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IGNITE: A MIXED MULTIMEDIA MICROBLOGGING APPLICATION

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SOFTWARE DESIGN AND ANALYSIS (CS-3004)



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FINAL PROJECT REPORT

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1. INTRODUCTION

This document is the final report for the IGNITE system, a university-centric social media platform designed to connect students. It details the complete system design and documentation, including Use Cases, System Sequence Diagrams, Class Diagrams and Extended Relationships Diagram that illustrate the workflow—from user registration and content creation to engagement and administrative moderation. The IGNITE system is designed to foster the student community through features like trending posts, direct user interaction, and secure, role-based access.

1.1 PURPOSE

University students often lack a dedicated, secure, and engaging digital space to connect with peers, share campus-related content, and stay updated with university trends. General-purpose social media platforms can be cluttered and lack campus-specific features. IGNITE addresses this gap by providing a tailored environment for student interaction.

1.2 SCOPE

- User registration and authentication.
- Core social features: posting, liking, commenting, following and unfollowing.
- Personalized Home Feed and algorithmically generated Trending Posts.
- Search functionality for users and posts.
- Comprehensive admin dashboard for user and content moderation.
- Inquiry handling.

1.3 OBJECTIVE

- Develop a comprehensive social media platform exclusive to university students.
- Enable users to create profiles, follow each other, and engage through likes and comments.
- Provide personalized feeds and trending content based on campus activity.
- Implement robust administrative tools for content moderation and user management.
- Ensure user privacy and data security through authentication.

1.4 PROBLEM STATEMENT

There is no secure, university-exclusive platform for students to share content, interact, and receive official updates. Existing social media lacks campus-specific moderation and controlled access. Students need a safe space to engage, while admins require tools to manage users, handle reports, and send alerts. A dedicated role-based social platform is needed to fulfill these needs.

2. OVERALL DESCRIPTION

2.1 PRODUCT PERSPECTIVE

IGNITE functions as an independent, social media platform designed specifically for student communities. It ensures secure access and identity verification. The system provides an interactive digital environment where students can interact and share content within a controlled and moderated ecosystem. Through its modular architecture, IGNITE supports user-generated content, administrative oversight, and community engagement.

2.2 PRODUCT FUNCTIONS

- User Registration and Authentication: Secure account creation and login.
- Profile Management: Ability for users to edit personal information.
- Content Creation and Sharing: Support for posting text, images, and media, including hashtag usage to enhance discoverability and topic categorization.
- Social Networking: Follow/unfollow capabilities enabling users to build personal networks.
- Content Engagement: Interaction with posts through likes, comments, and reporting mechanisms to support community dialogue and maintain platform integrity.
- Personalized Feed Generation: Automated feed populated with content from followed users.
- Advanced Search and Discovery: Multi-strategy search system enabling users to locate posts, hashtags, and user profiles efficiently.
- Administrative Content Moderation: Dedicated tools for administrators to review reported posts, manage user accounts, and enforce platform guidelines.
- System-wide Alert Broadcasting: Mechanism for administrators to issue announcements or urgent notifications that reach all users simultaneously.

2.3 LIST OF USE CASES

Key high-level use cases include:

- Student Functions: Follow User, Manage Profile, Create Post, Like/Unlike Post, View Home Feed, Search for users and posts, Report Post, Comment on Post, Send Inquiries.
- Administrator Functions: Moderate Reported Content, Alert All Users, Respond to Inquiries, Approve/Disapprove Users

2.4 EXTENDED USE CASES

UC1: Register / Login Account

Scope: Ignite Social Media Application

Level: User–Goal

Primary Actor: User

Stakeholders & Interests:

- User: Wants secure, quick access to their account.
- Admin: Wants only verified users to gain access.
- System: Must authenticate users accurately and securely.

Preconditions:

- User has the application installed and running.
- User possesses valid registration information (email, username, password).

Postconditions:

- The user is informed that their registration request has been forwarded to the administrator, and access to the system will remain pending until the administrator approves their account.

Main Success Scenario

1. User selects “Register/Login”.
2. System displays authentication form.
3. User enters credentials.
4. System validates credentials and checks database.
5. User submits the form.
6. System informs the user that their application has been sent to the admin for approval

UC2: Create Post

Scope: Ignite Social Media Application

Level: User–Goal

Primary Actor: User

Stakeholders & Interests:

- User: Wants to share thoughts/media quickly.
- Followers: Want to view new content promptly.
- System: Must store and display posts efficiently.

Preconditions:

- User must be approved.
- System is connected to the database.

Postconditions:

- A new post is stored and visible in feed and search.
- Post metadata is recorded.

Main Success Scenario

1. User selects/navigates to create post tab.
2. System displays post creation form.
3. User enters text/media.
4. System validates input.
5. User submits the post.
6. User sees confirmation.
7. System shows post in home feed.

UC3: Follow User

Scope: Ignite Social Media Application

Level: User–Goal

Primary Actor: User

Stakeholders & Interests:

- User: Wants to follow others to receive updates.
- Followed User: Wants to grow audience.
- System: Must update follower relationships reliably.

Preconditions:

- User is logged in.
- Target user profile exists.

Postconditions:

- A follow relationship is created.
- Feed algorithm updates recommendations.

Main Success Scenario

1. User visits another user's profile.
2. System loads profile and follow status.
3. User taps "Follow".
4. System records follow relationship.
5. User sees updated button "Following".
6. System refreshes feed with new posts from that user.

UC4: Search for Users and Posts

Scope: Ignite Social Media Application

Level: User–Goal

Primary Actor: User

Stakeholders & Interests:

- User: Wants accurate, fast results.
- System: Must filter and return relevant posts and users.

Preconditions:

- User is authenticated.
- System has indexed posts and users.

Postconditions:

- Relevant posts and user accounts are displayed.

Main Success Scenario

1. User enters a query.
2. System parses query (detects hashtag or username).
3. User submits search.
4. System retrieves matching users and posts.
5. User views results.
6. System displays results.

UC5: Report Post

Scope: Ignite Social Media Application

Level: User–Goal

Primary Actor: User

Stakeholders & Interests:

- User: Wants inappropriate content removed.
- Admin: Needs accurate report data for moderation.
- System: Ensures reporting is secure and traceable.

Preconditions:

- User is authenticated.
- Post exists.

