A Mini Project Report on

SmartPlate

T.E. - I.T Engineering

Submitted By

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CERTIFICATE

This to certify that the Mini Project report on **SmartPlate** has been submitted by **Akshata Nalavade(21104003), Manjiri Gole(21104006)** and **Shweta Bhutada(21104007)** who are a Bonafede students of A. P. Shah Institute of Technology, Thane, Mumbai, as a partial fulfilment of the requirement for the degree in **Information Technology**, during the academic year **2023-2024** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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ABSTRACT

The SmartPlate website is a dynamic online platform on a mission to transform the way we explore, create, and savor the world of culinary delights. At its core, our website seeks to simplify the often daunting task of meal planning and elevate cooking experiences. It caters to a diverse audience, welcoming everyone from busy professionals in need of convenience to passionate home cooks hungry for creativity, and health-conscious individuals dedicated to wholesome eating.

More than just a repository of recipes, our website is a culinary companion, an interactive space where food becomes an adventure. Here, users can dive into a treasure trove of categorized recipe collections, tap into a wealth of culinary knowledge, and join a vibrant community of like-minded food enthusiasts. It's a place to embark on a journey of flavor discovery, experiment with new dishes, and proudly share culinary triumphs.

To make this experience truly exceptional, we've packed our website with features that put the user in the chef's hat. You can expect personalized recipe recommendations that cater to your tastes, easy adjustments for serving sizes, and the added convenience of ingredient ordering for the dishes you can't wait to try.

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Chapter 1

Introduction

SmartPlate is user-friendly website for an online recipe box ordering service that enables customers to easily browse, customize, and order recipe boxes with pre-portioned ingredients and step-by-step cooking instructions. It is a recipe platform that provides users with both recipes and the corresponding ingredient lists for those recipes. The website aims to make cooking at home easier and more enjoyable by offering a comprehensive solution for meal planning and preparation.

The common challenges that many individuals face when it comes to meal planning and cooking. Busy schedules, limited resources, and repetitive cooking routines can hinder their ability to enjoy the benefits of cooking at home, such as variety in their meals and the satisfaction of preparing their own food. Solutions such as meal kit delivery services aim to address these challenges by providing convenience, diverse recipes, and pre-portioned ingredients to make home cooking more accessible and enjoyable. The website caters to the needs of busy individuals and families, aiming to streamline the meal planning process, promote healthier eating habits, and provide a delightful cooking experience at home.

1.1 Purpose:

i. Individuals with hectic schedules who seek convenient meal solutions without compromising on quality. The website serves as a comprehensive meal solution provider. It offers users a convenient and time-saving way to plan meals.

ii. Users can access a wide variety of recipes along with pre-portioned ingredients, eliminating the need of extensive meal planning and grocery shopping.

iii. It achieves this by offering detailed, step-by-step recipes with instructions and accompanying visuals. Users can learn new cooking techniques and explore diverse cuisines. This multifaceted approach aims to make home cooking enjoyable, educational and socially engaging.

1.2 Problem Statement:

i. Busy lifestyles, characterized by time constraints and resource limitations, can result in people feeling unable to engage in the enjoyable and rewarding activity of cooking.

ii. The challenges of juggling multiple responsibilities often result in time scarcity, making it difficult for people to allocate the necessary hours for preparing meals from scratch. As a result, they often resort to preparing the same dishes repeatedly for the sake of convenience.

iii. Recognizing and addressing these challenges can help individuals rediscover the joy of cooking and explore a wider range of culinary experiences.

iv. Our website aims to provide users with a comprehensive culinary platform, simplifying meal planning, offering diverse recipes, and fostering a community of cooking enthusiasts.

1.3 Objectives:

i. To promote healthy eating through a diverse array of nutrition-focused recipes, each accompanied by detailed nutritional information, including calorie counts and macronutrient details, to enhance user well-being.

ii. To offers user-friendly recipes for all skill levels, featuring clear instructions and visual aids to aid comprehension of cooking techniques.

iii. To diversify the cuisine offerings, the website caters to a broad audience with varying tastes, encouraging users to explore and experiment with different culinary traditions.

iv. To provide the provision of pre-portioned ingredients, simplifying the cooking process for users by saving time and reducing food waste without the need for measuring and weighing.

1.4 Scope:

i. Can implement a recommendation engine that analyzes user data, including past orders and search history, the website can provide personalized recipe suggestions aligned with users' tastes and preferences, enhancing the user experience.

ii. Can include filters for dietary preferences such as vegetarian, non-vegetarian, and low-carb etc. This allows users to easily find recipes that align with their specific dietary requirements. Users can filter recipes based on their cooking proficiency, ensuring they can explore dishes that match their skills.

iii. Can allow users to adjust portion sizes to match the number of servings they require, ensuring meals are perfectly portioned for their needs. This empowers users to create dishes that suit their needs.

Chapter 2

Literature Review

1.“Do Meal Boxes Reduce Food Waste from Households?” was published in the Journal of Cleaner Production in September 2022. The authors of the study include Sebastian Schuster, Melanie Speck, Erica van Herpen, Felix Buchborn, Nina Langen, Mariam Nikravech, Shantanu Mullick, Tilman Eichstädt, Yulia Chikhalova, Emma Budiansky, Tobias Engelmann, and Manuel W. Bickel.

To assess how household food waste is affected when households use meal boxes, we examined three types of food waste: preparation, cooking, and plate waste. When considering food waste, meal boxes were initially expected to result in less preparation waste compared to traditional meals, but the results provided a more nuanced view. While preparation waste was more likely to occur with meal boxes, the amount of waste was smaller, possibly due to the use of fresh ingredients. Cooking waste, often driven by incorrect portion size estimation and excessive buying, was identified as the largest type of household dinner food waste. Meal boxes effectively reduced cooking waste by providing appropriate quantities. Surprisingly, meal boxes didn't reduce plate waste as expected; instead, the chance of plate waste was higher, possibly indicating that some consumers didn't enjoy the meal's taste or found the portion sizes relatively large for their appetite.

