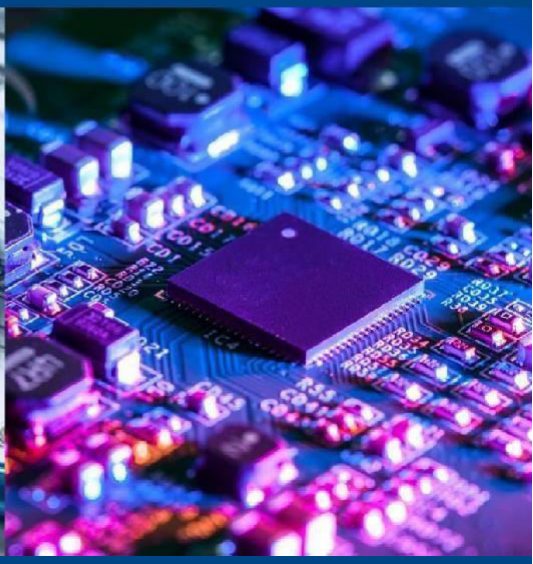
ISSN: 2582-7219





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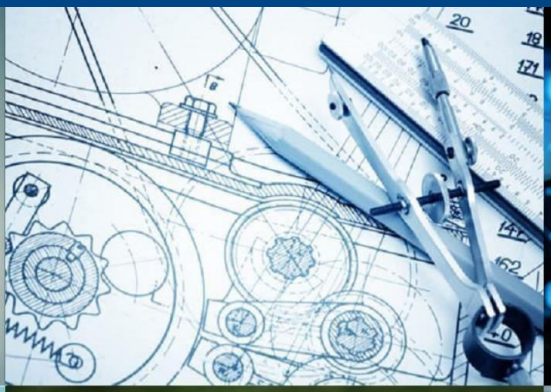

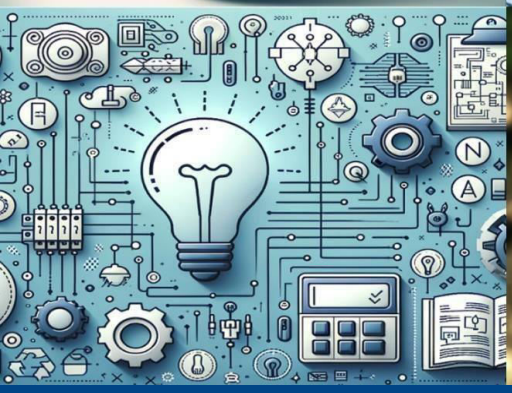

Impact Factor: 8.206

Volume 8, Issue 8, August 2025

© 2025 IJMRSET | Volume 8, Issue 8, August 2025| DOI:10.15680/IJMRSET.2025.0808104

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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RECIPEGURU: A COMMUNITY-POWERED WEB PLATFORM FOR CENTRALIZED SHARING AND MANAGEMENT OF CULINARY RECIPES

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ABSTRACT: The growing demand for quick access to diverse culinary resources has driven the development of digital recipe management systems. RecipeGuru is a community-driven web platform designed to bring together a wide variety of recipes in one easy-to-use space. Users can browse, search, and filter recipes by meal type, popularity, preparation time, or dietary preferences. Registered members can contribute their own recipes with step-by-step instructions, ingredient lists, and multimedia support. Integrated video tutorials and detailed preparation guides enhance the cooking experience for both beginners and experts. Built using HTML, CSS, PHP, JavaScript, and MySQL, the platform features separate user and admin modules for secure interactions and efficient content management. By offering organized, always-available, and interactive access, RecipeGuru overcomes the limitations of traditional cookbooks, TV shows, and unstructured online searches. It fosters knowledge sharing, engagement, and a sense of community within the online culinary world. The system's conception, design, implementation, methodology, and possible uses in promoting an inclusive and cooperative cooking ecosystem are all covered in this paper.

KEYWORDS: Recipe Management, Web Application, Community Sharing, Culinary Platform, PHP, MySQL.

I. INTRODUCTION

The way people access, share, and manage information has changed dramatically as a result of the internet's and web technologies' explosive growth. This change in the culinary industry has resulted in the rise of online resources that offer simple access to meal preparation instructions, cooking advice, and recipes. For learning and trying out new recipes, people have historically relied on printed cookbooks, handwritten notes, and television cooking programs. Despite their value, these approaches have some significant drawbacks, including limited accessibility, time-bound availability, and a lack of customized search options. Furthermore, users are frequently overwhelmed by the volume of unstructured culinary content available online, making it challenging to find accurate and trustworthy recipe information. RecipeGuru is a community-driven, centralized recipe management platform that combines a variety of culinary resources in an organized, interactive setting in response to these issues. The system's main goal is to provide a comprehensive digital repository where users can easily access and share recipes that are enhanced with ingredient lists, cooking times, multimedia support, and detailed instructions. No matter their level of experience, cooking enthusiasts can collaborate, be creative, and share knowledge thanks to the platform's integration of community participation.

