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Implementation of the ResepKita Application as an Innovative Platform for Creating and Sharing Food and Beverage Recipes

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Abstract - This research focuses on developing a web-based application designed to improve the management of food and beverage recipes in canteens. The application is built using PHP for the backend, MySQL for database management, and Bootstrap for a responsive user interface. The system helps canteen managers efficiently manage recipes, track inventory, and analyze menu preferences to optimize resource usage. Key features of the application include the ability to search for recipes based on ingredients, generate reports on popular and less popular menu items, and provide recommendations for stock management. The application was evaluated by testing its functionality with real-world data from canteen operations, showing its effectiveness in increasing operational efficiency and customer satisfaction. Future development will focus on integrating real-time inventory monitoring and expanding the application to support mobile devices for enhanced accessibility.

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ResepKita;
Application;
Food and Drink Recipes;
Implementation;

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1. INTRODUCTION

In today's ever-evolving digital age, information technology plays a very important role in various aspects, including the culinary world. Cooking routines and recipe sharing have transformed rapidly, making it possible for users to easily search for and share recipes through web-based applications. This easy access provides a practical solution for modern society, which often requires quick references for cooking needs.

This research aims to develop a food recipe application that not only presents a collection of recipes but also offers a personalised experience for its users. The application is designed using Laravel technology with a modular and scalable approach, enabling it to efficiently meet user needs. Some of the features offered include keyword-based recipe search, the ability for users to add recipes, and social interaction through likes, comments, and bookmarks. In addition, the application groups recipes by food or drink category to facilitate user navigation.

By applying the prototyping methodology, the application development process is carried out in stages, starting from identifying requirements, creating prototypes, to testing and implementation. This approach ensures that the application is not only designed according to technical requirements but also meets user expectations in terms of an intuitive and functional experience. Through this interactive and informative platform, it is hoped that the application can become a relevant solution in supporting the cooking activities of the community.

Through this research, a web-based recipe application has been developed that provides valuable experience, combining practical functions with a user-friendly interface design. This application is equipped with various excellent features, such as dynamic recipe search, the ability to add personal recipes, and social interaction through likes, comments, and bookmarks. Users can also explore recipes based on food or beverage categories, making it easier to find recipes according to their needs.

2. LITERATURE REVIEW

In the development of web-based applications for food and beverage menu management, previous studies have shown that the use of technology can significantly improve efficiency and accuracy in managing raw material data and customer preferences.

Related Research:

1. Design the Mobile-Based Resepku Application Interface
   This study utilised the Human Centred Design (HCD) method to design the application interface. The results showed that the HCD approach, which focused on understanding user needs, improved the user experience when accessing the recipe-based application.
2. Food Menu Determination System Based on Selected Ingredients
   Using the System Development Life Cycle (SDLC) software development cycle, this research developed a web-based and Android-based system that helps users select menus based on available ingredients. The SDLC stages used included requirements analysis, system architecture design, and application development.
3. Designing an Android-based Application for Makassar Speciality Recipes and Cakes
   This research developed an application that categorises food menus based on the ingredients used. Using a use case diagram and sequence diagram approach, this research successfully designed a system that is intuitive and easy to use for users.
4. Development of a Web-Based Cooking Recipe Application
   This study emphasises the importance of using class diagrams to define objects, methods, and attributes in application development. The developed application also includes a raw material recommendation feature that enables managers to better understand material requirements.

Literature Conclusion: The above studies indicate that the use of web-based or mobile applications can facilitate the management of recipes and food ingredients. By integrating technology and user-friendly system design, applications can assist managers in making more structured decisions. This study continues a similar approach with a focus on efficiency in canteen menu management.

