

HUNGER: A FOOD DELIVERY APP

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FINAL YEAR DESIGN PROJECT REPORT

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY

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APPROVAL

This Project titled “HUNGER: A FOOD DELIVERY APP”, submitted by **Pretty Dey** and **Md Siddiqur Rahman** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 13th July, 2024.

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We hereby declare that this project has been done by us under the supervision of **Mr. Narayan Ranjan Chakraborty (NRC)**, Associate Professor and Associate Head, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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ABSTRACT

Student life is the most stressful life, especially for those who live in hostels or dormitories. Facing academic pressure, attending classes all day long when we go back to our hostels or dorms,

the first thing we feel is hunger. Generally students take out meals from local restaurants or order foods via whatsapp or calling. This whole process is so hassling that the delivery boy sometimes forgets or the food is delivered late. Though food delivery apps are very common today, the local restaurants near Daffodil International University are not included in those existing applications. Also, these apps do not have the features of budget tracking, meal management, pre schedule meals for the whole month, etc. That's why this idea of this project comes into the picture. Through this app students can order meals, pre schedule the whole month meal three times a day, track the budget of the whole month, and set the budget at the beginning of the month. The app will be developed using dart language on Flutter, NodeJS. We will also use MySQL for databases. The app aims to enhance the overall well-being of students by providing a stress-free solution to meal management, fostering a more harmonious and effective campus community.

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CHAPTER 1

INTRODUCTION

1.1 Overview

Student life is the most hectic and stressful period of our life. Those who live away from their family in the hostel, dorm are more unlucky than the other students. Attending classes all day long, when we go to hostels or dorms, we have to cook our own meal or buy food before going home which is a hassle. In recognition of the busy schedules and demanding routines in the university-hostel life, as a result, We thought of making this app to lessen the difficulties and deliver the meal when a user is in their hectic schedules. This app will be a connection between students and local restaurants. The report begins by identifying the background issues, highlighting the difficulties students encounter, especially concerning the availability and quality of meals after standard dining hours. The objectives of the app are outlined, emphasizing its goal to offer convenience, nutritional variety, affordability, and user-friendly service. The scope and limitations section defines the operational boundaries of the app, detailing where it will be available and the factors that may impact its effectiveness.

1.2 Background and Present State

The landscape of university life, particularly for students residing in hostels or dormitories, presents unique challenges regarding access to nutritious and affordable meals. This demographic often faces hectic schedules and limited dining options, especially during late hours when canteens or nearby eateries may be closed or inaccessible. This situation is particularly tough for female students who have safety concerns and limited mobility after certain hours. Students often resort to cooking with induction ovens or ordering from local restaurants, known as "hotels", but these options often result in meals that are not very nutritious or satisfying. Ordering through platforms like WhatsApp is unreliable, with issues like late deliveries and inconsistent food quality being common. However, these methods often result in meals that are neither nutritious nor satisfactory in quality. The current state of food delivery services within university settings reflects a gap in meeting the specific needs of students living in hostels. While

some attempts have been made to address these issues through ad-hoc ordering systems, there remains a significant opportunity to streamline and enhance the dining experience for this demographic. Recognizing these challenges, the concept of a specialized food delivery app tailored for university students emerges as a promising solution. This app aims to revolutionize how students access meals by offering a convenient, user-friendly platform. It allows students to order meals anytime and anywhere within their campus area. The app features a variety of meal options tailored to different dietary preferences and nutritional needs, ensuring students can make healthier choices without hassle. One of the key benefits of the app is its flexibility in meal planning. Students can schedule meals in advance, helping them manage their time effectively amidst their academic commitments. It also emphasizes affordability, providing clear pricing and budgeting tools to help students stay within their financial means while enjoying quality meals. Unlike traditional methods, the app ensures reliable service with streamlined order management and timely deliveries. Its intuitive interface makes it easy for students of all technological backgrounds to navigate and use effectively. Moreover, the app's interface is designed with a user-centric approach, making it intuitive and easy to navigate for students with varying levels of technological proficiency. The background underscores the existing challenges faced by university students, particularly those in hostel environments, regarding meal accessibility and quality. The present state highlights the inadequacies of current solutions and emphasizes the need for an innovative approach to simplify students' lives and enhance their dining experiences. By leveraging technology and user-centric design, the proposed food delivery app aims to bridge these gaps effectively, offering a comprehensive solution that aligns with the dynamic lifestyle of university students today.

1.3 Problem Statement

As a student, I understand university-hostel life can be hectic, and finding nutritious and affordable meals shouldn't be an added stress upon this hostel life. This problem is more stressful for girl students. Girl students who live in dorms or hostels, can not go out after 7 o'clock. So they have to buy food from the hostel canteen which is neither tasty nor nutritious as well as costly. Some of them try to cook on their own using an induction oven or cooker. Furthermore, many of them buy supper from the hotels (in Ashulia, food restaurants are known as hotels) before going to the hostel but they usually have their

dinner around 11 pm in the night. But the food doesn't stay fresh or good till then, sometimes the food gets rotten. Some of them get to sleep with an unfed stomach. Not only girls but also boys suffer from this type of problem. So they came up with an idea of ordering food via whatsapp. But the food hotel workers can not manage the orders properly let alone deliver food on time. There are no current food delivery services within university campuses. There's a clear opportunity to improve how students access meals by introducing a specialized food delivery app designed specifically for university life. Analyzing all of these problems, I thought of an app that can lessen these problems and make university-hostel life more harmonious and enjoyable.

Our goal is to create a solution that not only simplifies meal planning and delivery but also fosters a more harmonious and enjoyable experience for students living in dormitories or hostels. This app aims to provide a convenient platform where students can order nutritious meals anytime and anywhere within their campus area, eliminating the need to venture out late at night or settle for subpar food options. By offering a variety of affordable meal choices and empowering students to schedule meals in advance, the app aims to ensure that dietary needs and preferences are met efficiently. Ultimately, the aim is to transform the dining experience for university students, making it a seamless part of their busy lives without compromising on quality or convenience.

1.4 Objectives

The primary objective of our food delivery app for university students living in hostels is to address the current challenges students face in accessing quality meals. Our key objectives include:

- i. **Convenience:** Provide a user-friendly platform that allows students to order meals anytime and anywhere within the campus vicinity, reducing the need to rely on inconvenient or unreliable food sources.
- ii. **Affordability:** Implement transparent pricing and budgeting tools to help students manage their expenses effectively while enjoying affordable meal options tailored to their budgets.
- iii. **Meal Planning:** Enable students to schedule meals in advance, facilitating better time management and reducing stress associated with last-minute dining decisions.

- iv. **Reliability:** Ensure consistent and reliable service with efficient order management and timely deliveries, overcoming the inconsistencies often associated with current food delivery methods like WhatsApp orders.
- v. **Enhanced User Experience:** Develop an intuitive and easy-to-use interface that accommodates students of varying technological proficiency, enhancing overall satisfaction with the app.
- vi. **Safety and Convenience for Female Students:** Specifically address the safety concerns of female students by providing a secure and reliable means of accessing meals without needing to venture out late at night.
- vii. **Nutritional Quality:** Offer a range of nutritious meal options that cater to diverse dietary preferences and ensure students have access to balanced and healthy food choices.
- viii. **Feedback and Improvement:** Continuously gather feedback from users to improve the app's features and services, ensuring it evolves to meet the dynamic needs of university hostel residents.

These objectives collectively aim to streamline the dining experience for students, making nutritious and affordable meals more accessible while alleviating the stress associated with meal planning and delivery in a university-hostel environment. By fulfilling these objectives, our app seeks to enhance the overall quality of life for students, allowing them to focus more on their academic pursuits and less on logistical challenges related to food.

1.5 Scope and Limitations

The scope of our food delivery app for university students in hostels focuses on enhancing the dining experience within campus environments. It will operate exclusively within the campus only. The app will prioritize ordering flexibility, allowing students to order meals at any time and schedule in advance to accommodate their busy schedules. A user-friendly interface will ensure easy navigation and accessibility for all students, regardless of their technological proficiency, while transparent pricing and budgeting tools aim to help students manage expenses effectively. Reliable order management and timely deliveries are essential goals to overcome current challenges associated with alternative food delivery methods. Safety measures, particularly for female students, will be prioritized, offering a secure platform that eliminates the need for late-night food outings.

However, the project is limited by initial geographic constraints, operational hours aligned with typical meal times, and technological accessibility.

- i. **Initial Geographic Constraints:** The app's initial rollout may be limited to specific university campuses or regions, potentially excluding students in other areas until further expansion.
- ii. **Service Hours:** The app's service hours may be limited to operational times that align with typical meal hours, potentially restricting its availability during late-night hours or off-peak times.
- iii. **Vendor Network:** The effectiveness of the app relies on the cooperation and capacity of local food vendors to fulfill orders promptly and maintain food quality, which could vary and impact service consistency.
- iv. **Technological Dependence:** The app's functionality depends on students having access to smartphones and internet connectivity, which may pose accessibility challenges for some users.
- v. **Regulatory and Compliance Considerations:** Compliance with local regulations and health standards will be critical, potentially influencing the types of vendors and menu options available through the app.

Despite these limitations, the project aims to significantly improve the dining experience for university students living in hostels by addressing current pain points and providing a reliable, convenient, and affordable solution for accessing nutritious meals. Future iterations and expansions will seek to mitigate these limitations and enhance the app's capabilities to better serve a broader student population.

1.6 Report Organization

The remaining chapters are arranged as below: In chapter 2, we have compared the features of the proposed model with the existing apps and websites. In chapter 3, the requirement analysis of the system has been explained. In chapter 4, the implementation interfaces are shown. Chapter 5, we have analyzed results. Chapter 6 includes impacts on society and environment. Chapter 7 includes future works and scopes in this field.

1.7 Summary

The proposed project aims to address the challenges faced by university students and individuals living in hostel environments by providing a convenient and stress-free solution for accessing meals. Recognizing the busy schedules of university-hostel life, the project seeks to offer a user-friendly app that allows users to order food anytime, anywhere around the varsity area as well as schedule the meal at the beginning of the month. The problem statement highlights the difficulties faced by students, especially girl students, in accessing affordable and nutritious meals within hostel premises, particularly after hours. Existing solutions, such as ordering food via WhatsApp, have proven ineffective. The motivation behind the project is to simplify the lives of students by providing a convenient platform for ordering meals. The project's objectives include offering a range of features such as meal planning, budgeting, and customizable meal options tailored to user preferences. Key objectives include improving meal accessibility, ensuring dietary diversity, and enhancing overall user satisfaction. The report discusses the scope of the app, detailing its operational boundaries and the constraints that may affect its effectiveness, such as geographic limitations and vendor dependencies. Methodologically, the report covers research approaches, technological considerations, and stakeholder engagement strategies employed during development. The project scope focuses on developing a user interface-centric app targeting university students and individuals living in dorm environments. The project seeks to fill existing gaps in food delivery services for university students, offering a planned and pre-scheduled meal option to cater to their specific needs and interests.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

The food delivery industry is growing strongly day by day driven by technological advancements and changing consumer preferences. It is an overview of the current state of the food delivery services. Each of the food delivery applications has unique features and customer preferences. Users can order food from anywhere online through these applications. Though we are only focusing on how the delivery system can lighten up the burden of the students, reducing stress on planning meals everyday every time before having food.

2.2 Related Works

Each of the food delivery applications have their own features and benefits to users and cater to different segments of the market.

FoodPanda[1] is a widely known global food delivery platform that operates globally. It mainly connects the local restaurants with the food vendors. Users can search or browse their favorite food and order as per their taste and interests. The ordered food will be delivered to the doorstep within some minutes to hour. Users can track their order, pay in a secured way when the food will be delivered.

Khaodao[2] is a food delivery app that works only in Bangladesh. They connect the local restaurants to the users. Users can order food online and pay when the food arrives.

We all know Pathao[3] is a ride sharing service app but they have expanded their service in delivering food also. Pathao food enables users to order food from nearby restaurants. Pathao mainly focuses on time management. They try to deliver the food as fast as they can.

Shohoz Food[4] is the best food service provider in Dhaka city. They provide multiple categorized foods such as lunch, dinner all over Bangladesh, especially in Dhaka city.

Hungrynaki[5] is the first ever food delivery application in Bangladesh. They deliver food from restaurants to home.

