

**ECHO Social Media App**  
**UCS 503 Software Engineering Project Report**  
**END-Semester Evaluation**

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## 1. Project Selection Phase

### 1.1 Software Bid/ Project Teams

#### UCS 503- Software Engineering Lab

Group: CS10

Dated: 05/02/2024

**Team Name: Vultures****Team ID (will be assigned by Instructor):**

Please enter the names of your Preferred Team Members: 2

- You are required to form a **three to four person** teams
- Choose your team members wisely. You will not be allowed to change teams.

Name	Roll No	Project Experience	Programming Language used	Signature
Varun Kumar	102217105	Crypto Trading App Stocks Analysis Website Firebase Chat App Travel App	Kotlin, Java	
Harmanjot Singh	102217099	Location App Notes CRUD CameraX App Stories App	Kotlin, Java	

#### Programming Language / Environment Experience

List the languages you are most comfortable developing in, **as a team**, in your order of preference. Many of the projects involve Java or C/C++ programming.

1. Kotlin
2. Java
3. C++

#### Choices of Projects:

Please select **4 projects** your team would like to work on, by order of preference: *[Write at-least one paragraph for each choice (motivation, reason for choice, feasibility analysis, etc.)]*

	Project Name
First Choice	<p>Group Collaboration and reminders App</p> <p>Features:</p> <ol style="list-style-type: none"> <li>1. Notifications for upcoming tasks.</li> <li>2. Task sharing with other user in your organization.</li> <li>3. Improved Productivity</li> <li>4. Synchronization among team members.</li> <li>5. Clean UI</li> </ol> <p>Feasibility:</p> <ol style="list-style-type: none"> <li>1. Realtime Collaboration using Websockets.</li> <li>2. Firebase database for storing data such as User profile etc.</li> </ol>
Second Choice	<p><i>Social Media App</i></p> <p>Features:</p> <ol style="list-style-type: none"> <li>1. Custom Home Feed</li> <li>2. Content Sharing</li> <li>3. Search specific users</li> <li>4. User profile showcase</li> <li>5. Followers and Following pages</li> </ol> <p>Feasibility:</p> <ol style="list-style-type: none"> <li>1. Using Firebase, Room database can be used for storing users' data, and their posts.</li> <li>2. A chat messaging app can be implemented to expand this app.</li> </ol>
Third Choice	<p>Pet Healthcare Management App</p> <p>Features:</p> <ol style="list-style-type: none"> <li>1. Pet electronic medical record system.</li> <li>2. Online appointment scheduling.</li> <li>3. Automatic notifications.</li> <li>4. Personalized medicine and service database.</li> </ol> <p>Feasibility:</p> <ol style="list-style-type: none"> <li>1. An online portal for doctors and clients for communication.</li> <li>2. Firebase Database can be used for storing medical records.</li> </ol>

Fourth Choice	<p>Blog App</p> <p>Features:</p> <ol style="list-style-type: none"><li>1. Easier access to information</li><li>2. Bookmark Blogs for later reading.</li><li>3. Personalized feed with topics catered to your reading interests.</li><li>4. Explore multiple publications and authors.</li></ol>
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## 1.2 Project Overview

### Introducing Echo: Where Conversations Fly!

**Summary:** Tired of the noise and negativity on other platforms? Echo is a refreshing social media app designed for positive, meaningful connections. Share quick thoughts, engage in respectful discussions, and build a community that inspires you.

**Solution:** Echo tackles the challenges of current social media platforms by:

- **Promoting positivity:** Encouraging users to uplift each other through features like "Kind Comments" and "Community Topics."
- **No tracking data of users:** A secure alternative to Instagram and prioritize user security and no data tracking.

**Unique Selling Point:** Echo is the only social media platform that prioritizes positive interactions and empowers users to create a kind and supportive online space.

#### **Objectives:**

- Increase user engagement by creating a safe and welcoming environment.
- Foster meaningful connections between individuals with shared interests.
- Promote positive social change through community collaboration.

#### **Outcomes:**

- Reduced negativity and trolling compared to other platforms.
- Increased user satisfaction and loyalty.
- Positive impact on communities through collaborative topics.

