the application works correctly across different devices
Deployment: Releasing the application to app stores
Maintenance: Ongoing updates and improvements
For LOCOMO App, we followed industry best practices and utilized modern frameworks to develop a robust and user-friendly application.

About Locomo app

LOCOMO (Local Commuter) is a food delivery application that connects users with local restaurants, allowing them to browse menus, place orders, track deliveries, and manage their food preferences. The app is designed to provide a convenient and efficient way for users to access food from their favorite local establishments.

Key features of the LOCOMO App include:

- User authentication and profile management
- Restaurant discovery and menu browsing
- Order placement and tracking
- Payment integration
- Delivery status tracking
- Ratings and review system

Personalized recommendations based on user preferences

The app is primarily developed using TypeScript (.tsx), with additional components in JavaScript, and Python suggesting a cross-platform approach with a focus on mobile applications.

Feasible Study

Technical Feasibility

The LOCOMO App utilizes modern technologies widely supported across devices, making it technically feasible to develop and maintain. TypeScript as the primary language offers strong typing and modern JavaScript features, while Kotlin support enables native Android functionalities.

Economic Feasibility

The food delivery market continues to grow, with a projected annual growth rate of approximately 10% through 2025. Initial development costs can be offset through commission-based revenue models from participating restaurants, delivery fees, and potential premium subscription services.

Operational Feasibility

The application requires minimal training for users as it follows common patterns in food delivery applications. For restaurants, a simple onboarding process ensures they can quickly join the platform and begin receiving orders.

Schedule Feasibility

The development timeline was structured into manageable phases, allowing for concurrent development of core features while maintaining quality control. The modular architecture enables feature additions without disrupting existing functionality.

Existing Study

Current market analysis reveals several established players in the food delivery space:

Zomato: One of the leading platforms with extensive coverage across districts. Zomato's district-based approach allows them to optimize delivery routes and provide localized offerings. Their model involves:

District-specific restaurant listings
Localized promotions and deals
Optimized delivery zones by district
District-based performance metrics
Swiggy: Offers real-time order tracking and scheduled deliveries.

UberEats: Leverages Uber's existing network for efficient delivery.

DoorDash: Known for their subscription model offering free deliveries.

LOCOMO differentiates itself through:

A stronger focus on truly local establishments
More transparent delivery fee structure
Enhanced order tracking capabilities
Community-driven restaurant recommendations
Integration with local public transport information

Software Requirement Specification

Functional Requirements

1. User Management
2. User registration and authentication
3. Profile management
4. Address management
5. Order history tracking
6. Restaurant Management

7. Restaurant registration and verification
8. Menu and pricing management
9. Order receipt and processing
10. Analytics and reporting
11. Order Management

12. Menu browsing and item selection
13. Cart management
14. Order placement and confirmation
15. Payment processing
16. Order tracking
17. Delivery Management

18. Delivery personnel assignment
19. Route optimization
20. Real-time tracking
21. Delivery confirmation
22. Rating and Review System

23. Restaurant ratings and reviews
24. Food item ratings
25. Delivery experience ratings
26. Non-Functional Requirements

Performance

Response time under 2 seconds for all user interactions
Support for up to 1000 concurrent users
Efficient data loading and caching mechanisms
Security

Secure user authentication
Payment information encryption
Data privacy protection
Protection against common vulnerabilities
Usability

Intuitive user interface
Accessibility features
Multi-language support
Dark mode support
Reliability

99.9% uptime
Graceful error handling
Data backup and recovery mechanisms
Compatibility

Support for Android and iOS platforms
Responsive design for various screen sizes
Compatibility with older OS versions (within reason)

Features

The LOCOMO app is designed to bridge the gap between Delhi's peripheral residents and its vibrant cultural and culinary scene. It offers a comprehensive set of features aimed at enhancing the user experience, ensuring reliable delivery, and supporting local businesses. Below are the key features of the application:

1. User Authentication and Profile Management

- Secure login and registration
- Password recovery functionality
- User profile customization
- Address and contact information management
- Saving favourite spots/events in profile section

2. Restaurant Discovery

- Location-based restaurant listing
- Featured and trending restaurant sections

3. Ratings and Reviews

- Post-order feedback system for food, restaurant, and delivery
- View public ratings and reviews while browsing
- Verified reviews to ensure authenticity

4. Location based Event and Spots Discovery

- Google Maps integration for accurate navigation
- Firebase real-time database and authentication

Project components

Frontend Components

- Authentication screens (Login, Register, Password Recovery)
- Home screen with restaurant listings
- Restaurant detail pages
- User profile management

Backend Components

- User authentication service
- Restaurant management service
- Order processing service
- Payment gateway integration
- Notification service
- Analytics service
- Database Components

- User data storage
- Restaurant and menu data
- Order information
- Payment records
- Ratings and reviews

Integration Components

- Maps and location services
- Payment gateway services
- SMS and email notification services
- Push notification services

Project planning

Phase 1: Initial Planning and Design (2 weeks)

Requirement gathering and analysis
Market research
UI/UX design
Architecture planning

Phase 2: Core Development (8 weeks)

User authentication implementation
Restaurant listing functionality
Menu browsing and cart management
Basic order placement

Phase 3: Advanced Features (6 weeks)

Payment gateway integration
Order tracking system
Rating and review system
Admin dashboard

Phase 4: Testing and Optimization (4 weeks)

