A

Mini Project Report

on

Flavour Fusion: Recipe Generator

Submitted in partial fulfillment of the requirements for the degree

Second Year Engineering – Computer Science Engineering - Data Science

by

Siddharth Kumar	**23107044**
Sarvesh Deve	**23107021**
Yash Patil	**23107007**
Arjun Talekar	**23107005**

Under the guidance of

Dr. Veena Trivedi

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING(DATA SCIENCE)

A.P. SHAH INSTITUTE OF TECHNOLOGY

G.B. Road, Kasarvadavali, Thane (W) - 400615

UNIVERSITY OF MUMBAI

Academic year: 2024 - 2025

CERTIFICATE

This to certify that the Mini Project report on **Flavour Fusion: Recipe Generator** has been submitted by **Mr. Siddharth Kumar (23107044), Mr. Sarvesh Deve (23107021) and Mr. Yash Patil (23107007) and Mr. Arjun Talekar (23107005)** who are bonafide students of A. P. Shah Institute of Technology, Thane, as a partial fulfillment of the requirement for the degree in **Computer Science Engineering (Data Science)** during the academic year **2024-2025** in a satisfactory manner as per the curriculum laid down by the University of Mumbai.

Dr. Veena Trivedi
Guide

Ms. Anagha Aher
HOD, CSE(Data Science)

Dr. Uttam D. Kolekar
Principal

External Examiner:

Internal Examiner:

Place: A. P. Shah Institute of Technology, Thane
Date:

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This project would not have come to fruition without the invaluable help of our guide **Dr. Veena Trivedi.** Expressing gratitude towards our HoD, **Ms. Anagha Aher,** and the Department of Computer Science Engineering (Data Science) for providing us with the opportunity as well as the support required to pursue this project. We would also like to thank our project coordinators **Ms. Avani Nair** who gave her valuable suggestions and ideas when we were in need of them. We would also like to thank our peers for their helpful suggestions.

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Chapter 1

Introduction

In today's fast-paced world, individuals are constantly looking for ways to simplify their cooking experience while exploring new and exciting flavours. Flavour Fusion is designed to be more than just a recipe suggestion tool; it serves as a smart and intuitive platform that transforms available ingredients into delicious meals. By focusing on user convenience and personalization, Flavour Fusion enhances the cooking process for both beginners and experienced chefs.

Unlike traditional recipe collections, Flavour Fusion allows users to input the ingredients they have on hand and instantly generates suitable recipe suggestions. This eliminates the hassle of searching for specific recipes and ensures minimal ingredient wastage. The platform is built with a user-friendly interface that enables effortless navigation and seamless meal planning, making it accessible to a wide range of users.

Our commitment to enhancing the culinary experience is reflected in the platform's innovative features. Users can filter recipes based on meal type, preparation time, and difficulty level. Additionally, Flavour Fusion provides ingredient substitution options, a shopping list for missing ingredients, and a random recipe generator for those looking to try something new. These functionalities ensure that users not only find the perfect recipe but also gain confidence in their cooking journey.

In summary, Flavour Fusion is dedicated to redefining the way people discover and prepare meals by offering an intelligent, adaptable, and user-centric solution. By combining efficiency with creativity, it empowers users to experiment with flavours and make the most of the ingredients they already have.

1.1. Purpose

The purpose of this project report is to document the development and implementation of Flavour Fusion, a recipe generation platform. Our system is designed to provide a user-friendly and efficient way for individuals to discover recipes based on available ingredients, catering to a wide range of dietary preferences and cooking skill levels. By

streamlining the recipe selection process, Flavour Fusion enhances the overall cooking experience and promotes creativity in the kitchen.

Flavour Fusion prioritizes intuitive design, ensuring that users can effortlessly navigate and discover the perfect recipes based on their available ingredients. We understand the importance of a seamless cooking journey, which is why our interface is thoughtfully crafted to help users explore a wide range of meal options with ease.

Moreover, we leverage advanced technology to personalize the cooking experience for our users. With Flavour Fusion, individuals can cook with confidence, knowing that our platform utilizes smart algorithms to suggest recipes, provide ingredient substitutions, and assist them in creating meals that best fit their dietary preferences and lifestyle.

1.2. Objectives

The objectives of the Flavour Fusion Project outline its key goals for creating an effective Recipe Generation platform:

1. To develop a method that can suggest recipes based on the input ingredients provided by the user.
2. To create an interactive and intuitive interface for users to input ingredients receive recipes.
3. To accommodate an expanding database of recipes and user inputs efficiently.
4. To effortlessly manage the users using our platform.

1.3. Scope

The scope of the Flavour Fusion project involves creating a recipe generation platform that helps users discover meals based on available ingredients, dietary preferences, and cooking constraints. It will feature an intuitive user interface for a seamless culinary experience, catering to home cooks, food enthusiasts, and individuals with limited cooking expertise. Additionally, the platform will support sustainable cooking by reducing food waste through ingredient-based recipe suggestions.

