RECIPE FINDER

A PROJECT REPORT
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CERTIFICATE

Certified that **Prashant Mishra 2200290140114, Prerna Bhardwaj 2200290140116** have carried out the project work having "**Recipe Finder**" (**Mini Project-KCA353**) for **Master of Computer Application** from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself/herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

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RECIPE FINDER

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ABSTRACT

In this project I have built a web application “Recipe Search Engine Using Yummly API”. This application is central information hub for the kitchen—connecting consumers with recipe ideas, ingredient lists, and cooking instructions. It will serve best for the people who uses digital tools to plan their cooking, these days almost everyone does. The various features available for users in this application are as following. Users can search for their favourite dishes. The search results contain information about ingredients list, total time needed for cooking, user’s rating and cooking directions. Basic search filters are provided to filter out the search results like Breakfast, Lunch and Dinner recipes. The order of displayed results can be sorted according to ratings, total time required to prepare the dish. User can create an account and build their own favourite recipe collection by liking the recipes displayed. The liked recipes are stored into user’s account and user can view, add and delete those recipes anytime from his recipe collection. Users can use their social networking platform Facebook account credentials to log into this application or create a new account in this application. The application will communicate with the Yummly API to consume data from it. The Yummly API is largest recipe information aggregator with over one million recipes data.

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Prashant Mishra

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CHAPTER 1

INTRODUCTION

Food is one of the main human need. Today food is only a filler of energy need ,but more than that food has becoming art and has added value . A wide variety of innovative creations in food have been developed and spread widely .A recipe is a set of instruction telling you how to prepare and cook food including the list of materials and ingredients used for cooking .

The research we did here is to build an application that has a feature to search for recipes based on materials owned by the user.

1.1 Motivation

The motivation to develop this "Recipe search engine using Yummly API" Web Application comes from my urge to learn technologies like ASP.NET with MVC, jQuery, AJAX and RESTful web services. A Web service is a service offered by an electronic device to another electronic device, communicating with each other via the World Wide Web. REST-compliant (Representation of State Transfer) Web services is one of the two identified major classes of Web services, in which the primary purpose of the service is to manipulate representations of Web resources using a uniform set of stateless operations. Also my interest to learn the implementation of OAuth to log users into this application. OAuth is an open standard for authorization, commonly used as a way for Internet users to log into third party websites using their Microsoft, Google, Facebook etc. accounts without exposing their password. In this web application web pages are created using ASP.NET 4.6 implemented in MVC 5 architecture, jQuery is used for client side scripting and also for creating rich and interactive user interface. Bootstrap 2.0 is used for creating responsive user interface and styling the web pages. This web application will communicate with other web API using RESTful web services to pull data from it. C# and JavaScript languages are used for building the business logic of the application. SQL server 2014 is used for database designing and Entity Framework 6 which is an object relational model (ORM) tool is used to connect the

application with database. Advanced technologies are used in building this web application thus making this application more effective. MVC 5 architecture is implemented i.e. model, view and controller layers are separated and independent of each other which increases the application performance in terms of speed, and also changes can be made in any layer without disturbing other layers. Another motivation is to develop a powerful recipe search engine that will aptly search for the results the users are intending and display the obtained Also provide required filters to filter out the search results and sorting options to sort the results according to users' interest. Thus, using the latest technologies to develop a powerful search engine and get familiar with the web services are the main motivation for the project.

1. 2 PROJECT OVERVIEW

This web application is central information hub for the kitchen—connecting consumers with recipe ideas, ingredient lists, and cooking instructions. Nowadays people rely on web for any kind of information. So by building a web application we can serve users who are looking for recipe ideas and instructions, list of ingredients for that recipe on the web. The different functionalities available for the users in this application are as following. Users can search for their favourite dishes. The search results contain information about ingredients required, total time needed for cooking, user's rating and cooking directions. Basic search filters are provided to filter out the search results like Breakfast, Lunch and Dinner recipes. The order of displayed results can be sorted according to ratings, total time required to prepare the dish. User can create an account and build their own favourite recipe collection by liking the recipes displayed. The liked recipes are stored into user's account and user can view, add and delete those recipes anytime from his recipe collection. Users can use their social networking platform Facebook account credentials to log into this application or create a new account in this application. The application will communicate with the Yummly API[1] to consume the data from it. The Yummly API is largest recipe information aggregator with over one million recipes data in it.

1.3 PROBLEM WITH EXISTING SYSTEM

The purpose of creating this Web Application is to outcast the discrepancies in hundreds of such existing systems on the World Wide Web. The various existing systems for recipe search and their disadvantages are discussed below.

- **Internet search engines:**
  One of the existing systems is Internet search engines like google, bing etc. If user wants to search for their favorite recipe, user will go to web, say google, and search for his recipe in his mind. The search results may redirect user to any other food blog website or any video casting site. But in that website all the information required like list of ingredients, cooking instructions, nutritional data and several other information may or may not be available at one place. Moreover you have to go through too many results to choose which result suits you best. This system involves more time and analysis which is a tedious task thus not ideal for many users.
- **Food Blogs:**
  Another existing system is Food blogs and channels on video sharing sites like YouTube. There are many food blogs which provide lot of information about recipes but the disadvantages with this kind of blogs is most of the times they don't support multi cuisine recipes. Most often they belong to one region which is a disadvantage most of the times. Personally I follow few YouTube channels and one among those is which contains interesting videos on how to cook various Indian dishes but if I want to cook some Mexican food I have to google it and follow some other blogs or video hosting sites. In this case of existing system, food blogs are mostly confined to one or two types of cuisine which is a disadvantage for users looking for multi cuisine. For better understanding of the disadvantages of existing system consider a regular scenario, I went for shopping groceries and I'm planning to cook some new dish and I don't know what ingredients are required and of what quantity are required. So I have to search on the web and I might be provided with numerous options throwing me into dilemma which one to rely and if it is video I have to manually jot down the ingredients or remember those list of ingredients which is not at all an ideal thing to do. These all are big drawbacks of existing system and this application is capable of addressing all these issues in an efficient way providing an

ideal platform to search for any food recipe and get all the 7required information such as ingredients, nutritional data, cooking instructions. This application supports all multi cuisine thus serving wide range of people.