2. "How Tech and Big Data Enable Us to Personalize the Meal Kit Experience" was published on June 25, 2021, and it was authored by Dominik Richter.

In this article published by Dominik Richter we can see what are the impacts and uses of big data and how we can use them to personalize our user experience. Through the accumulated feedback the website incorporates the development or improvement of the recipes. If negative feedback points to an operational issue, soon an action is taken and then collaborate closely with the suppliers.

As we learn about our customers’ preferences, we use that information to sort recipes according to our understanding of an individuals’ taste. By that we make their experience highly personal and increase the relevance of recipes they see on our menu. Its emphasis on

convenience, culinary education, community engagement, and sustainability reflects a concerted effort to address the challenges of modern living while promoting healthier, more sustainable, and socially connected culinary experiences.

Chapter 3

Proposed System

3.1 Features and Functionality

1. Recipe Exploration and Selection

   • Categorized Recipe Collections: The website will offer users a diverse array of recipes neatly categorized based on criteria such as cuisines, dietary preferences, difficulty levels (e.g., beginner, intermediate, advanced)

   • Detailed Recipe Pages: Each recipe will have its own dedicated page featuring high-quality images of the dish, a list of ingredients, step-by-step cooking instructions, and estimated preparation time.

   • Nutritional Information: Nutritional information, including calories, macronutrients (e.g., protein, carbohydrates, fats), and dietary labels (e.g., low-sodium, high-fiber), will be provided to help users make informed choices about their meals.

2. User Registration and Profiles

   • User Registration: Users will have the option to create accounts on the website, facilitating a personalized experience.

   • User Profiles: Registered users can create profiles where they can save their favorite recipes, customized serving size preferences, dietary restrictions, and cooking skill levels. This information enables a tailored user experience.

3. Chat-bot

   • If the users have any frequently asked questions or any query regarding something they can use the Chat-bot to solve their query.

4. Feedback and Reviews

   • Ratings and Reviews: Users will have the ability to rate recipes and leave detailed reviews based on their cooking experiences.

5. Cart and Checkout

   • Shopping Cart: Users can add ingredients from recipes to a shopping cart for easy access and organization.

   • Checkout Process: When users are ready to purchase the ingredients, a streamlined checkout process will be implemented.

Chapter 4

Requirement Analysis

4.1 Requirement Gathering:

4.1.1 User Requirements:

- Quick Recipes: A user’s requirement is quick and easy-to-follow recipes that align with their busy schedule. They may need recipes that don't demand extensive prep time or complicated techniques, allowing them to prepare meals efficiently.
- Ingredient Ordering: User may seek convenience in ingredient procurement. Integration with local grocery stores or suppliers for ingredient ordering and delivery is crucial. This feature would save them valuable time and streamline the shopping process, ensuring they have the necessary ingredients when they need them.
- Ingredient Information: A user requires access to information about where to find specialty ingredients. This could include recommendations for local specialty food stores, online sources, or even farmer's markets. Knowing where to procure these unique ingredients simplifying their cooking journey.
- Diverse Recipes: To keep their cooking exciting and varied, we seek a wide range of diverse and international recipes. We want to explore different cuisines and cooking styles, which can broaden their culinary horizons.
- Efficient Search: A user needs the ability to search for recipes based on ingredient availability, preparation time, and dietary preferences. These features help them discover recipes that align with their specific needs and interests.

4.2 Software Requirement Specification:

4.2.1 Functional Requirements:

- Define how recipes will be categorized, tagged, and presented to users.
- Detail how users can search for recipes, apply filters, and receive personalized recipe recommendations.
- Specify how users can customize recipes, including adjusting serving sizes.
- Define features for user interactions, such as comments, reviews.

4.2.2 Non-Functional Requirements:

- Performance: The website should load quickly and respond promptly to user actions.
- Scalability: It must be capable of handling increased user traffic as the site grows.
- Data Backup: Regular data backups should be performed to prevent data loss.
- Security: User data and payment information must be securely stored and transactions should be protected.