Shebafood[6] is a food delivery app which rules over all types of food sectors. Their services are with all types of homemade foods, catering foods, dairy products, restaurant food, and more. They introduced a new way of representing homemade foods to the world.

Foodmart[7] is a food delivery application that is Dhaka-city and Chittagong-city based. It is not available all over Bangladesh.

2.3 Comparison between existing works

Table 2.1 Comparative analysis with previous work

Sr No.	Criteria	Foodpanda[1]	Khaodao[2]	Proposed Model (Hunger)
1	Target Consumer	All kinds of people	All kinds of people	Students or residents who lives around the university
2	Availability	Not available in the targeted area	Not available in the targeted area	It will be programmed specially for the targeted area
3	Budget tracking (feature)	No option about budget and expense tracking	No option about budget and expense tracking	User can set budget and they can track and manage their expenses
4.	Budget calculator(feature)	Not available	Not available	User can calculate budget by picking food for a week or month
5.	Authentication	Strong authentication system	Strong authentication system	Strong authentication
6.	Use	Easy to use	Quite complicated	Easy to use

2.4 Open Issues

Existing applications focus on huge consumers including every sector of people. But any of them are not available in the targeted area I am working on. Generally, users browse food items and order the food online on the current apps. But the proposed model is not for ordering food one or two times a week or month. Though the existing apps work for all kinds of people, it is not a scheduled meal provider service. Using the proposed app, students can pre-schedule their meal items for breakfast, lunch, and dinner. They can set a budget at the beginning of the month and schedule food as per their budget and food taste. They can track their weight, budget, and food. They can even find out the total spent cost at the end of the month.

2.5 Summary

This section highlights the current state of food delivery services, emphasizing the unique features and customer preferences of each application. While users can order food from anywhere through these apps, the focus here is on how such delivery systems can alleviate the burden on students, reducing the stress of planning meals daily. The current market is ruled by FoodPanda, Khaodao, and Pathao. Each offering distinct features and benefits to users. FoodPanda, a global platform, connects local restaurants with food vendors, allowing users to order food online and track their deliveries. Khaodao operates exclusively in Bangladesh, facilitating food orders from local restaurants with payment upon delivery. Pathao prioritizes fast delivery times in ordering food. A comparative analysis between these existing works reveals key differences in criteria such as target consumer, availability, budget tracking features, authentication systems, and ease of use. While existing apps cater to a broad consumer base, none are available in the specific targeted area. Additionally, the proposed model aims to provide more than just general food orders, offering students the ability to pre-schedule meals for breakfast, lunch, and dinner, track expenses, and manage budgets effectively.

CHAPTER 3

REQUIREMENT ANALYSIS & DESIGN

3.1 Overview

This chapter will cover the detailed explanation of methodology that is being used to make this project finished from scratch to deployment. In order to evaluate this project, the methodology is based on software development life cycle (SDLC).

Planning phase: Understanding problem statements , collecting required data, requirements.

Analysis phase: Types of data, user roles, application features, security

Design phase: UML diagram, ER diagram, UI and Ux design

Coding and implementation phase: Programming language , frameworks, development

Testing phase: UI testing, security testing

Deployment phase: Android play store, ios app store.

3.2 System Design

The Software Development Life Cycle (SDLC) is a structured framework that outlines the processes and phases involved in the development of software applications. It serves as a guideline for software developers and project managers to ensure systematic and efficient development while meeting project goals and user requirements.

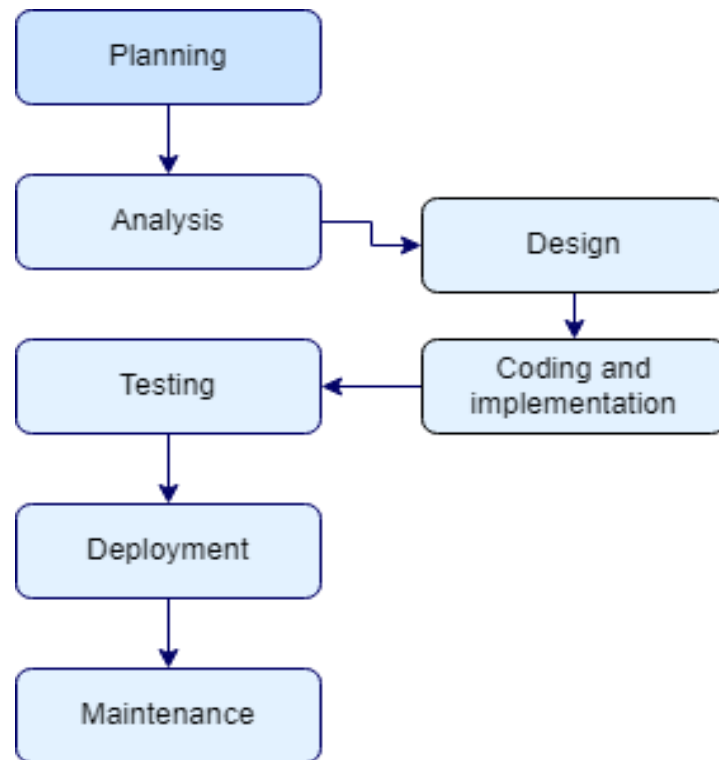


figure 3.2.1 SDLC phases

3.2.1 Planning Phase

Perfect outcome comes from a well defined plan. The planning phase includes three elements to execute namely understanding problems, collecting data, and identifying requirements.

Understanding Problem Statements

Before making a solution through a software project ,breaking down problems and understanding them in a well organized manner plays an important role. Major problems behind this project are:

- a. Ordering food from the best food stores available as a user
- b. Delivering the ordered food to the customers
- c. Managing the details of ordered foods and finance as an owner of the restaurant/hotel.

3.2.2 Analysis Phase

Delivering data within vast amounts of people is the main goal of any public application. Before this distribution process, identifying which data should be available for which users and the ways of storing data securely into the database is done through analysis. Delivering data within vast amounts of people is the main goal of any public application. Before this distribution process, identifying which data should be available for which users and the ways of storing data securely into the database is done through analysis.

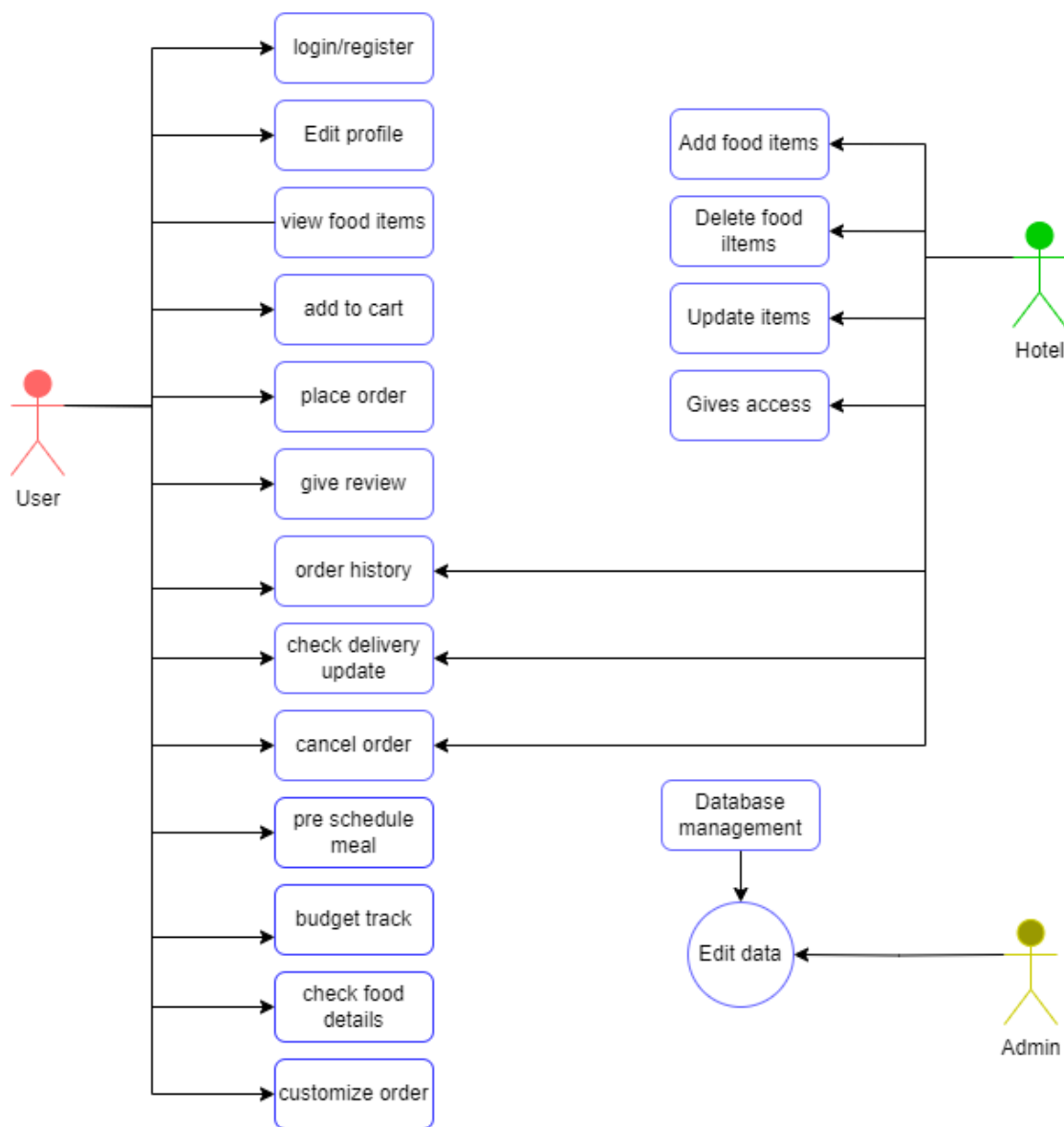


figure 3.2.2 Use Case Diagram

Types of data

- a. Foods information
- b. Persons information
- c. Restaurant/Hotels information

Users Roles

- a. App Admin (all privilege)
- b. Admin (restaurant/hotel manager)
- c. Editor (decided by Admin)
- d. Customer

Application features

- Registration and login
- View Foods and Hotels List
- Filtering Food list
- Searching for specific food
- Add to cart
- Place order
- Give Review
- Add to favorite list
- Editing Profile
- Food and Hotel recommendation
- Order history
- Delivery update
- Pre schedule food items for months
- Estimate budget by making a meal plan for a week or month by selecting foods
- Defining an estimated budget (by default this option is off. User can turn on and set budget from profile)
- Editing budget
- Getting budget alert when current expense is 30%, 50%, 70% and 90% of defined budget

- Monthly total expense history tracker
- Apply discount coupons
- For admins :
 - a. Add, Delete food items
 - b. info about orders
 - c. update about foods information and price
 - d. information about total complete order details
 - e. information about total sell
- Logout

Security

Making sure the application data is safe in every stage for every user.

3.2.3 Design Phase

User friendly user interface and well organized database design for making the app easy to understand for the users and developers.

Architectural Design: Determining how different components will interact. This involves defining the client-side (mobile app) and server-side (backend) architecture.

Database Design: We have designed the database schema to efficiently store and retrieve data related to users, orders, menus, and transactions. We have used relational database design using tools like MySQL ensuring scalability and data integrity.

User Interface (UI) Design: We have developed wireframes or prototypes to visualize app screens, focusing on easy navigation, clear menu displays, and intuitive order placement.

Backend System Design: The functionality and APIs (Application Programming Interfaces) needed to support app features have been defined such as user registration, menu browsing, order placement, payment processing, and order tracking with frameworks like Node.js with Express.js.

Security Design: We have taken some security measures such as encryption for sensitive data (like user credentials and payment information), authentication

mechanisms, and secure communication protocols (HTTPS) between the app and server to protect user privacy and prevent unauthorized access.

