Computer System Design
Assignment 1: Food Delivery System

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Contents

Introduction

- Campus Delivery Systems are an essential part of simplifying living in a residential campus

- Here, the presented solution aims to improve the Food services provided inside the campus

- This is to be done via a unified application comprising of the necessary features integrated with IDs of students of IIT Bhilai allowing for ease of payment and better accessibility

Literature Review

1. **GRUBHUB [1]**
   An on-site solution for Food ordering and delivery where it allowed integration of Campus Cards, Self-Driving Robots and smart lockers
2. **STARSHIP [2]**
   A on-campus delivery system which made use of robots (with self-driving features) in order to safely deliver and to efficiently track the order
3. **TACIT [3]**
   A solution for campus delivery whose main features include Student Cards & Payroll systems, Loyalty and Gift Cards, Integration with leading POS etc
4. **BYPPO [4]**
   A campus delivery system whose main focus is experimental learning via jobs on campus in delivery system

Functional Requirements

1. User can register/login with a new/existing account

2. Users are separated by roles, Ex: Customer, Store Owner, Delivery Person, Admin

3. User can search different restaurant based on his/her location

4. User can select a restaurant

5. User can see the menu of selected restaurant

6. Restaurant can change the menu any time

7. User selects restaurant and add different food items from the menu

8. User orders the food by selecting different online payment modes

9. Cash on delivery can be also option (Optional)

10. User can track the order in real time

11. User can cancel the order

12. The restaurant process the orders by preparing the meal and packaging the orders.

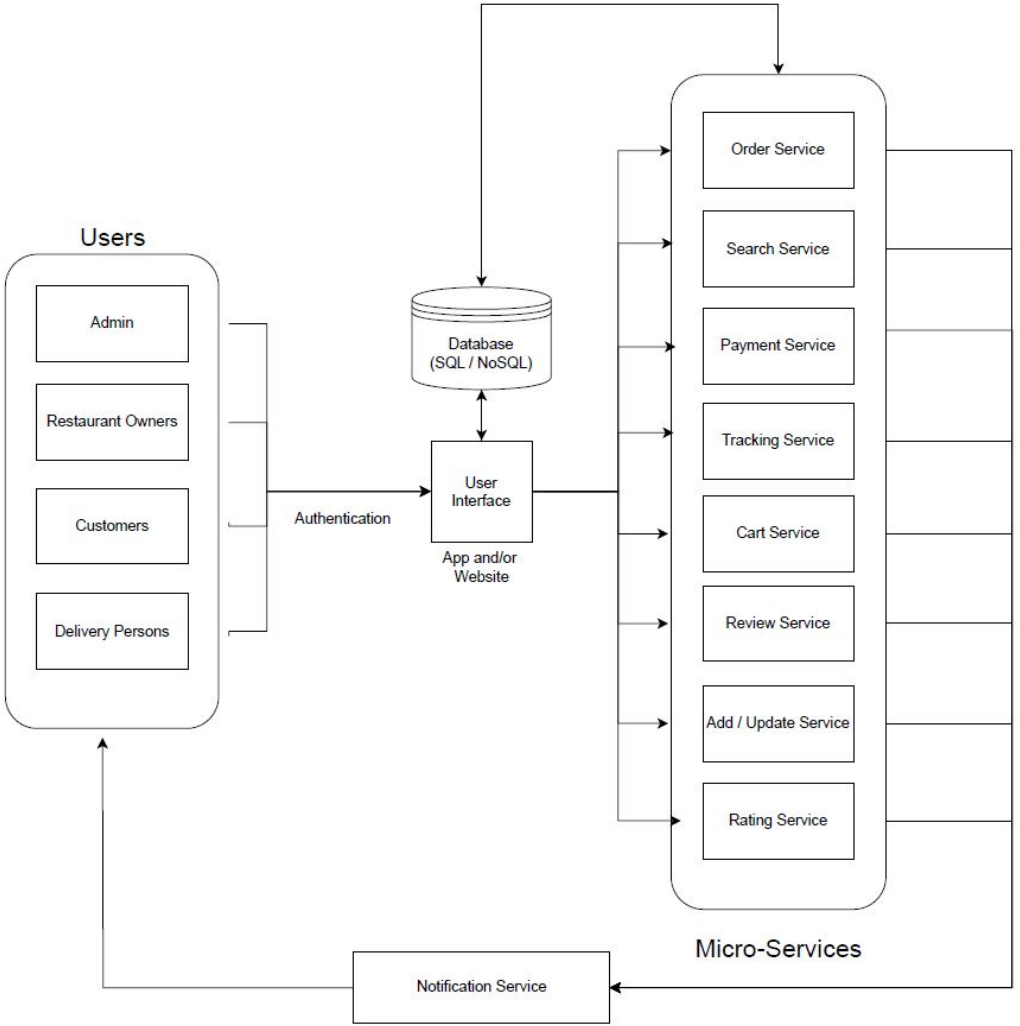
13. The restaurant contacts the delivery service or their personnel delivery staff to deliver.