1. **Recipe Discovery:** The platform's adaptable framework provides a robust system for generating diverse recipe options, helping users explore new meal ideas while utilizing the ingredients they have.
2. **User Experience:** The versatile and intuitive features ensure a smooth and engaging experience, allowing users to filter recipes based on meal type, preparation time, and difficulty level.
3. **Sustainability and Accessibility:** The scalable framework promotes resourceful cooking by suggesting recipes that minimize food wastage while catering to individuals with various dietary needs and skill levels.
4. **Target Audience:** The platform provides a valuable tool for students, working professionals, and home cooks looking for quick, budget-friendly, and creative meal solutions.

Chapter 2

Proposed System

The purpose of the Flavour Fusion project is to create a dynamic and user-friendly platform that empowers individuals to make the most of the ingredients they have on hand by suggesting creative and diverse recipes. The platform aims to simplify the cooking process by eliminating the need for users to search through long recipe lists, instead offering personalized suggestions based on the ingredients available to them. With Flavour Fusion, users can explore meal options tailored to their dietary preferences, skill levels, and time constraints, enhancing their overall cooking experience. By focusing on ease of use, sustainability, and personalization, Flavour Fusion helps reduce food waste, encourages healthier eating, and brings culinary creativity into everyday cooking. The goal is to make meal preparation more accessible, fun, and efficient, whether users are cooking on a tight schedule or experimenting with new flavours.

2.1 Features and Functionality

Implementing Flavour Fusion includes several key features that significantly enhance the user experience. The platform boasts a user-friendly interface with intuitive navigation, ensuring accessibility for users of all skill levels. It leverages smart algorithms to generate personalized recipe suggestions based on available ingredients, dietary preferences, and cooking constraints. Additional functionalities such as ingredient substitutions, a shopping list feature, and a random recipe generator further enrich the cooking experience. Collectively, these features make Flavour Fusion a versatile and engaging tool for home cooks, food enthusiasts, and busy individuals. The key features of Flavour Fusion are:

1. **User-Friendly Interface:** The platform is designed with simplicity and efficiency in mind. It provides a clean and organized layout, making it easy for users to input ingredients, browse recipes, and plan meals without hassle. Responsive design ensures a seamless experience across different devices, including smartphones, tablets, and desktops.

2. **Random Recipe Generator**: For users looking to try something new, the platform provides a random recipe generator. This feature encourages experimentation with different cuisines and ingredients, making cooking an exciting and adventurous experience.
3. **Recipe Rating System** – Users can rate and review recipes posted by others, helping the community identify the best and most popular meal ideas. This fosters engagement and encourages users to share their cooking experiences.
4. **Search by Ingredients or Category** - Users can search for recipes by entering ingredients they have or by selecting from categories like Starter, Main Course, or Dessert.

Block Diagram:

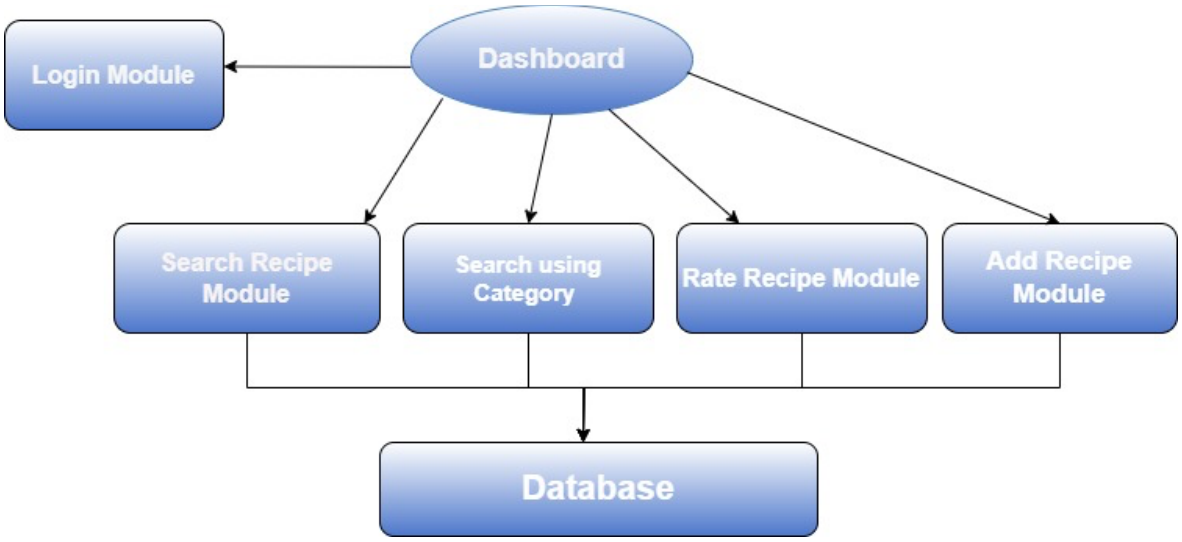


Figure 2.1 Block Diagram for Flavor Fusion:Ingredient to Recipe Generator

Chapter 3

Project Outcomes

The expected outcomes of the Flavour Fusion project will transform the cooking experience for users while promoting sustainability and efficiency in meal preparation. By creating a functional recipe generation platform, Flavour Fusion aims to simplify the cooking process, encourage culinary creativity, and reduce food waste. These outcomes reflect the project's success in making meal planning more accessible and enjoyable for users of all skill levels.