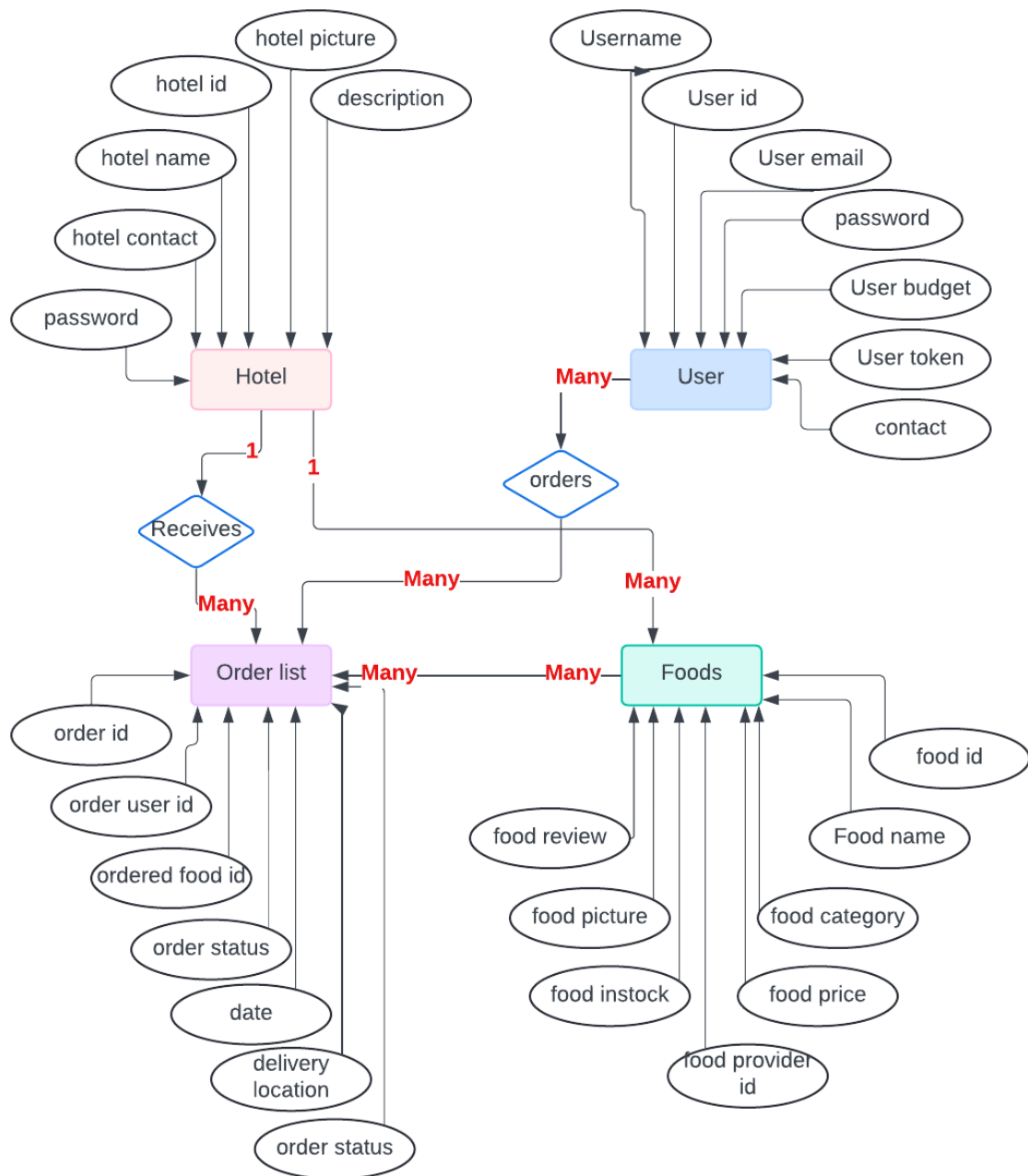


Figure 3.2.3 ER Diagram

3.2.4 Coding and Implementation

Programming Language

- A. Dart: Dart is commonly used for building mobile, web, server-side applications with Flutter, Google's UI toolkit.
- B. Javascript: Javascript is a widely used programming language for both front-end and back-end.

Frameworks

- A. Flutter: Flutter is an open source UI software development kit by Google. It allows developers to build cross platform applications for android, iOS, web, and desktop using a single codebase.
- B. NodeJs(Expressjs): It is a server-side JavaScript framework that allows developers to build back-end applications. This project's back-end will be done using NodeJs.

Databases

- A. Mysql (Prisma): Prisma is an open-source database toolkit for Node.js and TypeScript that provides an ORM (Object-Relational Mapping) layer for interacting with databases, including MySQL. Information about user, admin, food menu, orderlist will be stored using MySQL.

Front-end Design

Our app has two parts: The frontend part and The backend part. The frontend part is created using Flutter and the backend part is developed using NodeJS. Node.js is a runtime environment that allows us to run JavaScript code server-side. The system is divided into 2 apps.

- i. Admin app
- ii. User app

Admin user interface

Admin App: Register

The register screen for the admin app features a user-friendly interface with fields for username/email and password. Admin must register to perform actions in this app.



The screenshot shows the 'Register' screen of the 'Hunger Kitchen' admin app. At the top, the status bar displays the time 01:11, signal strength, and 100% battery. The app's header features a cartoon illustration of a kitchen with a chef and the text 'Welcome Hunger Kitchen'. Below the header, there are four input fields: 'Hotel Name', 'password', 'location details', and 'Picture url'. A large brown 'Register' button is positioned below the fields. Underneath the button, it says 'Have Account? Login'. At the bottom of the screen, there is a cartoon illustration of a small table with two chairs and a teapot. The bottom navigation bar shows three icons: a list, a home button, and a back arrow.

Figure 3.2.4: Admin App: register

Admin App: Log In

The login screen for the admin app features a user-friendly interface with fields for username/email and password. Log in Activity will allow only admin to log in except that no other person will be able to pass this step.

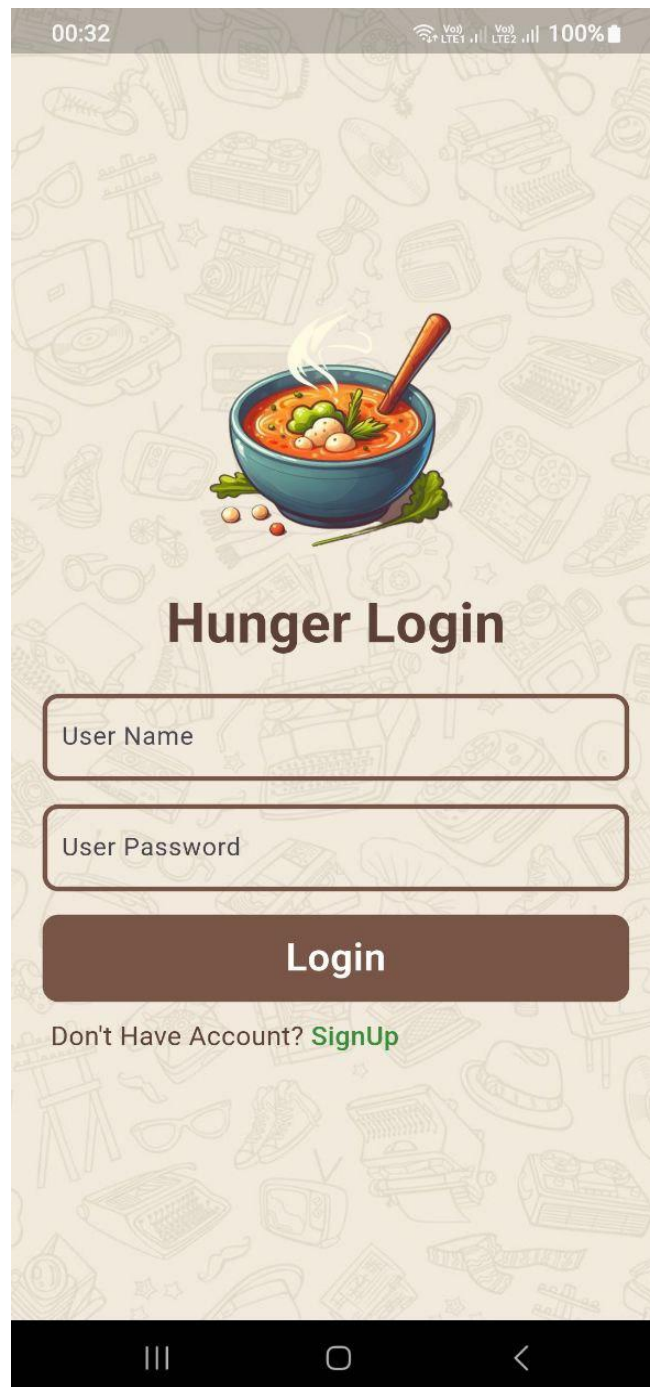


Figure 3.2.5: Admin App: Log In

Admin App: Home Page

Admin Home page is designed to manage all possible parts. Using the admin interface, admin can do all the necessary tasks such as add food menu, delete, check order, proceed order.

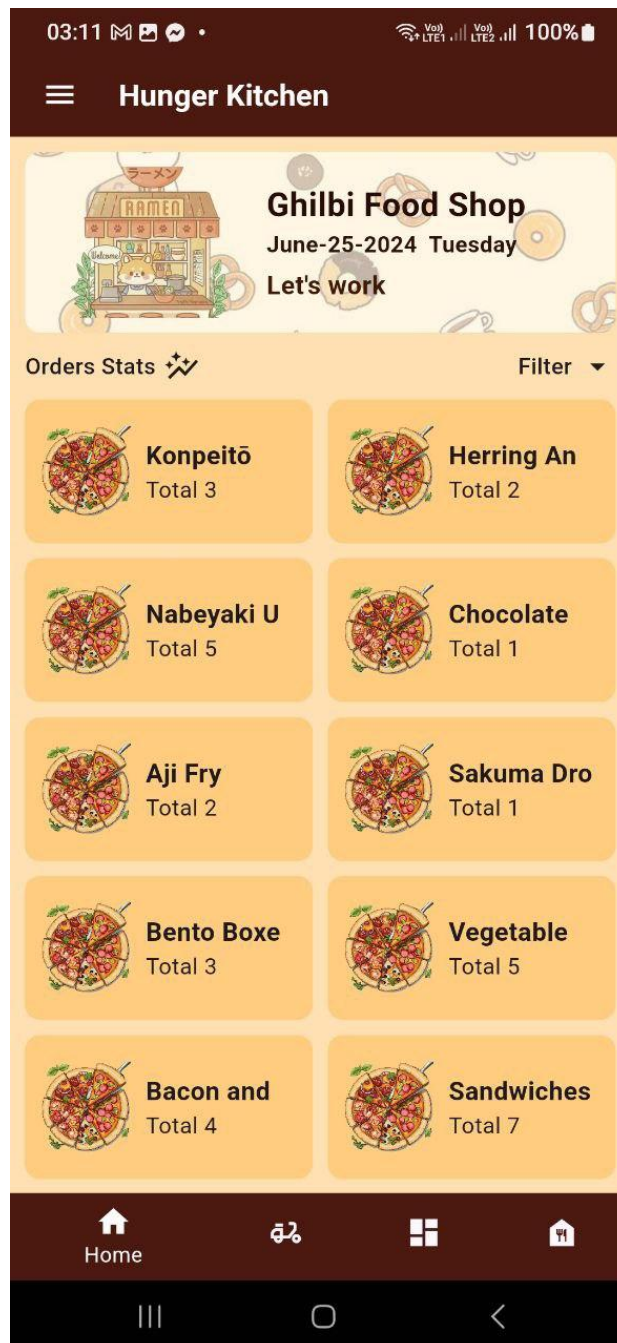


Figure 3.2.6: Admin App: Home Page

Admin App: Pending order checking page

In this page, admin can check who has ordered and which orders are still pending and which are delivered already. Admin can also delete orders after delivering the food.