Chapter 5

Project Design

5.1 Use case Diagram

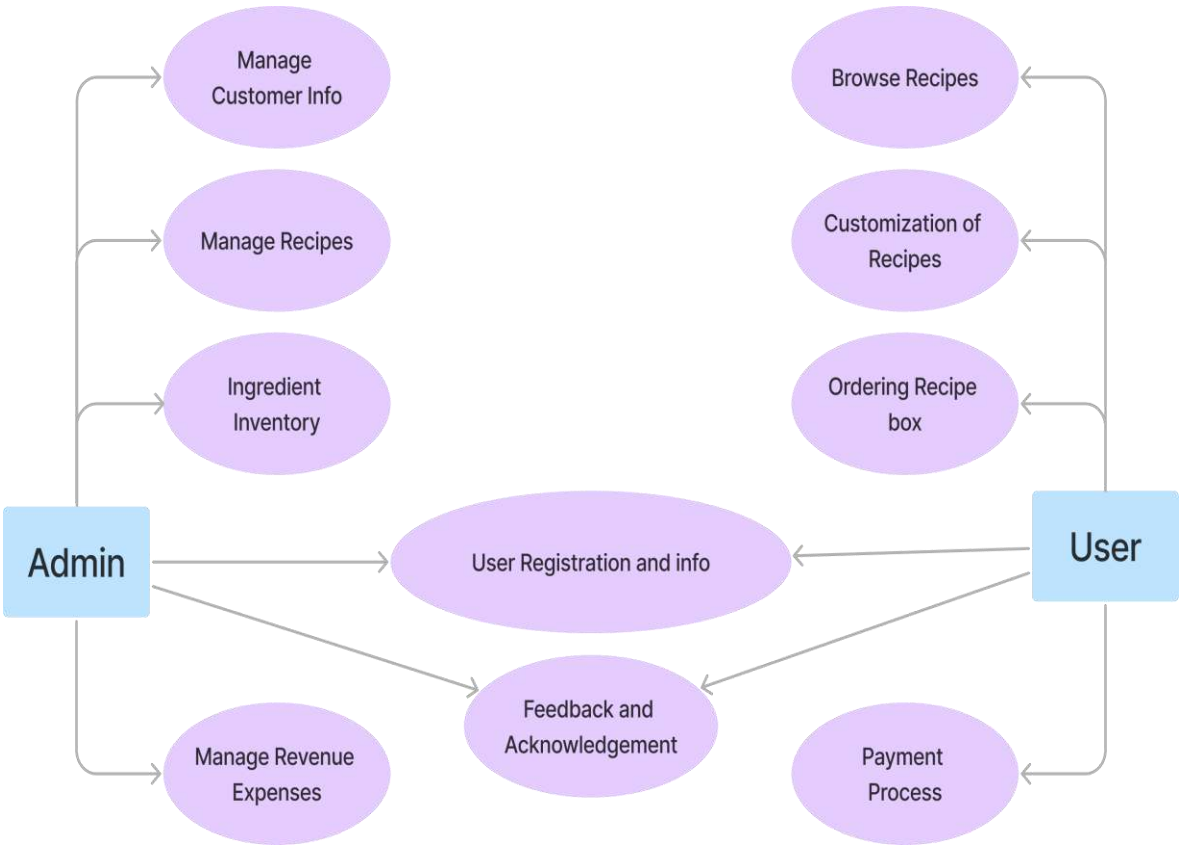

Fig 5.1.1 Use case diagram

Figure 5.1.1 is a general use case diagram for the SmartPlate defining two main actors Admin and User. As an admin, you have access to a wide range of use cases, including managing customer information and overseeing delivery services. As an admin, you can manage user information, update recipes, and keep track of ingredient records, including stock levels. You are also responsible for managing overall expenses and tracking the delivery service by maintaining delivery records. On the user's side, user can browse what they want and customize their orders before purchase. Furthermore, we highly value their feedback and encourage them to share their thoughts on how the recipe worked for them. Here also we are trying to implement the tracking system to check the status of order.

5.2 DFD Diagram

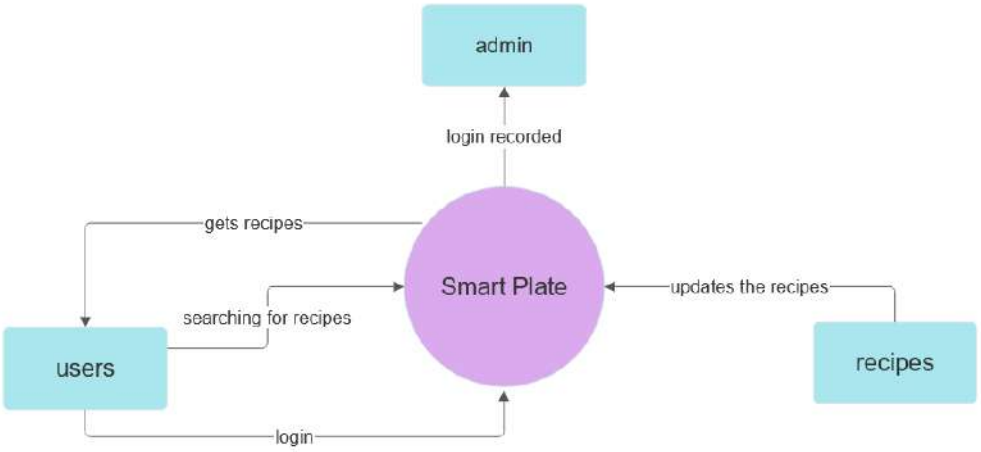

Fig 5.2.1 Level – 0 DFD

Fig 5.2.1, we have users who interact with the "Smart Plate" website. Users can perform several key actions, such as accessing and obtaining recipes, searching for specific recipes, and logging into their accounts. The system maintains a record of user logins, ensuring a secure and personalized experience. This diagram outlines the fundamental flow of activities within the system, where users engage with recipes and the platform.

