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INTRODUCTION

Problem Statement:

WhatsApp groups have become a popular means for individuals to share and discuss recipes with others. However, relying on WhatsApp groups for recipe sharing poses significant challenges. The unstructured nature of conversations makes it difficult to organize and search for recipes effectively. As the number of participants and recipes shared in the group grows, finding specific recipes becomes increasingly cumbersome. Moreover, there is a lack of dedicated features for managing the shared recipes, such as categorization, rating, and commenting. These limitations hinder the overall user experience and discourage efficient recipe sharing and management. The Recipe Sharing and Management System aims to address these challenges by providing a specialized platform that offers structured and organized recipe sharing, along with dedicated management features. It strives to streamline the process of sharing, discovering, and managing recipes, enabling users to create a vibrant community centered around culinary exploration and enjoyment.

Objectives

Specific objectives:

General objectives :

1. Enable Recipe Sharing: Allow users to share their recipes with others in a straightforward manner.
2. User-Friendly Interface: Create a simple and intuitive interface that is easy to navigate and understand.
3. Recipe Search and Discovery: Implement a basic search functionality to help users find recipes based on keywords, ingredients, or categories.
4. Recipe Organization: Provide a simple system for organizing recipes into categories or tags for easy browsing.
5. User Interaction: Allow users to interact with recipes through ratings, comments, and sharing options.
6. Easy Recipe Submission: Simplify the process for users to add and submit their recipes to the system.
7. Resonsive Design: Ensure the system is responsive and optimized for different devices and screens.

8. Basic Admin Functionality: Include basic admin features for content moderation and user management, keeping it straightforward and easy to use.

Challenges of current existing system

1. Unstructured Conversations: WhatsApp groups lack a structured format for organizing and searching recipes. This makes it difficult to find specific recipes as the number of participants and recipes shared increases.

2. Ineffective Organization: Without dedicated features for categorization, recipes in WhatsApp groups can become disorganized and challenging to navigate. There is a need for a system that provides a more organized approach to recipe management.

3. Limited Features: WhatsApp groups lack dedicated features such as rating, commenting, and recipe management. This restricts users from engaging with recipes in a comprehensive manner and limits the overall user experience.

4. Cumbersome Search Process: Due to the lack of efficient search functionality, finding specific recipes in WhatsApp groups becomes time-consuming and cumbersome. A dedicated recipe sharing and management system should address this challenge by providing an optimized search experience.

5. User Experience: The overall user experience in WhatsApp groups for recipe sharing may be hindered by the limitations and inefficiencies mentioned above. There is a need for a specialized platform that streamlines the recipe sharing and management process, offering a better user experience.

Solution to current business operations

1. Develop a recipe sharing and management system. This system should provide a structured and organized environment for users to share, discover, and manage recipes.
2. User Registration and Authentication: Implement a user registration system that allows individuals to create accounts. This enables user authentication and ensures that only registered users can participate in recipe sharing activities.
3. Recipe Submission and Management: Create an easy-to-use interface for users to submit their recipes. Include fields for recipe title, ingredients, instructions, cooking time, and any other relevant information. Develop functionality for users to edit or delete their submitted recipes.
5. Search and Discovery: Implement an efficient search functionality that allows users to search for recipes based on keywords, ingredients, categories, or tags. Provide filters and sorting options to enhance the search experience.
6. User Interaction Features: Enable users to engage with recipes through features such as rating, commenting, liking, and sharing. This encourages user interaction, fosters a sense of community, and allows users to provide feedback and recommendations.
7. Admin Dashboard: Develop an admin dashboard that provides the necessary tools for managing user accounts, monitoring recipe submissions, and handling reported content. This allows the admin to review and moderate user activity effectively.

8. Responsive: Ensure that the platform is responsive and optimized for mobile devices, as many users access recipe information from their smartphones or tablets.

9. Performance and Scalability: Design the system to handle a growing number of users and recipes. Optimize database queries, implement caching mechanisms, and scale the infrastructure as needed to ensure reliable performance.

Deliverables

The deliverables of a recipe sharing and management system include:

1. User Interface Design: A visually appealing and user-friendly interface design for the web or mobile application, ensuring ease of navigation and efficient access to recipe-related features.

2. User Registration and Authentication: Functionality for users to create accounts, sign in, and manage their profiles. This includes account creation forms, password management, and user authentication.