1. **A functional recipe generation platform**: The project will result in a fully operational system that allows users to input ingredients and receive instant recipe suggestions. With a user-friendly design and intuitive functionality, the platform will help individuals prepare meals with ease and efficiency.
2. **Greater accessibility for diverse user groups**: The platform caters to a wide audience, including beginners, experienced cooks, and individuals with dietary restrictions. By offering personalized meal suggestions and flexible filtering options, Flavour Fusion ensures that all users can find recipes that meet their unique needs and preferences.
3. **Recipe Ratings:** The recipe rating system allows users to rate and review recipes shared by others. This feature helps highlight the best and most popular recipes, enabling users to make informed decisions about what to cook. By fostering an interactive and supportive community, Flavour Fusion encourages users to share their cooking experiences and discover highly rated meal ideas.
4. **User-Generated Content:** Flavour Fusion allows users to add their own recipes by entering details like ingredients, instructions, categories, and images. This encourages community engagement and helps grow a diverse recipe database. It also keeps the platform dynamic with fresh, user-driven content.

Chapter 4

Software Requirements

The software requirements section of the Flavour Fusion project outlines the essential technical specifications needed for the recipe generation platform. It includes both functional requirements**,** detailing specific features such as ingredient-based recipe suggestions and the recipe rating system, and non-functional requirements**,** addressing performance, security, and usability.

Front-end Development:

1. **Python with Tkinter** – Python, along with the Tkinter library, is used to develop the user-friendly graphical interface for Flavour Fusion. It enables the creation of a simple yet effective UI for the user.

Back-end Development:

1. **MySQL (Version 8.0.1)** – MySQL serves as the database management system for Flavour Fusion, handling user profiles, recipe data, ratings, and ingredient records. Its relational structure ensures efficient data retrieval, security, and integrity, allowing users to access personalized recipe recommendations seamlessly.

Additional Technologies:

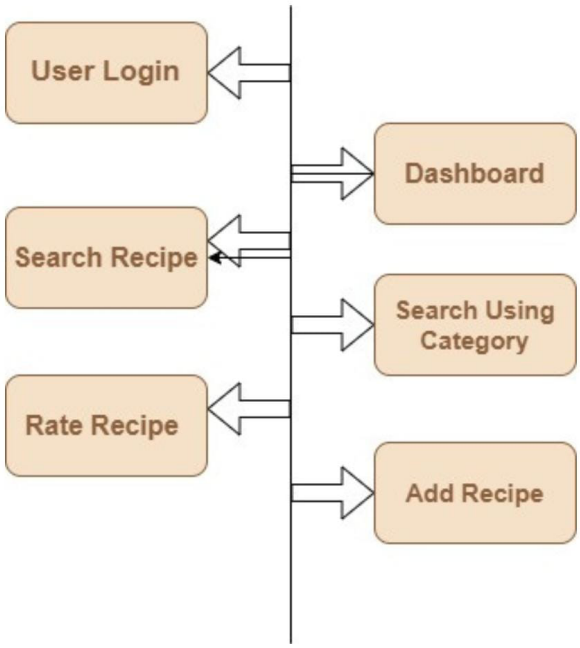
1. **Python (Python Development Environment)** – Python provides the core functionality for the application, supporting data processing, database interaction, and algorithm-driven recipe generation. It offers scalability and flexibility, making it ideal for this project.
2. **Tkinter (Python GUI Library)** – Tkinter is used for creating the interactive user interface, allowing users to input ingredients, browse suggested recipes, and rate meals with ease.
3. **MySQL Connector for Python** – This library enables smooth communication between the Python-based front end and the MySQL database, ensuring efficient data transactions.

Chapter 5

Project Design

The design of our Flavour Fusion project is structured to facilitate a seamless user experience while providing comprehensive administrative controls. At the core of the system is a block diagram that outlines the main functionalities for both users and administrators.

Workflow:



5.1 Workflow of the project

For users, the process begins with a user login feature, allowing new customers to register and returning customers to log in securely. Once logged in, users can easily search for recipes using a search functionality, explore recipes by category, rate recipes, and even add their own recipes. The user journey culminates in discovering new meal ideas based on available ingredients and personalized suggestions.

On the administrative side, the project features a robust dashboard for efficient management. Admin can manage user accounts, recipe listings and add/modify recipes. This dual functionality ensures that both user and admin needs are met, promoting a streamlined and engaging culinary experience

Chapter 6

Project Scheduling

Project scheduling is a crucial aspect of effective project management for the Flavor Fusion platform, providing a roadmap for the timely completion of tasks and milestones within a defined timeframe. To visualize this schedule, a Gantt chart is employed, offering a graphical representation of task durations, start and finish dates, and dependencies between tasks. Additionally, Gantt charts help illustrate the project's work breakdown structure and the relationships between various activities, ensuring effective progress tracking and resource allocation. A detailed explanation of the Gantt chart is provided below after Figure 6.1.