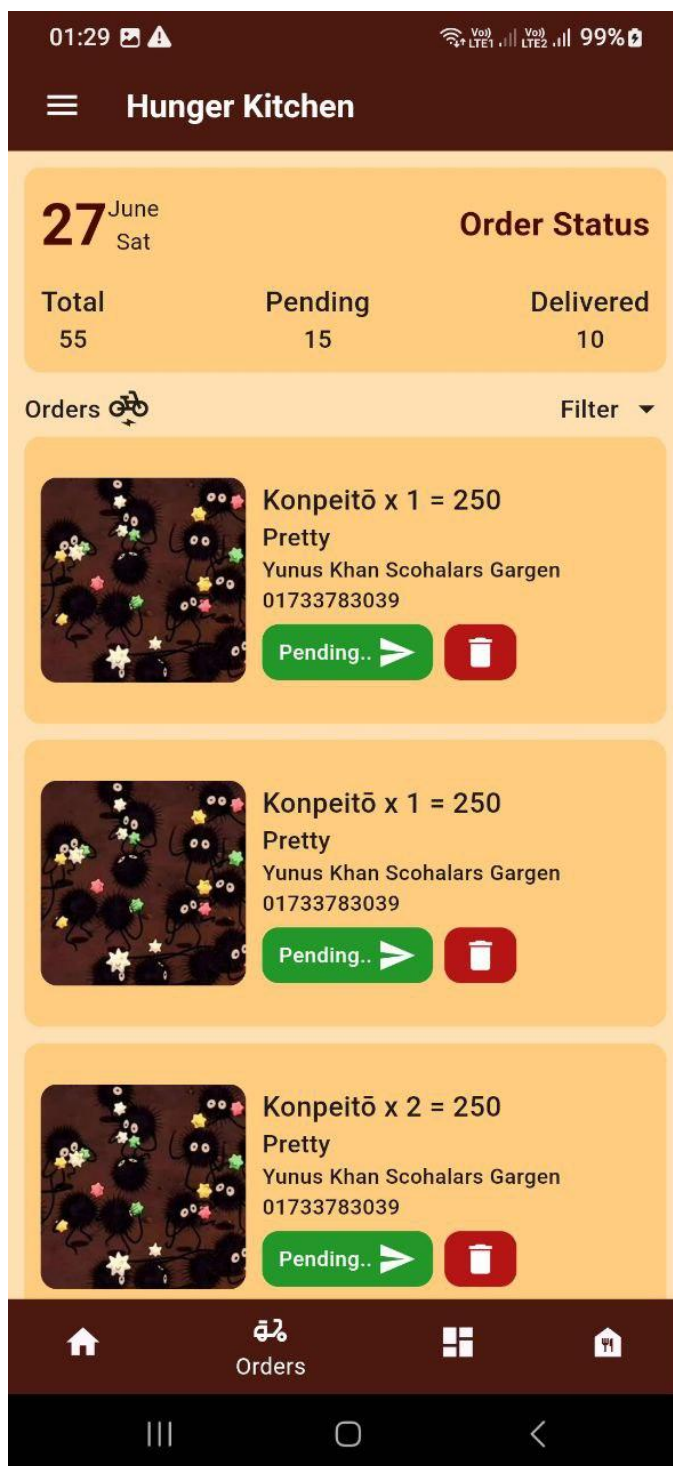
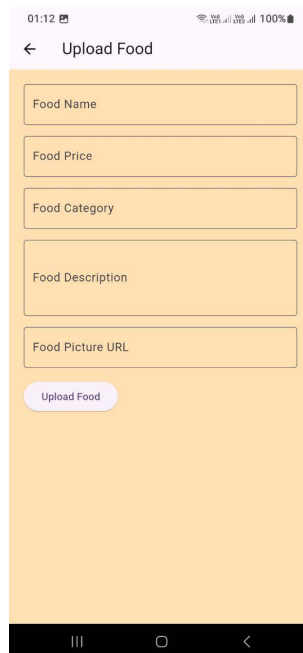


Figure 3.2.7: Admin App: Pending order checking page

Admin App: Add menu

Admin can add a new menu using this page.



The screenshot shows a mobile app interface for uploading food. At the top, there's a status bar with the time 01:12 and 100% battery. Below it is a header bar with a back arrow and the text 'Upload Food'. The main area contains five input fields: 'Food Name', 'Food Price', 'Food Category', 'Food Description', and 'Food Picture URL'. At the bottom of the form is a purple button labeled 'Upload Food'.

Figure 3.2.8: Admin App: Add Menu

Admin App: Profile Page

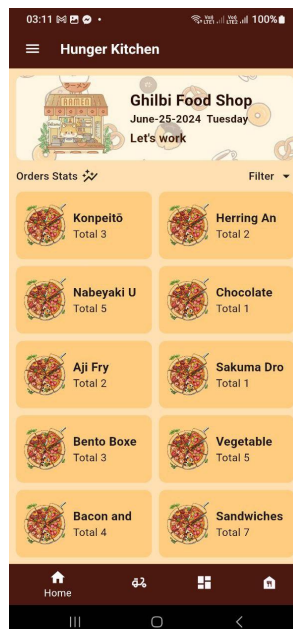


Figure 3.2.9: Admin App: Profile Page

User App

The user app interface provides a seamless experience for ordering meals, featuring intuitive navigation, a variety of food options.

User App: login

Users must log in to the app to perform activities. Users will provide simple necessary data so that the system can know the actual user list of the system.

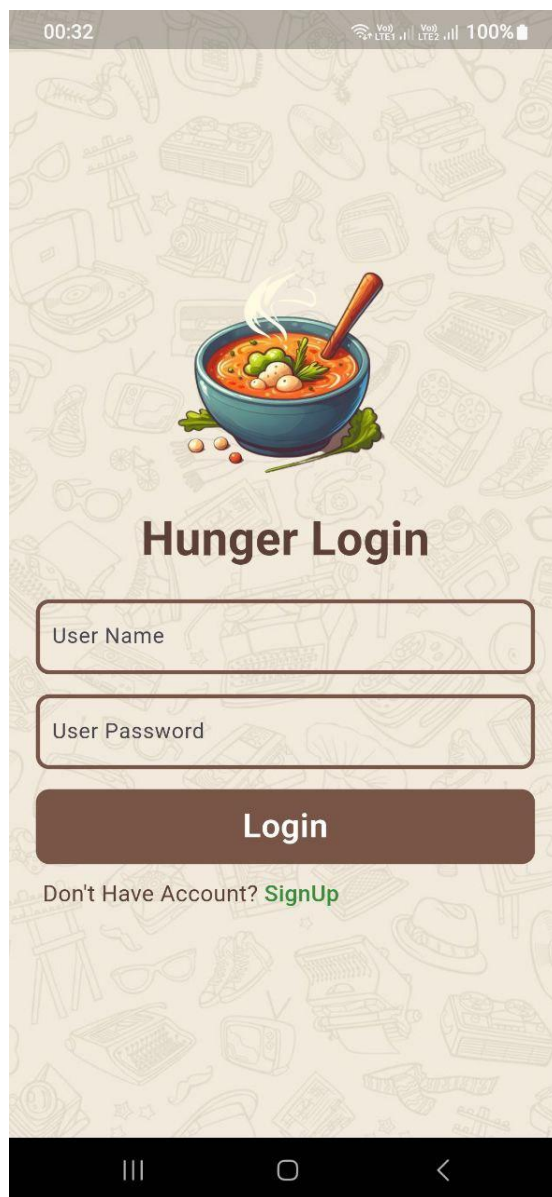


Figure 3.2.10: User App: Login

User App: Home Page

User home is also simple but organized where all the food menus are displayed. Users can custom order using the **custom order** button.

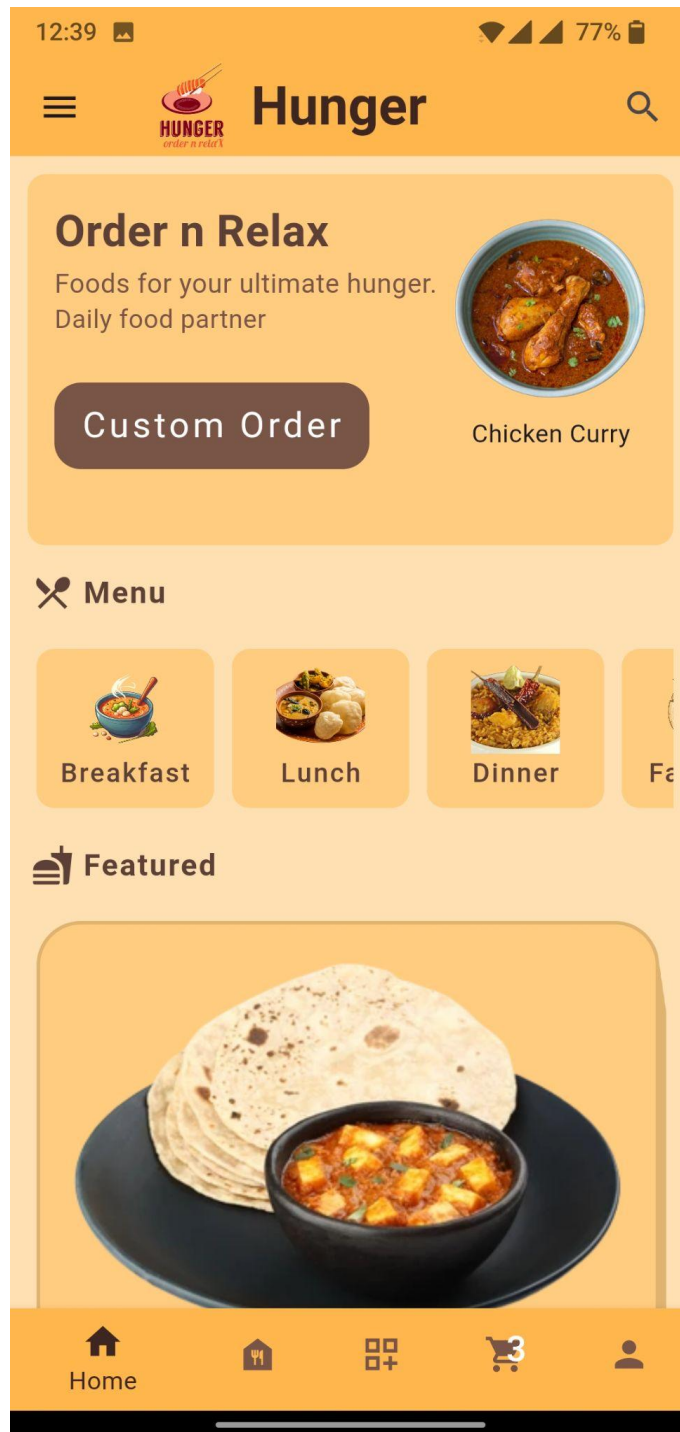


Figure 3.2.11: User App: Home Page

User App: Food Page

Users can check out the food list provided by the restaurant or vendor and make their customized order. They can add their preferred food to the cart using the **add to cart** button.

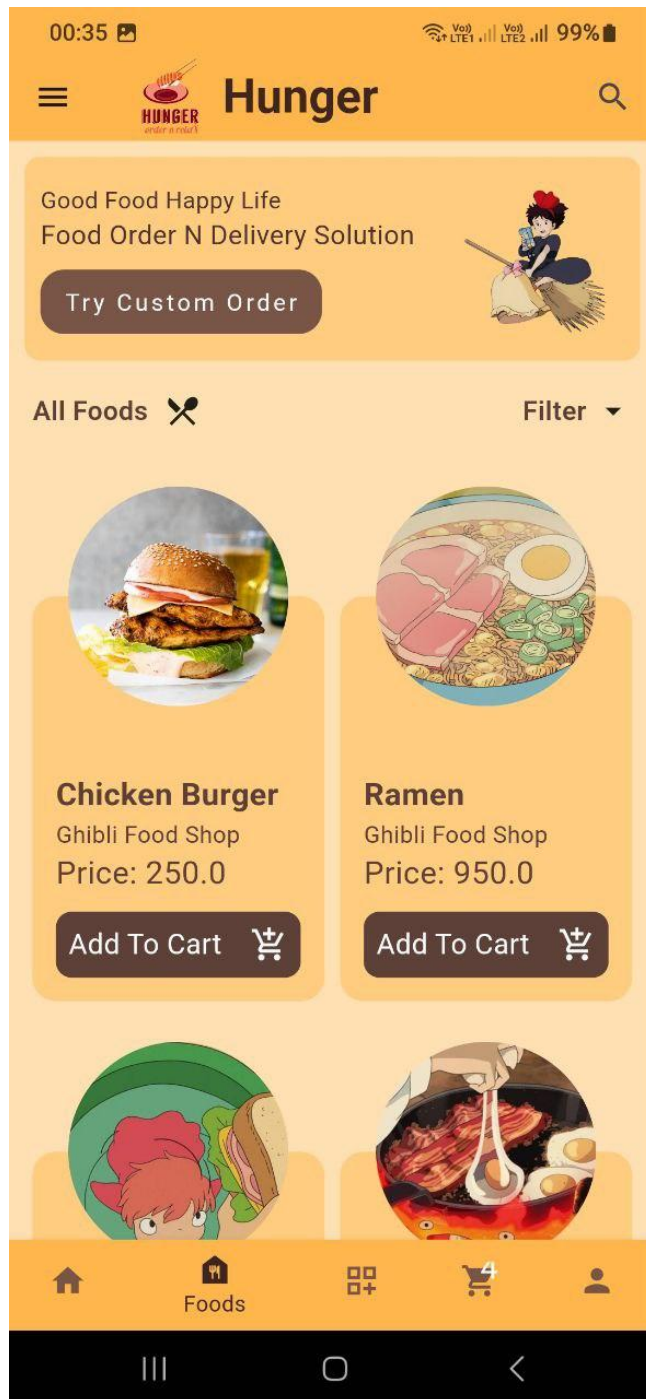


Figure 3.2.12: User App: Food page

User App: Food Details Page

Users can click over the food and see the details of the preferred food item. It contains food name, food details, price, hotel name, quantity button. They can also order food from this page.