14. Daily allows users to schedule their meals in advance or opt for a daily, weekly or

monthly subscription.

15. Customers will have different offers in the form of coupon, discounts, etc

High Level Design Diagram



Proposed Technology Stack

Backend

- Microservices: Python (and/or) Java
- UI Backend: Java (and/or) Javascript
- Execution: Shell Scripting

Testing

- UI Testing: Selenium
- Unit Tests: Python Unit Test Library
- API Testing/ Stress Testing: Postman

Frontend

- UI Platform: Android (and/or) Website
- Android Interface: Java
- Website Interface: HTML, CSS, JavaScript

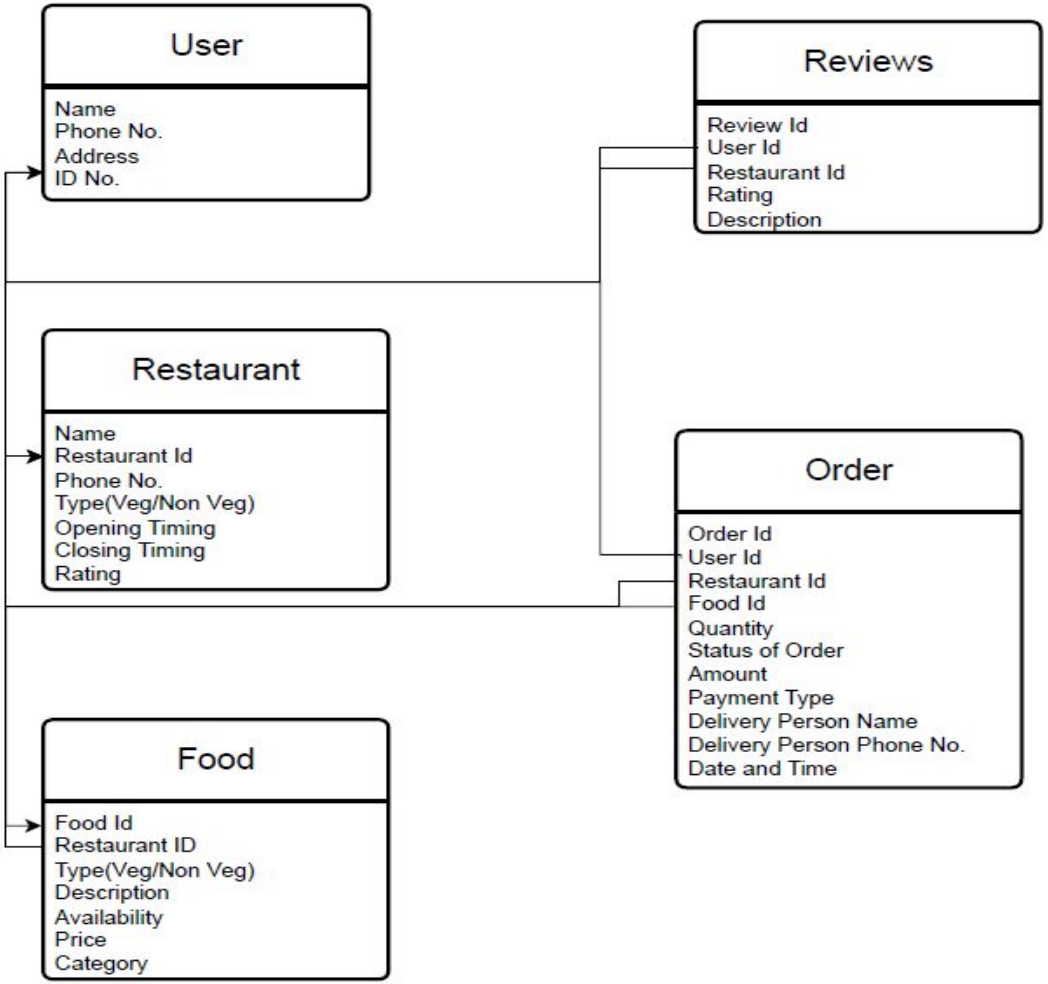
Deployment

- Docker, Docker-compose, AWS EC2

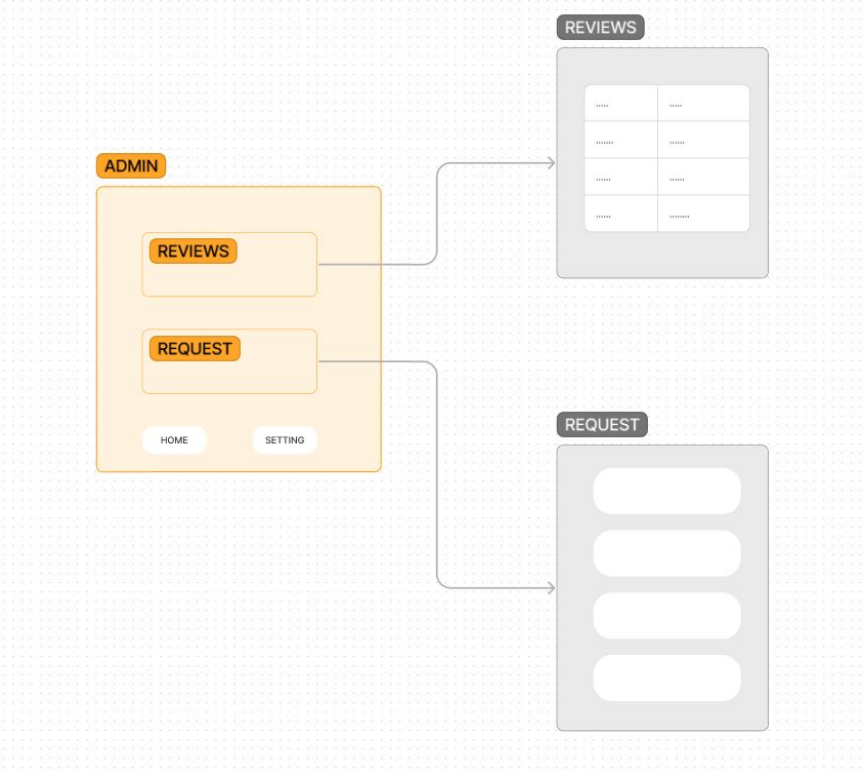
(OR)