3. Recipe Submission and Management: A feature that allows users to submit their recipes, including fields for recipe details such as title, ingredients, instructions, and cooking time. Users should also be able to edit or delete their submitted recipes.

4. Recipe Organization: Categorization and tagging options for users to organize their recipes into different categories or assign relevant tags. This ensures easier navigation and search capabilities for users.

5. Search and Discovery: A search functionality that enables users to search for recipes based on keywords, ingredients, categories, or tags. The search results should be accurate and relevant to the user's query.

6. User Interaction Features: Features that allow users to engage with recipes, such as rating recipes, leaving comments or reviews, liking recipes, and sharing them with others.

7. Admin Dashboard: An administrative dashboard that provides access to user management functionalities, content moderation tools, and analytics related to recipe submissions and user activity.

8. Mobile Compatibility: The system should be designed to be responsive and compatible with various mobile devices and screen sizes, ensuring a seamless user experience for mobile users.

REQUIREMENTS

Functional requirements

REQ001	Users should create accounts and securely log in to access the system.
REQ002	Users can submit recipes, edit or delete their own recipes.
REQ003	: Recipes can be categorized and tagged for easy organization and browsing.
REQ004	Users can search for recipes using keywords, ingredients, categories, or tags, with filtering options.
REQ005	Users can rate recipes, comment on them, and share recipes with others.

REQ006	: Admins have a dashboard to manage user accounts, review submitted recipes, and moderate content.
REQ007	The system is responsive and optimized for mobile devices.

Non-functional Requirements

REQ001	The system should have an intuitive and user-friendly interface.
REQ002	The system should be responsive and provide fast loading times.
REQ003	The System should implement appropriate security measures to protect user data.
REQ004	The system should be designed to handle a growing user base and a large number of recipes.
REQ005	The system should have high availability, minimizing downtime.
REQ006	The system should be compatible with different web browsers and devices.
REQ007	The system should respect user privacy and adhere to data protection regulations.

Security Requirements

REQ001	The system should safely store user information, including passwords, using proper encryption techniques to prevent unauthorized access or data breaches.
REQ002	The system should Encrypt data transmission over the network using protocols like HTTPS to protect sensitive information exchanged between the user's device and the system.

REQ003	The system should Implement role-based access control to ensure that users have appropriate access privileges based on their roles (e.g., regular user, admin) within the system.
REQ004	The system should Validate and sanitize user input to prevent malicious data or code from being executed on the system, thereby protecting against potential attacks.

DEVELOPMENT METHODS/ METHODOLOGIES

I'll use Agile methodology for your Recipe Sharing and Management System:

Advantages of Agile:

1. **Flexibility:** Agile allows for flexibility and adaptability to changing requirements. As you develop your system, you can easily adjust and incorporate new features or changes based on user feedback or evolving needs.
2. **Customer Satisfaction:** Agile emphasizes regular customer involvement and feedback. This ensures that the final product meets the needs and expectations of the users, leading to higher customer satisfaction.
3. **Incremental Delivery:** Agile promotes iterative development and frequent product releases. This enables you to deliver functional increments of your system at regular intervals, providing value to users early on and allowing for faster time-to-market.
4. **Collaboration and Communication:** Agile methodologies encourage collaboration and communication among team members. This fosters a shared understanding of project goals, facilitates knowledge sharing, and enhances teamwork.

5. Risk Mitigation: By breaking the project into smaller iterations, Agile reduces the risk of developing a system that does not meet user requirements or market needs. Regular feedback and testing help identify and address issues early in the development process.

Disadvantages of Agile:

1. Limited Predictability: Agile focuses on adaptability and responsiveness, which can make it challenging to predict exact project timelines and outcomes. This can be a drawback when it comes to planning and meeting strict deadlines.

2. Increased Customer Involvement: Agile relies on active customer involvement throughout the development process. If you do not have immediate access to users or stakeholders, obtaining timely and meaningful feedback may be more challenging.

3. Potential Scope Creep: Without proper control and monitoring, Agile projects can be susceptible to scope creep, where additional features or changes are continually introduced. This can impact the project timeline and budget if not managed effectively.

Why Choose Agile for my Project:

1. Adaptability: Agile allows you to adapt to changing requirements, which is beneficial for a project that may evolve over time or require adjustments based on user feedback.