Postconditions:

- Report is logged.
- Admin receives report for review.

Main Success Scenario

1. User navigates to Report Post tab.
2. System displays report form.
3. User selects reason.
4. System validates input.
5. User submits.
6. System stores report.

UC6: Moderate Reported Content (Admin)

Scope: Ignite Social Media Application

Level: User–Goal

Primary Actor: Admin

Stakeholders & Interests:

- Admin: Needs efficient moderation workflow.
- Users: Expect safe environment.

Preconditions:

- Admin is authenticated.
- At least one report exists.

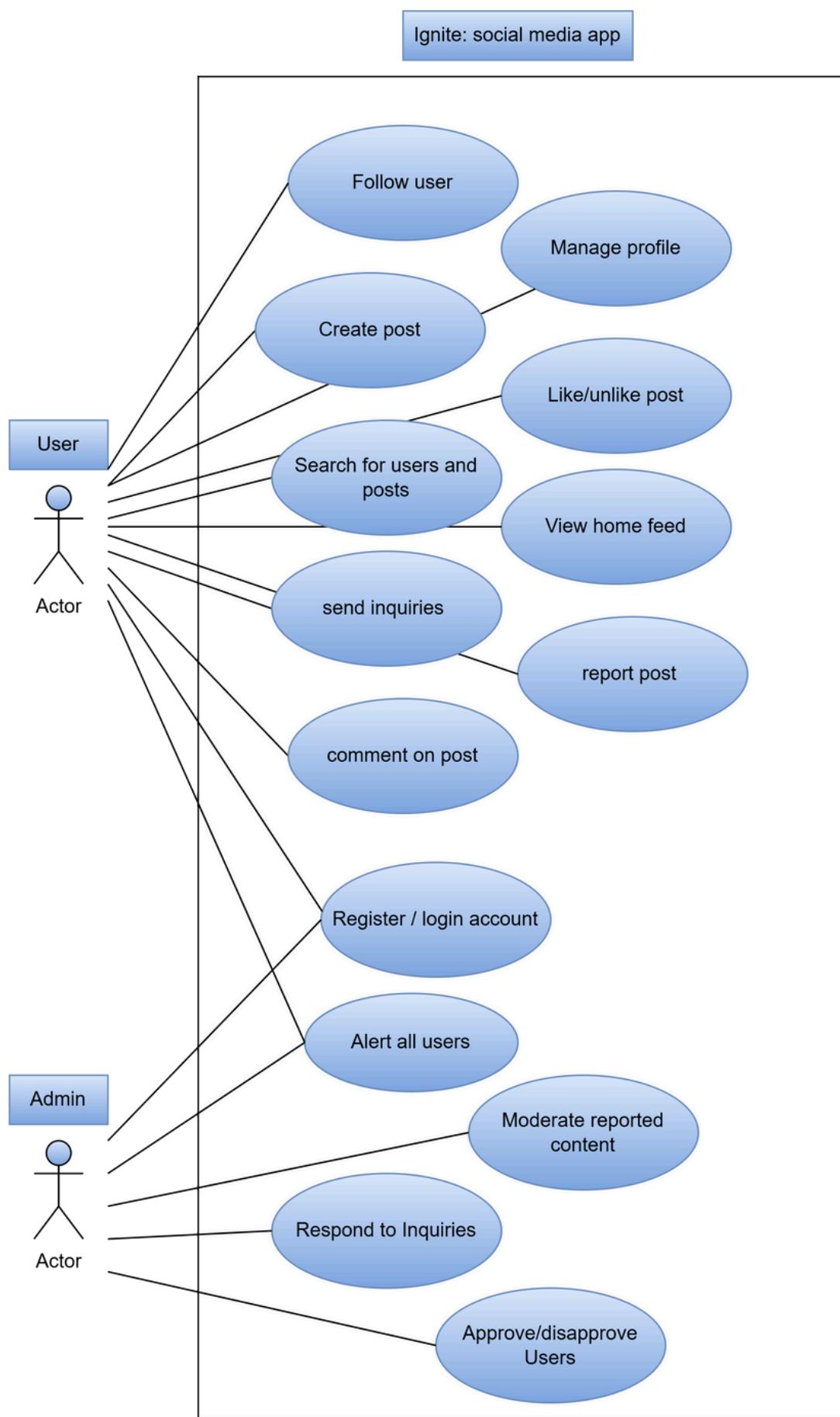
Postconditions:

- Post is approved or removed.

Main Success Scenario

1. Admin selects “Moderate Reports”.
2. System displays list of reports.
3. Admin reviews a specific post.
4. System loads report details and content.
5. Admin chooses action (approve/remove).
6. System updates content status and logs decision.

2.5 USE CASE DIAGRAM



3. OTHER NONFUNCTIONAL REQUIREMENTS

3.1 PERFORMANCE REQUIREMENTS

Response Time Requirements

- Page Load Time: All application screens shall load within 2 seconds under normal load conditions
- Authentication: User login and registration shall be completed within 1.5 seconds
- Feed Loading: Home feed and trending posts shall load within 2 seconds
- Data Storage: Shall handle storage of up to 10,000 users and 50,000 posts without performance degradation

3.2 SAFETY REQUIREMENTS

- Personal user information (email, bio) shall be accessible only to authorized users and administrators
- Admin tools shall include content removal capabilities for inappropriate posts and comments
- Reporting system shall allow users to flag inappropriate content for admin review

3.3 SECURITY REQUIREMENTS

- User Authentication: All users must authenticate with username and password
- Role-Based Access: Distinct permissions for Students, Admins with principle of least privilege
- Password Policy: Minimum 6 characters with strength validation
- Audit logs for all admin actions and security-related events

3.4 SOFTWARE QUALITY ATTRIBUTES

- **Learnability:** New users able to perform basic operations within 10 minutes
- **Efficiency:** Frequent tasks (posting, liking) completable within 3 clicks
- **Modularity:** Separation of concerns between presentation, business logic, and data layers
- **Java Version:** Compatible with Java 11 and later
- **Database:** SQL Server 2019 compatible