1.4 BENEFITS

- **Convenience:** Users can quickly find recipes based on various criteria such as ingredients, cuisine type, dietary restrictions, or cooking time, saving them time and effort in meal planning.

- **Variety**: Recipe finder apps typically offer a vast database of recipes from various sources, ensuring users have access to a wide range of dishes to suit different tastes and preferences.

- **Inspiration:** These apps can inspire users to try new ingredients, cuisines, or cooking techniques they may not have considered before, fostering culinary creativity and experimentation.

- **Healthier Eating:** Many recipe finder apps allow users to filter recipes based on dietary preferences or restrictions, helping them make healthier choices that align with their nutritional goals.

- **Customization:** Users can often customize recipes based on serving size, adjust ingredient quantities, or substitute ingredients to accommodate personal preferences or dietary needs.

- **Learning Opportunities**: Recipe finder apps may offer cooking tips, step-by-step instructions, and tutorial videos to help users improve their culinary skills and confidence in the kitchen.

- **Accessibility**: Recipe finder apps are often available on multiple platforms, including smartphones, tablets, and computers, making it easy for users to access recipes anytime, anywhere.

CHAPTER 2

SYSTEM ANALYSIS

2.1 REQUIREMENT ANALYSIS

2.1.1 PROBLEM DEFINITION

A recipe finder application is a digital tool designed to assist users in discovering, organizing, and accessing culinary instructions. It streamlines the process of searching for recipes by allowing users to input various criteria such as ingredients, dietary restrictions, cuisine type, and cooking time. The application retrieves relevant recipes from its database or the internet, presenting them in an easily accessible format. Users can browse through recipes, view detailed ingredient lists and cooking instructions, and often access user-generated reviews and ratings. Additionally, some recipe finder apps offer features like meal planning, grocery list generation, and personalized recommendations based on user preferences. By leveraging technology to simplify the search for culinary inspiration and guidance, these applications aim to enhance cooking experiences, promote healthier eating habits, and facilitate diverse culinary exploration for users of all skill levels.

2.1.2 PERFORMANCE REQUIREMENT

The following performance characteristics should be taken care of while developing the system:

- **Performance:**
  Response Time: The application should respond to user queries within 2 seconds, even under peak load conditions.

Scalability: The system should be able to handle an increasing number of users without significant degradation in performance.
Throughput: The system should support at least 1000 concurrent users at any given time.

- **Usability:**

Intuitiveness: The user interface should be intuitive and easy to navigate, even for users with minimal technical expertise.
Accessibility: The application should comply with accessibility standards to ensure usability for users with disabilities.
Multi-platform Support: The application should be accessible across various devices and platforms, including web browsers, mobile devices, and tablets.

- **Reliability:**

Availability: The system should be available 99.9% of the time, excluding scheduled maintenance windows.
Fault Tolerance: The application should gracefully handle errors and failures without losing user data or functionality.
Backup and Recovery: Regular backups of the recipe database should be performed, and there should be a mechanism in place for quick recovery in case of data loss.

- **Compatibility:**

Browser Compatibility: The application should be compatible with major web browsers such as Chrome, Firefox, Safari, and Edge.
Operating System Compatibility: The mobile application version should support popular operating systems like iOS and Android.
Integration Compatibility: The application should integrate seamlessly with other services or APIs used for features like social sharing or ingredient ordering.

- **Maintainability:**

Modularity: The codebase should be modular and well-structured, making it easier to maintain and extend.
Documentation: Comprehensive documentation should be provided for developers and administrators, covering installation, configuration, and troubleshooting procedures.

2.1.3 FUNCTIONAL REQUIREMENT

- **Search Functionality**: The application should allow users to search for recipes based on various criteria such as ingredients, cuisine, dietary restrictions, cooking time, and difficulty level.

- **Filtering Options:** Users should be able to filter search results based on preferences like vegetarian, vegan, gluten-free, dairy-free, nut-free, etc.

- **Recipe Details**: Each recipe should display detailed information including ingredients, cooking instructions, preparation time, servings, nutritional information, and user ratings.

- **Save or Bookmark**: Users should be able to save or bookmark their favourite recipes for future reference.

- **Personalization:** The application could provide personalized recipe recommendations based on user preferences, browsing history, and saved recipes.

- **User Profiles**: Users should have the option to create profiles where they can manage their saved recipes, preferences, dietary restrictions, and other settings.

- **Social Sharing:** Users should be able to share recipes with friends and family through social media platforms or email.