RecipeGuru's importance stems from both its function as an online recipe database and its capacity to create a vibrant, cooperative culinary community. By guaranteeing real-time accessibility, user-friendly navigation, and a systematic approach to recipe discovery, the platform fills in the gaps in current systems. Additionally, it can be easily integrated with new technologies in the future, including voice-activated cooking instructions, AI-powered recipe recommendations, and dietary preference-based personalization. This paper presents the conceptual framework, literature background, system architecture, methodology, design, implementation, and evaluation of the *RecipeGuru* web application. It also highlights the advantages of community-driven content sharing in enhancing user engagement and contributing to the growth of digital culinary ecosystems.

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II. LITERATURE SURVEY

Over the past ten years, the expansion of online communities, the need for easily accessible cooking resources, and the development of online recipe management systems and culinary content platforms have all attracted a lot of attention. From static databases to interactive, user-driven ecosystems, a number of researchers and developers have investigated different strategies for creating recipe-based platforms.

Smith et al. (2017) looked at the drawbacks of conventional recipe discovery techniques, emphasizing that although educational, cookbooks and TV series frequently lack flexibility, personalization, and instant access. They highlighted how web-based solutions can offer dynamic content that can be updated often and customized to meet the needs of users. The groundwork for creating systems that emphasize accessibility and interactivity was established by this work.
A web-based recipe recommendation system with user ratings and preference tracking was created by Johnson and Patel (2018). Their method made recipe recommendations based on comparable user profiles by using collaborative filtering techniques. In contrast to traditional search-only interfaces, the study showed that personalized recommendations could greatly increase user satisfaction and engagement.

In a different study, Lee et al. (2019) suggested a recipe platform with multimedia enhancements that included textual instructions and instructional videos. According to their findings, adding multimedia content enhanced recipe comprehension, especially for inexperienced cooks. This is consistent with RecipeGuru's design decision to incorporate video tutorials to improve user education.

Projects like Allrecipes.com and Tasty, where user-generated content adds to the variety and genuineness of available recipes, have also examined the function of community-driven platforms. In their 2020 study, Kumar and Singh examined how user contributions affect content richness and came to the conclusion that community involvement encourages user trust, creativity, and a sense of ownership. The RecipeGuru model, which enables users to add, modify, and share recipes within the platform, was directly impacted by these insights.

The incorporation of artificial intelligence into recipe management systems has also been investigated in recent developments. An AI-assisted meal planner that produced recipe recommendations based on dietary needs and ingredient availability was presented by Gupta et al. in 2021. Despite not implementing AI-based recommendations at this time, RecipeGuru's modular architecture permits the addition of such features in the future.

In conclusion, earlier studies highlight the significance of community involvement, multimedia integration, accessibility, and personalization in recipe management systems. By providing a structured, community-driven, and interactive platform, RecipeGuru expands on these ideas, resolving current issues and setting the stage for future improvements.

EXISTING SYSTEM

Printed cookbooks, handwritten notes, and television cooking shows are the mainstays of traditional recipe discovery techniques. Although these resources offer useful culinary information, they are frequently limited in a number of ways. It takes a lot of time to find specific recipes in printed cookbooks because they must be manually browsed and have few search options. Even though they are visually appealing, television cooking programs follow set schedules and don't let viewers go back and change the content whenever they want.

Additionally, while there are many websites and blogs that offer recipes, their unstructured content can result in information overload, making it difficult for users to find trustworthy and pertinent instructions. A less interesting learning experience is produced by the fact that many of these platforms lack sophisticated filtering options, multimedia support, and interactive features. Furthermore, the majority of current systems do not successfully integrate community-driven content sharing, which restricts the variety and genuineness of recipes that are accessible.

PROPOSED SYSTEM

RecipeGuru is a centralized, community-driven recipe management platform that aims to solve the drawbacks of current systems. A vast database of culinary recipes is available through the system, which is arranged according to meal type, popularity, preparation time, and dietary requirements. Advanced parameters allow users to search and filter recipes, guaranteeing a focused and effective discovery of the dishes they want. Because of the platform's support for

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multimedia integration, recipe developers can include step-by-step text instructions, images, and instructional videos. This improves understanding, especially for users who haven't cooked much. In order to promote cooperation and a variety of content, the community participation model allows registered users to post their own recipes, edit already-existing entries, offer comments, and participate in discussions. From an administrative standpoint, the system has an Admin Module that makes it possible to manage users, moderate content, and maintain the platform, guaranteeing the dependability and quality of recipes that are published.