### Product Perspective:

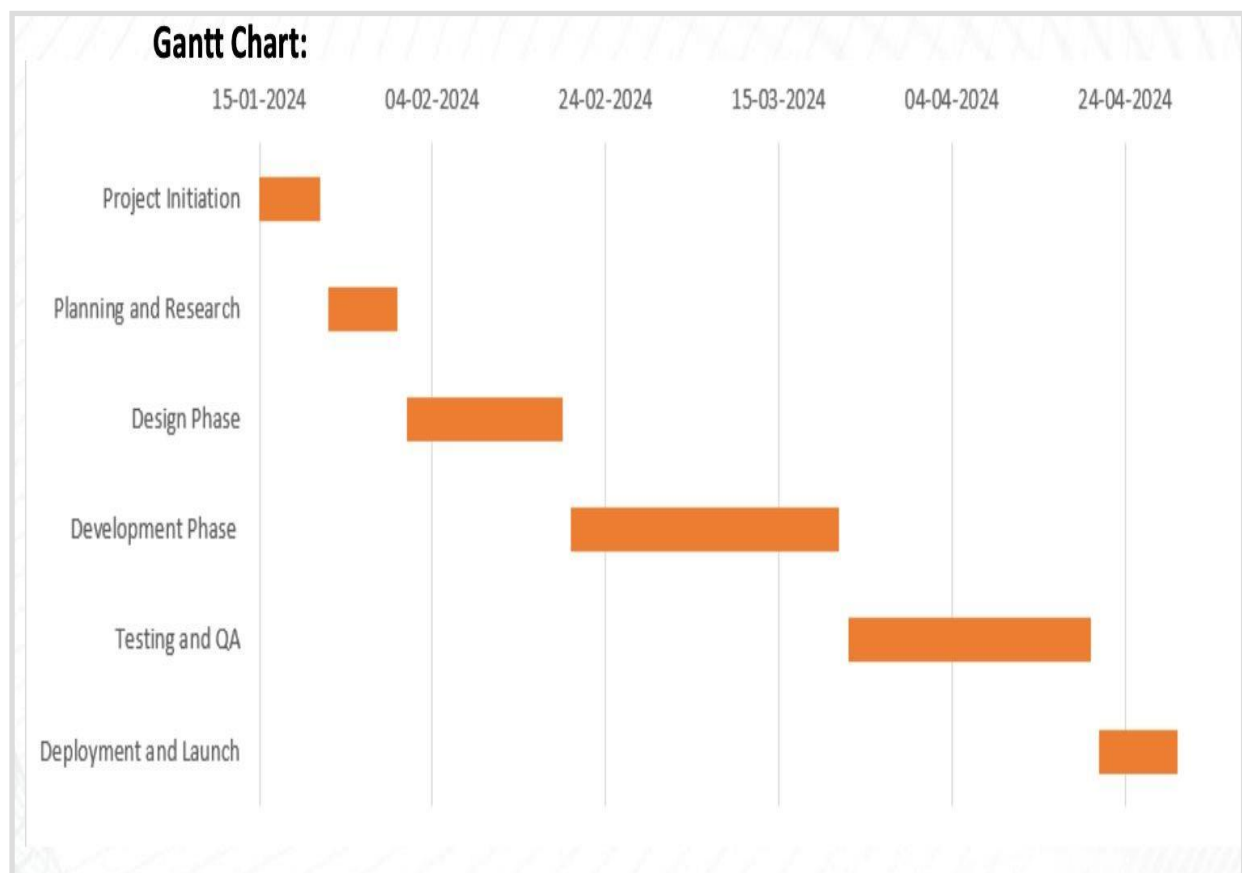
- Echo is available as an android mobile app.
- Users can create profiles, share text-based posts with images, and participate in discussions.
- Unique features include "Kind Comments," "Community Topics."
- The platform prioritizes user privacy and data security.

### Scope of Application:

- Echo is ideal for individuals and communities seeking an uplifting online experience.
- Can be used for personal connections, professional networking, and social activism.
- Businesses can utilize Echo to engage with customers and build brand loyalty in a positive environment.