2.2 FEASIBLITY STUDY

2.2.1 Technical feasibility

Recipe Finder application is technically feasible by leveraging various technologies such as web scraping, natural language processing (NLP), and machine learning algorithms. Web scraping can extract recipe data from various online sources, while NLP can analyse and understand user queries to accurately match them with relevant recipes. Machine learning can enhance the application's recommendation system by learning user preferences over time. Additionally, cloud computing infrastructure can support the scalability and reliability of the application, ensuring smooth performance even with a large user base. Overall, with the right technological implementation, a Recipe Finder application is indeed technically feasible.

2.2.2 Operational feasibility

A recipe finder application has strong operational feasibility due to its straightforward functionality and widespread demand. The application can utilize existing databases of recipes, leveraging APIs from various cooking websites or user-generated content platforms. Implementation costs are relatively low, as the infrastructure required for hosting and maintenance is minimal. Additionally, the application's user interface can be designed for ease of use, allowing users to search for recipes based on ingredients, cuisine, dietary restrictions, or cooking time. Overall, the operational feasibility of a recipe finder application is high, making it a viable and practical solution for culinary enthusiasts.

2.2.3 Economical feasibility

A recipe finder application can be economically feasible due to several factors. Firstly, it can attract a large

user base, offering value through convenience and variety in culinary options. Revenue streams can be generated through advertisements, premium subscription models offering advanced features or ad-free experiences, and partnerships with grocery delivery services. Additionally, data analytics can be leveraged to personalize content and targeted marketing, enhancing user engagement and potential for monetization. With relatively low development and maintenance costs compared to physical products, a well-executed recipe finder app has the potential for significant profitability and sustainability in the digital marketplace.

CHAPTER 3

SYSTEM DESIGN

Designing is the most important phase of software development. It requires a careful planning and thinking on the part of the system designer. Designing software means to plan how the various parts of the software are going to achieve the desired goal. It should be done with utmost care because if the phase contains any error, then that will affect the performance of the system, as a result it may take more processing time, more response time, extra coding workload etc.

Software design sits at the technical kernel of the software engineering process and is applied regardless of the software process model that is used. After the software requirements have been analyse and specified, software design is the first of the three technical activities Designing, Coding and Testing that are required to build and verify the software. Each activity transforms information in such a manner that ultimately results in validated computer software.

3.1 DESIGN GOAL

The recipe finder application aims to provide users with an intuitive, efficient, and personalized experience in discovering recipes. Its design prioritizes simplicity, ensuring ease of navigation and usage for users of all technical backgrounds. The application emphasizes accuracy, delivering relevant and diverse recipe suggestions tailored to individual preferences, dietary restrictions, and available ingredients. Integration of user feedback mechanisms facilitates continuous improvement and enhances user satisfaction. Additionally, the application prioritizes responsiveness, delivering quick search results and seamless performance across various devices and platforms. Ultimately, the goal is to inspire culinary exploration and empower users to effortlessly create delicious meals.

3.2 USE CASE DIAGRAM

A use case diagram depicts the application from an external observer perspective. Use case diagram identifies the agents of the system and the functions that these agents perform with the system. In this application only one agent or actor is identified i.e. user who interacts with application and performs various tasks. These various actions are depicted in the below use case diagram.

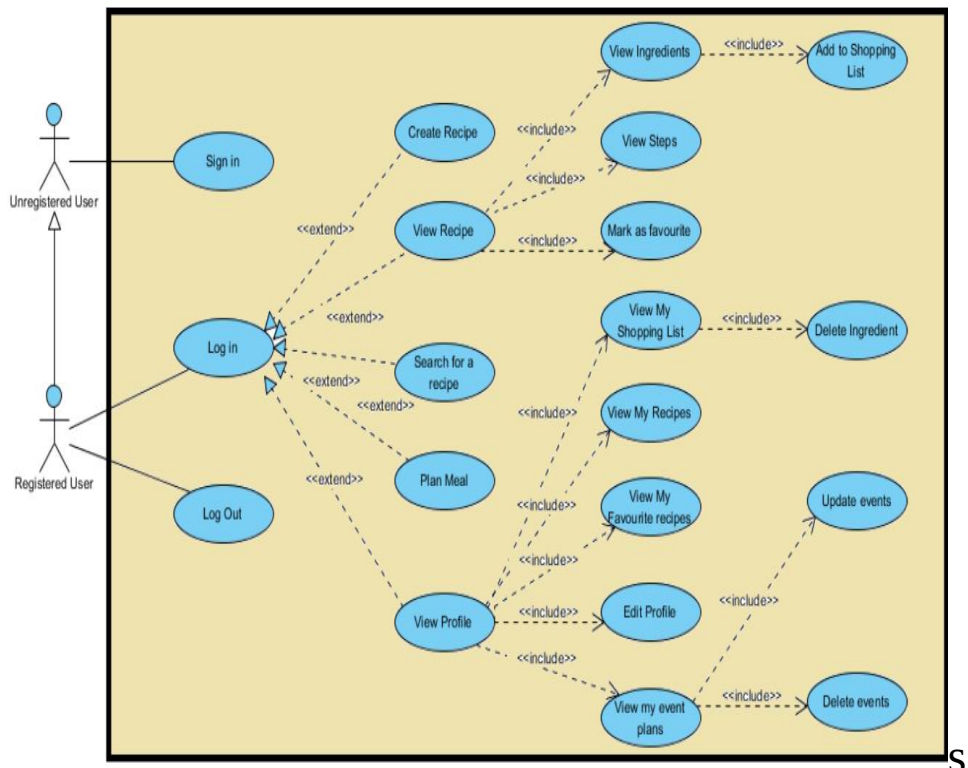

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Fig 3.2 Use Case Diagram

3.3 CLASS DIAGRAM

In UML, class diagram is a static structure diagram which describes the structure of a system by showing the classes, attributes and their relationships. It is the main building block in object oriented model. The classes represent the structure or framework for the main objects and interactions in the application. The class diagram consists of classes represented in boxes which contain three parts. The name of the class is contained in the upper part, with the attributes of classes in the middle part and the bottom part contains the methods or operations that the classes undertake. The following figure shows the class diagram of the application.