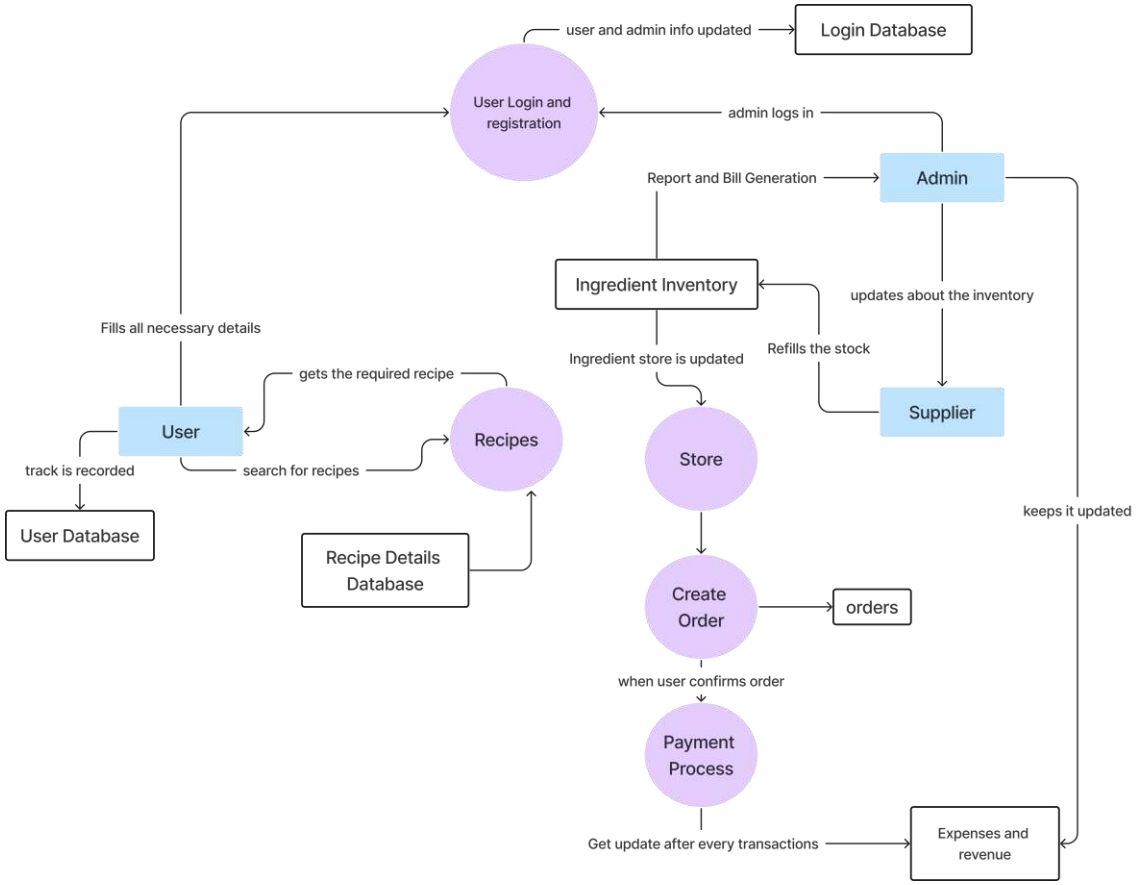

Fig 5.2.2 Level – 1 DFD

Figure 5.2.2 is a DFD diagram which gives us more detail information about the process. A user may start with filling their personal details and complete the registration process. All this information is gets stored into login database. As the user we can browse or search different recipes, these recipes are retrieved from the recipe database, allowing the user to access and view them. The admin is responsible for receiving reports and bills for the ingredients supplied to the store.

Users then create the order which is recorded into order database. As the user confirms the order, they are headed towards the payment process. The receipt then gets generated which us forwarded to user as well the admin. Transactions are updated into the expenses database which is monitored by the admin