3. METHODOLOGY

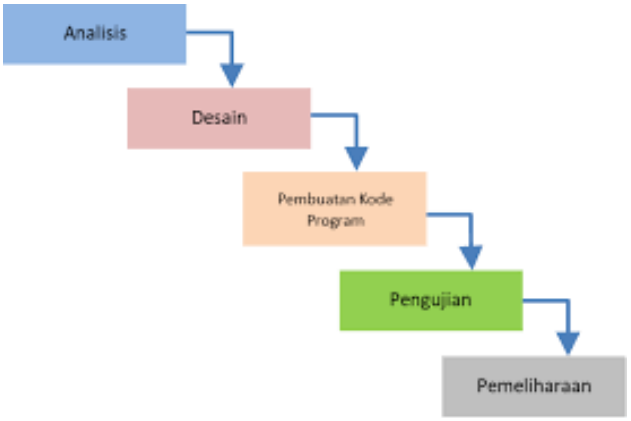
Software Development Methodology

The Waterfall software development method is a linear approach consisting of five main stages:

- *Analysis, to gather and analyse user requirements, producing a requirements specification document (SRS)*
- *Design, to design software, including architecture, interfaces, and databases*
- *Program Code Creation, where code is written according to the design*
- *Testing, to ensure that the software is free of bugs and meets requirements through various types of testing*
- *Maintenance, to fix bugs and adapt the software to changing requirements.*

The advantage of this model is its structured approach and comprehensive documentation, but it lacks flexibility in the face of change, making it less suitable for large or complex projects with dynamic requirements.

Figure 1. Waterfall Method



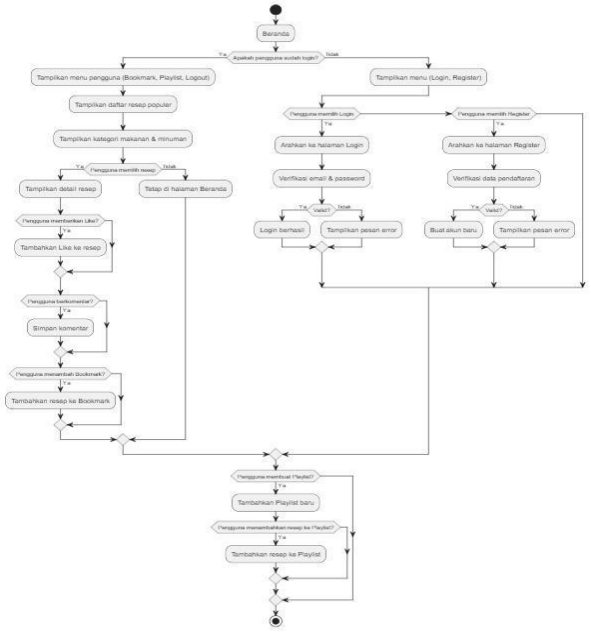
Experimental Stage

1. Determining the Theme: The first step is to choose a theme related to managing food and beverage menus in the canteen, focusing on the suitability of the menu to customer preferences, efficient management of raw materials, and reviewing menus with low purchases to reduce losses.
2. Data Collection: Collecting transaction data, including information on raw materials and menu purchase levels, to analyse customer consumption patterns.
3. Literature Study: A literature study was conducted using journals, books, and other relevant sources to understand the algorithms that support menu management, particularly clustering algorithms for analysing purchasing patterns and raw material usage.
4. System Design: Designing application workflows using UML diagrams, such as use case diagrams, activity diagrams, and class diagrams, as well as simple and user-friendly user interface (UI) designs.
5. Application Design: The application is designed to assist canteen managers in grouping raw materials using clustering algorithms. Web-based technology is utilised with PHP and the CodeIgniter framework as the backend, Bootstrap for the UI, and MySQL for the database.
6. Testing: The application is tested using the blackbox method to ensure that the system functions as required. The testing scenarios include positive and negative tests to verify features and anticipate errors. This application is

expected to assist canteen managers in managing raw materials and improving customer satisfaction.

Design Stages

Figure 2. Flowchart



4. RESULTS AND DISCUSSION

Method Implementation

1. Recipe Search Feature

Implementation Method: For the recipe search feature, the approach used is to create dynamic queries on the database to search for recipes based on keywords (recipe name, ingredients, or category).

- Algorithm: Users type keywords into the search field, which are then forwarded to the backend to be processed by an SQL query that will search for matching recipes.
- Database: The recipe table will contain columns such as id, recipe_name, ingredients, category, and steps. The SQL query will use the LIKE operator to search for recipes that match the keywords entered by the user.
- Metode:
  - The front end uses HTML and JavaScript to create search forms and display search results dynamically.
  - The backend uses PHP to receive search queries, run queries on the database, and send the results back to the front end.