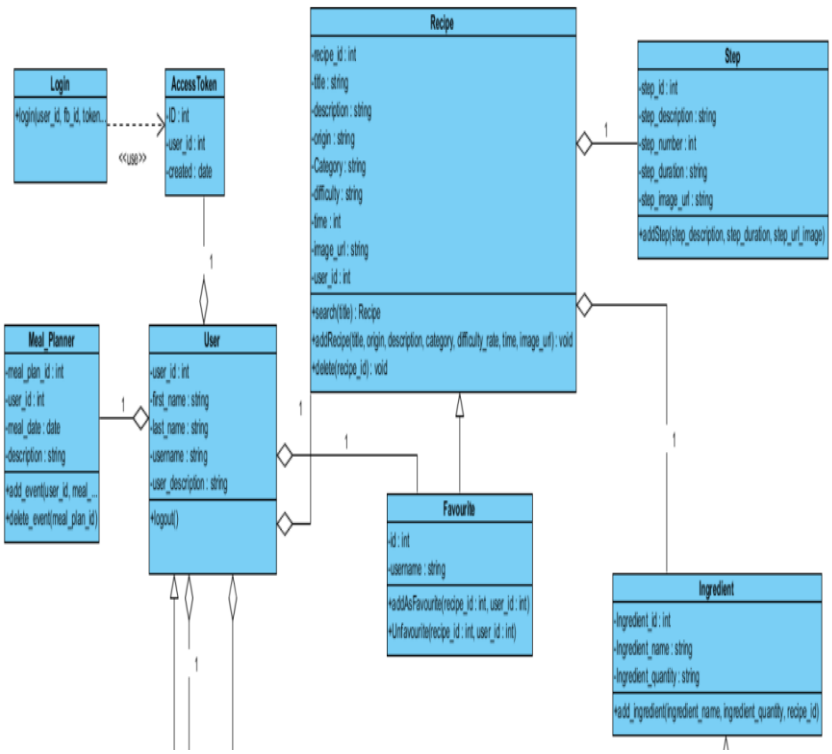

Fig 3.3 Class Diagram

3.4 DATABASE DESIGN

The Microsoft ADO.NET Entity Framework is an Object/Relational Mapping (ORM) framework that enables developers to work with relational data as domain-specific objects, eliminating the need for most of the data access plumbing code that developers usually need to write. Using the Entity Framework, developers issue queries using LINQ, then retrieve and manipulate data as strongly typed objects. The Entity Framework's ORM implementation provides services like change tracking, identity resolution, lazy loading, and query translation so that developers can focus on their application-specific business logic rather than the data access fundamentals.