GANTT CHART TEMPLATE

Smartsheet Tip A Gantt chart's visual timeline allows you to see details about each task as well as project dependencies.

PROJECT TITLE: Flavor Fusion: Ingredient to Recipe Generator

INSTUTUTE & DEPARTMENT NAME: AP SHAH INSTITUTE OF TECHNOLOGY(CSE-Data Science)

PROJECT GUIDE: Dr. Veena Trivedi

DATE:28/04/2025 10/8/24

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION(Weeks)	PERCENTAGE OF TASK COMPLETE
1	**Project Conception and Initiation**					
1.1	Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project	Siddharth	1/8/25	1/16/25	1	100%
1.2	Identifying the functionalities of the Mini Project	Sarvesh	1/16/25	1/28/25	2	100%
1.3	Discussing the project topic with the help of paper prototype.	Siddharth,Sarvesh, Arjun,Yash	1/28/25	2/5/25	1	100%
1.4	Designing the Graphical User Interface(GUI)	Siddharth	2/5/25	2/11/25	1	100%
1.5	Presentation I	Siddharth,Sarvesh, Arjun,Yash	2/11/25	2/17/25	1	100%
2	**Project Design and Implementation**					
2.1	Database Design	Sarvesh,Arjun	2/17/25	3/3/25	2	100%
2.2	Database Connectivity of all modules	Sarvesh,Arjun	3/3/25	3/13/25	2	100%
2.3	Integration of all modules and Report Writing	Siddharth	3/13/25	3/31/25	3	100%
2.4	Presentation II	Siddharth,Sarvesh, Arjun,Yash	3/31/25	4/1/25	1	100%

PHASE ONE: WEEK 1 – WEEK 9; PHASE TWO: WEEK 10 – WEEK 14 (days M T W T F per week)

Figure 6.1: Gantt Chart of Flavor Fusion: Ingredient to Recipe Generator

Following is the detail of the Gantt chart for the Flavour Fusion project – In the first week of January, Siddharth Kumar, Yash Patil, Sarvesh Deve, and Arjun Talekar formed a group to discuss and finalize the project's topic, scope, and objectives. This initial planning phase was completed by the end of the first week.

In the following weeks, the team worked on creating a paper prototype and refining the concept of the recipe generation platform. This phase was completed by the end of Februrary. By mid-February, the team started executing the design and integration of the graphical user interface (GUI) of the platform. After the first internal review on 11/02/2025, the team received feedback on the GUI, which led to several revisions that were approved by the end of the month.

During the last week of March, Sarvesh Deve and Arjun Talekar focused on connecting the MySQL database with the front-end interface, while Yash Patil and Siddharth Kumar worked on finalizing documentation and the technical report. This integration was completed by the end of March

Finally, the team integrated all modules and completed the final report and documentation by early April. The final presentation took place on 02/04/2025, which was successfully reviewed and approved by the faculty and the project’s complete execution took 12 weeks.

Chapter 7

Results

The results section showcases the successful implementation of the Flavour Fusion project through a series of detailed screenshots and images. These visuals highlight key stages of development, including the design of the graphical user interface, recipe generation algorithm integration, and the overall functionality of the platform. By visually documenting our progress, we provide clear evidence of our efforts and the effectiveness of our solutions. The images serve not only to illustrate our work but also to demonstrate the seamless user experience and the robust architecture of the Flavor Fusion platform.

Figure 7.1 : Home Page

Figure 7.1 above showcases the home page layout, highlighting the focus on the login and register options, allowing users to access their accounts or sign up with ease. The clean and user-friendly design ensures smooth navigation and encourages user engagement, setting the tone for an intuitive recipe discovery experience on the Flavor Fusion platform.

Figure 7.2: Sign In Page

Figure 7.2 above shows the login page, which serves as the gateway for both users and administrators to access their respective accounts on the Flavor Fusion platform. It includes input fields for email and password, with options for user login, admin login, and new user registration. The layout emphasizes simplicity and security, ensuring a smooth and safe login experience for all users.