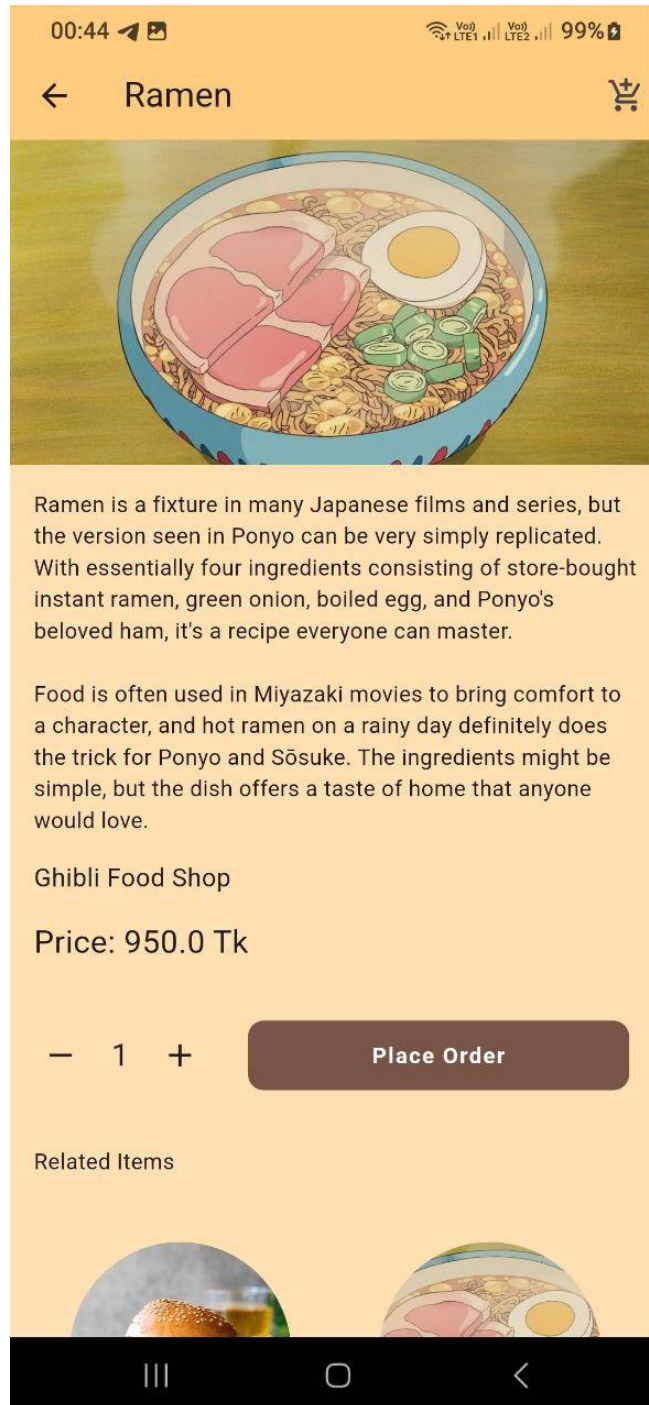


Figure 3.2.13: User App: Food details page

User App: Basket Page

After adding the menu to the cart, users can go to this basket page and check out the listed items. They can increase and decrease the quantity of the items. Total price will be calculated as per the quantity and item price. They can also place orders from this page. Users can also delete items from this basket page. To order again, they need to go to the food page and add to cart items again and order.

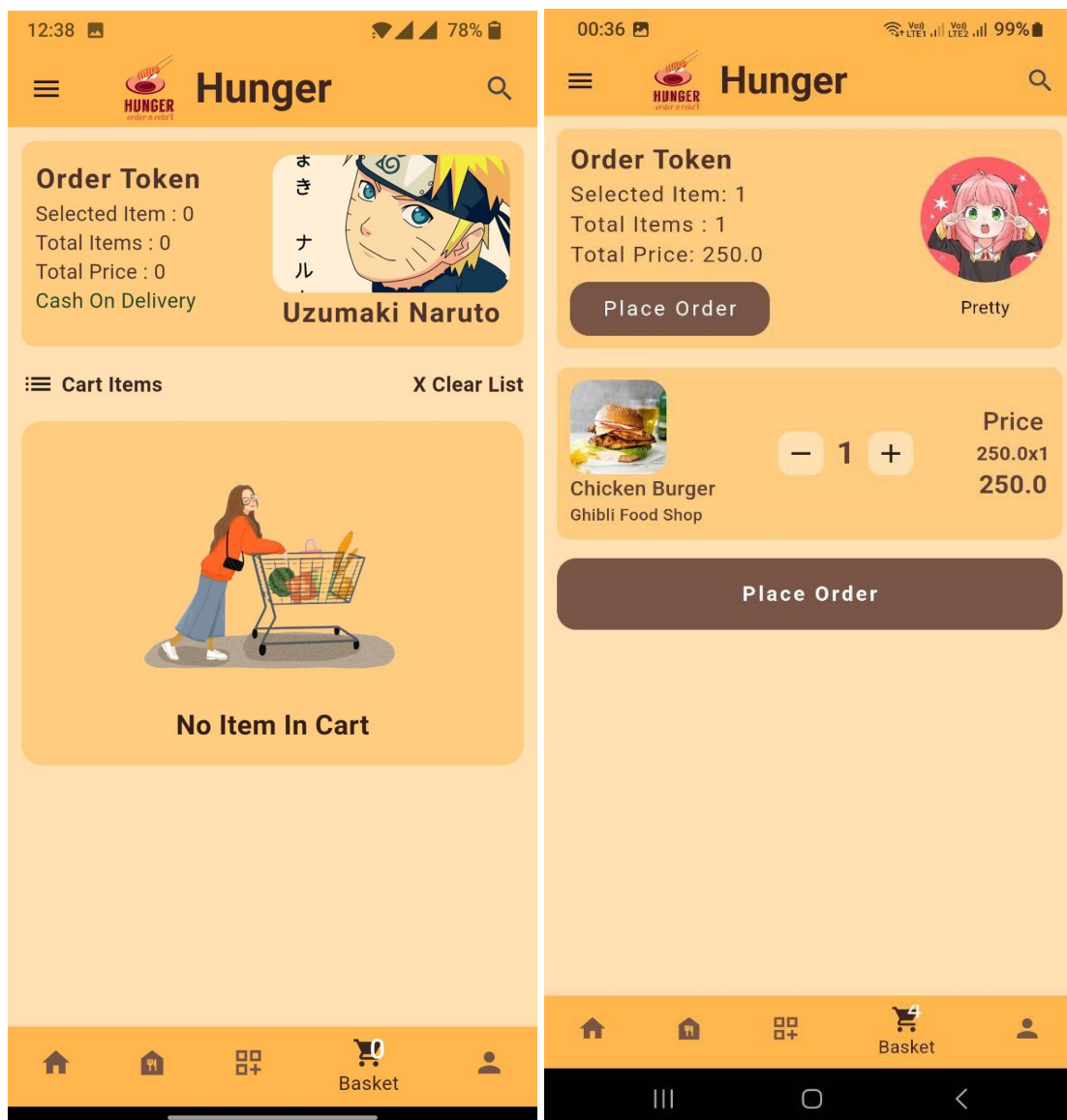


Figure 3.2.14: User App: Basket page

User App: Place order

After adding food items in the cart. They can finally order the food by clicking the confirm order button.

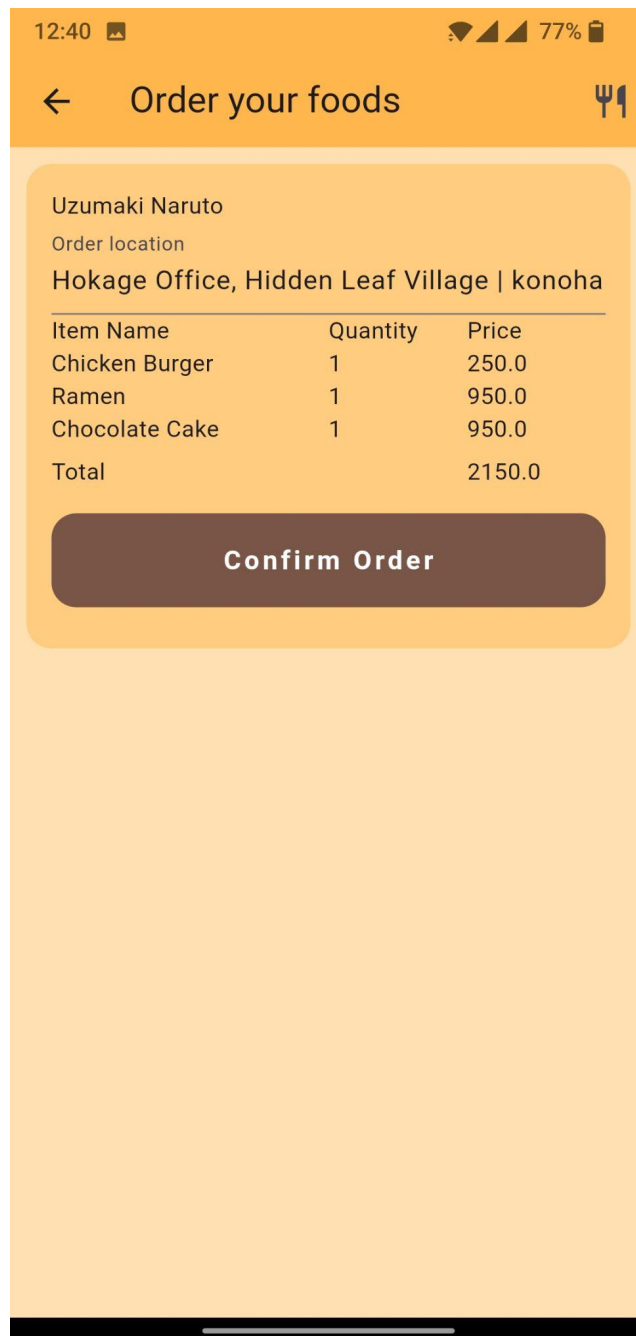


Figure 3.2.15: User App: confirm order

User App: Custom page

Users can customize the food list on this page. They can select dates from when they customize food till the day they want. They can filter the food as per breakfast, lunch and dinner.