III. SYSTEM ARCHITECTURE

Layers for data management, application logic, and presentation are separated in the RecipeGuru system's modular, multi-tier architecture. This method preserves a distinct division of responsibilities while guaranteeing scalability, maintainability, and effective handling of user requests.

1.Front-end presentation layer
The presentation layer is in charge of communicating with end users via an intuitive and responsive web interface. It was created with HTML, CSS, and JavaScript and offers features like browsing recipes, filtering, viewing, and submitting content. Additionally, it incorporates multimedia elements, allowing users to view pictures and educational videos right within the interface.

2.Application Layer (Back-End)
The platform's main logic is implemented in PHP at the application layer. In order to retrieve or update data, it interacts with the database, processes user requests, and applies business rules. In order to maintain the separation of administrative and user functionalities, this layer also controls that are role-based access control, session handling, and authentication.

3.Layer of Databases
MySQL is used by the database layer to store and retrieve structured data. User profiles, recipes, categories, favourites, comments, and feedback are all kept up to date in its tables. To improve the speed and effectiveness of search operations, indexing and optimized queries are used.

4.Modules
The admin module gives administrators the ability to view feedback, moderate content, manage user accounts, and respond to reported issues. Registered users can add, edit, remove, and search recipes using the User Module. They can also mark recipes as favourites, leave comments, and participate in community discussions.

5.Overview of Workflow
When a user makes a request, like looking for a recipe, it is routed from the presentation layer to the application layer, where the specified logic is applied. After being retrieved from the database layer, pertinent data is arranged and presented back to the user interface.
Easy maintenance, scalability for future improvements, and reliable performance under a range of user loads are made possible by this layered design.

IV. METHODOLOGY

The Waterfall Software Development Life Cycle (SDLC) model, a sequential design process where progress flows through distinct, well-defined phases, was used in the creation of RecipeGuru. This model was chosen because it is well-structured, works well for projects with well-defined requirements, and is simple to track and document Analysis Requirements: Through stakeholder discussions and an analysis of the current recipe-sharing platforms, the project started by obtaining functional and non-functional requirements. User registration, recipe submission, search and filter capabilities, feedback management, multimedia integration, and administrative moderation were among the essential requirements.

Design of the System: Developing the system's high-level and low-level architecture was the main goal of the design phase.

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High-Level Design (HLD): Specified the database schema, data processing workflow, and the division of admin and user functionalities within the modular structure.

The system's data entities, relationships, and process flows were depicted in detail using Low-Level Design (LLD), which included ER diagrams, Data Flow Diagrams (DFDs), Schema diagrams, and activity diagrams.

Execution: The following technologies were used in the system's implementation
Frontend: HTML, CSS, and JavaScript to create a responsive and interactive user interface.
Backend: PHP for processing requests, managing business logic, and server-side scripting.
Database: MySQL is a database used to store and retrieve structured data, including user information, recipes, comments, and multimedia links.

Server: Apache Server for handling and hosting requests from applications.
Modularization of the application code ensured scalability and ease of maintenance.
Implementation: The application was put live on a server after it was verified. During this stage, the database was set up, the hosting environment was configured, and secure connections for user interactions were ensured.
Upkeep & Prospects: The system is kept up to date after deployment with regular updates, bug patches, and content moderation. Voice-assisted navigation, AI-based recipe recommendations, and integration with smart kitchen appliances are possible future improvements.