2. Iterative Development: Agile's iterative approach enables you to deliver working increments of your system, ensuring that you can continuously refine and enhance your product.

3. Early Feedback: Agile promotes regular customer feedback, even if you don't have immediate users. Seeking feedback from stakeholders or potential users can provide valuable insights to improve your system.

4. Simplified Development: Agile methodologies emphasize simplicity and focus on delivering value incrementally. This aligns with your goal of creating a simple and minimalistic system.

By embracing Agile, you can leverage its benefits, such as flexibility, customer satisfaction, and incremental delivery, while addressing the challenges, such as limited predictability and customer involvement. It allows you to adapt your approach as your project progresses and ensures that you can create a user-centric system that meets your objectives.

ARCHITECTURE OF THE SYSTEM

The recipe sharing and management system will be structured using a **micro service architecture**:

1. User Service: Handles user authentication, registration, and profile management. It stores user information and provides APIs for user-related operations.
2. Recipe Service: Manages the core functionalities of creating, retrieving, updating, and deleting recipes. It stores recipe data and provides APIs for CRUD operations on recipes.
3. Comment Service: Handles comments and discussions related to recipes. It allows users to add comments, view existing comments, and interact with each other.
4. Search Service: Provides search functionality to allow users to search for recipes based on various criteria such as ingredients, tags, or keywords. It indexes recipe data and offers efficient search capabilities.