3.5 BUSINESS RULES

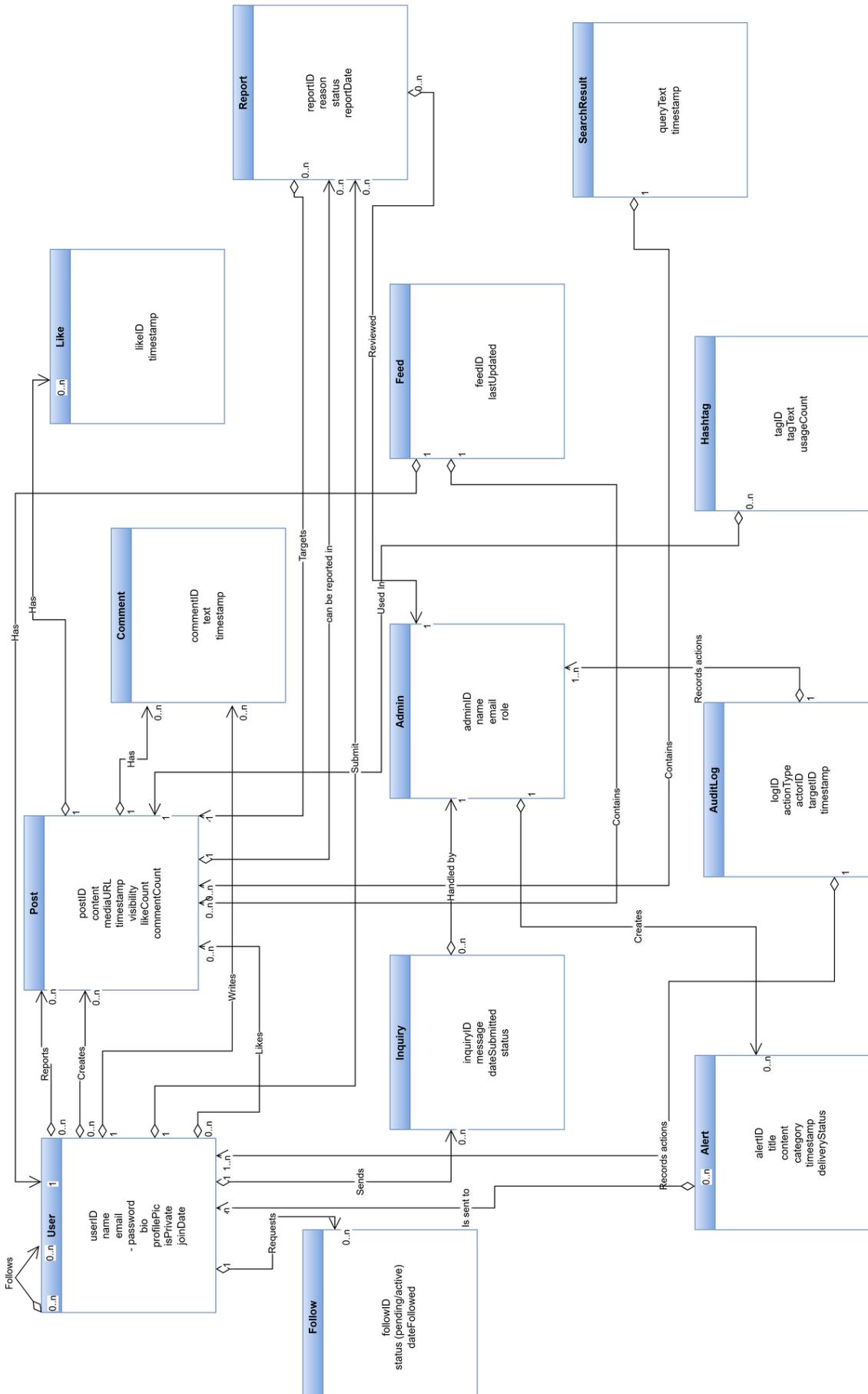
- New user accounts require admin approval before full access granted
- Content Management
- Posts and comments must adhere to community guidelines
- Users may report content violating terms of service
- Admins have final authority on content moderation decisions
- Social Interactions
- Users can follow/unfollow other users with mutual consent not required
- Only authorized administrators may access moderation tools
- Admin actions logged with timestamp and user identification