5.3 System Architecture

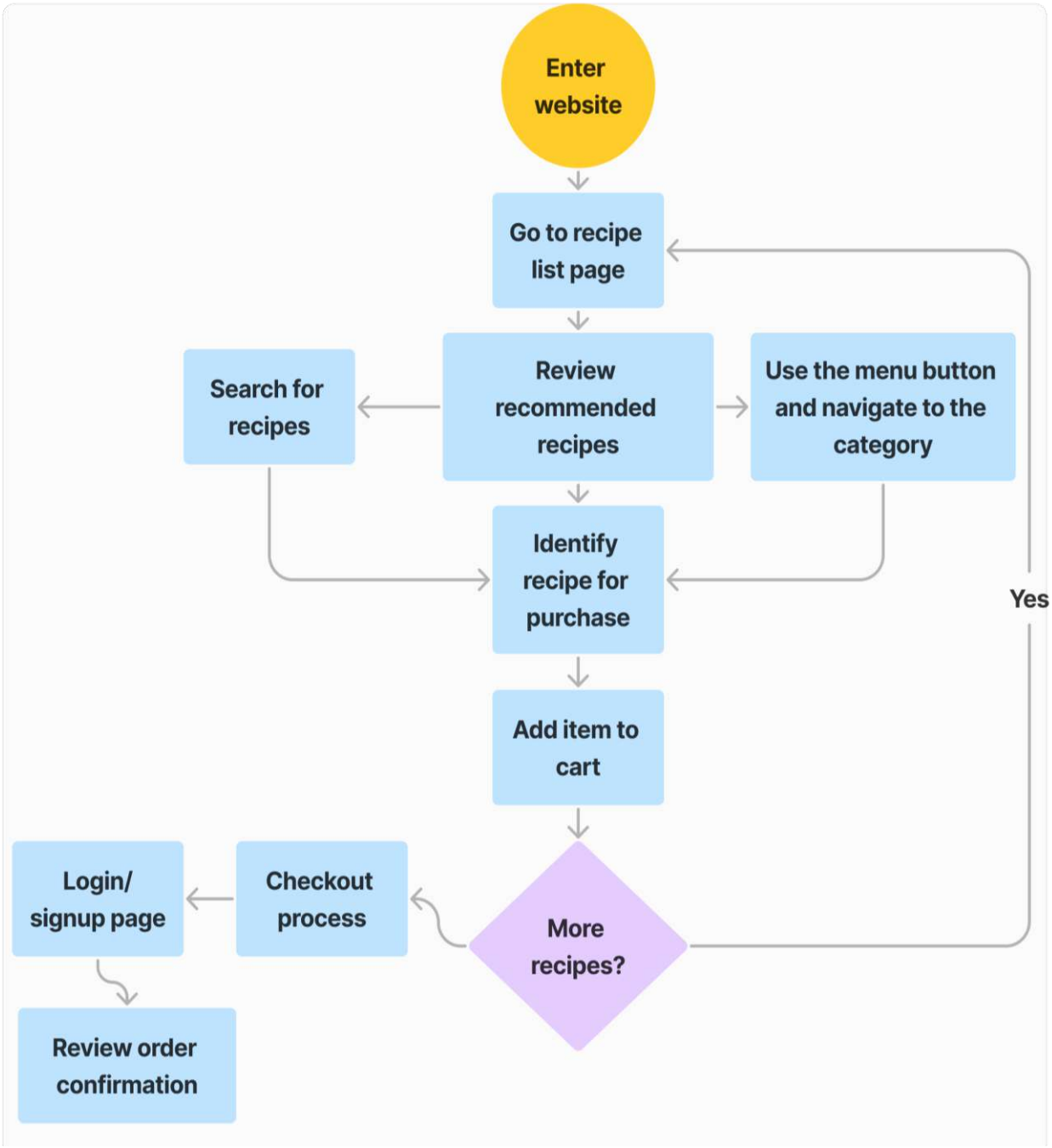

Fig 5.3.1 System Architecture

Figure 5.3.1 is the system architecture of the website which offers a seamless and intuitive user experience for meal planning and recipe selection. Starting from the homepage, users can easily access the recipe list page, where a variety of culinary options await. They can then explore recommended recipes, tailored to their tastes through the website's recommendation engine. If users prefer to browse by category, they can simply use the menu

button to navigate and find recipes of their choice. For those with specific preferences, a search feature is available for easy recipe discovery. Upon identifying a recipe they'd like to prepare, users can add the required ingredients to their cart for a convenient shopping experience. Should users wish to explore more recipes, the website offers a continuous selection. After finalizing their recipe choices, the seamless checkout process begins, allowing users to review their orders and make any necessary adjustments. If not already logged in, users can sign up or log in at this stage. Once confirmed, users receive an order confirmation, ensuring they have successfully completed their culinary journey on the website.

Chapter 6

Technical Specification

HTML & CSS: HTML provides the structural framework for your website's content. It defines the layout of pages, including headings, paragraphs, lists, and links. HTML provides the foundation for integrating JavaScript for interactive features. It's also used as the basis for rendering content from a database or generating dynamic web pages. CSS enables responsive web design, ensuring that your website adapts to various screen sizes and devices. This can improve user engagement and make the site more dynamic.

JavaScript: JavaScript can be used to validate user inputs in forms. This ensures that users provide accurate and complete information when registering, logging in, or submitting orders, preventing errors and improving data quality. Can be used to display user feedback messages, such as success messages after placing an order or error messages when submitting a form with incomplete data. This provides a more user-friendly experience.

Databases – MongoDB: MongoDB uses a flexible schema-less data model, allowing you to store recipe data without a predefined structure. This flexibility accommodates changes in the types of data you want to store, making it easier to adapt to evolving recipe formats or features. As we are using Node.js for our website's backend, MongoDB offers excellent compatibility and performance when paired with Node.js applications. Recipes often have various components like ingredients, measurements, steps, and additional notes. MongoDB allows for the storage of complex data structures like arrays and nested documents, making it suitable for representing detailed recipes. MongoDB's flexibility, scalability, and efficient handling of complex data structures make it a strong candidate for serving as the database for a recipe website.

NodeJS: Node.js uses JavaScript on both the client and server sides. This means that it can use the same language and data structures throughout the application, making it easier to manage and maintain. Node.js allows us to use JavaScript on both the frontend and backend, providing a unified development environment. This means that developers can seamlessly work with JSON data, which is the native format for both JavaScript and MongoDB.

Chapter 7

Project Scheduling

Sr. No	Group Members	Time Duration	Work to be Done
1	Akshata Nalavade Manjiri Gole Shweta Bhutada	Week 1 – Week 3	Design Implementations: specific components of the recipe website have been visually designed and laid out. Designed login page, homepage, recipe pages and category page.
2		Week 4 - Week 5	Research on recipes, ingredients and plan. Commenced the HTML/CSS implementation phase, laying the foundation for the website's visual and structural elements.
3		Week 5 – Week 6	Working on login/signup database connection. Interlinking all web pages, ensuring a smooth user experience throughout the site.
4		Week 7 – Week 8	Analysis of feedback after review 1. In the process of developing an interactive chatbot system that will be seamlessly integrated into the website.
5		End of the week	Engaging in research on the delivery system.