Unit and integration testing
Performance optimization
Security testing
User acceptance testing

Phase 5: Deployment and Launch (2 weeks)

App store submission
Pre-launch marketing
Initial restaurant onboarding
Launch monitoring

Flow of Project
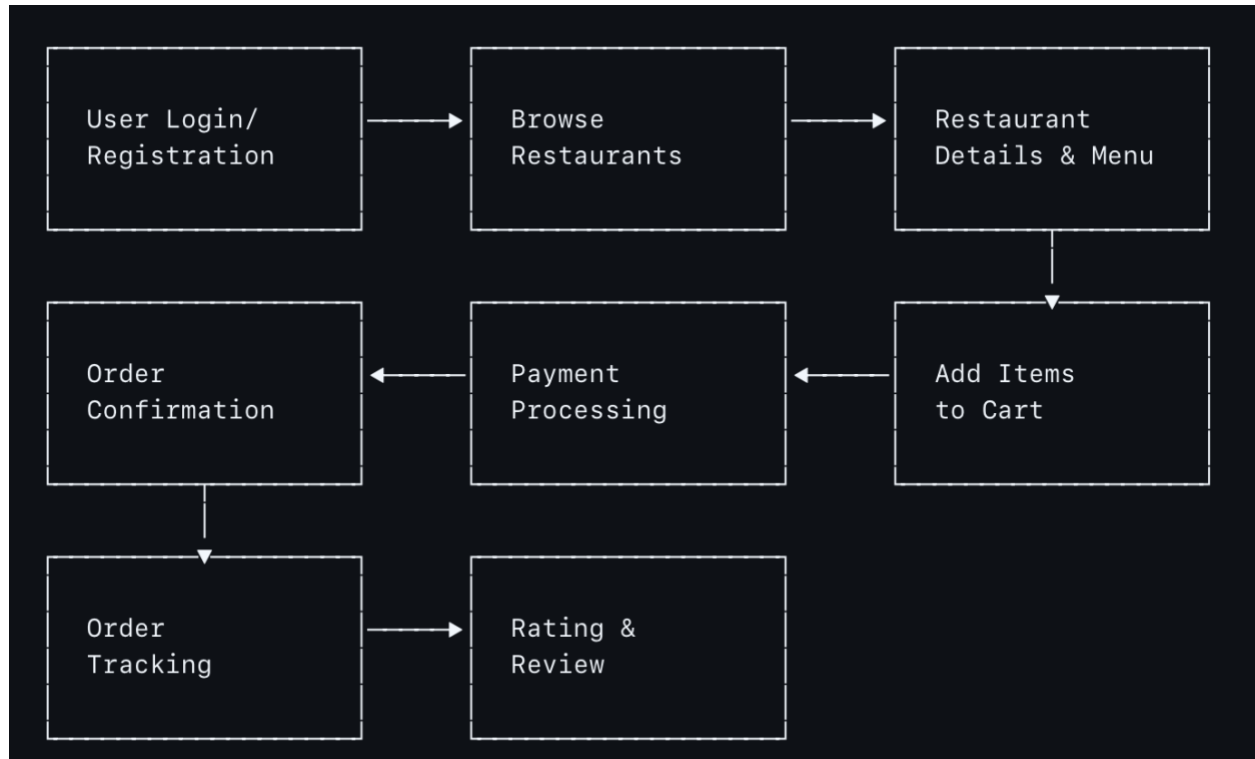
Implementation

Technology Stack

Frontend:
React Native with TypeScript for cross-platform mobile development
Redux for state management
Styled Components for styling
React Navigation for navigation

Backend:
Node.js with Express for API development
MongoDB for database
Firebase for real-time features and authentication
AWS for hosting and infrastructure
Other Tools and Services:

Google Maps API for location services
Stripe/Razorpay for payment processing
Sentry for error tracking
Jest for testing

Project structure

```
src/
├── assets/           # Images, icons, and other static assets
├── components/       # Reusable UI components
│   ├── common/       # Buttons, inputs, etc.
│   ├── restaurant/   # Restaurant-related components
│   ├── order/        # Order-related components
│   └── user/         # User profile components
├── navigation/       # Navigation setup and routing
├── screens/          # Main application screens
│   ├── auth/         # Authentication screens
│   ├── home/         # Main home screen
│   ├── restaurant/   # Restaurant detail screens
│   ├── cart/         # Cart and checkout screens
│   ├── orders/       # Order tracking screens
│   └── profile/      # User profile screens
├── services/         # API services and external integrations
│   ├── api/          # API client setup
│   ├── auth/         # Authentication services
│   ├── location/     # Location services
│   └── payment/      # Payment gateway integration
├── store/            # State management
│   ├── actions/      # Redux actions
│   ├── reducers/     # Redux reducers
│   └── selectors/    # Redux selectors
├── utils/            # Helper functions and utilities
├── config/           # Configuration files
└── App.tsx           # Root component
```