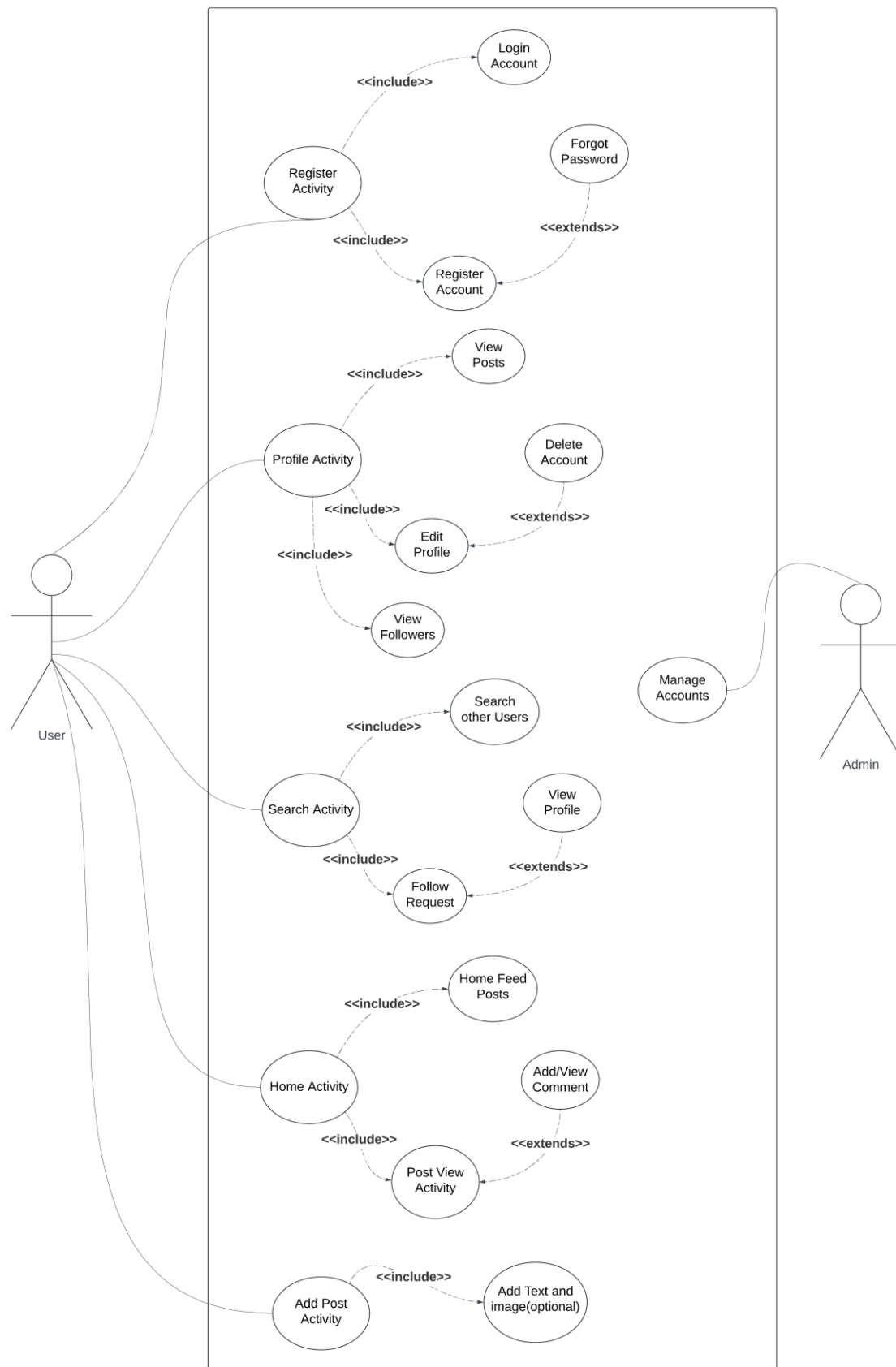
**Join Echo today and experience the difference!**