3.6 OPERATING ENVIRONMENT

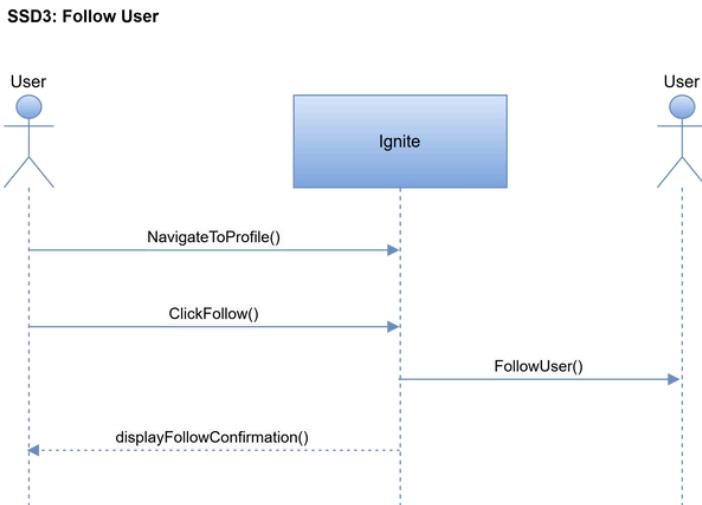
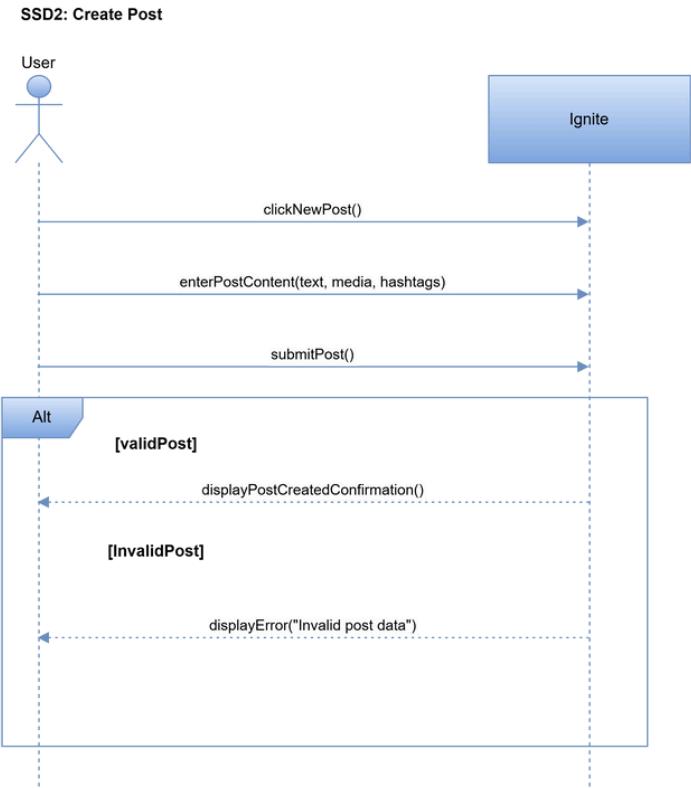
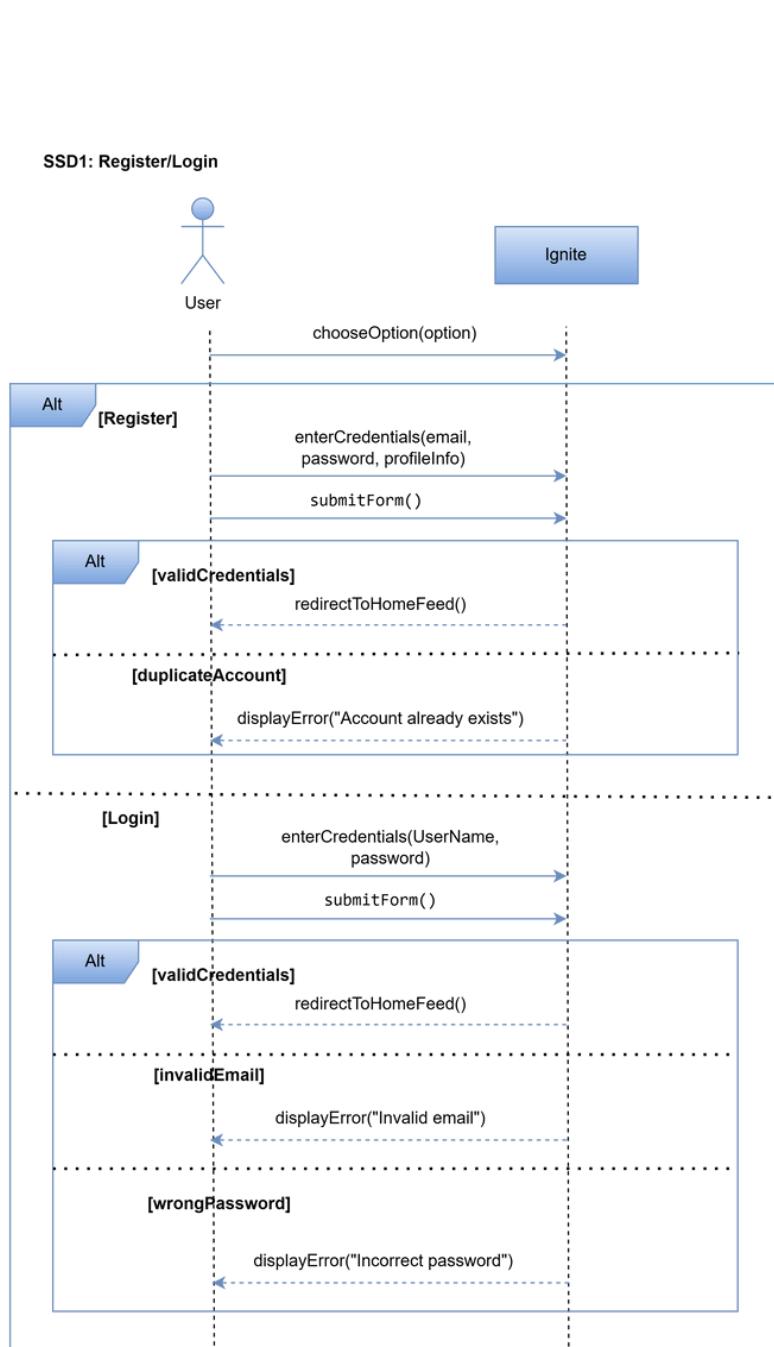
- Operating System: Windows Server 2019
- Java Runtime: OpenJDK 11
- Database: Microsoft SQL Server 2019
- Operating System: Windows 10
- Java Version: Java 11 or later
- JavaFX 17 for user interface components
- JDBC for database connectivity