Proposed System

The LOCOMO App aims to create a more streamlined and user-friendly experience compared to existing solutions:
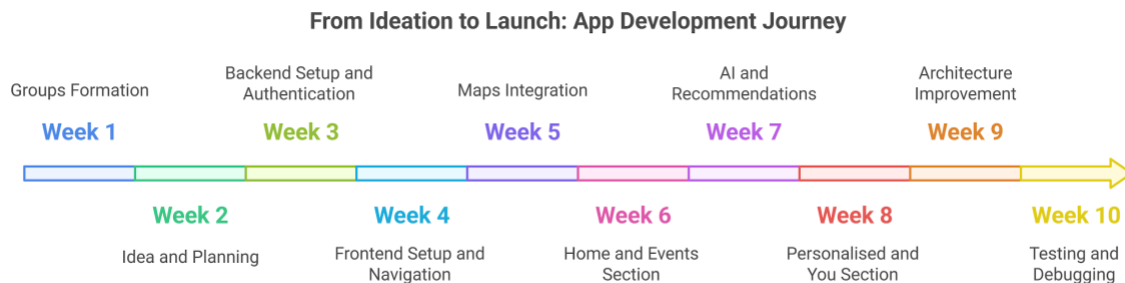
Key Innovations

Smart Order Routing: Using machine learning to predict the optimal restaurant based on preparation time, delivery distance, and rider availability to minimize delivery times.

Personalized Recommendations: Learning user preferences over time to suggest relevant restaurants and dishes, improving user satisfaction and order frequency.

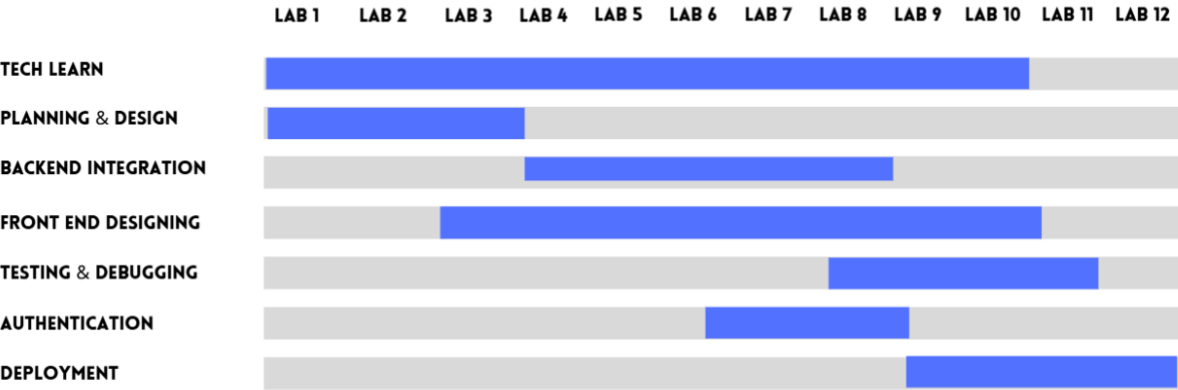Transparent Pricing: Clearly breaking down delivery fees, service charges, and taxes to build trust with users.

Community Features: Allowing users to share recommendations, create group orders, and discover trending restaurants in their area.

Sustainability Focus: Options for eco-friendly packaging and carbon-offset deliveries to appeal to environmentally conscious users.

From Ideation to Launch: App Development Journey

Groups Formation	Backend Setup and Authentication	Maps Integration	AI and Recommendations	Architecture Improvement
Week 1	**Week 3**	**Week 5**	**Week 7**	**Week 9**
Week 2	**Week 4**	**Week 6**	**Week 8**	**Week 10**
Idea and Planning	Frontend Setup and Navigation	Home and Events Section	Personalised and You Section	Testing and Debugging

Timeline

APP DEVELOPMENT
GANTT CHART

	LAB 1	LAB 2	LAB 3	LAB 4	LAB 5	LAB 6	LAB 7	LAB 8	LAB 9	LAB 10	LAB 11	LAB 12
TECH LEARN												
PLANNING & DESIGN												
BACKEND INTEGRATION												
FRONT END DESIGNING												
TESTING & DEBUGGING												
AUTHENTICATION												
DEPLOYMENT												