### App development Schedule:

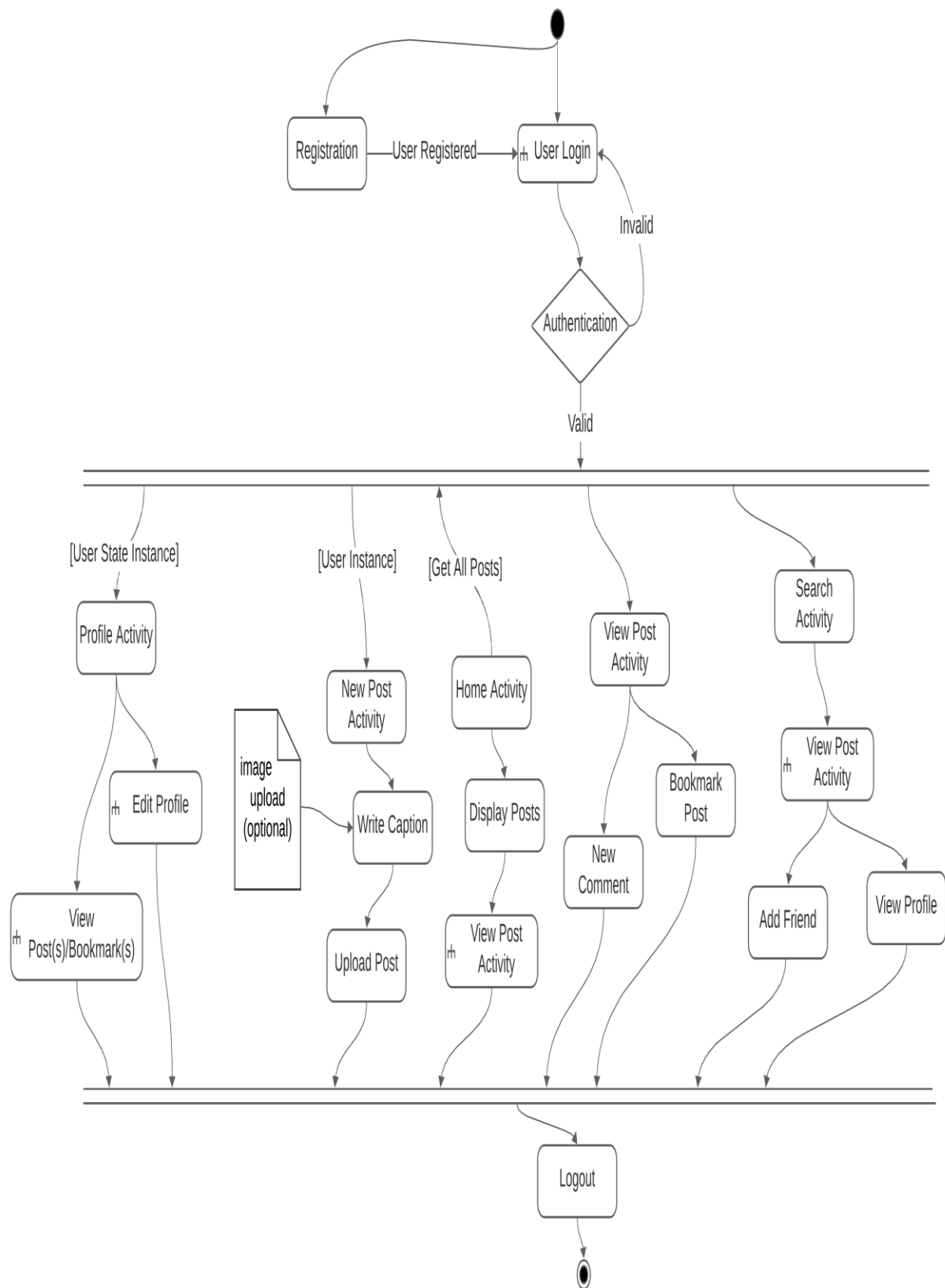


## 2. Analysis Phase

### 2.1 Use Cases Diagram



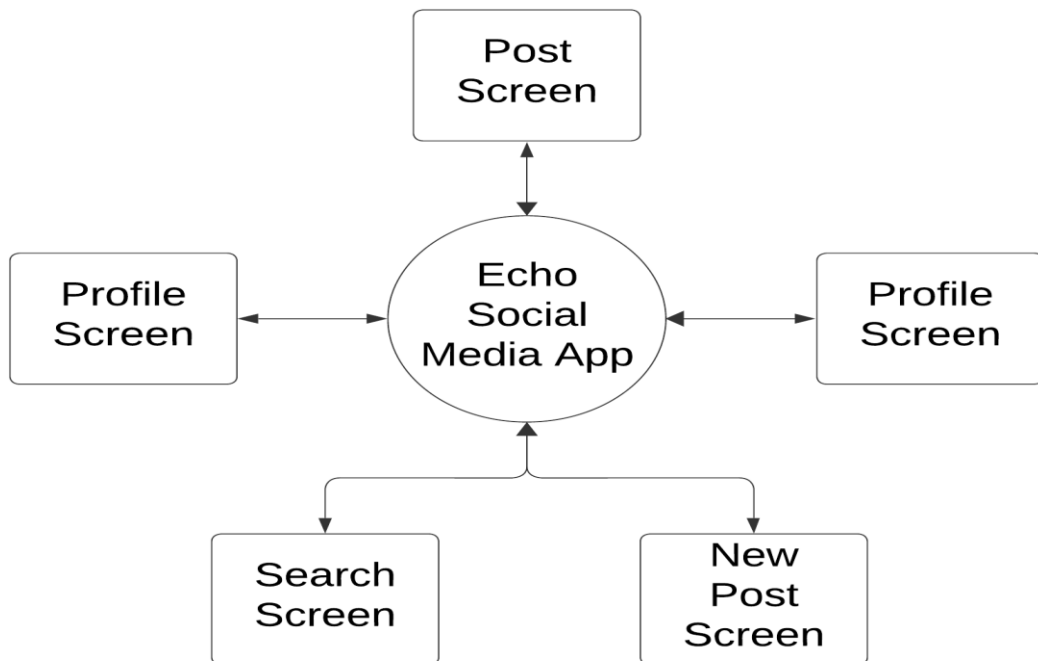
## 2.2 Activity Diagram



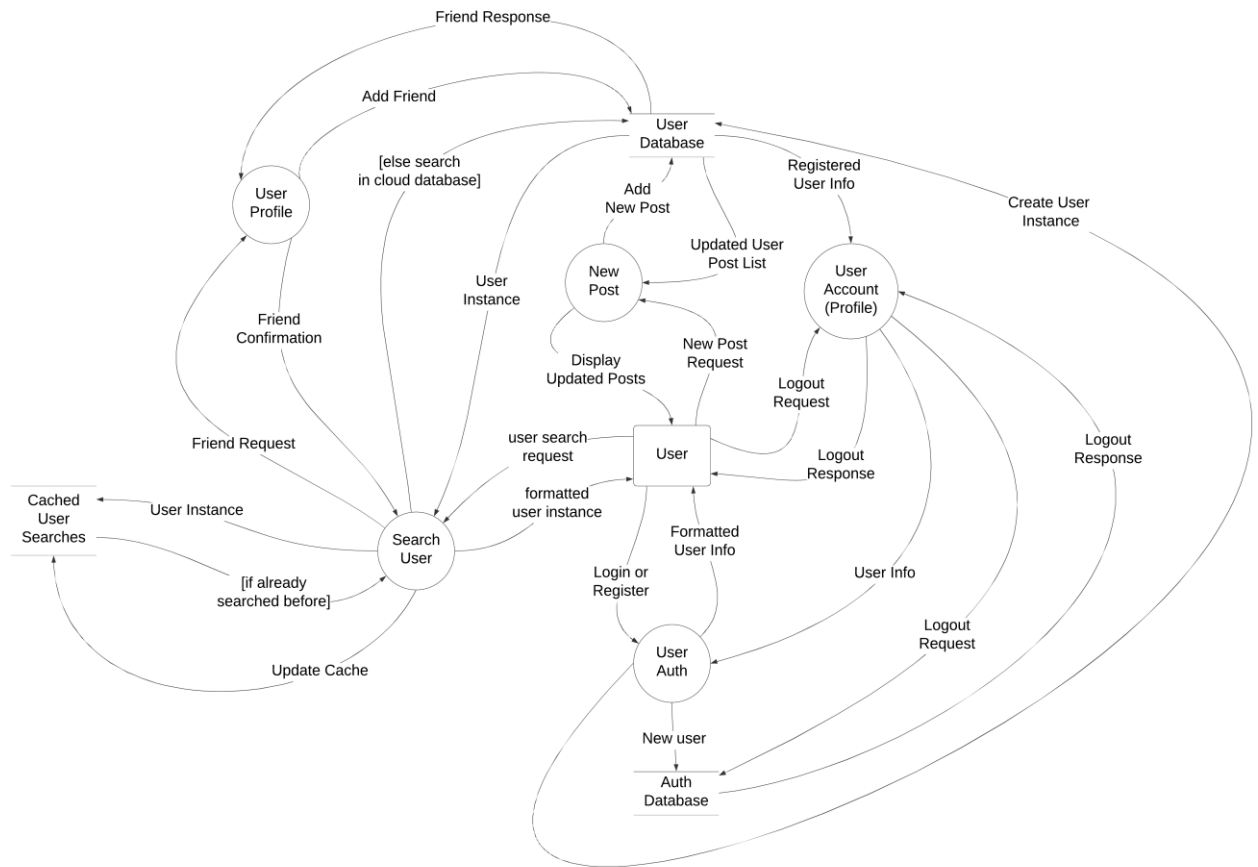


## 2.3 Data Flow Diagrams (DFDs)

### 2.3.1 DFD Level 0



### 2.3.2 DFD Level 1



## 2.4 Software Requirement Specification in IEEE Format

### 2.4.1 Introduction

#### Purpose

The purpose of this Software Requirement Specification is to give an overview of the functional and non-functional requirements of Echo Social Media Android App.

#### Document Conventions

Term	Definition
FRU	Functional Requirement: User Registration and profile Settings.
FRF	Functional Requirement: Friends and suggestions.
FRP	Functional Requirement: Posts.
FRC	Functional Requirement: Comment.

#### Intended Audience and Reading Suggestions

This document is intended for a varied set of audiences. This document serves as a contract agreement with the stakeholders. This document is intended for the stakeholders' authorities, the design team, the developers, project managers, team leads, supervisors, security analysts, testing team to better understand the system requirements.

#### Product Scope

Echo Social Media App is an online community. The social network can help one maintain existing relationships with people and share pictures and messages, and establish new ones by reaching out to people one has never met before. The App also provides the features of blogging all at one place. The main idea behind blogging is to share your thoughts with all your friends which can be read by all the users using the app. This blog can be handled by the user as he wants for example adding photos also.