- AWS Amplify, AWS Lambda

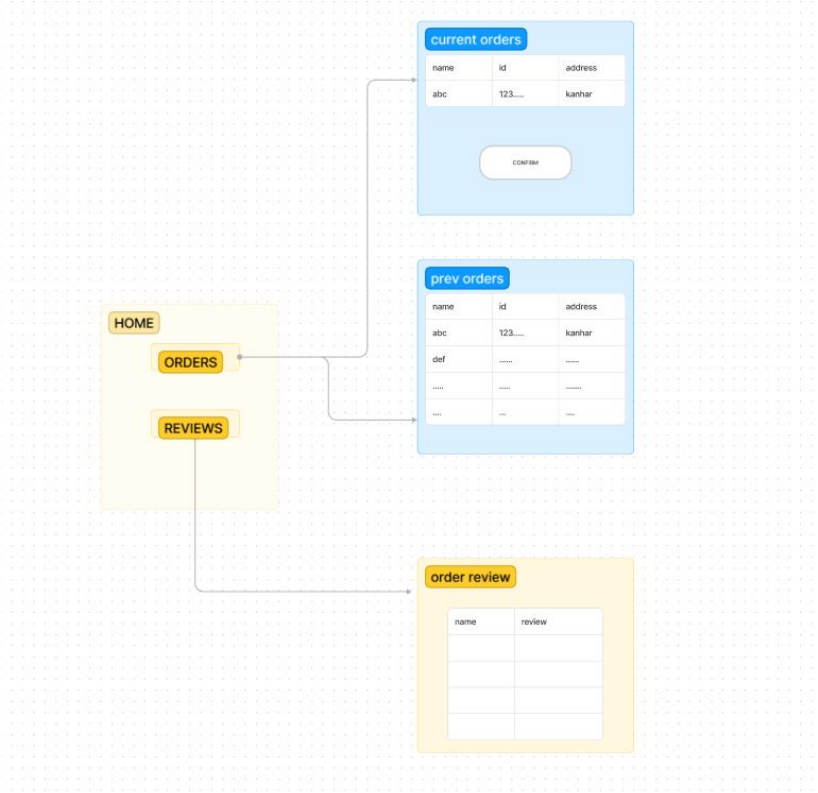
Database Structure



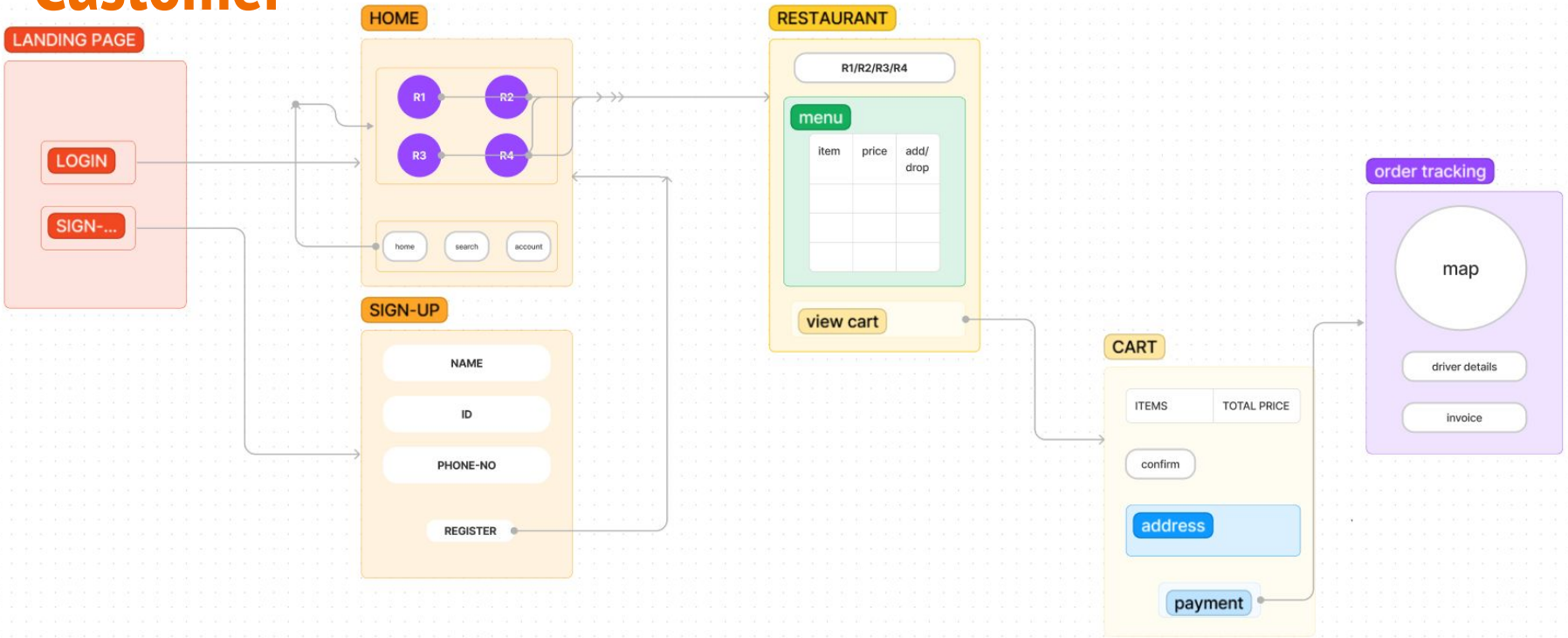
Interface Diagram: Admin



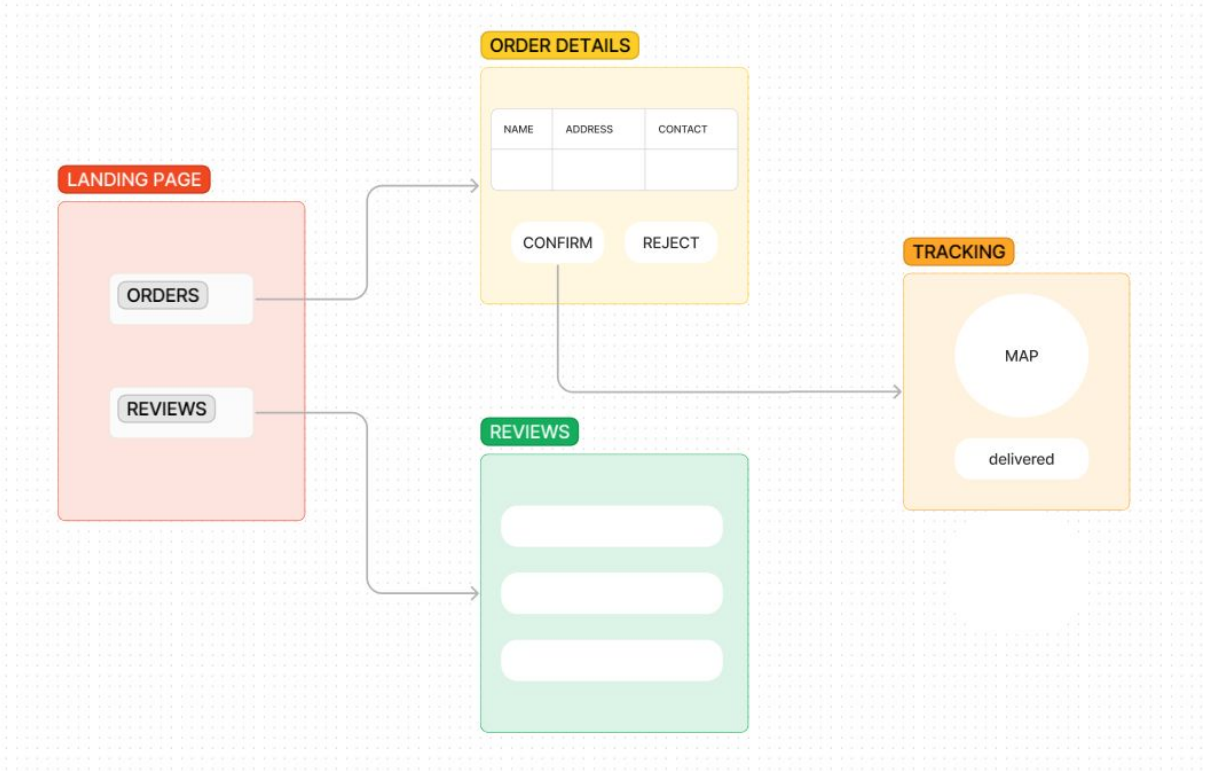
Interface Diagram: Restaurant



Interface Diagram: Customer



Interface Diagram: Delivery Person



Proposed Innovation

Registration with Student ID Numbers and Database Integration:
The app ensures exclusivity by requiring users to register with valid student ID numbers. This information is cross-verified with a secure database containing corresponding email addresses during the registration process. Once verified, users can create profiles with additional details. This streamlined approach enhances security and ensures that only valid students gain access to the app.
Volunteer-Based Delivery System:
The app optimizes delivery logistics by integrating GPS to match orders with nearby students willing to volunteer for delivery. A rewards system incentivizes voluntary participation, offering users redeemable points for successful deliveries. The system includes a communication platform for users to coordinate details securely, a rating system for reliability, and an opt-in feature to maintain flexibility. This innovative approach not only streamlines the food delivery process but also fosters a sense of community engagement among the university students.
More Underway 🤞