Firebase Integration

```
                                              ┌─ App Name and Logo
                                              │
                                              ├─ Search Bar
                                              │
                                   ┌─ Home Screen ─┤─ Quick Filters ──── Categories: 'Food', 'Events',
                                   │              │                      'Shopping', 'Nightlife'
                                   │              │
                                   │              ├─ Trending Spots ──── Cafes, Restaurants, etc.
                                   │              │
                                   │              └─ Upcoming Events ─── Festivals /Carnivals
                                   │
                                   │              ┌─ Search Bar
                                   │              │
                                   ├─ Maps Screen ─┤─ Show Nearby Events List ── Event Details: 'date', 'time',
                                   │              │                              'distance'
                                   │              │
                                   │              └─ Map with Map Markers
        Navbar ────────────────────┤
                                   │              ┌─ Category-Based Browsing
                                   ├─ Events Screen ─┤
                                   │              └─ Event Details: 'date', 'time',
                                   │                 'distance'
                                   │
                                   │                   ┌─ User Info &amp; Preferences
                                   │                   │
                                   │                   ├─ Places Visited
                                   │                   │
                                   └─ You (Profile Screen) ─┤─ Reviews Given
                                                       │
                                                       ├─ Bookmarks ──── Enable Notifications
                                                       │
                                                       └─ Personalization ── Enable Dark Mode
```
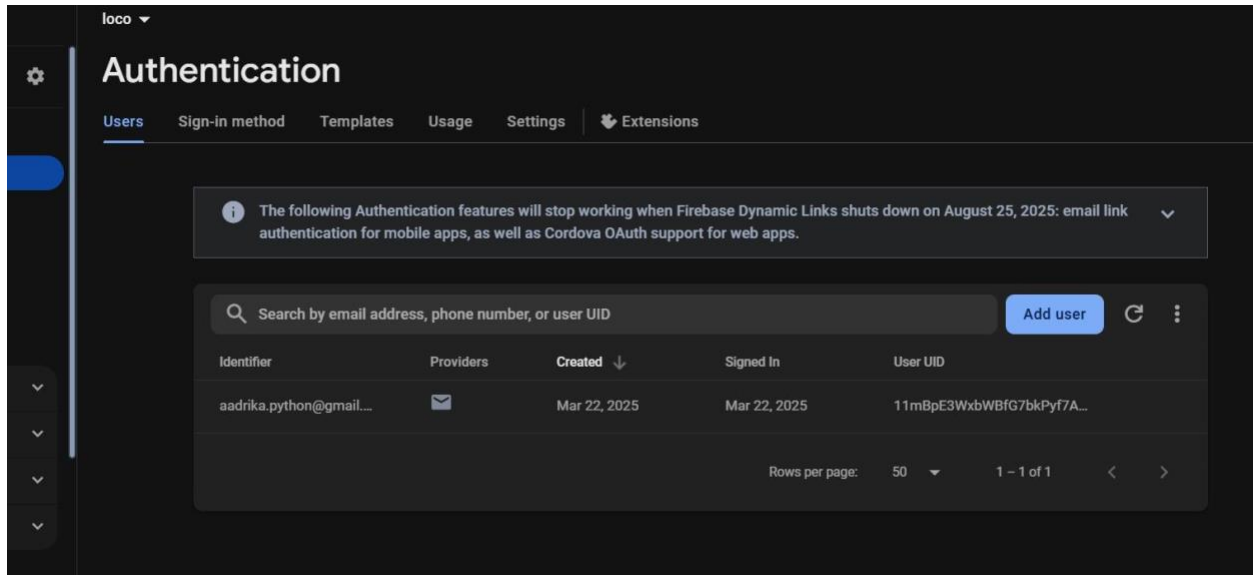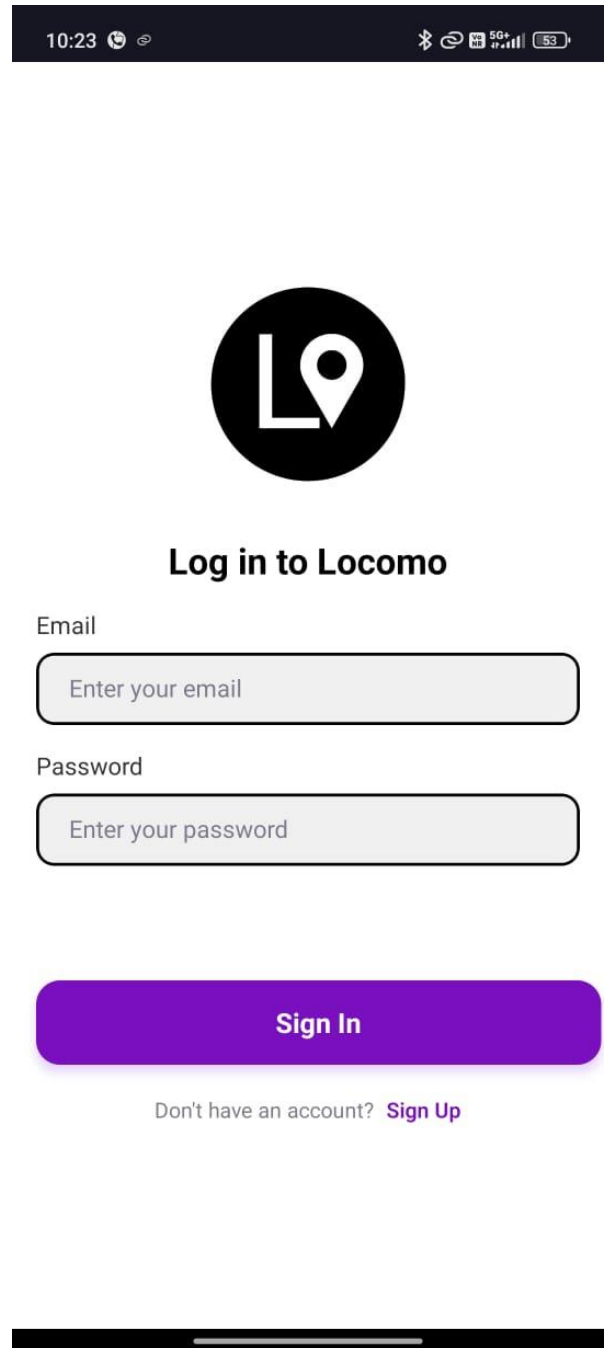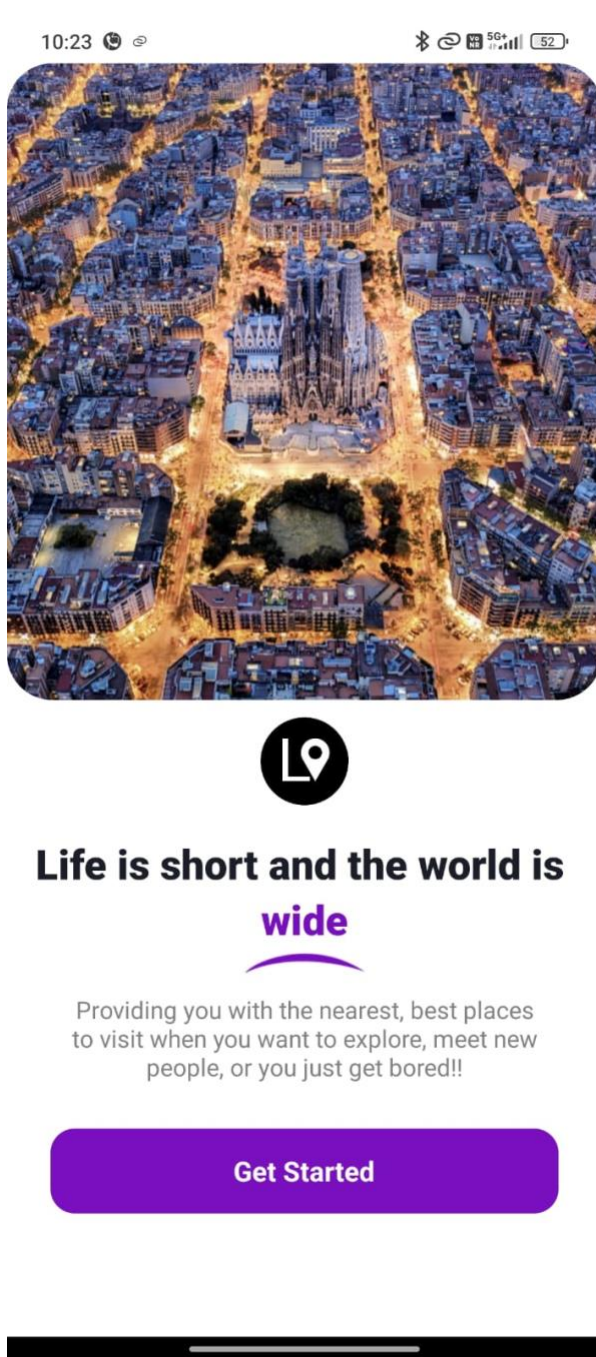
Screenshots Data Flow Diagrams:
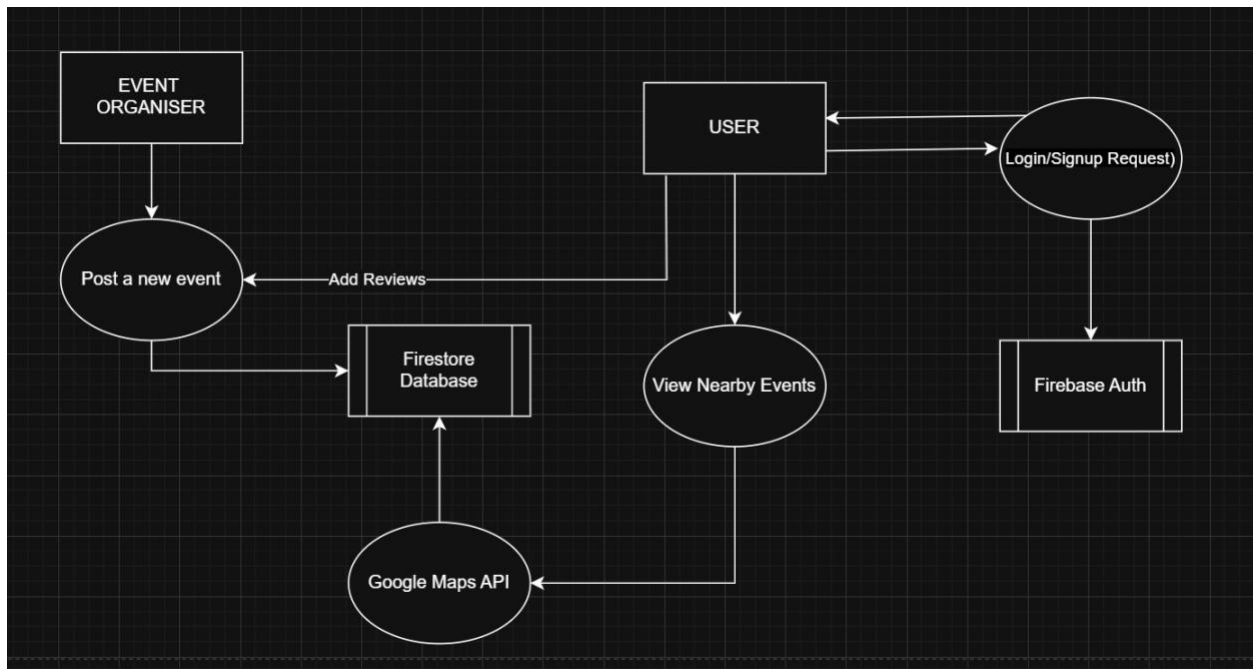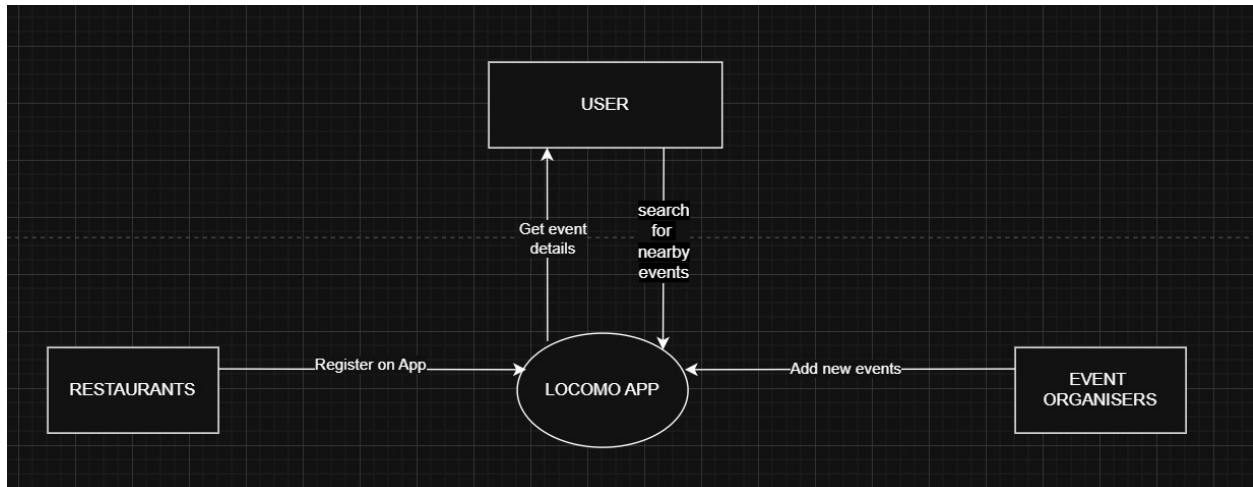
Firebase Authentication:

Screenshots

User

ananditasharma@gmail.com

Edit Profile

Settings

Privacy Policy

Help & Support

LOG OUT

| Home | Maps | Events | Profile | index |

Sign Up to Locomo

Username

Enter your username

Email

Enter your email

Password

Enter your password

Sign Up

Already have an account? **Log In**

Food

Nearby Restaurants

Khana Khazana

Metro Pillar Number 604, Shop No 4 Near, Dhauli Piao, Vikaspuri, New Delhi

⭐ 3.7   **$200/Person**

Burger King

Unit No 5, GF, Unity One Mall, West Metro Station, near Janak Puri, Najafgarh Road, Chander Nagar, New Delhi

⭐ 4.3   **$200/Person**

Kingdom of Momos Corporate Office Janakpuri

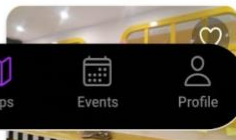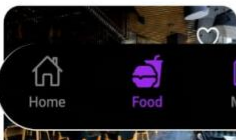125 2nd Floor, Westend Mall, District Centre, Janakpuri, New Delhi

⭐ 4   **$200/Person**

Vencob

Site- 1, Shankar Garden Vikaspuri, West Delhi, Delhi

⭐ 5   **N/A**

Home   Food   Maps   Events   Profile

Search location...

Just Chill Water Park
वाटर पार्क, नई दिल्ली

DELHI

IDC
IAL AREA

City Park Green Resort

Shri Khatu Shyam
Temple, Delhi

Profile   Events   Maps   Food   Home

← **Saved Favorites**

(All)   (Spots)   (**Events**)

Zamna India
◉ Gurugram
29 Mar, 4 PM

Education Worldwide India Fair
◉ Connaught Place, New Delhi
5 Apr, 10 AM

← **Saved Favorites**

(All)   (**Spots**)   (Events)

Barish Restaurant
◉ Delhi

Sydney Grand Hotel and Resort
◉ SYDNEY GRAND HOTEL, near JUST CHILL WATER PARK, MAIN, GT Karnal Road, Delhi

Palm Green Hotel & Resort
◉ Main, GT Karnal Road, 21/30, Bakoli, New Delhi

Delhi Kamboj Restaurant
◉ R59F+XFH, Bakhtawar Pur Village, Delhi

Food

Nearby Restaurants

Tivoli Grand Resort Hotel

📍 opp. Sai Baba Mandir, Main, GT Karnal Road, Alipur, New Delhi

N/A ♡

Palm Green Hotel & Resort

📍 Main, GT Karnal Road, 21/30, Bakoli, New Delhi

N/A 💜

Sydney Grand Hotel and Resort

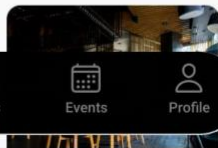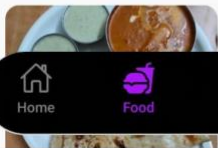📍 SYDNEY GRAND HOTEL, near JUST CHILL WATER PARK, MAIN, GT Karnal Road, Delhi

N/A 💜

Pistawala

📍 Shop NO.1, MSP Mall, DSIDC Industrial Area, Narela, Delhi

$200/Person ♡

| Home | Food | Maps | Events | Profile |

← (modals)/FavoritesScreen

Saved Favorites

All **Spots** **Events**

Zamna India

📍 Gurugram

29 Mar, 4 PM

Education Worldwide India Fair

📍 Connaught Place, New Delhi

5 Apr, 10 AM

Barish Restaurant

📍 Delhi

Sydney Grand Hotel and Resort

📍 SYDNEY GRAND HOTEL, near JUST CHILL WATER PARK, MAIN, GT Karnal Road, Delhi

Palm Green Hotel & Resort

📍 Main, GT Karnal Road, 21/30, Bakoli, New Delhi

Left Screen (Profile)

User

aadrika.python@gmail.com

Edit Profile

Favorites

Change Password

Settings

Help & Support

LOG OUT

Right Screen (Event Details)

Zamna India

29 Mar, 4 PM

⦿ Gurugram

About Event

A vibrant cultural festival showcasing Indian heritage and traditions with live music, dance performances, and authentic cuisine.