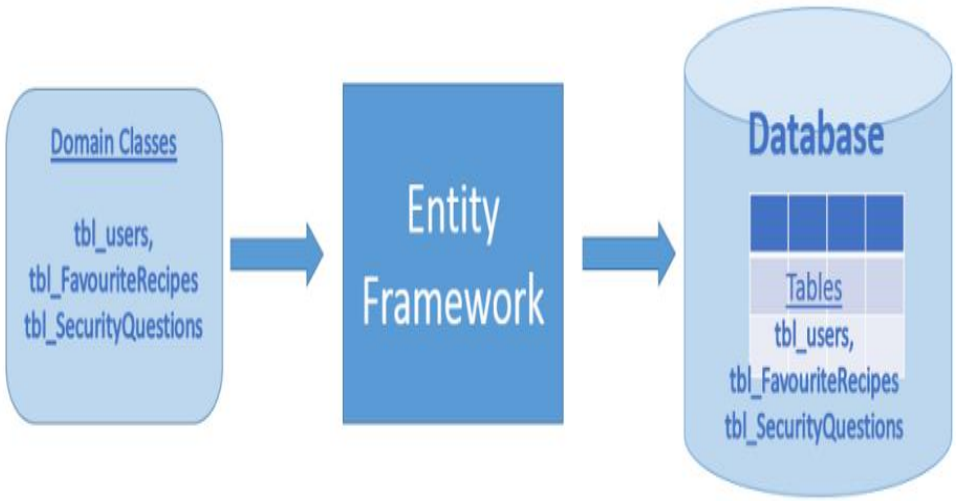

Fig 3.4 Database Design

3.5 FLOW CHART OF THE SYSTEM

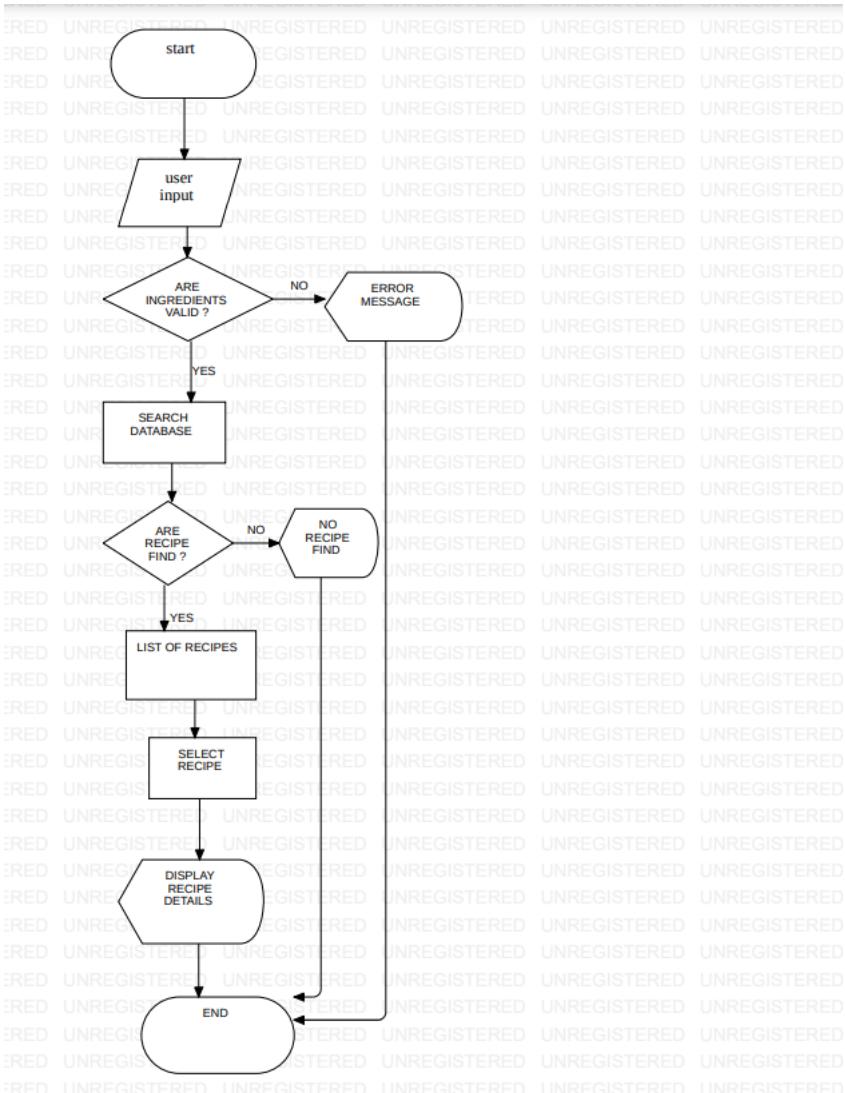

Fig 3.5 Flowchart

3.6 ACTIVITY DIAGRAM

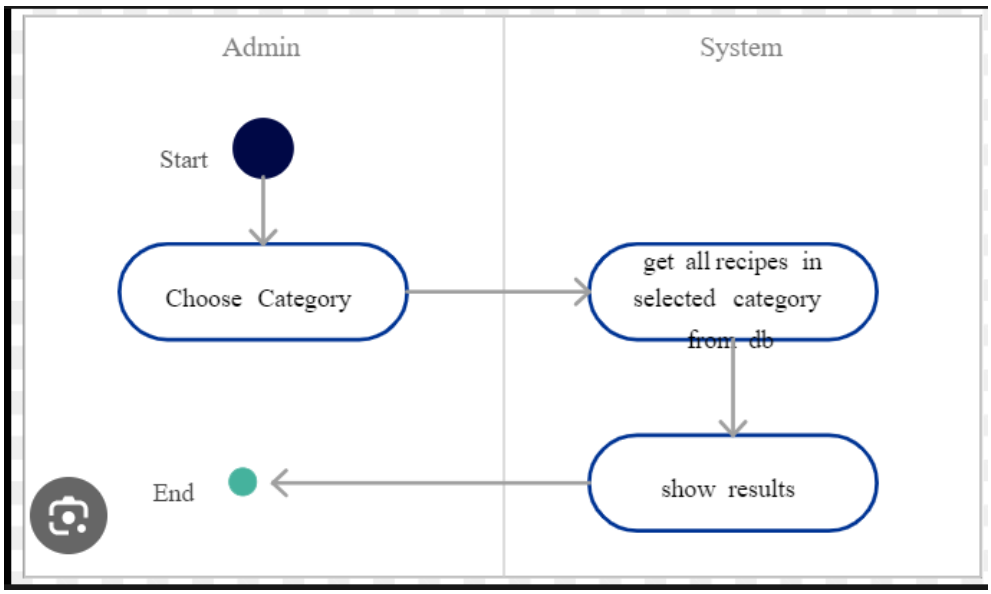

Fig 3.6 Activity Diagram

CHAPTER 4

APPLICATION MODULES

The application has four major functionalities in this application. They are browsing all the favourite recipes, filtering and displaying the recipe based ingredients selected by the user, displaying all the recipes and adding a