#### Overview

The remaining sections of this document provide a general description, including characteristics of the users of this project, the product's hardware, and the functional and data requirements of the product. General description of the project is discussed in section 2 of this document. Section 2 gives the functional requirements, data requirements and constraints and assumptions made while designing the multi-utility system. It also gives the user viewpoint of product use. Section 3 gives the specific requirements of the product. Section 3.0 also discusses the external interface requirements and gives detailed description of functional requirements.

#### Reference

- IEEE Standard for Software Requirements Specifications (IEEE Std 830-1998): This standard provides guidelines for creating software requirements specifications, including templates and best practices.
- "SRS Template and Example" by Karl Wiegers: Karl Wiegers is a well-known expert in software requirements engineering. His website provides a template and example of an SRS document, which can serve as a starting point for creating your own.
- GitHub Repositories: Many developers and organizations share their project documentation, including SRS documents, on GitHub.

- Open-Source Projects: Explore open-source social media platforms on platforms like GitHub. Studies from project's documentation, issue trackers, and discussions to understand how requirements are managed and documented in real-world projects.
- Books on Software Requirements Engineering: Books like "Software Requirements" by Karl Wieggers and Joy Beatty or "Writing Effective Use Cases" by Alistair Cockburn.

### 2.4.2 Overall Description

#### Product Perspective

- The Echo Social Media app allows users to connect with their family and friends all over the globe. It gives a global platform for users around the world to connect with each other. Users can also share photos and blog and engage themselves in chatting using comments.