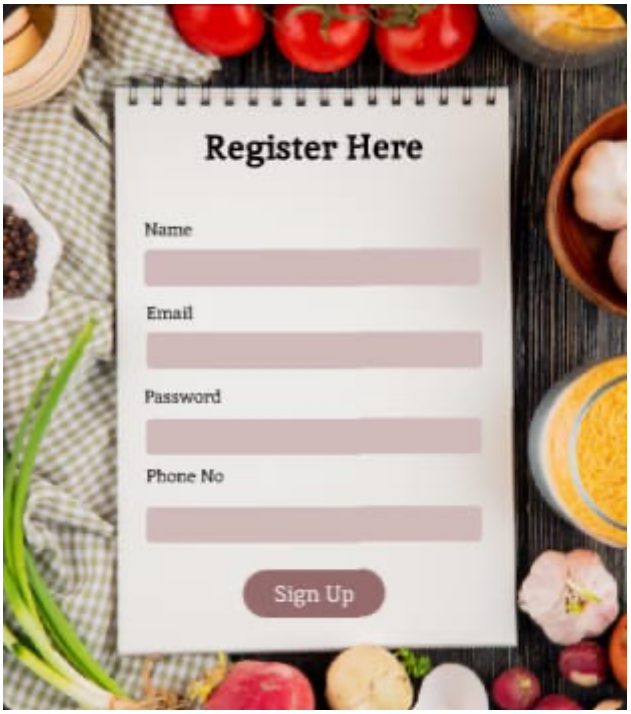


Figure 7.3: Registration Page

Figure 7.3 shows the signup page, where new users can create an account on the Flavour Fusion platform. The page includes fields for entering basic information such as name, email, password, and phone number. Its simple and clean layout ensures a quick and user-friendly registration process, allowing users to easily get started and access personalized recipe suggestions

Figure 7.4: Admin Dashboard

Figure 7.4 above shows the admin dashboard, which serves as the central hub for managing user profiles and recipes on the Flavour Fusion platform. The interface allows administrators to view, add, update, or delete user accounts and oversee all recipes submitted by users. With its simple and intuitive layout, the dashboard ensures efficient management and smooth platform moderation.

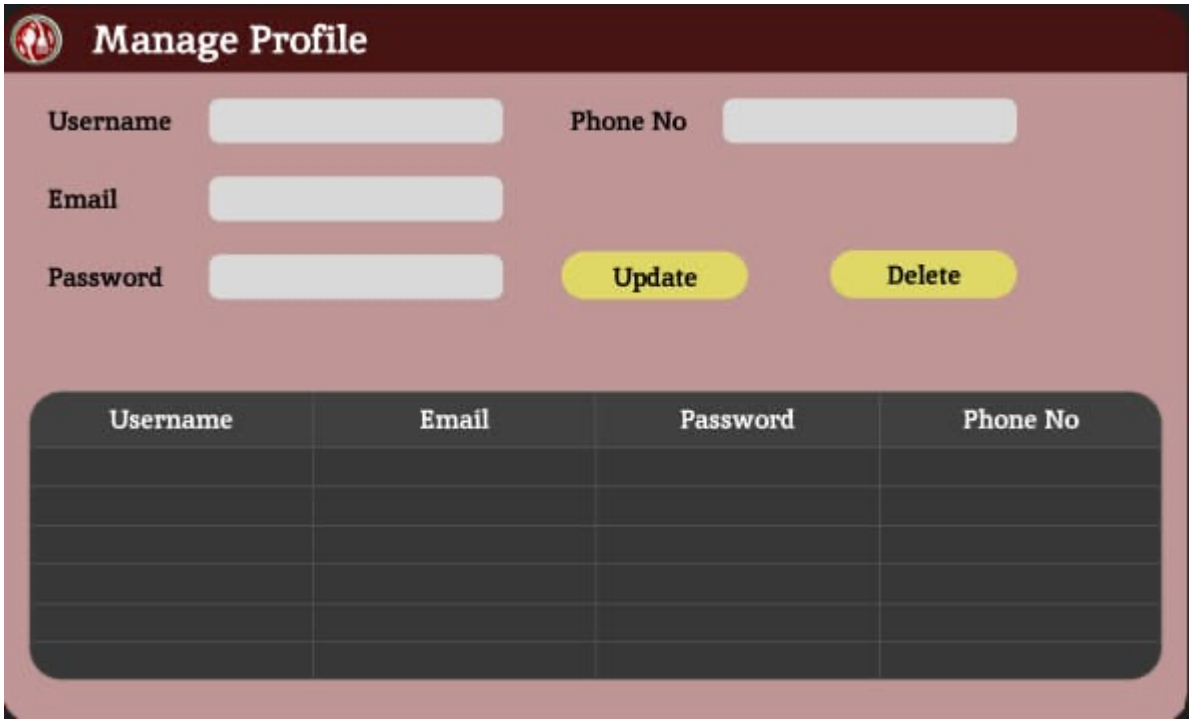


Figure 7.5: Admin Manage User Page

Figure 7.5 above shows the manage user profiles page, where administrators can update or delete user information as needed. This functionality ensures that the user database remains accurate and up to date. The simple interface allows admins to easily browse through user records and make quick modifications, enhancing overall user management and maintaining platform integrity.