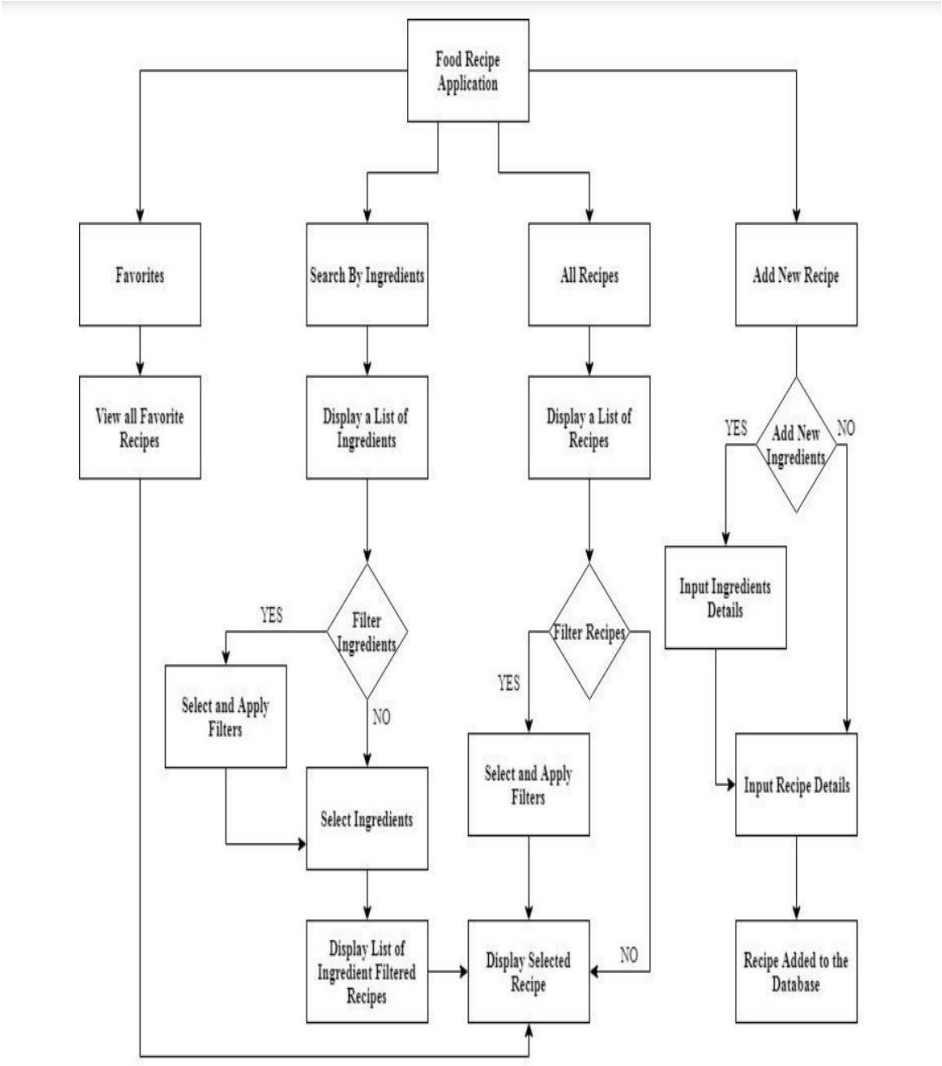

Fig 4 Application Modules

4.1 HOME PAGE

The home page of an application typically serves as the main or starting point for users. It provides an overview of the application's features, navigation options, and often includes important information or actions.

- **Navigation Menu or Bar:** A menu or bar that allows users to easily navigate to different sections or features of the application.
- **Featured Content:** Highlighted or featured content that may include promotions, important announcements, or popular features.
- **Search Bar:** If applicable, a search bar for users to quickly find specific content or products.
- **Footer:** Information such as contact details, terms of service, privacy policy, and links to other important pages may be included in the footer.
- **Social Media Links:** Links to the application's social media profiles for users to stay connected and engaged.
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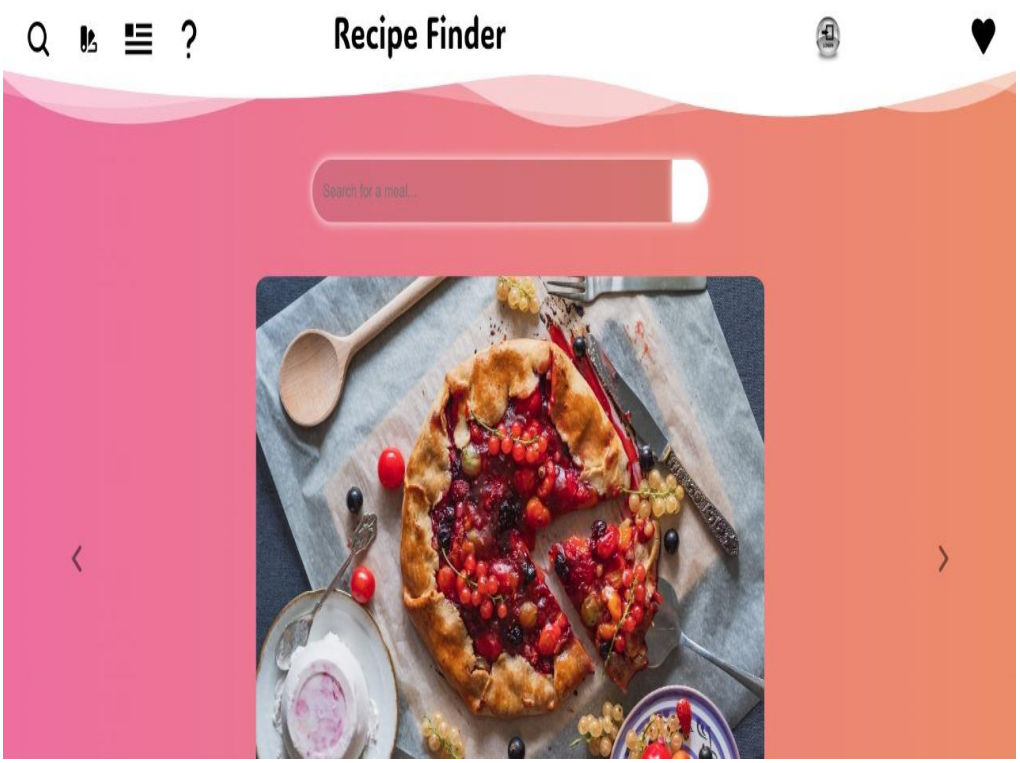

Fig 4.1 Home Page

4.2 FAVOURITE PAGE

The favourite's page displays all the recipes that have been favourited by the user. The user can directly select and view the favourite recipes from the favourite's page. The user can also favourite and un-favourite a recipe in this page.