2. Recipe Addition Feature

Implementation Method: This feature allows users to add their own recipes to the website.

- Process: Users fill out a form with recipe details such as recipe name, ingredients, steps, and images (optional). After that, the data will be processed and stored in a database.
- Database: The recipe table will store recipe information, with columns such as id, recipe_name, ingredients, steps, and images.
- Method:
  - The frontend uses HTML for the recipe addition form and JavaScript for input validation (for example, ensuring that the recipe name is filled in).
  - The backend uses PHP to process and store data in the database. A function for uploading images will also be implemented here if images are added.

3. Like, Comment, and Bookmark features

Implementation Method: Interactive features such as likes, comments, and bookmarks allow users to interact with recipes they like.

- Like: Users can like recipes they enjoy, which will then influence which recipes are displayed as popular.
- Comment: Users can add comments to specific recipes.
- Bookmark: Users can save recipes to their favourites list.
  - Database: The interaction table will store data about likes, comments, and bookmarks. The relationship between recipes and users will be used to track who provided the interaction.
  - Method:
    - The front end uses HTML for the like button, comment form, and bookmark.
    - The backend uses PHP to process and store interaction data in the appropriate tables. For example, for likes, the data will be stored in the likes table with links to recipes and users.

4. Popular Features Based on Likes and Views

Metode Implementasi: Fitur ini menampilkan resep-resep paling populer berdasarkan jumlah likes dan views.

- Method:
  - Every time a recipe is viewed, the number of views will increase. The same applies to likes, which will be counted for each recipe.
  - SQL query: To display popular recipes, an SQL query was created that sorts recipes based on the number of likes and views.
- Database: The recipe table will have columns for number_of_likes and number_of_views. These columns will be updated every time a user likes or views a recipe.
- Algorithm: Recipes with the highest number of

likes and views will be prioritised for display on the main page.

- Metode:
  - The frontend will display recipes based on queries that have sorted results by number of likes and views.
  - The backend uses PHP to handle the calculation logic and processing of the most frequently interacted with recipe data.

5. Food and Beverage Category Features

Implementation Method: The category feature allows recipes to be grouped based on specific types of food or beverages.

- Database: The category table will contain data about various categories of food and beverages, while the recipe table will have a category_id column that references the recipe category.
- Metode:
  - Users select specific categories when searching for recipes or adding recipes. This feature also allows recipes to be displayed based on specific categories.
  - Frontend: Category forms are created using HTML with dropdown options or search filters based on category.
  - Backend: PHP will be used to handle category selection and search for recipes according to the selected category. The database query will join the recipe and category tables to display recipes according to category.

6. Fitur Subscribe

Implementation Method: The subscribe feature allows users to subscribe and receive the latest recipe updates.

- Process: Users can click the subscribe button on a particular recipe or category. Subscribers will receive notifications about new recipes.
- Database: The subscriptions table will store data on users who subscribe to specific recipes or categories.
- Metode:
  - Frontend: Subscription form using HTML with a button to activate subscription.
  - Backend: PHP is used to process subscriptions and store data in the subscriptions table. Notification emails can be sent using PHP to inform users about updates.

7. Fitur Algoritma Pencarian

Metode Implementasi: Pencarian resep dapat ditingkatkan menggunakan algoritma untuk memberikan hasil yang lebih relevan.

- Process: Users enter search keywords, and the algorithm adjusts the results based on the relevance of the keywords to the recipe name, ingredients, or category.
- Algorithm: The search algorithm can use a fuzzy matching algorithm or search relevance ranking based on the similarity of keywords to recipe data in the database.
- Method:
  - The backend will use SQL queries to sort search results based on relevance.
  - PHP is used to process search inputs and execute more advanced search queries, while the frontend displays the correctly sorted search results.