Organizer	Tickets
Zamna Events Co.	**₹500**

Attendees

1500

Book Tickets

KING DELICIOUS PIZZA & BURGER

⭐ **5.0** N/A

📍 Shop no 5, Main Road, opposite Punjab National Bank, Bakoli, Delhi, 110036, India

About

No description available.

🍴 Cuisine: N/A

🕐 Hours: Monday: 9:00 AM – 10:00 PM
Tuesday: 9:00 AM – 10:00 PM
Wednesday: 9:00 AM – 10:00 PM
Thursday: 9:00 AM – 10:00 PM
Friday: 9:00 AM – 10:00 PM
Saturday: 9:00 AM – 10:00 PM
Sunday: 9:00 AM – 10:00 PM

📞 N/A

Ajay Sweet Corner

⭐ **5.0** N/A

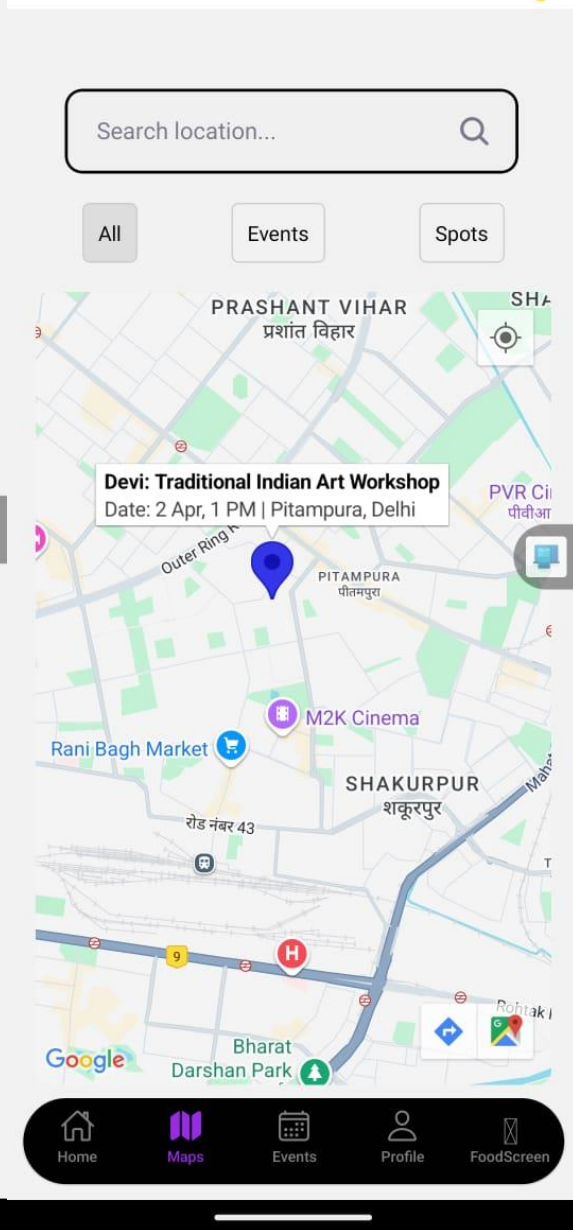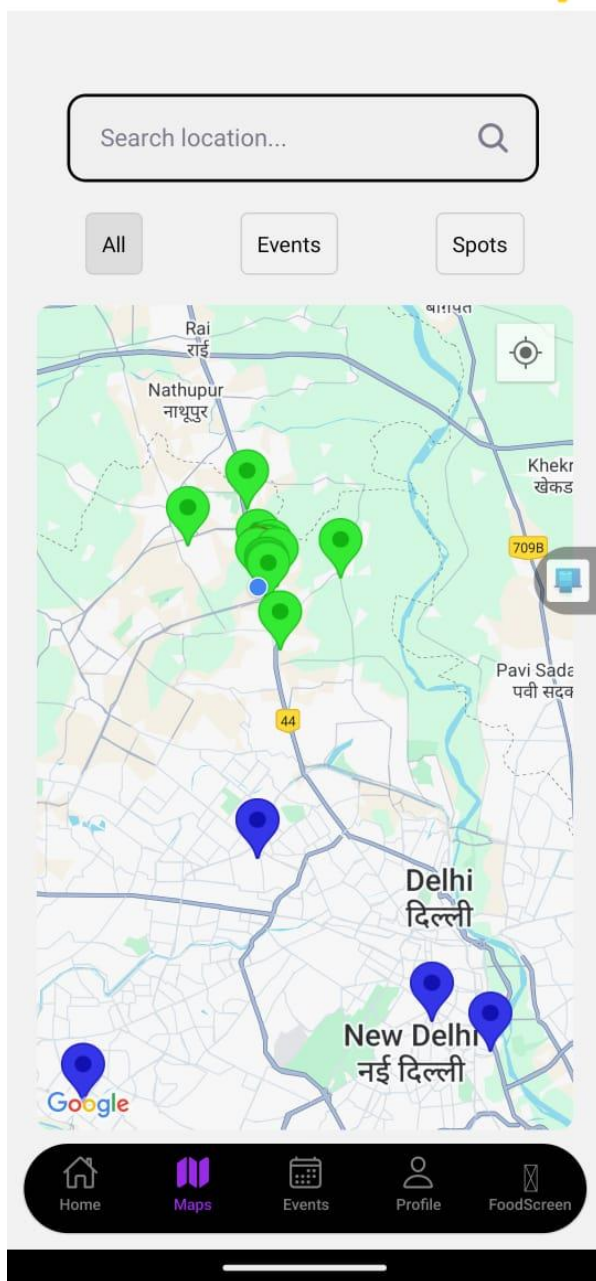📍 Shop No 1 Main Road Bakoli, Nera, PNB Bank, Alipur, New Delhi, Delhi, 110039, India