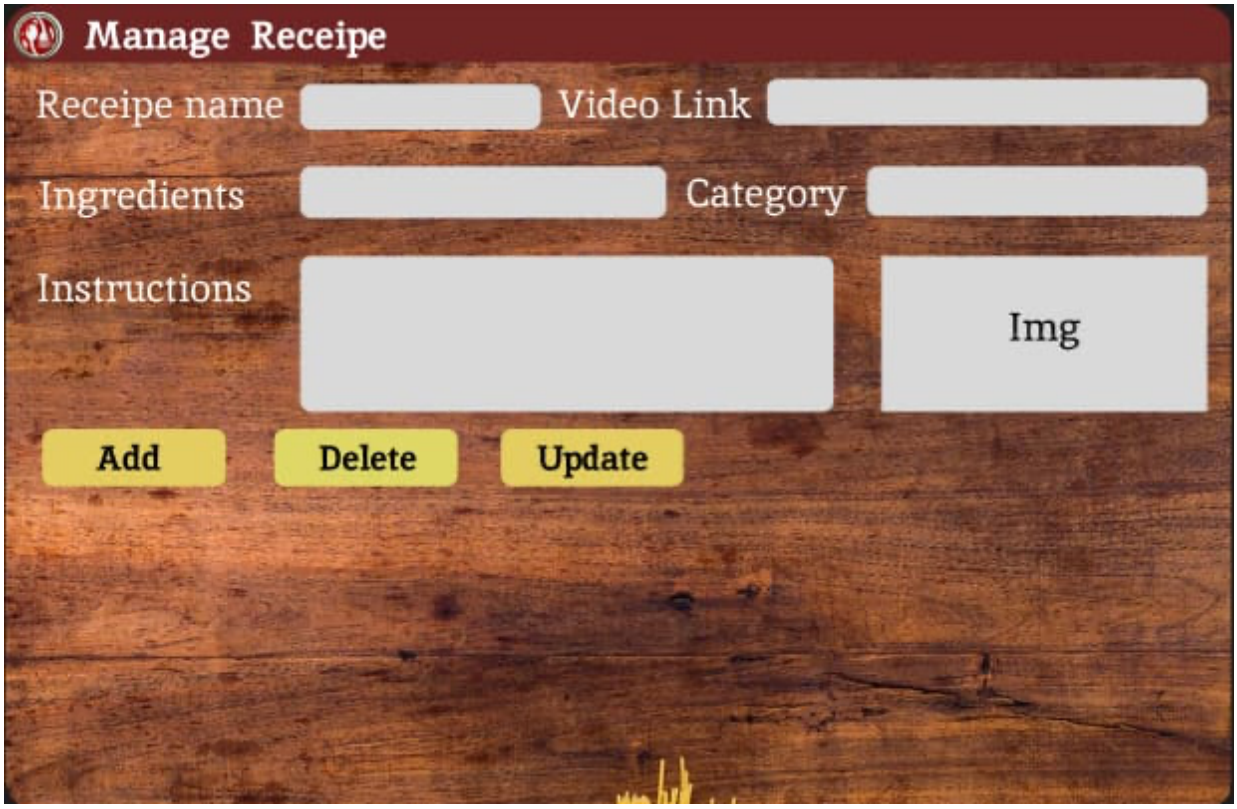


Figure 7.6: Admin Add Recipe Page

Figure 7.6 above shows the admin add recipe page, where administrators can add, update, or delete recipes on the platform. When adding a recipe, the admin inputs details such as the recipe name, video link, category, ingredients, instructions, and an image. This page helps maintain a high-quality recipe database, ensuring users have access to well-organized and informative cooking content. The user-friendly layout makes recipe management efficient and straightforward for administrators.

Figure 7.7: User Dashboard

Figure 7.7 above shows the user dashboard, which provides users with multiple ways to explore recipes on the Flavour Fusion platform. Users can search for recipes by entering available ingredients or by selecting a category of their choice. This dual search functionality ensures a personalized and efficient recipe discovery experience, helping users find meals that match their preferences and available resources. The clean and interactive layout makes it easy for users to navigate and engage with the platform.

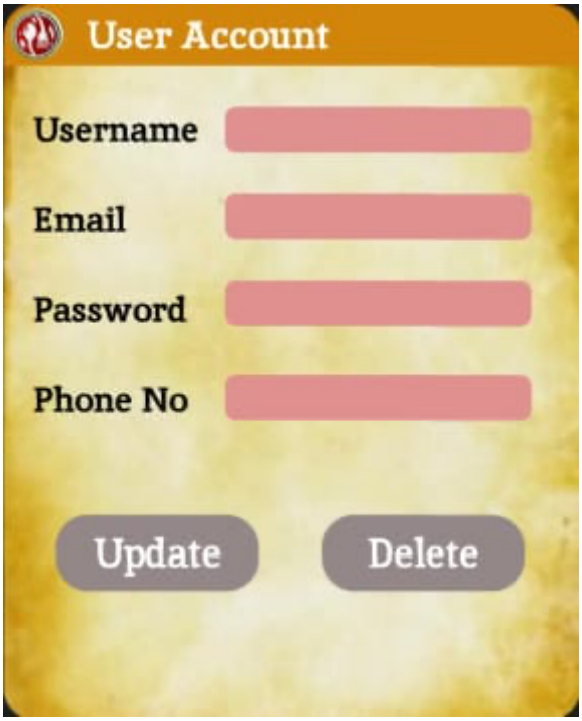


Figure 7.8: User Profile Display

Figure 7.8 above shows the user profile display page, where users can view their account details including username, email, password, and phone number. The page also provides options to update or delete their profile information. This feature allows users to maintain control over their personal data, ensuring their account remains accurate and secure.