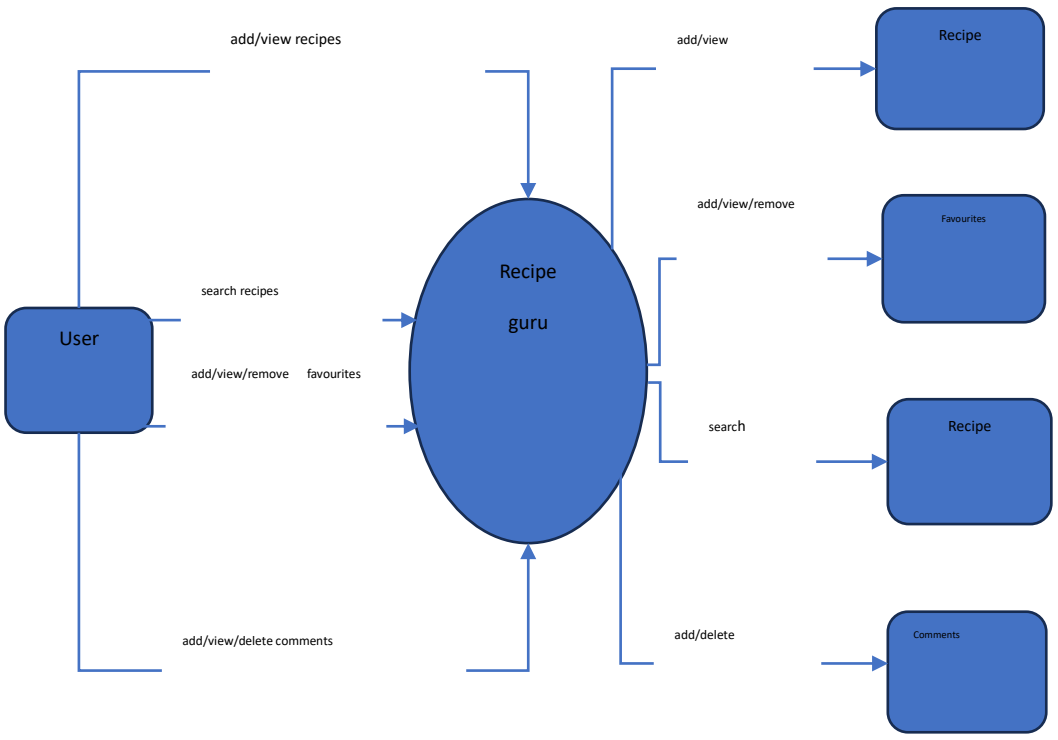

Fig.1 System Architecture

V. DESIGN AND IMPLEMENTATION

The goal of RecipeGuru's design and implementation phase was to convert the system's conceptual framework into a useful and intuitive web application. To guarantee scalability, maintainability, and user-friendliness, this require developing user-friendly interfaces, organized databases, and modular application logic. Design of User Interfaces: The user interface (UI) was intended to be easy to use, aesthetically pleasing, and compatible with a variety of devices. Among the important design factors.

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Navigation: Easy access to the main sections, including Home, Recipes, Categories, and User Profile, is made possible by a clear and consistent navigation bar.

Responsive UI: Using CSS media queries to guarantee the best possible viewing experience on PCs, tablets, and mobile devices is known as responsive layout.

Visual Hierarchy: To improve user engagement, place a strong emphasis on descriptive headings, well-organized recipe details, and excellent food imagery.

Accessibility: Using font sizes, colour contrast, and alternative text for images in a way that is appropriate for all users.

Design of Modules: There are two main modules in the application, each with distinct functions:
Admin Module User Management: Manage, view, and approve user accounts.

Recipe Moderation: To guarantee high-quality content, check, revise, or remove submitted recipes.

Review of User Feedback: Examine user comments and reply as needed.

System maintenance: Includes monitoring database performance, managing server resources, and handling security updates.

User Module Registration and Login: New and returning users can use this secure authentication system.
Recipe Management: View, edit, remove, and add your own recipes. Search and Filters: Detailed search by dietary restrictions, recipe type, or popularity.

Favourites and Comments: Use comments to communicate with other users and save favourite recipes for easy access.
Feedback Submission: Inform administrators of problems or offer recommendations.

Design of Databases: In order to prevent redundancy and guarantee effective data retrieval, the database was designed using MySQL and a normalized schema.

Important tables consist of:
Users Table: Holds contact details, access roles, and account information.
Recipes Table: Includes category, duration, ingredients, preparation instructions, metadata, and multimedia links.
Feedback Table: Keeps track of timestamps, ratings, and user feedback messages.
Comments Table: Holds user-generated remarks related to particular recipes.
Favourite's Table: Keeps track of user-saved recipes for later use.
To maintain referential integrity, primary and foreign keys were used to define the relationships between these tables.
Specifics of Implementation: The following methods were used to implement the system.
Frontend: JavaScript, HTML, and CSS for responsive and interactive user interfaces.
Backend: PHP for database interaction, business logic execution, and request processing.
MySQL is the database used to store user information and structured recipes.
Server: Apache for handling requests and hosting.
Iterative coding and integration were used throughout the development process to make sure every module worked on its own before being combined into the entire system.
Safety Procedures: Authentication: Hashed passwords are kept safe to avoid unwanted access.
Validation: To reduce the risks of SQL injection and cross-site scripting (XSS), input is validated on both the client and server sides.