About

No description available.

🍴 Cuisine: N/A

🕐 Hours: Monday: 8:00 AM – 10:00 PM
Tuesday: 8:00 AM – 10:00 PM
Wednesday: 8:00 AM – 10:00 PM
Thursday: 8:00 AM – 10:00 PM
Friday: 8:00 AM – 10:00 PM
Saturday: 8:00 AM – 10:00 PM
Sunday: 8:00 AM – 10:00 PM

📞 088510 70265

Left screen

Search location...

All   Events   Spots

Rai
राई

Nathupur
नाथूपुर

Khekr
खेकड़

709B

Pavi Sad
पवी सदव

44

Delhi
दिल्ली

New Delhi
नई दिल्ली

Google

Home   Maps   Events   Profile   FoodScreen

Right screen

Search location...

All   Events   Spots

PRASHANT VIHAR
प्रशांत विहार

SHA

PVR Ci
पीवीआ

Devi: Traditional Indian Art Workshop
Date: 2 Apr, 1 PM | Pitampura, Delhi

Outer Ring R

PITAMPURA
पीतमपुरा

M2K Cinema

Rani Bagh Market

रोड नंबर 43

SHAKURPUR
शकूरपुर

Maha

9

H

Rohtak

Google

Bharat
Darshan Park

Home   Maps   Events   Profile   FoodScreen

← **Event Details**

Zamna India

29 Mar, 4 PM

📍 Gurugram

About Event

A vibrant cultural festival showcasing Indian heritage and traditions with live music, dance performances, and authentic cuisine.

Organizer	Tickets
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Book Tickets

🔍 Search location... 🔍

All   Events   Spots

Devi: Traditional Indian Art Workshop

Delhi दिल्ली

New Delhi नई दिल्ली
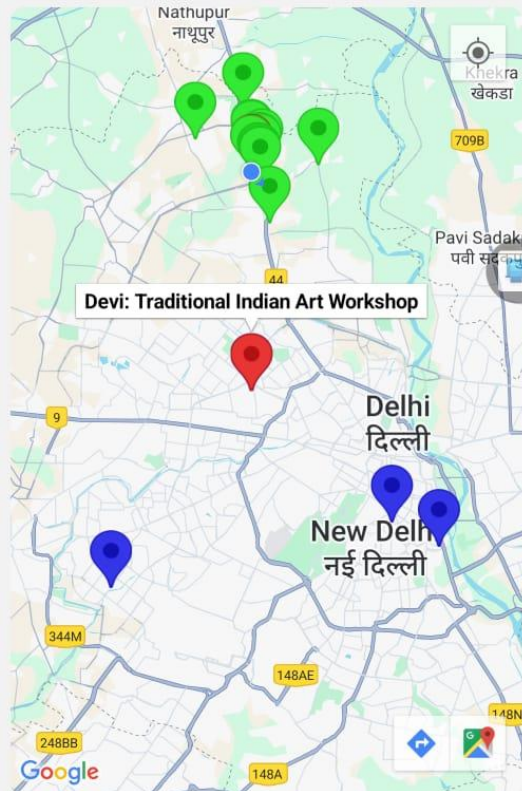
Home   Food   **Maps**   Events   Profile

Conclusion

The LOCOMO App has been meticulously designed as a comprehensive event and restaurant discovery platform, prioritizing user experience, performance, and scalability. By leveraging modern technologies and adhering to industry best practices, LOCOMO delivers a robust and seamless solution for connecting users with local restaurants and events.

 Key Achievements:

- Cross-Platform Compatibility: Developed a versatile application that functions flawlessly on both Android and iOS platforms.
- Real-Time Order Tracking: Enabled precise and transparent tracking of orders to enhance user trust and satisfaction.
- Intuitive User Interface: Designed a user-friendly interface to ensure effortless navigation and usability.
- Secure Payment Integration: Incorporated robust payment processing systems to ensure secure and reliable transactions.
- Scalable Backend Architecture: Implemented a backend capable of handling high concurrency, ensuring stability during peak loads.

Future Scope

AI-Powered Features:

Implementing machine learning algorithms for personalized recommendations
Predictive order suggestions based on user habits
Intelligent delivery route optimization
Expanded Services:

Voice ordering capabilities
Augmented reality menu visualization
Social media integration for sharing and recommendations
Business Expansion:

Geographic expansion to more cities and regions
Additional restaurant partnerships
Corporate ordering programs
Technical Enhancements:

Offline functionality for menu browsing
Advanced analytics for user behavior
Further optimization for performance and battery usage