Figure 7.9: Recipe Search page

Figure 7.9 above shows the search by ingredients page, where users can input the ingredients they have on hand to receive personalized recipe suggestions. The system processes the entered ingredients and displays a list of matching recipes, helping users make the most of what they already have.

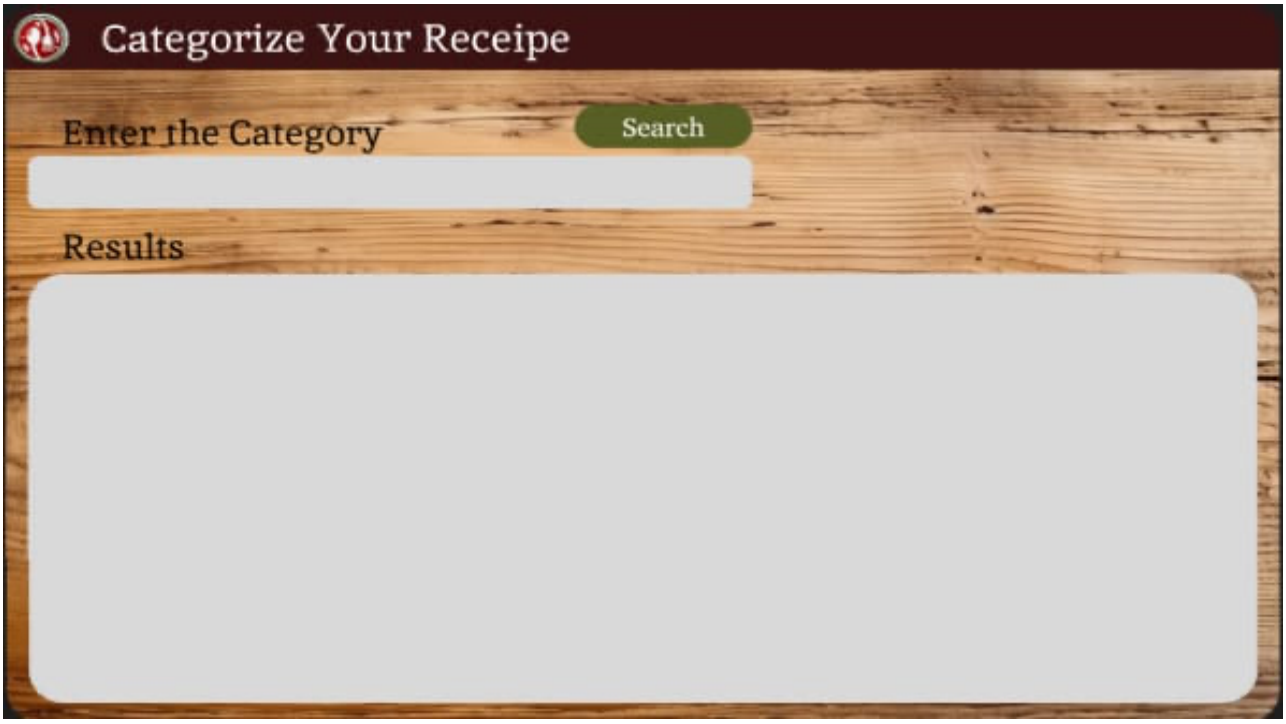


Figure 7.10: Search by Categories Page

Figure 7.10 above shows the search by categories page, where users can explore recipes based on specific meal types such as starters, main course, and desserts. This categorization helps users quickly find the kind of dish they're looking to prepare, making recipe discovery more structured and convenient.

Figure 7.11: User Add Recipe Page

Figure 7.11 above shows the add recipe page for users, where they can contribute their own recipes to the platform. Users can enter details such as the recipe name, category (starter, main course, or dessert), ingredients, instructions, video link, and an image. This feature encourages user participation and helps grow a diverse recipe collection, making Flavour Fusion a more community-driven platform.