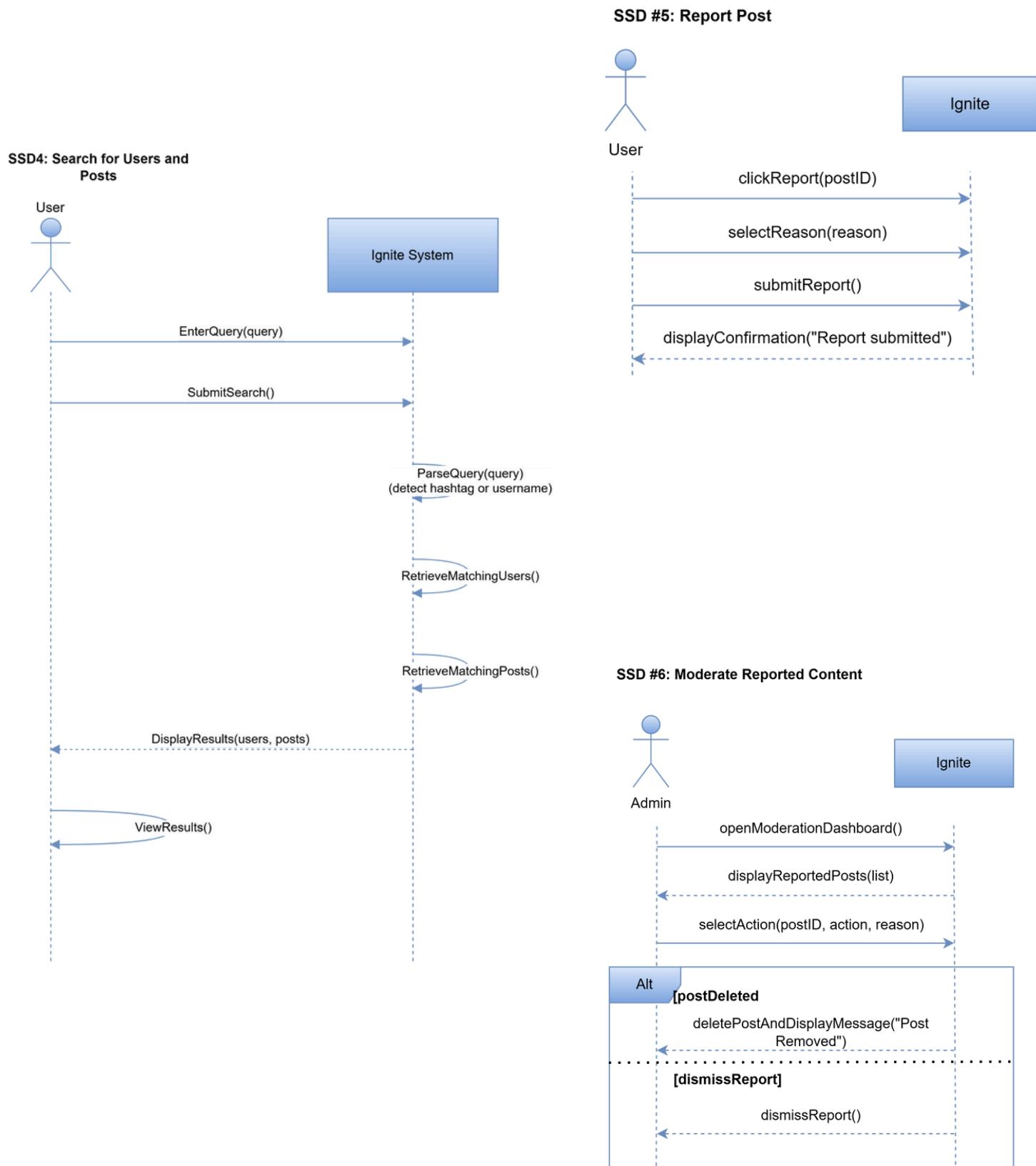
3.7 USER INTERFACES

4 DOMAIN MODEL



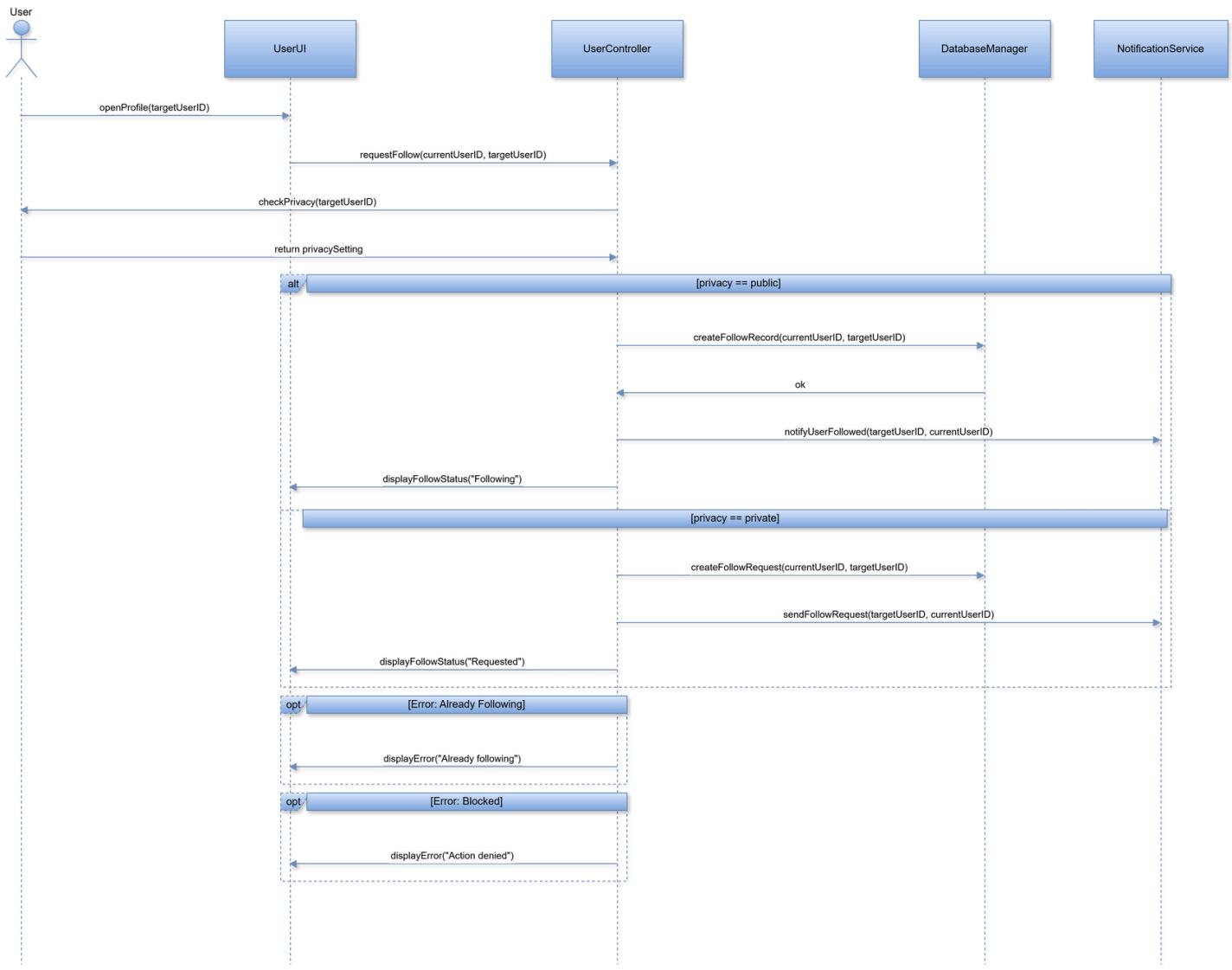
5: SYSTEM SEQUENCE DIAGRAMS