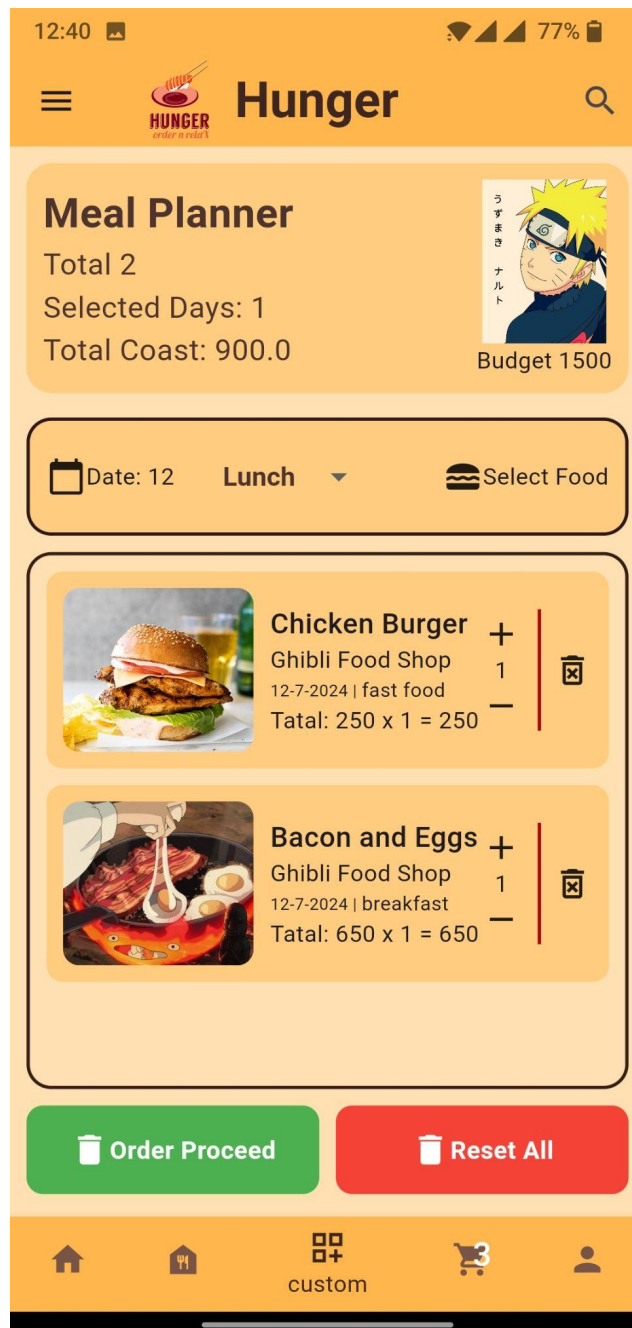


Figure 3.2.16: User App: Custom page

User App: User Profile

User profile is a regular activity page where the user will be able to see his/her data saved in the system.

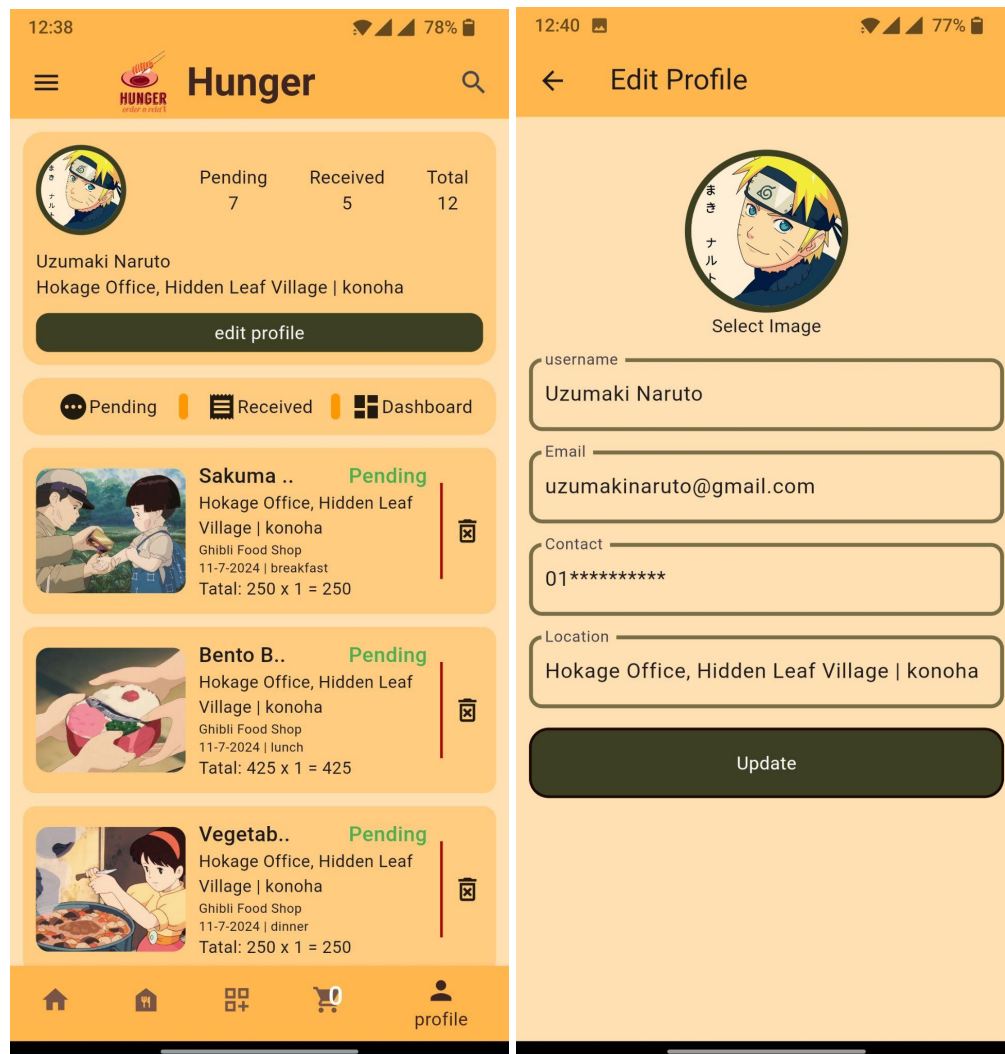


Figure 3.2.17: User App: User profile

Back-end Design

The back-end design of a food delivery app for university students in hostels involves creating a robust architecture that supports various functionalities crucial to its operation. At its core, the back-end serves as the foundation responsible for managing data, processing requests, and ensuring seamless communication between the user

interface and the database. Using the express server APIs and prisma warem fetching data from mysql database. Testing those API using thunder extension in VS code.

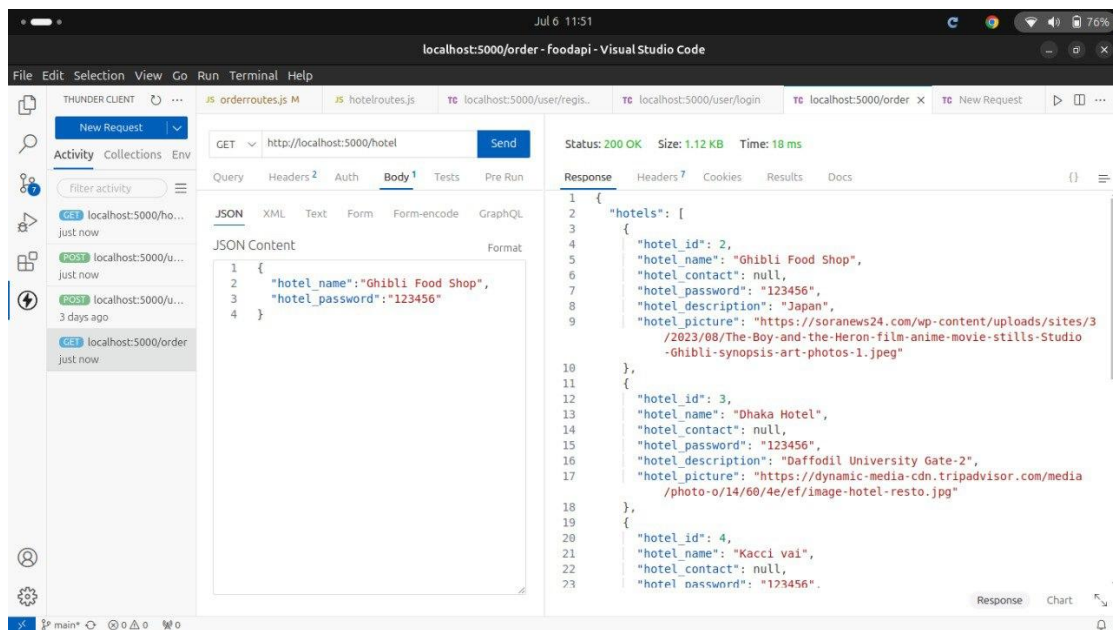


Figure 3.2.18: Hotel Table

Fig. 3.18.1 shows the every needed information of users. The detailed information is stored in the database and they are being fetched using this API (<http://192.168.1.106:5000/user/1>).