Appearance of the Application

1. Welcome

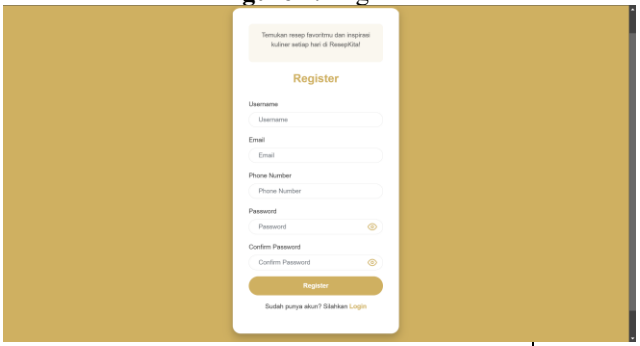
The landing page of the "ResepKita" website displays its main features as a recipe sharing platform with the tagline "Welcome to the ResepKita Website". This page encourages users to log in so they can explore and share recipes. There is also a promotion for the mobile application with a "Download Application" button. The background features a rustic wooden table with cooking ingredients such as pepper, salt, rosemary, and a wooden mortar, creating a warm atmosphere that supports the culinary theme.

Figure 3. Welcome

2. Register

The Register page on the "ResepKita" website provides fields for Username, Email, Password, and Confirm Password, with a toggle feature to view the password. Once the fields have been filled in, users can press the Register button to sign up. The cooking-themed background with rustic wooden table elements and cooking ingredients creates a warm atmosphere. There is also a Login option for users who already have an account.

Figure 4. Register



3. Login

The Login page on the "ResepKita" website provides an Email and Password field for users to access their accounts by pressing the Login button. The simple page design with a cooking-themed background matches the Register page, creating a warm atmosphere. There is an option for users who do not yet have an account to Register.

Figure 5. Login

4. Dashboard

The Dashboard page on the "ResepKita" website welcomes users with a warm message saying, "Welcome to our application". This page displays Popular Food Recipes and Popular Drink Recipes based on the number of views as the main recommendations. In addition, there is a complete list of all recipes that users can explore. An Upload Recipe button is provided to make it easy for users to add new recipes. The dashboard design is simple and intuitive for easy navigation.

Figure 6. Dashboard

5. Upload Recipe

The Recipe Upload page on the "ResepKita" website provides a form for sharing complete recipes. The form elements include fields for Recipe Title, Recipe Description, Ingredients, Steps, Cooking Time, and Servings per Person. There is a feature for uploading recipe images and selecting food or beverage categories, including specific subcategories such as main dishes or fresh drinks. The page design is structured and intuitive, making it easy for users to fill in recipe information. Once all the data has been filled in, users can press the Upload Recipe button to share the recipe with the community.

Figure 7. Upload Recipe

6. Profile

The Profile page on the "ResepKita" website displays detailed user information, including Profile Photo, Username, number of Followers with the option to view the list of followers, and a list of Recipe Posts that includes the title, image, and detail link. There is an Edit Profile button to change user information and an Upload Recipe shortcut to add new recipes. The page design is neat and easy to access, prioritising social interaction and content shared by users.

Figure 8. Profile

7. Search

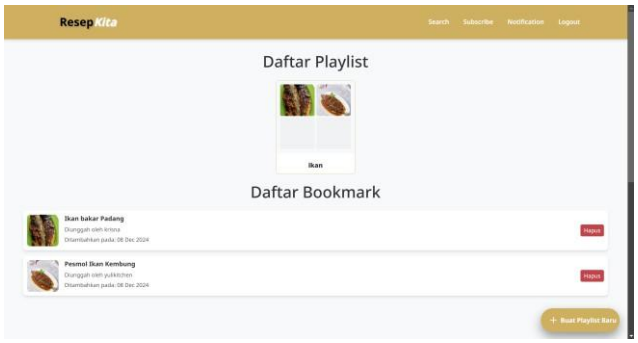
The Search page on the "ResepKita" website is designed to facilitate recipe searches through a Search Bar that allows users to enter keywords such as food names, ingredients, or categories. Search results display relevant recipes with images, names, and brief descriptions, which can be accessed in detail. The Search History feature makes it easy for users to revisit previously searched recipes, with the option to clear the history. The simple and intuitive page design ensures an efficient and comfortable search experience.