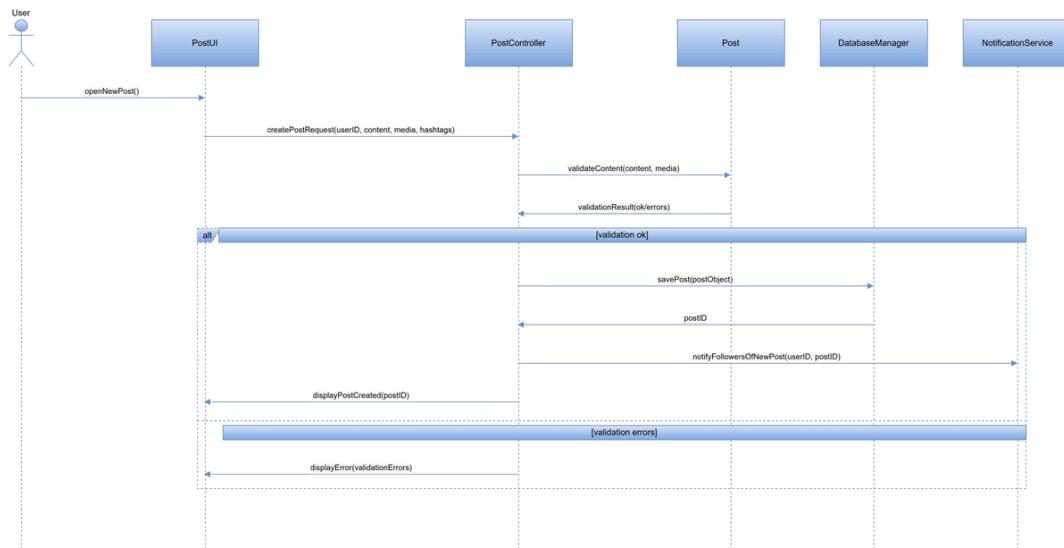


6: SEQUENCE DIAGRAMS

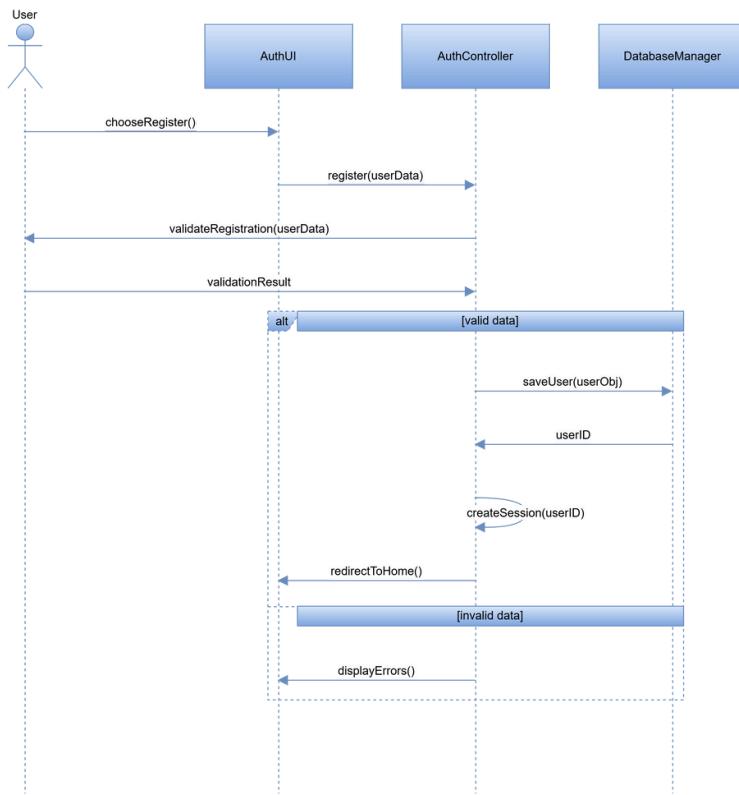
SD3: Follow User



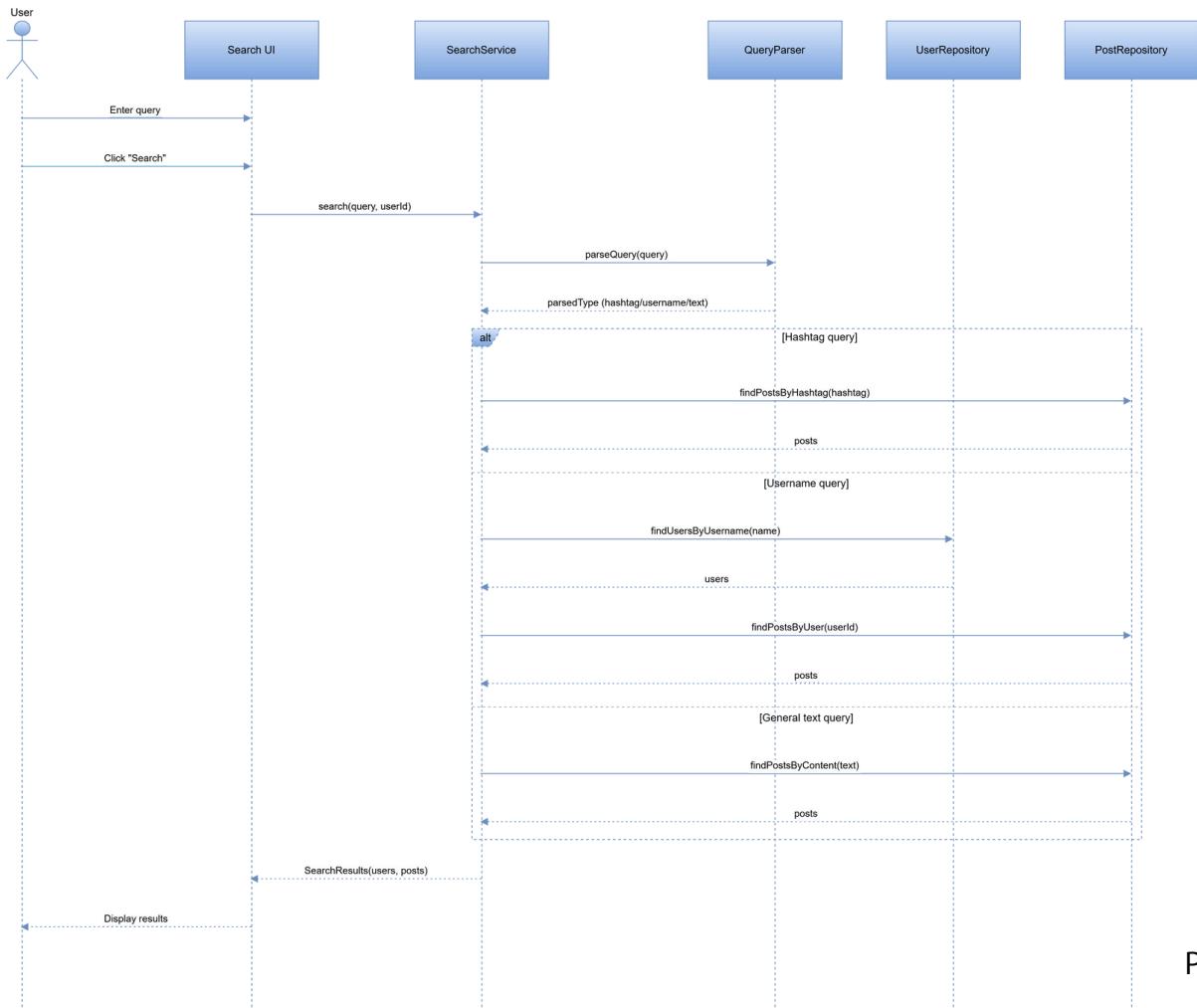