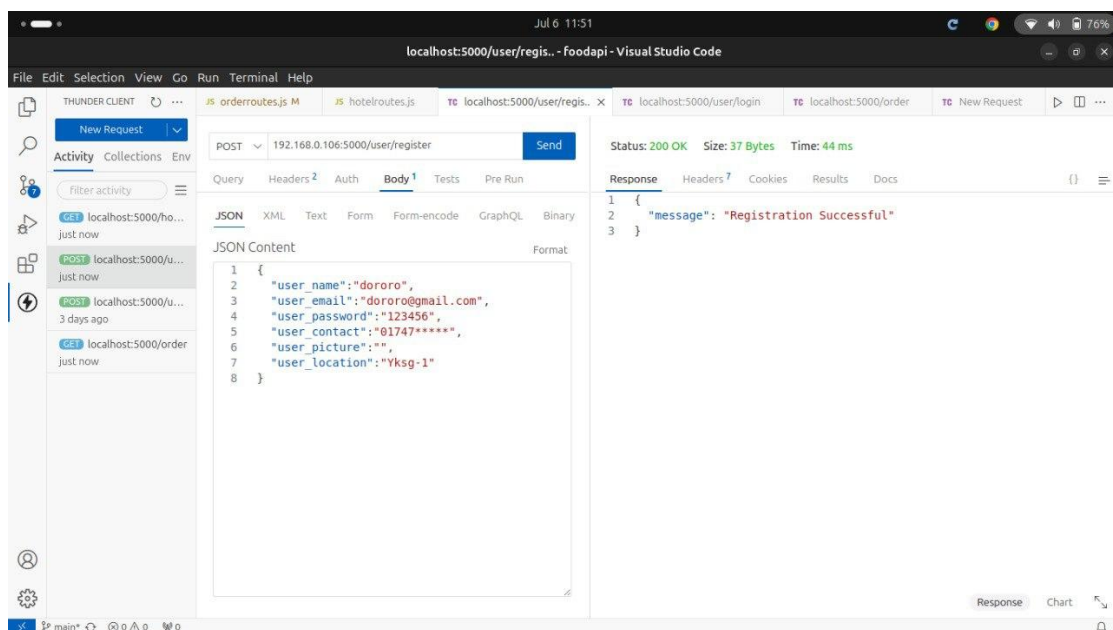


Figure 3.2.19: User registration

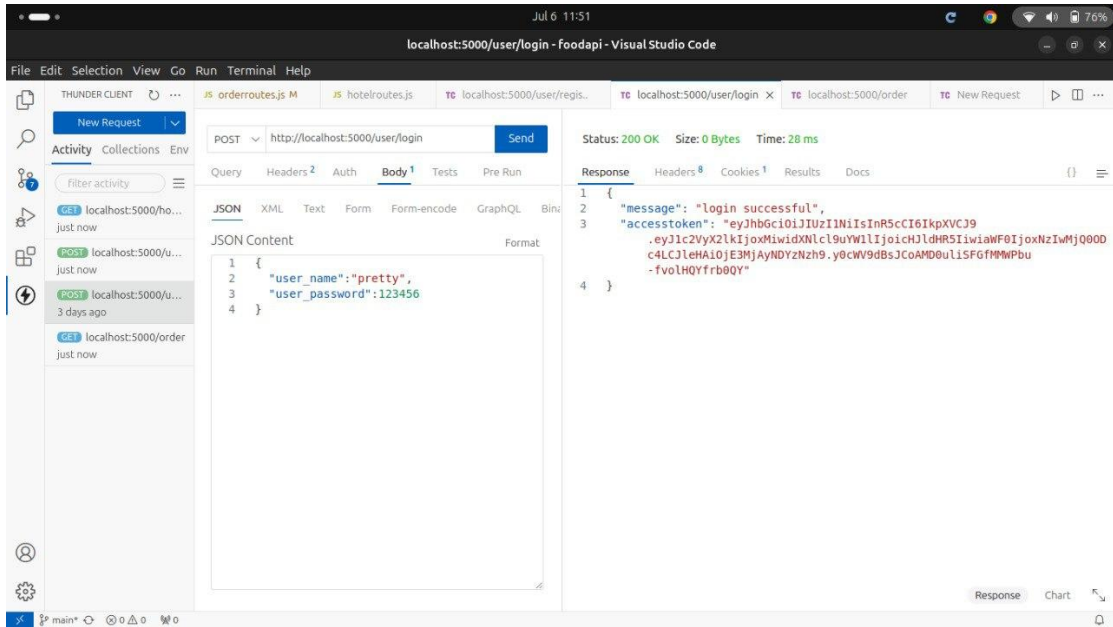


Figure 3.2.20: User Login

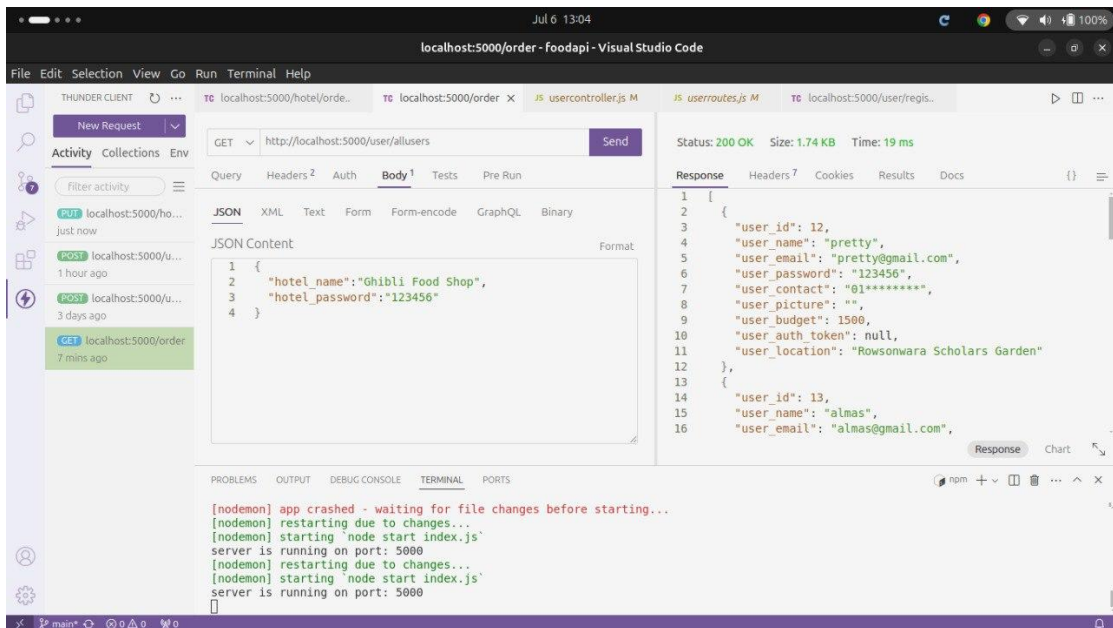


Figure 3.2.21: User Details

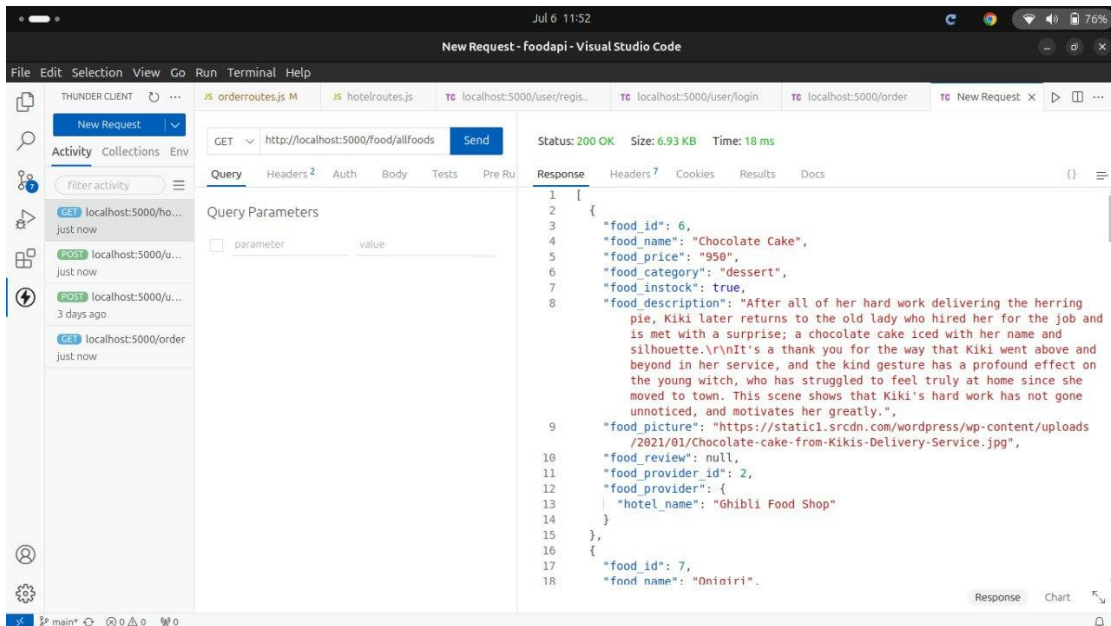


Figure 3.2.22: Details of Foods

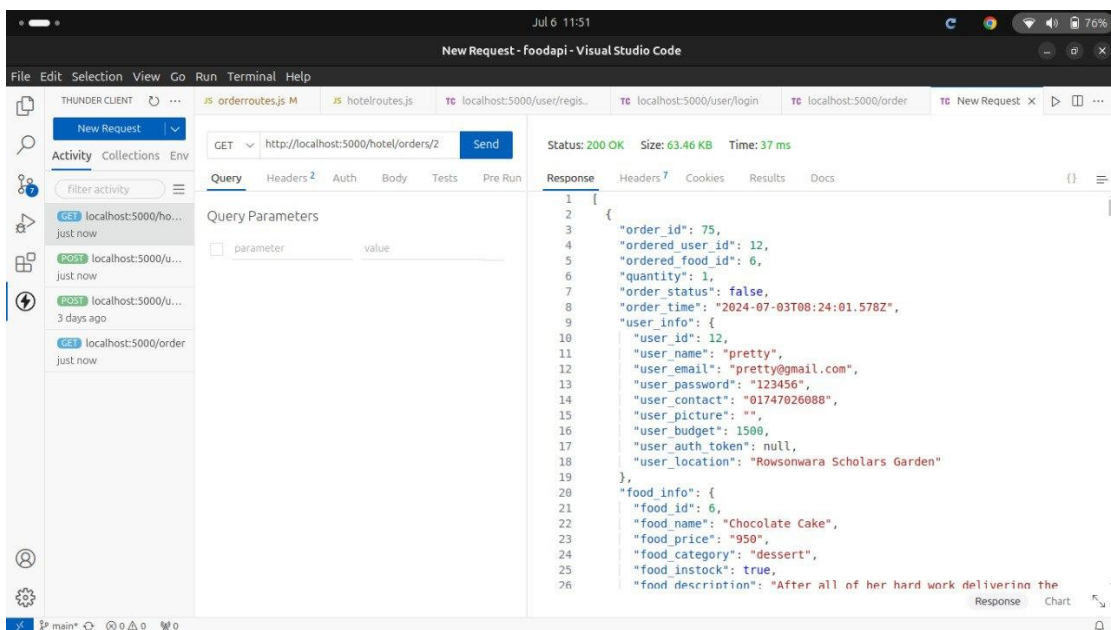


Figure 3.2.23: Details of Ordered Food

3.2.5 Testing Phase

UI Testing

We have made sure all the features belonging to the app are working perfectly without any bugs and delays.

Security Testing

Testing the most common and top security threats.

Top priority security concerns are :

- A. Idor security
- B. Improper credential use
- C. Insecure access control
- D. Data encryption
- E. Misconfiguration
- F. Insufficient Input/Output Validation

3.2.6 Deployment Phase

Apps will be available for both android and iOS device users after we finish all the testing.

3.3 Hardware and Software Requirement

3.3.1 Hardware Requirements

- Windows Operating System.
- A device that supports Android.
- Computer configuration:
 - 16 GB RAM
 - 520 GB SSD
 - 2.1 GHz Processor.

3.3.2 Software Requirements

- **Android studio:** Android Studio is the official software development environment for building Android apps. It provides tools like a code editor for writing and debugging code, a visual layout editor for designing app interfaces, and an emulator to test apps without needing a physical device.
- **Android Virtual Device:** An Android Virtual Device (AVD) helps developers make sure their apps work well on various screen sizes and versions of Android before they are released to real users. AVDs are set up and managed directly within Android Studio, making it easier to debug and improve apps.
- **Database:** MySQL and Prisma work in conjunction to provide efficient data storage and retrieval capabilities. MySQL serves as the underlying database where data is stored and managed, while Prisma acts as an intermediary layer that facilitates seamless interaction with MySQL through its ORM capabilities.

3.4 Project Management and Financial Analysis

Effective project management is essential for creating a successful food delivery app. We follow a structured approach called the Software Development Life Cycle (SDLC).

- **Planning Phase:** In this phase we focused on understanding the problem statements, collecting necessary data, and defining project requirements.
- **Analysis Phase:** During analysis, we categorized essential data for the app's functionality, including user preferences, meal demands, and security considerations to protect user information.
- **Design Phase:** In the design phase, we created detailed diagrams (UML, ER) and developed UI/UX designs to ensure the app is intuitive and meets user expectations.
- **Coding and Implementation Phase:** Here, we wrote code using chosen languages and frameworks, translating design into functional features.
- **Testing Phase:** The app underwent comprehensive testing for UI usability and security to identify and fix any issues, ensuring reliability across various devices.

- **Deployment Phase:** Finally, the app is prepared but we have not released it yet. We look forward to launching it on platforms after running some more crucial testing.

Table 3.1 Financial Analysis

Sr No.	Details	Estimated time	Cost
1	Designing front end	40 hrs	1,50,000
2	Implementing server-side	61 hrs	2,05,000
3	Building and connecting with database	10 hrs	50,000
4	Testing	10 hrs	10,000

3.5 Summary

The chapter describes requirement analysis, emphasizing the designing of necessary features and setting up development environments. It also proposes a systematic methodology for system design, categorizing problems, defining user roles and application features, and ensuring robust security measures. It begins with a meticulous requirement analysis phase, which focuses on understanding the unique challenges students face in accessing affordable and nutritious meals. Following requirement analysis, the chapter outlines a systematic approach to system design. We have used Dart and JavaScript for programming, Flutter and NodeJs/ExpressJs for frameworks, and MySQL with Prisma for database management. Security measures, such as JWT implementation, are integrated to ensure robust data protection throughout the application.

CHAPTER 4

IMPLEMENTATION

4.1 Overview

This chapter provides a detailed account of how we transformed our initial concept into a fully operational platform tailored specifically for university students living in hostels. We began by adopting agile development methodologies, allowing us to iteratively refine the app based on continuous user feedback and emerging requirements. The chapter delves into the technical architecture, outlining the robust backend infrastructure, database management systems, and seamless API integrations crucial for ensuring the app's scalability, security, and adherence to industry standards. Key features like customizable meal options, real-time order tracking, and advanced scheduling capabilities are highlighted for their role in enhancing user convenience and satisfaction. We have also taken measurements for rigorous testing phases such as unit testing and user acceptance testing, which were implemented to guarantee the app's reliability and performance under various scenarios.

4.2 System Testing

Unit testing plays a crucial role in ensuring the robustness and reliability of the user app in a food delivery system designed for university students. Each unit or module within the app undergoes rigorous testing to validate its functionality independently of other components. For instance, authentication features are tested to confirm seamless user login and registration processes, with checks for handling various inputs and error scenarios effectively. Menu management functionalities are scrutinized to ensure users can browse, add, and remove items from their cart accurately without encountering inconsistencies. Similarly, order placement functionalities are tested to verify that users can select delivery options, review orders before confirmation, and manage payment processes securely.