Figure 9. Search

8. Collection

The Collection page on the "ResepKita" website allows users to save and manage their favourite recipes. The list of Saved Recipes is displayed with images, names, and brief descriptions, which can be accessed in detail. The Playlist Button feature allows users to group recipes into special playlists, such as "Healthy Recipes" or "Dessert Recipes," to make organisation and searching easier. The design of this page supports structured recipe management, providing more efficient access to users' favourite recipes.

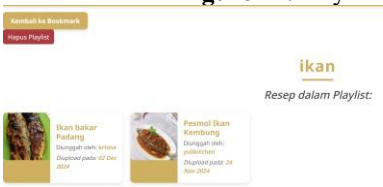
Figure 10. Collection



9. Playlist

The Playlist page on the "ResepKita" website displays a list of recipes that have been added to a specific playlist, complete with images, names, and brief descriptions for easy identification. There is a Delete Playlist button that allows users to delete playlists without affecting the recipes in them. This page is designed to help users manage their recipe collections in an organised manner, with flexibility in grouping and deleting playlists as needed.

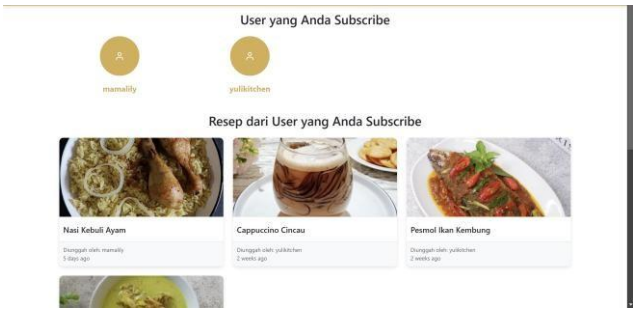
Figure 11. Playlist



10. Subscribe

The Subscribe page on the "ResepKita" website displays a list of subscribed users along with the latest recipes they have uploaded. Each subscribed user is displayed with their name and profile photo, providing a clear picture of who you are following. The latest recipes from subscribed users are displayed based on upload time, complete with images, names, and brief descriptions. This page makes it easy for users to follow recipe updates from people they are interested in and always receive the latest recipe updates.

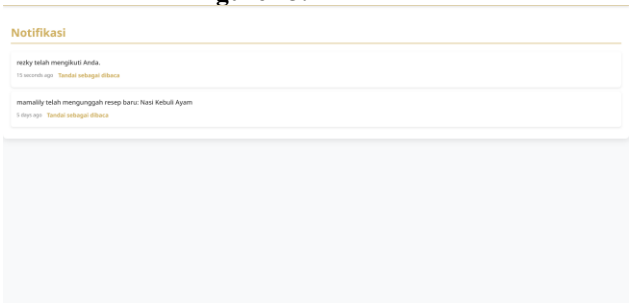
Figure 12. Subscribe



11. Notification

The Notifications page on the "ResepKita" website displays notifications related to activities relevant to users. The main elements include notifications of new recipes from subscribed users, including the username, recipe title, and link to view the recipe, as well as notifications about users who have started subscribing to their accounts. There is also a Mark as Read button to help users distinguish between read and unread notifications. This page provides up-to-date information about interactions and activities on the user's account, maintaining order and keeping users informed about developments.

Figure 13. Notification



Black-box Testing

Black-box testing focuses on testing the functionality of existing features without looking at the implementation of the code. Testers only need to understand the inputs provided, the processes performed by the system, and the expected outputs.

In this test table, the test steps are designed based on feature usage scenarios. Some examples of tests performed are:

1. Recipe Search

   Testing whether the search feature produces a

list of recipes that match the keywords.

2. Addition of Recipes
   Test whether the new recipe data has been successfully added to the recipe list after the user has filled in the form.
3. Login and Register
   - Login: Ensuring that users with valid credentials can access the system.
   - Register: Ensuring new users can register with valid data.
4. Bookmark dan Like
   Testing whether users can save recipes to their Bookmark list and give recipes a Like.

Black-box testing ensures that every feature works according to user requirements without needing to know how the feature is implemented.