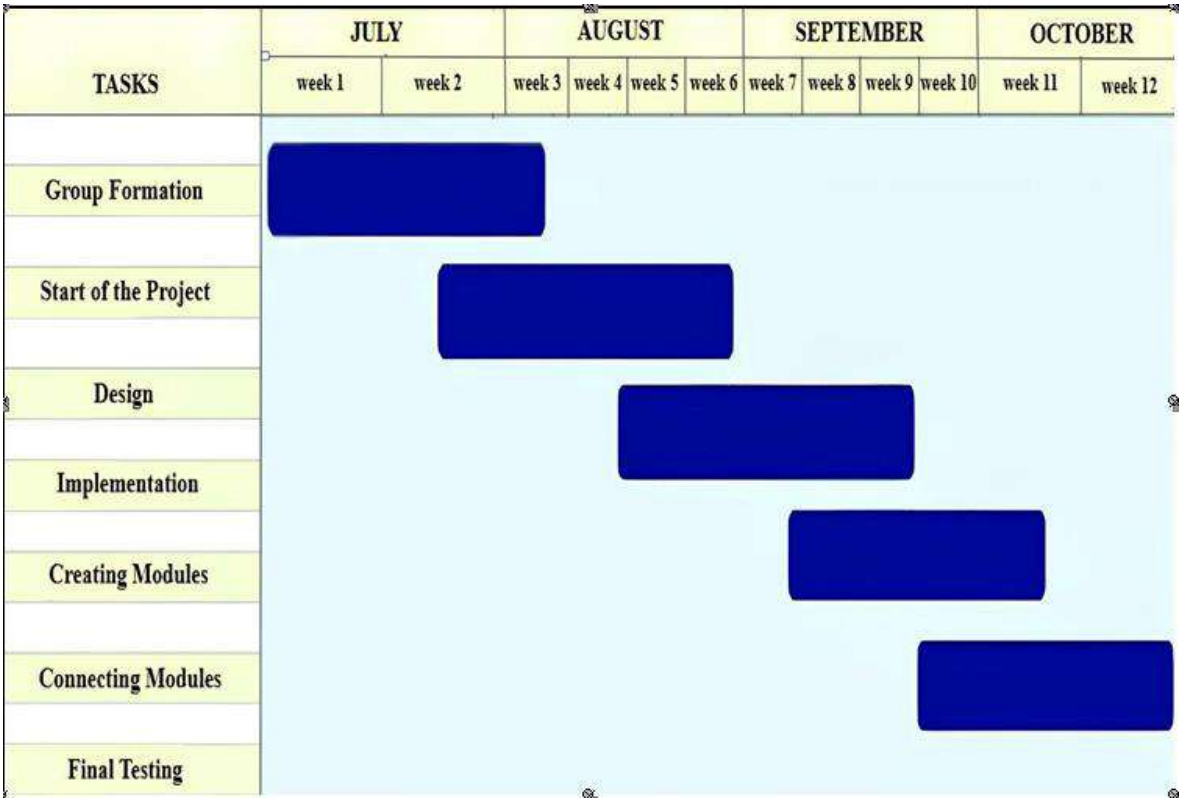

Fig 7.1 Gantt Chart

Chapter 8

Implementations

The implementation phase of the recipe website has seen meaningful progress. Specific components of the website have been meticulously designed and arranged, focusing on optimizing user experience. The login page, homepage, recipe pages, and category pages have all undergone a thorough design process, ensuring they are both visually appealing and intuitively functional. This step is instrumental in shaping the layout and user flow, ensuring that the user experience is both intuitive and engaging. It aligns with the commitment to making the website more user-centric and accessible. Architecture design encompassing the frontend, backend, and database components.

We did research on recipes and ingredients, providing valuable insights into user preferences and cooking habits. The HTML/CSS implementation phase has been initiated to shape the visual aspects of the website.

A significant focus has been directed towards establishing a secure and efficient login/signup system, including the essential database connections. The server-side logic has been implemented using Node.js and Express.js, laying the foundation for the website's functionalities. Database interactions, user authentication, and user login procedures are being actively developed, ensuring that user data is handled securely and efficiently.

Feedback obtained after the first review has been meticulously analyzed. The development of an interactive chatbot system represents a forward-looking step towards increasing user engagement and support capabilities. This feature is being seamlessly integrated into the website, offering users instant assistance and guidance. Concurrently, research into the delivery system is underway. This research will inform the development of features like delivery tracking and estimated delivery times, adding practicality and assurance to the user journey.

Chapter 9

Results and Discussions

1. Chatbot System Integration

   The implementation and integration of a chatbot system have been completed. The chatbot is designed to be seamlessly integrated into the website, offering guidance. Users can interact with the chatbot through a user-friendly interface.

2. Payment Portal Development:

   The payment portal, which is an essential component of the website's e-commerce functionality. The payment portal will accommodate a range of payment methods. It involves connections to facilitate smooth payment transaction.

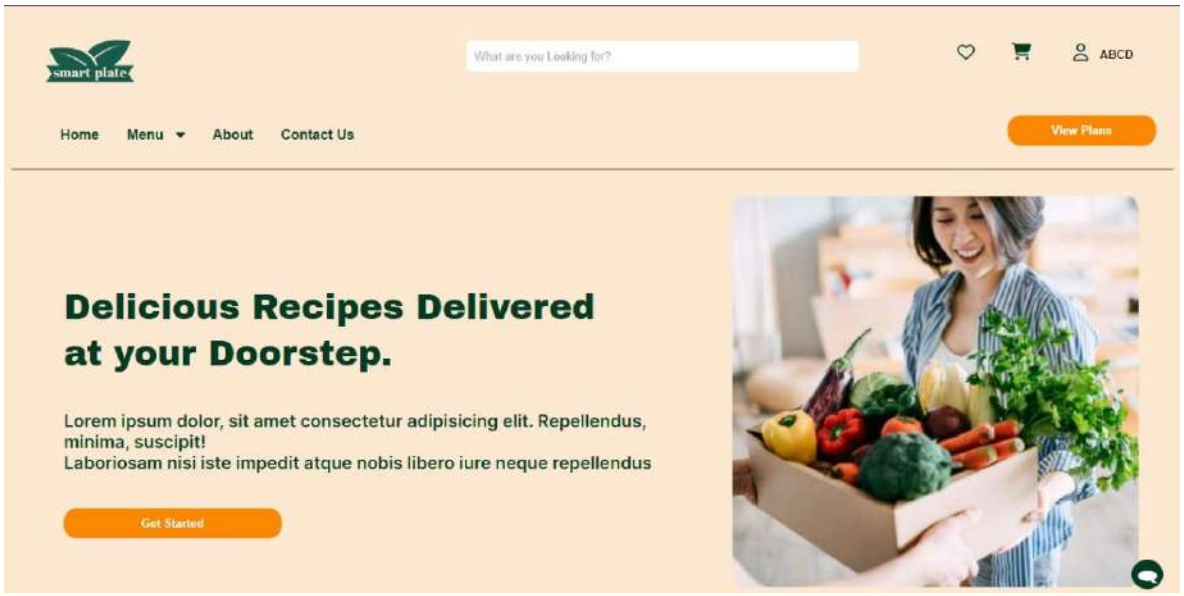

Fig 9.1 – Homepage (Hero Section)