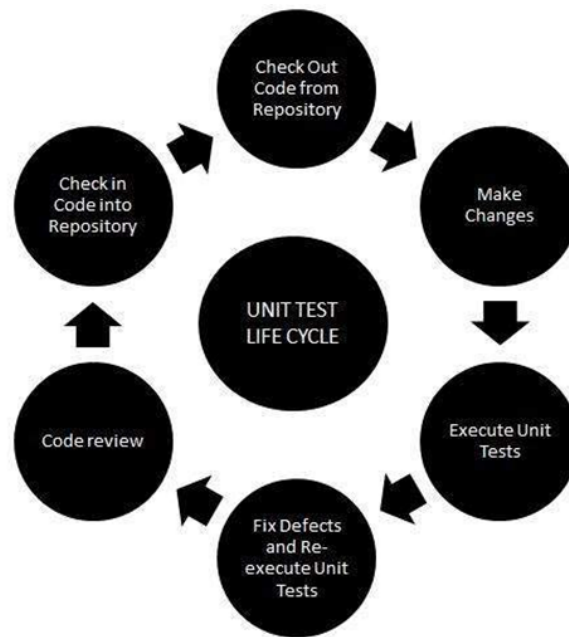


Figure 4.2.1: Unit testing

4.3 Summary

This chapter showcases planning, technical expertise, and user-centric design simulation in the successful development of a specialized food delivery app. This section includes the UI of the app, such as customizable meal options, and real-time order tracking. Quality assurance processes, including rigorous testing phases like unit testing and user acceptance testing, are emphasized to guarantee the app's reliability and operational readiness. Deployment strategies are detailed to minimize disruptions and ensure a smooth transition to production environments, accompanied by ongoing maintenance practices aimed at continuous improvement and adaptation to meet evolving user needs and technological advancements.

CHAPTER 5

RESULT AND ANALYSIS

5.1 Overview This section focuses on evaluating the proposed food delivery app through simulations and comparative analysis. It aims to assess the app's functionality and performance in meeting the specific needs of university students, particularly those living in hostels. The chapter includes detailed discussions on simulation results, covering metrics such as user satisfaction, order processing times, delivery accuracy, and backend system performance. Additionally, it provides insights from a comparative analysis with existing food delivery services, highlighting unique features and benefits of the proposed app tailored to student lifestyles.

5.2 Simulation Result

- **User Satisfaction:** We have collected feedback from users and the results indicated generally positive responses to the app's user interface and ease of use. Users appreciated features such as meal scheduling and budget management, which enhanced their overall experience.
- **Order Processing Times:** The simulations revealed varying processing times for different types of orders. While most orders were processed efficiently, there were instances of delays. There is room for improvement in processing time.
- **Backend System Performance:** Metrics such as server response times and scalability under simulated load were evaluated. The app's backend systems generally performed well but showed potential challenges under heavy user loads.
- **User Feedback and Iterative Improvements:** Insights gathered from simulation results are used to iteratively improve the app. We will try new features as per the taste of the users.

5.3 Performance Analysis

The performance analysis focuses on comprehensive evaluation of the proposed food delivery app, focusing on its functionality and effectiveness.

- **Functionality and User Experience:** The app's usability and user interface are scrutinized to ensure ease of navigation and seamless interaction. Special attention is given to features such as meal customization.
- **Efficiency:** Metrics like order processing times, system responsiveness, and vendor integration are assessed to optimize operational efficiency. The analysis aims to streamline processes and improve service reliability.
- **Reliability and Timeliness:** The app's performance in ensuring accurate orders, timely deliveries, and adherence to scheduled meal times is evaluated.
- **Comparative Analysis:** A comparison with existing food delivery services helps benchmark the app's features, scheduling meals.

By addressing key metrics and user feedback, the analysis aims to ensure that the app delivers a superior and tailored dining experience for university students, aligning closely with their lifestyle and preferences.

5.4 Summary

In this chapter, the analysis focused on evaluating the proposed food delivery app through simulated scenarios and comparative analysis. Simulation results provided insights into the app's functionality and performance metrics, including user satisfaction, order processing times, delivery accuracy, and backend efficiency. Findings underscored strengths in user experience design while highlighting areas for enhancement in service reliability and scalability. The comparative analysis conducted the proposed app against existing food delivery services, emphasizing its tailored features for university students, such as meal scheduling, budget management, and enhanced user safety. This evaluation positioned the proposed app, codenamed 'Hunger,' as a promising solution addressing the unique dining needs of students in hostel environments, with clear opportunities for further refinement and market differentiation.

CHAPTER 6

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Life

The food delivery app designed for university students residing in hostels significantly enhances their daily lives by revolutionizing how they access and experience meals. Students can now order meals anytime and anywhere within their campus vicinity, eliminating the need to physically visit canteens or local eateries. This convenience is particularly beneficial during late hours when traditional dining options are limited or closed. The app caters to diverse dietary preferences and nutritional needs, ensuring students have access to nutritious and balanced meal options. This accessibility empowers students to make healthier choices without compromising on taste or quality. For female students, the app provides a secure alternative to late-night food outings, addressing safety concerns and promoting a safer campus environment. This feature enhances overall peace of mind and reduces potential risks associated with venturing out after hours. Transparent pricing and budgeting tools offered by the app assist students in managing their expenses effectively. By providing clear cost structures and options for meal planning, the app supports financial stability and responsible spending among students. The ability to schedule meals in advance helps students better manage their busy academic schedules and extracurricular activities. This feature reduces last-minute meal planning stress and allows for more efficient use of time. By streamlining the dining experience, the app contributes to improved overall well-being among students.

6.2 Impact on Society & Environment

The food delivery app designed for university students living in hostels brings about significant positive changes that extend beyond convenience. The app promotes community inclusion by ensuring that all students, regardless of their dietary needs, can easily access meals. This fosters a sense of belonging and support within the campus community, enhancing overall student well-being. By partnering with local restaurants

and vendors, the app supports the local economy. This collaboration not only stimulates economic growth but also creates job opportunities and strengthens ties between the university and surrounding businesses. Safety is prioritized, especially for female students, as the app provides a secure alternative for obtaining late-night meals without needing to leave campus. This contributes to a safer campus environment and reduces potential risks associated with off-campus travel.

The food delivery app not only enhances societal inclusivity and safety for students but also promotes sustainable practices and reduces environmental impact within university campuses.

Reduced Food Waste: The app's ability to streamline food orders and deliveries helps reduce food waste associated with traditional dining practices. By optimizing meal preparation and delivery processes, it minimizes the environmental footprint of food consumption within the university campus.

Sustainable Practices: Through efficient logistics and vendor partnerships, the app encourages sustainable practices in food sourcing and delivery. This includes promoting eco-friendly packaging options and encouraging vendors to adopt sustainable food production methods.

Educational Opportunities: The app can serve as an educational tool, raising awareness among students about sustainable food choices and environmental impacts. By promoting conscious consumption habits, it fosters a culture of sustainability and responsibility within the student community.

6.3 Ethical Aspects

Privacy and data protection are paramount, requiring rigorous adherence to regulations to safeguard students' personal information throughout the ordering and delivery processes. Embracing sustainable practices, such as reducing food waste and minimizing carbon emissions from deliveries, demonstrates ethical responsibility towards the environment, supporting broader sustainability initiatives within the campus community. Respecting student privacy and safeguarding their personal information is crucial. The app must adhere to stringent data protection regulations to maintain trust and ensure ethical handling of user data throughout the ordering and delivery processes. The app strives to

ensure fair access to meals for all students, regardless of their dietary preferences or restrictions. This ethical principle promotes inclusivity within the campus community and addresses potential disparities in dining options that could otherwise affect student well-being. Transparent pricing and clear communication about meal options and delivery schedules uphold ethical standards. This ensures that students can make informed choices about their food purchases and understand the ethical commitments of the app's operations. In essence, the food delivery app operates within a robust ethical framework that prioritizes fairness, transparency, privacy protection, environmental responsibility, support for local economies, and student safety. These ethical considerations guide its development and implementation, ensuring it enhances the dining experience while upholding ethical standards and promoting the overall well-being of university students.

6.4 Sustainability Plan

Our food delivery app is committed to sustainability by promoting eco-friendly packaging, supporting local vendors with sustainable practices, minimizing food waste, optimizing energy use, educating users about sustainable choices, and continuously improving our environmental impact. We aim to enhance convenience while reducing our carbon footprint and contributing positively to the community and environment.

6.5 Summary

The food delivery app designed for university students living in hostels aims to revolutionize dining experiences while promoting sustainability and community well-being. It enhances convenience by allowing students to order meals anytime, anywhere on campus, while also prioritizing eco-friendly practices such as sustainable packaging and local sourcing. The app reduces food waste through efficient inventory management and supports energy efficiency in its operations. By educating users about sustainable food choices and fostering partnerships with local businesses, the app not only improves student life but also contributes to environmental conservation and promotes a culture of sustainability on campus. Moving forward, continuous improvement and community engagement will ensure that the app evolves to meet both student needs and environmental goals, making it a cornerstone of sustainable campus living.

CHAPTER 7

CONCLUSION AND FUTURE WORK

7.1 Conclusions

The development and implementation of the food delivery app for university students in hostels have addressed significant challenges related to dining convenience, accessibility, and sustainability. The app has successfully enhanced the overall dining experience by providing students with a user-friendly platform to order nutritious and affordable meals at their convenience. It has mitigated safety concerns, particularly for female students, by offering a secure alternative to late-night food outings. Moreover, the app has promoted environmental responsibility through initiatives such as reducing food waste, supporting local vendors with sustainable practices, and optimizing energy efficiency in operations.

7.2 Further Suggested Works

Looking ahead, there are several opportunities for further enhancement and expansion of the food delivery app:

Enhanced Features: Introducing additional features such as nutritional tracking.

Extended Reach: Expanding service areas to include off-campus housing and collaborating with nearby universities to broaden user base and vendor partnerships.

Technological Advancements: Incorporating AI-driven recommendations for menu choices, improving delivery logistics through route optimization algorithms, and enhancing user interface for better accessibility.

7.3 Limitations

Despite its successes, the app faces limitations such as initial geographic constraints, dependency on local vendor capacities, and potential technological barriers. Conflict of interests may arise concerning vendor selection and pricing models, requiring transparent policies and continuous stakeholder engagement to mitigate concerns. The food delivery app has significantly improved the quality of life for university students in

hostels while laying the groundwork for future innovations in sustainable dining solutions. By addressing current challenges and planning for future enhancements, the food delivery app is set to become a vital part of campus life, promoting health, safety, and sustainability for all users.

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Appendix A

Complex Engineering Problems (EP) and Complex Engineering Activities (EA) Analysis

Title: Food Delivery App that Makes Hostel Life Better

Students ID: 202-15-14395, 202-15-14398

CO Description for FYDP-Phase-I

CO	CO Descriptions	PO
CO1	Integrate recently gained and previously acquired knowledge to identify a real-life complex engineering problem for the Final Year Design Project	PO1
CO2	Analyze different aspects of the goals in designing a solution for the Final Year Design Project	PO2
CO3	Explore diverse problem domains through a literature review, delineate the issues, and establish the goals for the Final Year Design Project	PO4
CO4	Perform economic evaluation and cost estimation and employ suitable project management procedures throughout the development life cycle of the Final Year Design Project	PO1 1

Addressing of COs, Knowledge Profile (K), and Attainment of Complex Engineering Problems (EP):

SN	EP Definition	Attainment	CO	Justification (with Knowledge Profile)	References
1.	EP1: Depth of Knowledge required	Yes	CO1, CO2, and CO3	All the required data for this application is collected from the local restaurants.	Page no: 1-6
				Our project will require various components to develop both front-end and back-end that covers K5 and K6.	Page no: 23-27

				We have studied existing applications that cover K8 .	Page no: 20-25
2.	EP2: Range of Conflicting Requirements	Yes	CO2	We did not face any conflicting requirements.	Page no: 21-22
3.	EP3: Depth of analysis required	Yes	CO2	Reducing the stress of the students, so that they can track their expenses while buying foods with a pre scheduled meal plan.	Page no: 10-12
4.	EP4: Familiarity of Issues	Yes	CO3	This project is going to affect the food and the marketing domain.	Page no: 8-10
5.	EP6: Extends of stakeholders involved and conflicting requirements	Yes	CO3	As part of our project, we visited a local restaurant owner. The purpose was to know the taste of students on the basis of time and the number of food orders they get daily 3 times a day.	Page no: 13-15
6.	EP7: Interdependence	Yes	CO3	Our project has some sub-problems. but we have not analyzed them yet.	Page no: 26-27
7.	EP8:	Yes	CO4	We have prepared a budget on the basis of work and time.	Page no: 34-35

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