Table 1. Black-box Testing

No	Feature	Steps to Perform	Expected Result	Actual Result	Status
1	Recipe Search	Enter recipe keyword(s) into the search box and click the search button.	A list of recipes matching the entered keywords is displayed.	[Result]	Pass
2	Add Recipe	Fill out the add recipe form with complete data and click the submit button.	New recipe is added and appears in the recipe list.	[Result]	Pass
3	Like Recipe	Click the Like button on a specific recipe.	The number of likes on the recipe increases.	[Result]	Pass
4	Bookmark Recipe	Click the Bookmark button on a specific recipe.	The recipe is saved in the bookmark list.	[Result]	Pass
5	Responsive Display	Resize the browser window or access the application on different devices.	The display remains professional and consistent across all screen sizes.	[Result]	Pass
6	Login	Enter a valid email and password, then click the Login button.	User is successfully logged into their account.	[Result]	Pass
7	Register	Fill out the registration form with valid data and click the Register button.	A new user account is successfully created.	[Result]	Pass
8	Logout	Click the Logout button after logging in.	User is successfully logged out and redirected to the login page.	[Result]	Pass
9	Comment on Recipe	Enter a comment in the comment field on a specific recipe and click submit.	The comment is successfully added and displayed below the recipe.	[Result]	Pass
10	Create Playlist	Fill out the form to add a new playlist and click submit.	A new playlist is successfully created and added.	[Result]	Pass

White-box Testing

White-box testing focuses on testing the internal structure or implementation logic of a feature. Testers have access to the source code and test whether each function and program flow works as it should.

In this test table, several functions are tested, including:

1. Search function (search)
   Test whether the search function accepts keyword input, processes it, and returns a list of matching recipes.
2. Add recipe function (add)
   Testing whether the new prescription data has been successfully saved to the database.
3. Login function (login)
   Testing whether users with valid credentials can be verified and log in, while users with invalid credentials are denied access.
4. Form validation (validate)
   Testing whether user input is validated correctly to prevent incorrect data from entering the system.
5. Comment and playlist functions
   Ensuring that comments can be added to specific recipes and playlists can be created and linked to users.

Table 2. White-box Testing

No	Function Tested	Tested Input	Expected Result	Actual Result	Status
1	Search Function (search())	Input: recipe keyword	The search function returns recipes matching the entered keyword.	[Result]	Pass
2	Add Recipe Function (add())	Input: recipe data	A new recipe is successfully added to the system.	[Result]	Pass
3	Like Function (addLike())	Input: recipe ID	The total number of likes for the recipe increases.	[Result]	Pass
4	Form Validation Function (validate())	Input: all fields from the add recipe form	All input fields are validated according to the defined rules.	[Result]	Pass
5	Bookmark Function (addBookmark())	Input: recipe ID	The recipe is successfully added to the bookmark list.	[Result]	Pass
6	Login Function (login())	Input: email and password	User authentication is successful and access is granted.	[Result]	Pass

No	Function Tested	Tested Input	Expected Result	Actual Result	Status
7	Register Function (register())	Input: user registration data	A new user account is successfully created.	[Result]	Pass
8	Logout Function (logout())	Input: user logout action	User session is terminated and the user is redirected to the login page.	[Result]	Pass
9	Comment Function (addComment())	Input: recipe ID and comment text	The comment is successfully added and displayed.	[Result]	Pass
10	Playlist Creation Function (createPlaylist())	Input: playlist data	A new playlist is successfully created and added to the system.	[Result]	Pass

5. CONCLUSION

Test results show that this application can provide optimal experience for its users. The recipe search and grouping features are designed to help users find recipes quickly and accurately. The interactive interface, supported by an effective input validation process, ensures that users can easily upload and share their own recipes. Thus, this application not only functions as a recipe provider, but also as a collaboration platform for the culinary community.

Moving forward, further development can focus on integrating more interactive features, such as a recommendation system based on user preferences and a subscription service to receive the latest recipe updates. Increasing the application capacity to support more users and data is also a priority for future development. With this evolving approach, it is hoped that this application can have a positive impact on users by supporting their daily culinary activities.

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