SD2: Create Post



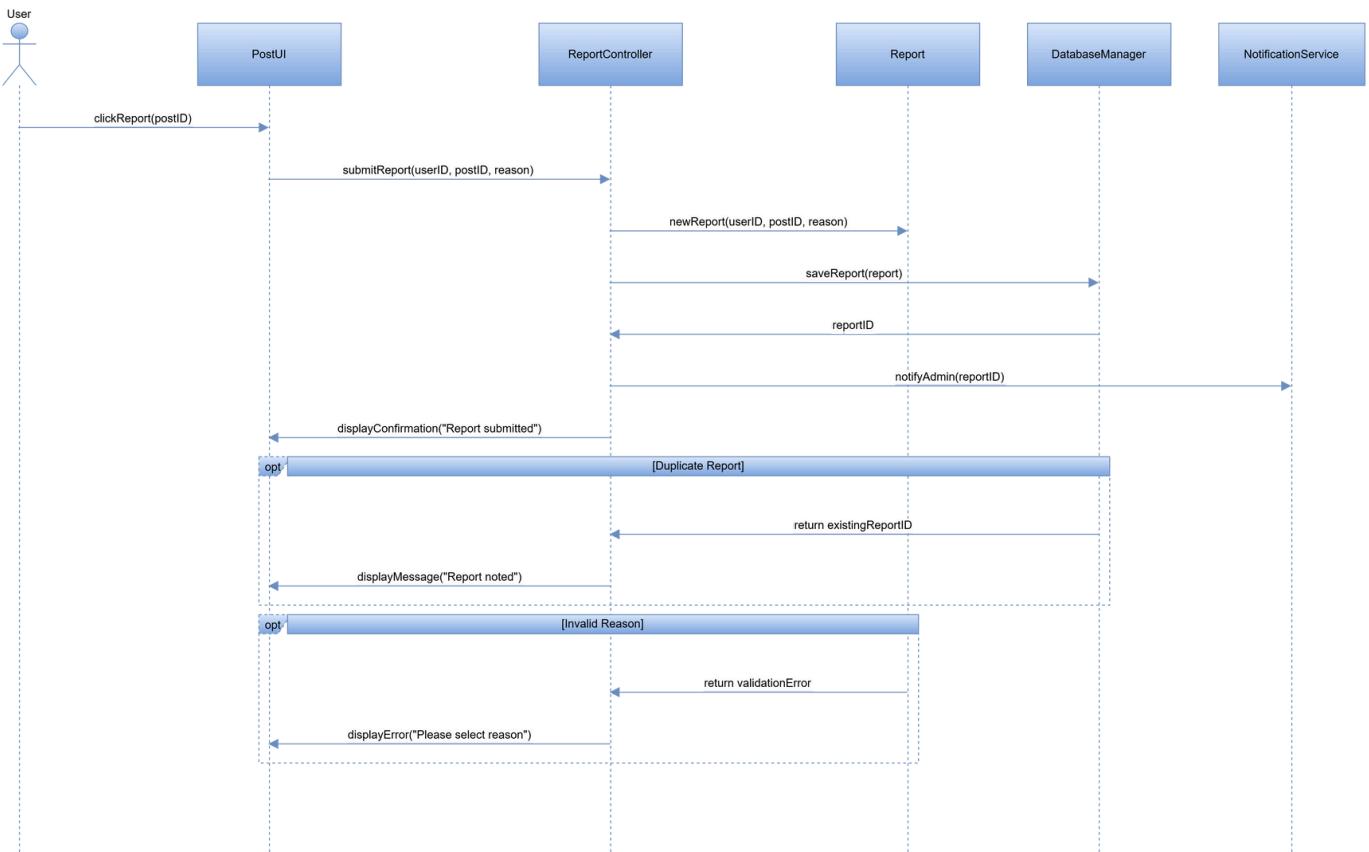
SD1: Register Account



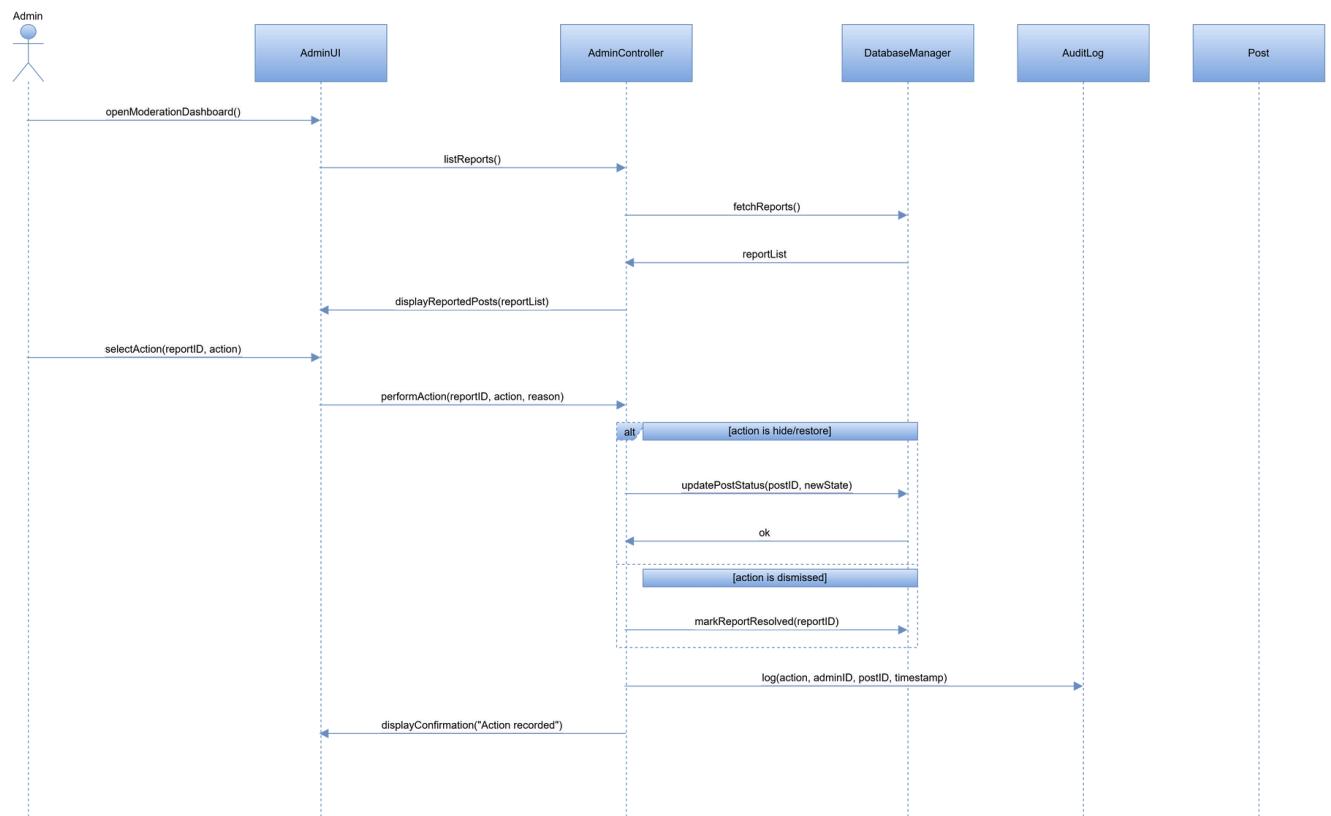
SD4: Search for Users and Posts