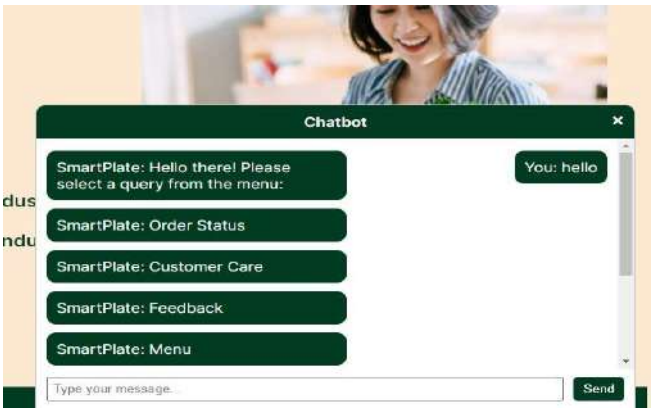

Fig 9.2 – Chat-Bot

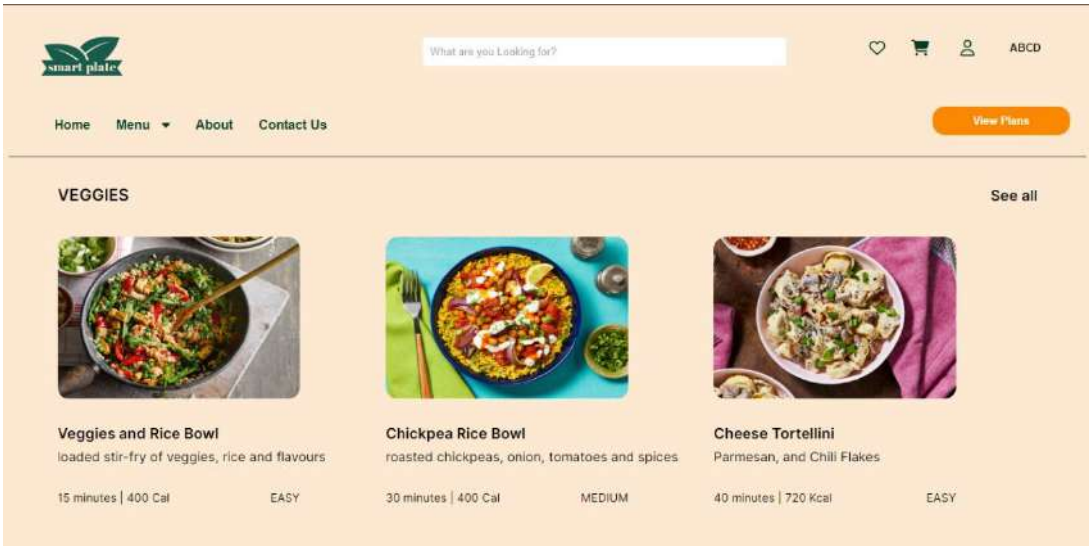

Fig 9.3 – Menu Page

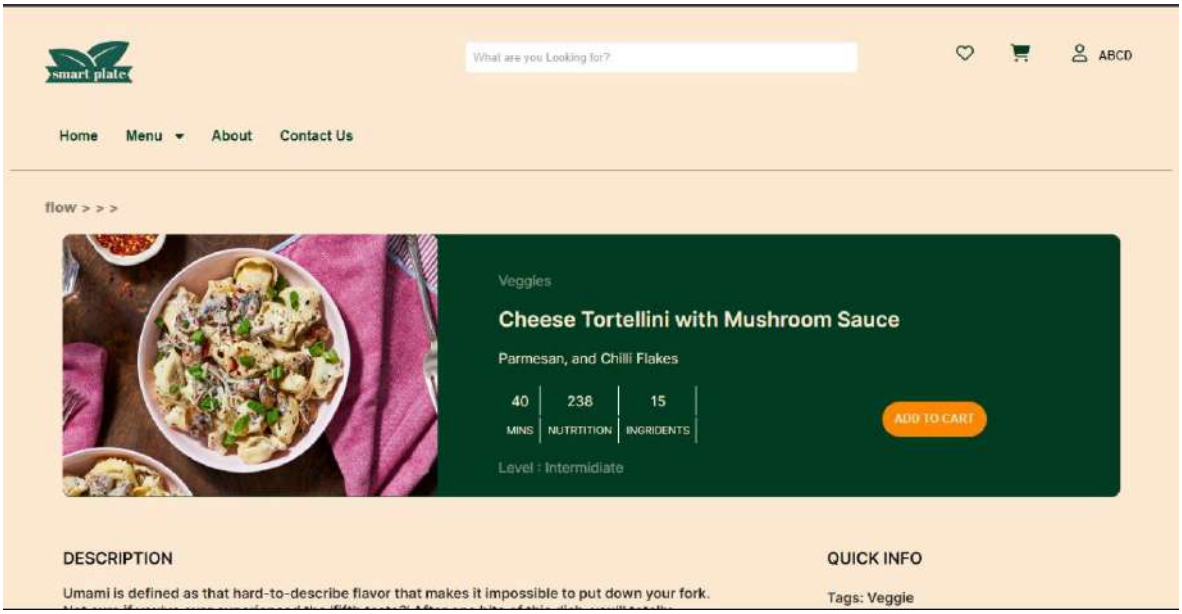

Fig 9.4- Recipe Pages

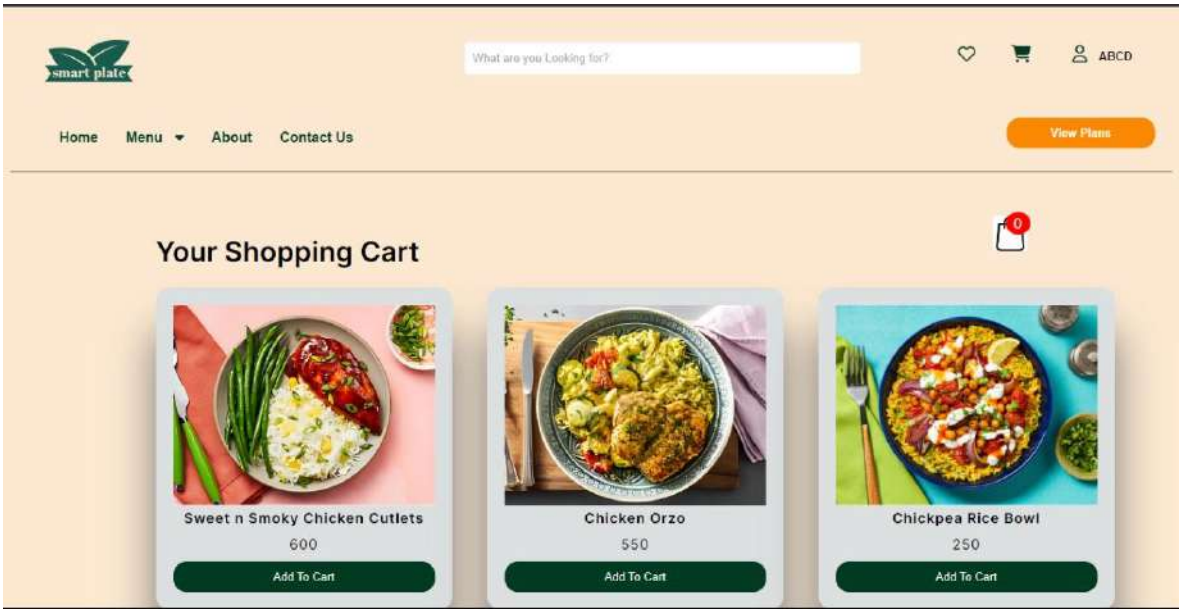

Fig 9.5- Cart Page

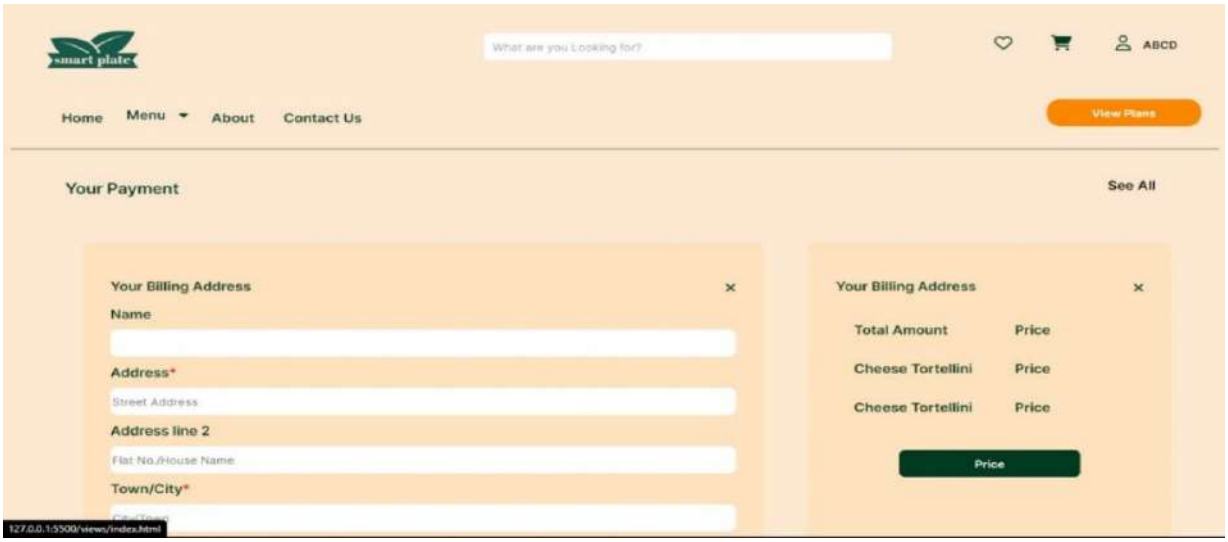

Fig 9.6- Payment and Checkout Page

Chapter 10

Conclusion and Future Scope

Conclusion

The recipe website, following extensive research and a series of well-thought-out implementations, stands ready to provide a comprehensive and enriching culinary experience for its users. The journey began with a clear understanding of the challenges faced by individuals with busy lifestyles and a passion for cooking, ultimately leading to the development of a user-centric platform.

Through real-time features such as a chatbot system, the website has laid a strong foundation for enhancing user engagement and convenience. These features, informed by user feedback and preferences, are instrumental in shaping a dynamic and user-responsive environment. The website's design, while already visually appealing, is continually refined to ensure that the concept is both intuitive and accessible. Users can easily navigate through a diverse range of recipes, and enjoy a seamless ordering experience.

Future Scope

1. Enable Data-Driven Decision-Making:

   Implement a system that encourages users to provide feedback and reviews on recipes they've tried. With the insights gained from user data, build or refine a recommendation engine. This engine can suggest recipes based on a user's past interactions, including recipes they've tried, liked, or disliked.

   The goal is to provide users with personalized suggestions that align closely with their culinary preferences.
2. Enable Cart Checkout Process and Delivery Tracking:

   Design the cart checkout process to be user-centric. This involves a clear and intuitive interface, where users can review their orders, add or remove items, and confirm their purchase with ease. Implement a delivery tracking system that provides users with real-time updates on the status of their orders. Users should be able to see the estimated delivery time and track the delivery's location as it progresses.

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