Conceptual Design

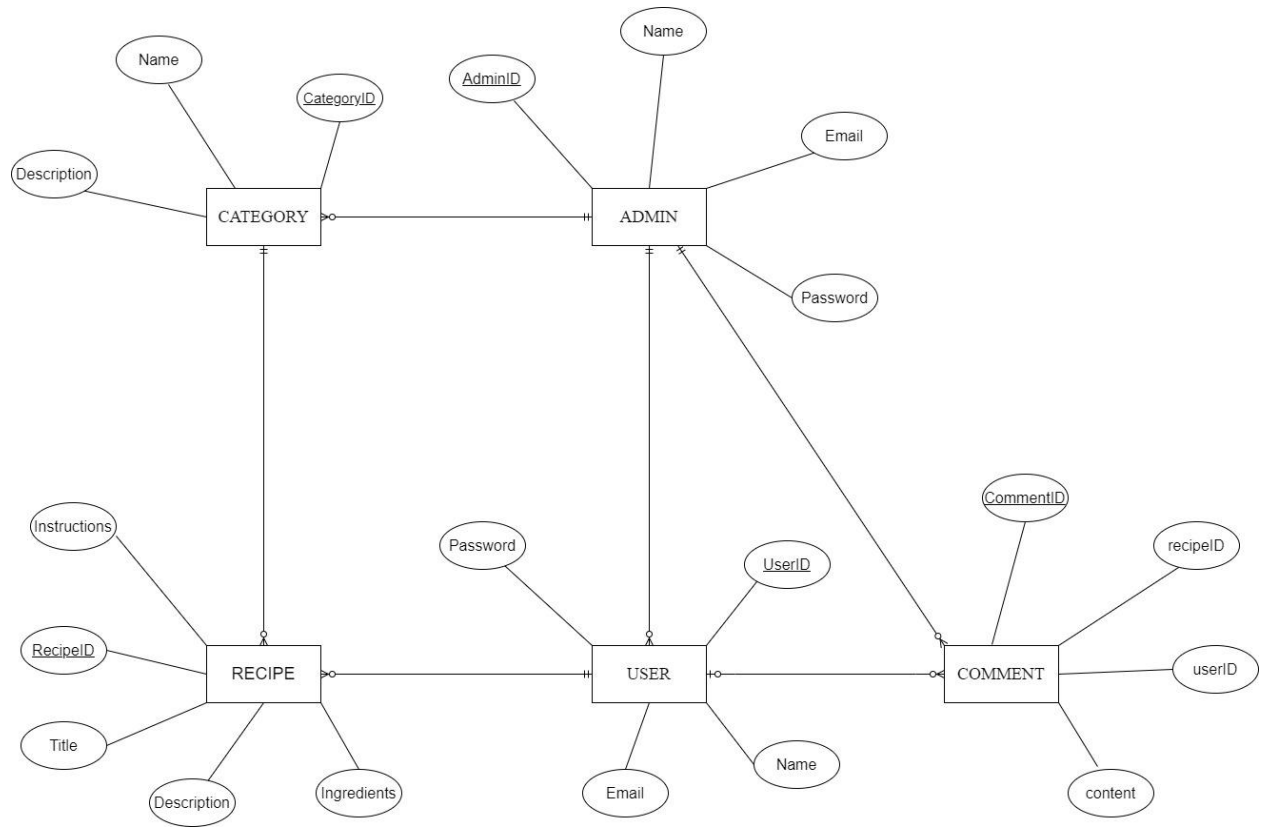


Figure 1: Entity Relationship Diagram

User Interface

Database Design

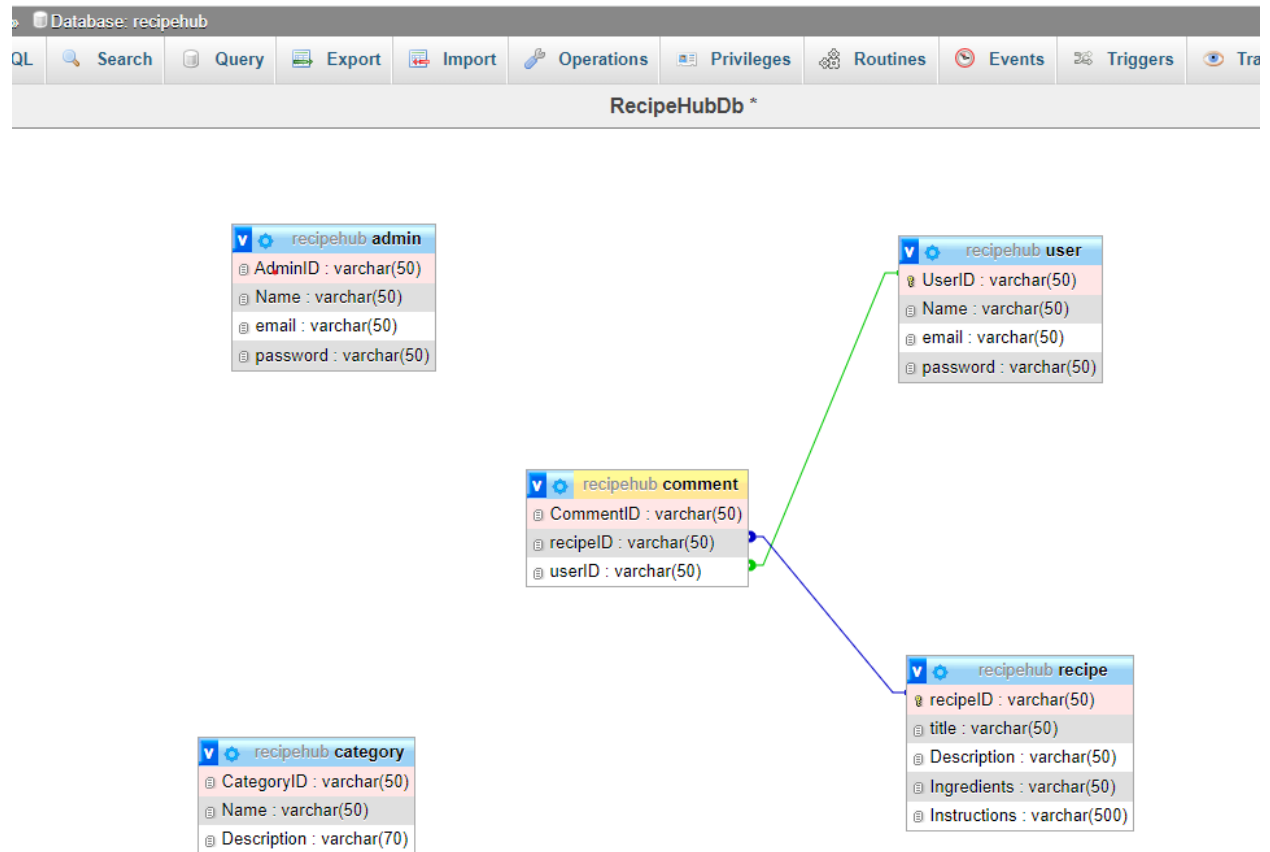


Figure 2: Database Design

Use Case Diagram

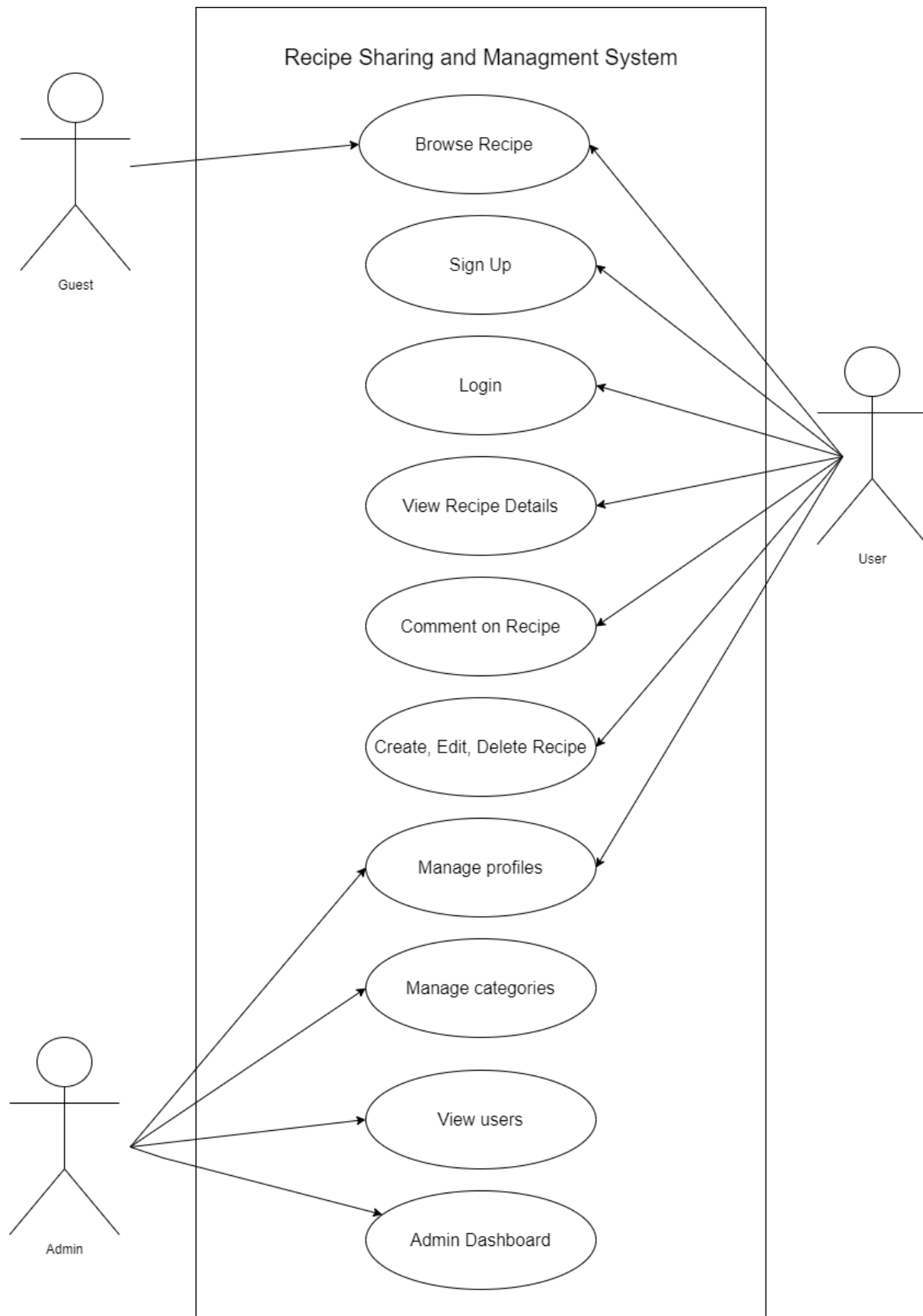


Figure 3: Use case Diagram

Class Diagram