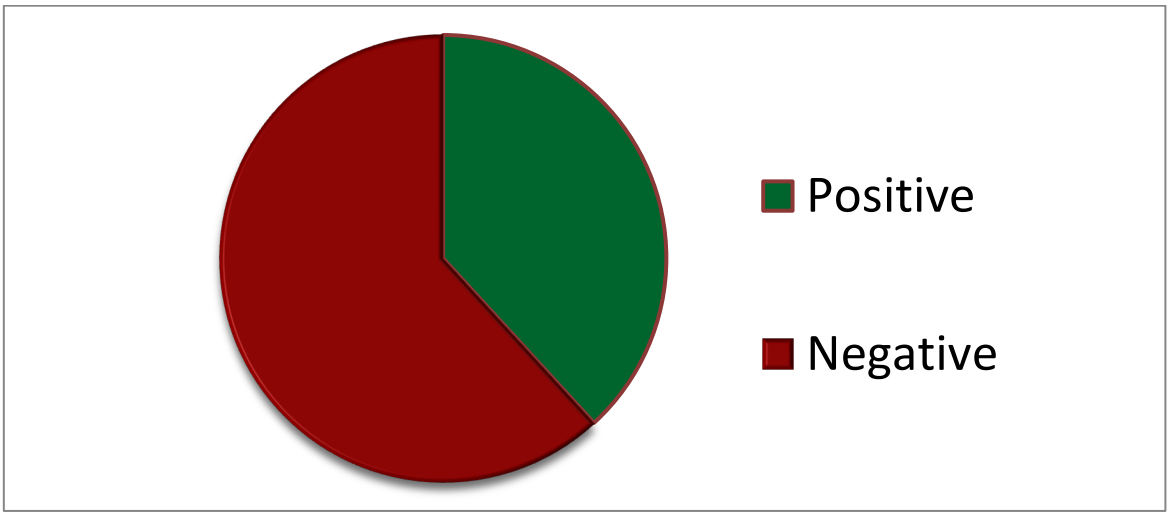


Fig 7.12: Pie chart for Ratings

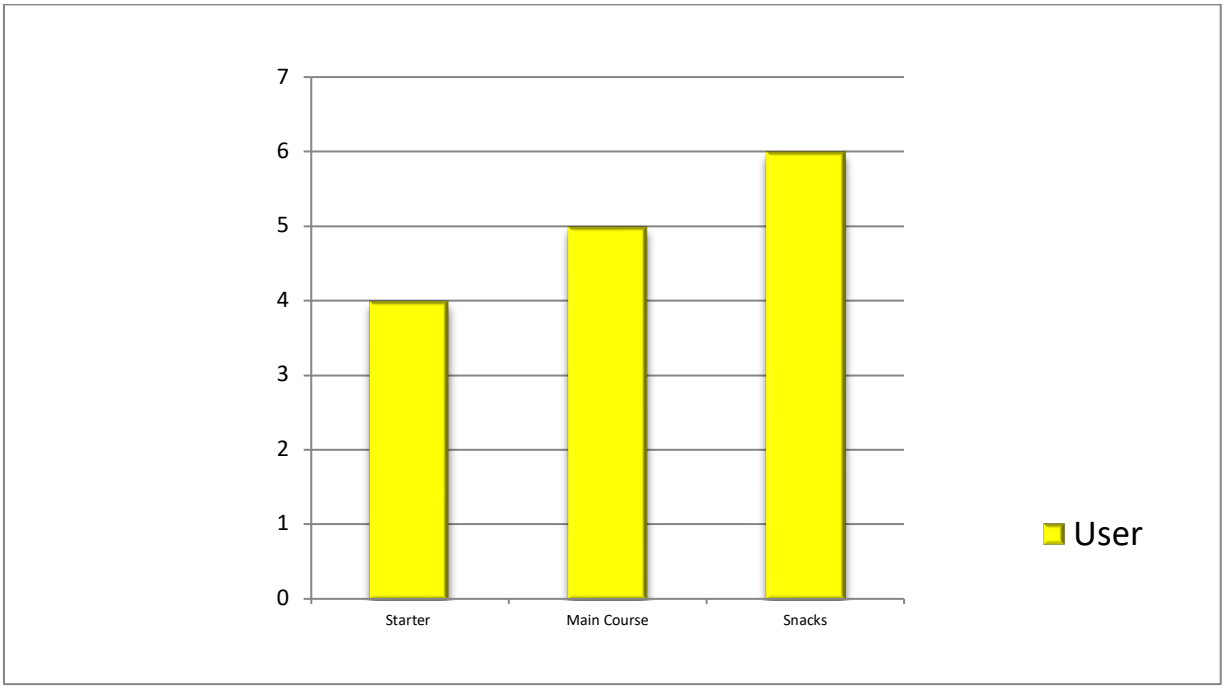


Fig 7.13: Graph for Category – User

In summary, the implemented pages create a strong foundation for both administrators and users on the Flavour Fusion platform. The login and signup pages ensure secure and easy access, while the admin dashboard allows efficient management of user profiles and recipes. Users benefit from a dashboard that supports searching recipes by ingredients or category, and also allows them to add their own recipes. Additional features like profile management and personalized search options enhance usability and engagement, making the overall cooking experience more convenient and interactive.

Chapter 8

Conclusion

In conclusion, the development and implementation of Flavour Fusion reflect a thoughtful integration of technology and user-focused design to enhance the cooking experience. Built using Python for the front end with MySQL for the back end, the platform provides a reliable and intuitive solution for generating recipes based on available ingredients.

Flavour Fusion not only simplifies meal planning but also promotes creativity and sustainability in the kitchen. As user needs and culinary trends continue to evolve, ongoing improvements and feature enhancements will be essential to ensure the platform remains engaging, relevant, and impactful.

The future enhancement to this project could be using Machine Learning for generating recipes using given ingredients dynamically.

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