Access Control: Role-based permissions guarantee that administrator and user functions are kept apart.
Improvements to the User Experience: To increase user engagement and make the platform more interactive, other features like category-based browsing, trending recipe highlights, and video tutorials were added.

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VI. OUTCOMES OF RESEARCH

The creation and implementation of RecipeGuru produced a fully functional, approachable, and community-focused recipe management system. The responsive design of the platform guaranteed a consistent user experience on desktops, tablets, and smartphones, according to testing conducted on a range of devices. Compared to more conventional methods, the advanced filtering and search features greatly reduced the amount of time spent browsing by enabling users to find recipes quickly based on categories like meal type, preparation time, and popularity.

The importance of combining detailed textual instructions with multimedia content was emphasized by user feedback. Many participants reported that watching video demonstrations helped them better understand cooking methods, especially when it came to complicated dishes. This supports earlier results from related studies that demonstrated how visual aids improved recipe comprehension and learning effectiveness. Furthermore, enabling users to post their own recipes and participate in comments promoted a feeling of community and raised platform engagement levels overall.

Technically speaking, the division of the database, application, and presentation layers worked well to preserve system performance and stability. Even when retrieving massive amounts of recipe data, the MySQL database's relational schema design and indexing allowed for quick query execution. System integrity and user data were protected by security features like role-based access control, input validation, and hashed passwords.

Although the platform achieved its main goals, certain restrictions were noted. For example, the current recommendation system does not yet use machine learning to provide personalized recommendations and is restricted to category-based filters. Additionally, even though multimedia integration improved usability, future server optimization may be necessary to host high-resolution videos in order to sustain performance during periods of high usage.

VII. RESULT AND DISCUSSION

RecipeGuru's implementation produced a web application that was community-driven, interactive, and functional, and it achieved most of its stated goals. The platform continuously provided responsiveness and seamless navigation on a variety of devices, including desktops, tablets, and smartphones, during testing. With the addition of sophisticated search and filtering features, users were able to find recipes fast by meal type, popularity, preparation time, and dietary requirements. Compared to more conventional approaches like cookbooks or unstructured internet searches, where information retrieval is frequently time-consuming and less focused, this efficiency in recipe discovery represented a major improvement.

The multimedia-enhanced recipe presentations were highly appreciated, according to user evaluation sessions. Participants reported that the use of ingredient lists, instructional videos, and step-by-step textual instructions increased their understanding and confidence, particularly when making complicated dishes. These results are consistent with earlier research on multimedia learning, which highlights how visual aids can improve retention of information and the development of useful skills. Key elements that promoted community involvement and return visits were the interactive elements, which included the ability to submit recipes, mark favourites, and leave comments.

Technically speaking, stable performance and simple maintainability were made possible by the modular architecture, which divided the presentation, application, and database layers. Even as the volume of content increased, the MySQL database's indexing and normalized schema allowed for effective data storage and retrieval. Data integrity and unauthorized access were successfully maintained by security measures like role-based access control, input validation, and hashed passwords.

Nevertheless, during testing, some restrictions were noted. Although discoverability was improved by the category-based filtering system, the platform's ability to accommodate different user preferences was constrained by the absence of tailored recommendations. Similarly, even though video integration greatly enhanced the quality of instruction, hosting high-resolution videos presented difficulties for optimizing server storage and bandwidth, especially during periods of high usage. Overall, the findings show that RecipeGuru effectively connects contemporary, interactive online platforms with traditional culinary resources. The analysis of these results demonstrates the system's capacity to

provide both practical utility and community involvement, while also pointing out areas in which new technologies, like AI-powered personalization and cloud-based media hosting, could improve the user experience even more.

VIII. CONCLUSION

By offering a centralized, community-driven, and interactive culinary platform, the RecipeGuru web application effectively overcomes the drawbacks of conventional and unstructured online recipe discovery techniques. From inexperienced cooks to seasoned chefs, the system's well-structured database, sophisticated search filters, multimedia integration, and user contribution model improve accessibility and user engagement. The project shows how well collaborative features and organized content management can work together to create a thriving online culinary community. Scalability, maintainability, and secure interactions are guaranteed by its modular architecture. all of which greatly enhance the overall experience of finding and sharing recipes.

The current system accomplishes its objectives, but it also provides a strong foundation for future advancements. Some potential improvements include voice-activated cooking instructions, personalized recommendations driven by AI, and real-time assistance through connections to smart kitchen appliances. By embracing such innovations, RecipeGuru can further evolve into a comprehensive digital cooking assistant that fulfills a range of culinary needs in a society that is growing increasingly dependent on technology.

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