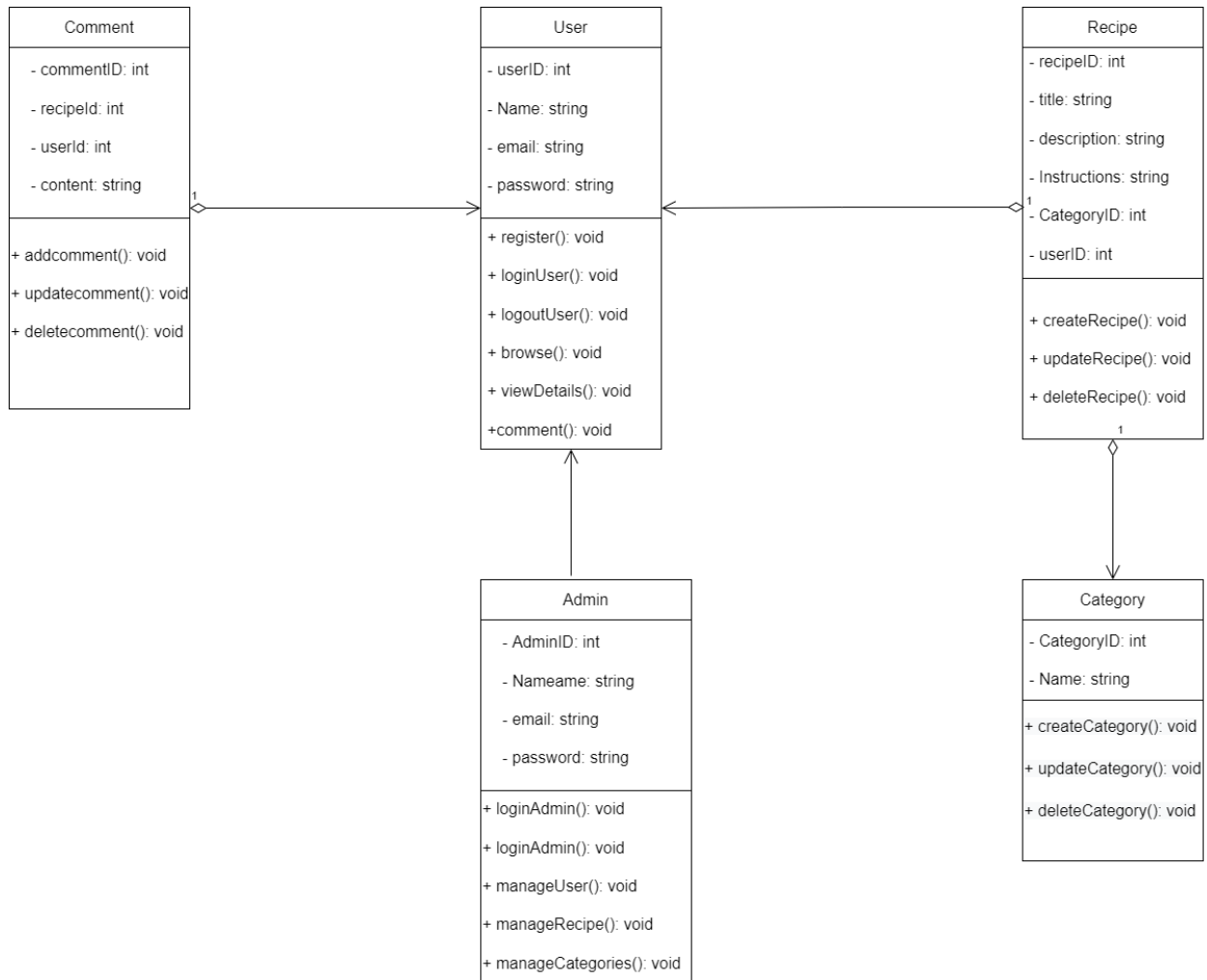


Figure 4: Class Diagram

DEVELOPMENT TECHNOLOGIES

Front-end Development Technologies:

- **HTML**: Used for creating the structure and content of web pages.
- **CSS**: Used for styling and formatting the visual appearance of web pages.

- JavaScript: Used for adding interactivity and dynamic functionality to the web pages.

- React

Back-end Development Technologies:

- Springboot

- Database Management System:

- MongoDB/Postgres

DEPLOYMENT TECHNOLOGIES/METHODS:

- AWS (Amazon Web Services): Provides various hosting services like EC2, Elastic Beanstalk, or Lightsail.