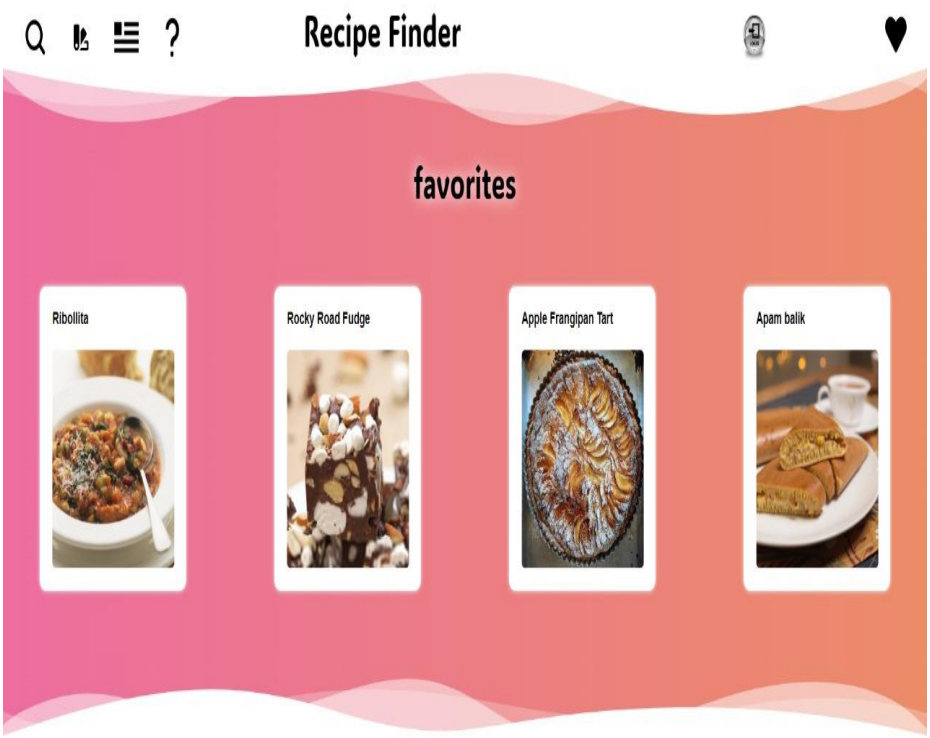

Fig 4.2 Favourite Page

4.3 CUISINE PAGE

Similar to the courses page, in this page the user can get the list of recipes based on the cuisine of different countries provided. These include, American, Italian, Mexican, and Middle Eastern. Again, adding new cuisine choices can be done very easily.

Fig 4.3 Cuisine Page

4.4 Food Categories page

This page displays various kind of recipes of different categories .these categories include desert ,pasta , different meat recipes including lamp ,pork, beef and chicken , and sea food recipes .

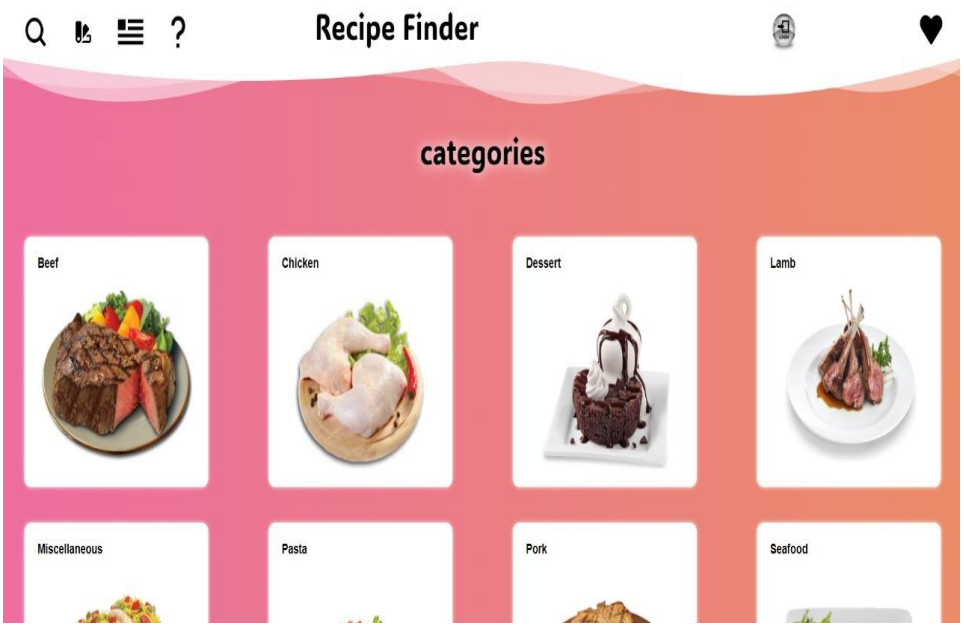

Fig 4.4 Food Categories Page

CHAPTER 5

TESTING

Software testing is a critical element of the ultimate review of specification design and coding. Testing of software leads to the uncovering of errors in the software functional and performance requirements are met. Testing also providesa good indication of software reliability and software quality as a whole. The result of different phases of testing are evaluated and then compared with the expected results. If the errors are uncovered, they are debugged and corrected. A strategy approach to software testing has the generic characteristics:

- Testing begins at the module level and works "outwards" towards theintegration of the entire computer-based system.
- Different testing techniques are appropriate at different points of time.
- Testing and debugging are different activities, but debugging must beaccommodated in the testing strategy

5.1 UNIT TESTING

The module interface is tested to ensure that information properly flowsinto and out of the program unit under test. The unit testing is normally considered as an adjunct step to coding step. Because modules are not astandalone program, drivers and/or stubs software must be developed for each unit. A driver is nothing more than a "main program" that accepts test cases data and passes it to the module. A stub serves to replace the modules that are subordinate to the modules to be tested. A stub may do minimal data manipulation, prints verification of entry andreturns.

Approaches used for Unit Testing were:

Functional Test: Each part of the code was tested individually and thepanels were tested individually on all platforms to see if they are working properly.

Performance Test: These determined the amount of execution time

spent on various parts of units and the resulting throughput, response time given by the module

Stress Test: A lot of test files were made to work at the same time inorder to check how much workloads can the unit bear.

Structure Test: These tests were made to check the internal logic of theprogram and traversing particular execution paths.

5.2 INTEGRATION TESTING

If they all work individually, they should work when we put them together. The problem of course is "putting them together". This can bedone in two ways:

Top-down integration: Modules are integrated by moving downwards through the control hierarchy, beginning with main control module areincorporated into the structure in either a depth first or breadth first manner.

Bottom-up integration: It begins with construction and testing with atomic modules i.e. modules at the lowest level of the program structure. Because modules are integrated from the bottom up, processing required for the modules subordinate to a given level is always available and the need of stubs is eliminated.

Testing includes Verification and Validation

Verification:-is a process of confirming that software meets its specification.

Validation :- is the process of confirming that software meets the customer's requirements.

5.3 SYSTEM TESTING

System testing is a type of software testing that evaluates the overall functionality and performance of a complete and fully integrated software solution. It tests if the system meets the specified requirementsand if it is suitable for delivery to the end-users. This type of testing is performed after the integration testing and before the acceptance testing.

System Testing is a type of software testing that is performed on a complete integrated system to evaluate the compliance of the system with the corresponding requirements. In system testing, integration testing passed components are taken as input. The goal of integration testing is to detect any irregularity between the units that are integratedtogether. System testing detects defects within both the integrated unitsand the whole system. The result of system testing is the observed behaviour of a component or a system when it is tested.

System Testing Process:

System Testing is performed in the following steps:

- Test Environment Setup: Create testing environment for thebetter quality testing.
- Create Test Case: Generate test case for the testing process.
- Create Test Data: Generate the data that is to be tested.
- Execute Test Case: After the generation of the test case and thetest data, test cases are executed.
- Defect Reporting: Defects in the system are detected.
- Regression Testing: It is carried out to test the side effects of thetesting process.
- Log Defects: Defects are fixed in this step.
- Retest: If the test is not successful then again test is performed.

5.4 ACCEPTANCE TESTING

It is formal testing according to user needs, requirements, and businessprocesses conducted to determine whether a system satisfies the acceptance criteria or not and to enable the users, customers, or other authorized entities to determine whether to accept the system or not.

Acceptance Testing is the last phase of software testing performed afterSystem Testing and before making the system available for actual use.

5.5 DEBUGGING

Debugging occurs as a consequence of successful testing i.e. when atest case uncovers an error, debugging is the process that results in identifying the location of error an d the removal of error. The poorly understood mental process that connects a symptom to cause is debugging. This process will always have one of the two outcomes.

- The cause will be found, corrected and then removed or
- The cause will not be found. In the latter case the person performing debugging may suspect a cause, design a test case tohelp validate his suspicion, and then work towards the correction of errors in the interactive fashion.

Following three approaches of debugging were used:

- Debugging by Induction
- Debugging by Deduction
- Backtracking

BIBLIOGRAPHY

The recipe finder application offers a comprehensive solution for individuals seeking culinary inspiration and guidance. By harnessing the power of technology, it simplifies the daunting task of meal planning and recipe selection. Through a user-friendly interface, users can effortlessly explore a vast database of recipes tailored to their preferences, dietary restrictions, and available ingredients.

This application revolutionizes the way people approach cooking by providing personalized recommendations and suggestions, thereby enhancing their culinary experiences. Its intuitive search functionality allows users to easily discover new dishes, explore diverse cuisines, and experiment with different cooking techniques. Whether users are novice cooks or seasoned chefs, the recipe finder application serves as a valuable tool for expanding their culinary repertoire and honing their skills in the kitchen.

Furthermore, the application fosters a sense of community by enabling users to share their own recipes, tips, and culinary experiences with others. This collaborative aspect enhances engagement and encourages a culture of learning and creativity among users. Overall, the recipe finder application not only simplifies the process of meal planning but also inspires a deeper appreciation for food and cooking, enriching the lives of individuals and fostering a vibrant culinary community.

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