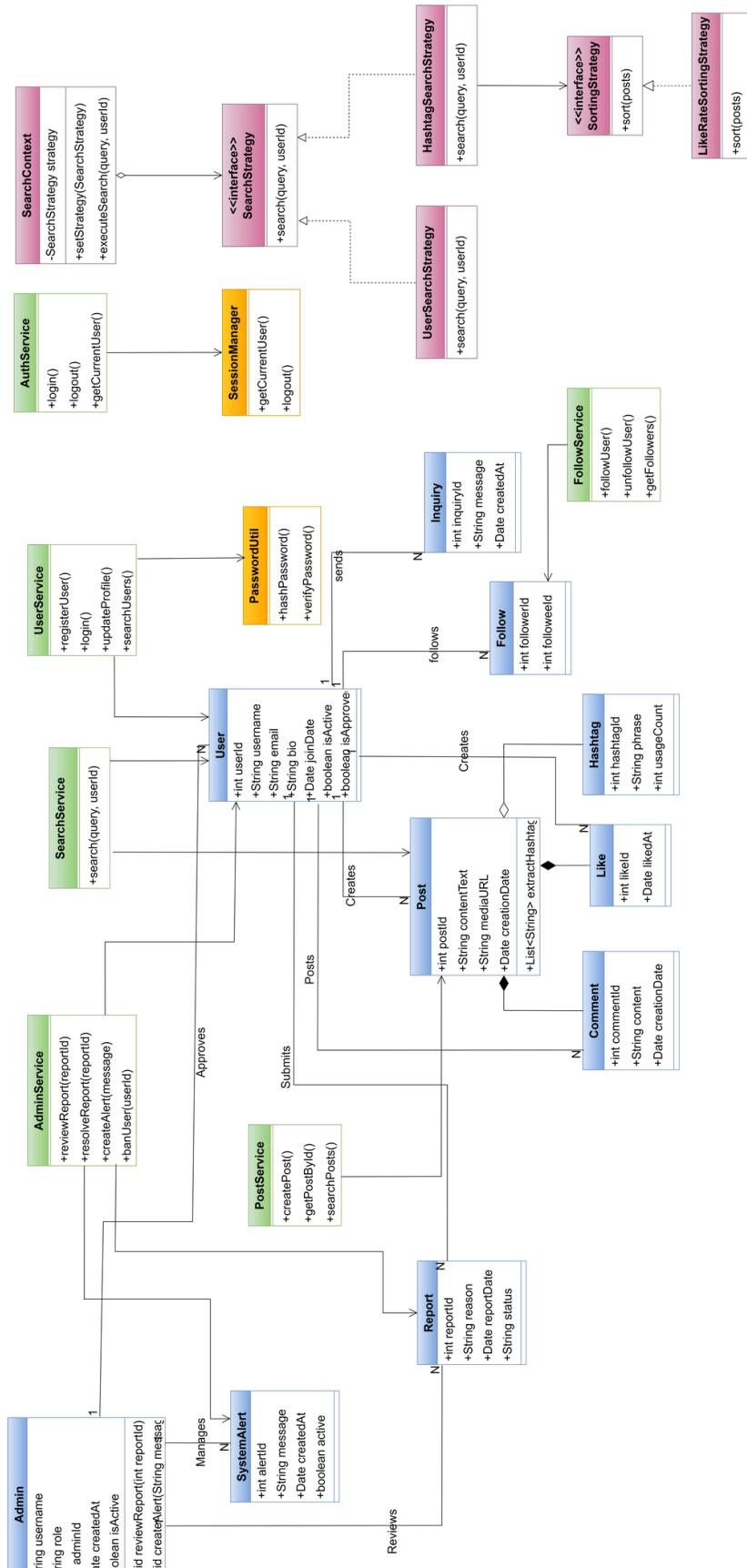
SD5: Report Post



SD6: Moderate reported content



7: CLASS DIAGRAM



8: ENTITY RELATIONSHIP DIAGRAM (ERD)