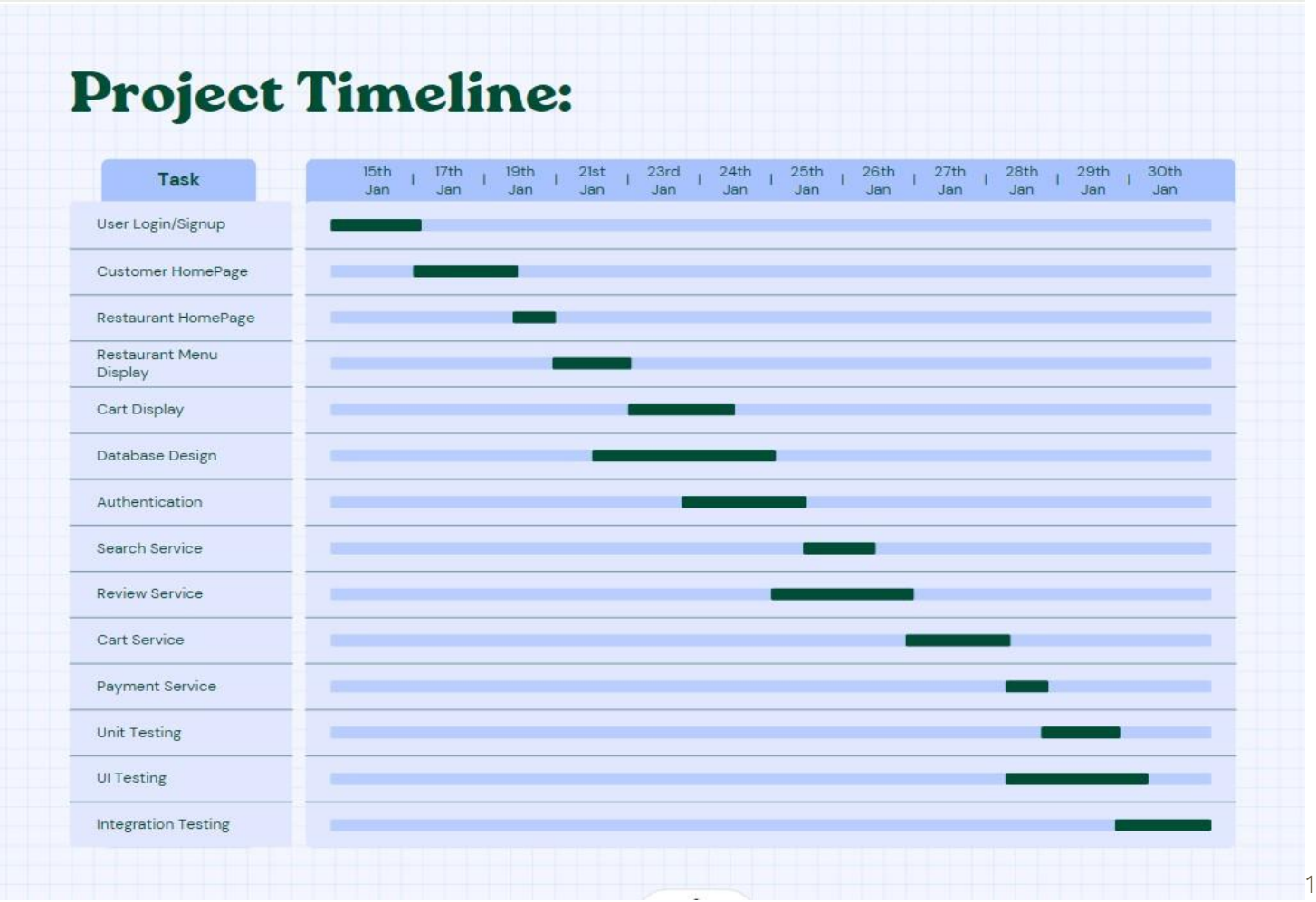
Feasibility

Technical Feasibility:
The Android app, backed by AWS for scalable cloud infrastructure and Firebase for secure authentication, ensures robust real-time tracking and encryption protocols. This dynamic tech stack optimizes scalability, providing a seamless and secure user experience.

Economic Feasibility:
The comprehensive cost estimate, encompassing AWS and Firebase integration, aligns with potential revenue streams, ensuring a viable economic model. This, coupled with AWS's cost-effective cloud solutions, establishes financial sustainability and growth potential.

Operational Feasibility:
Efficient user role management, streamlined order processing, and operational stability through AWS's infrastructure support a seamless food delivery experience. Subscription management and marketing strategies further contribute to operational efficiency

Execution Timeline



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