#### Product Functions

The Product should be able to perform the following operations:

- User can register to the app or login whenever he wishes to do so.
- User can create his profile, add, edit information, set visibility to various profile sections, so his own profile and upload profile picture to his profile.
- Allow users to manage their profiles, including updating profile information, changing profile pictures, and editing privacy settings.
- Display a personalized feed of content from users' connections (friends, followers) and followed accounts. Show a mix of text posts and images content.
- Support various forms of engagement such as likes, comments, shares, retweets, and reactions.
- Facilitate conversations and discussions among users through comments and replies.
- With the application users can connect with their friends and family through a common platform. A user can search for his friends and will be shown appropriate results if matching profiles are found.

#### User Characteristics

- Standard users may belong to any demographic group including any gender, nationality that have access to android phone. The app requires its users to be above 16 years of age. It does require its users to have any basic android knowledge. User interface is in English language so users should have a basic English reading knowledge.

#### Operating Environment

Hardware Requirements:

- Above 2GB ram.
- Support for various network types (Wi-Fi, 3G, 4G, 5G)
- 16GB of internal storage is recommended, but preferably 32GB or more for better user experience.
- Gyroscope Sensor for app screen rotation.
- Camera for capturing photos and sharing multimedia

#### Software Requirements

- Operating System: Android

## UCS503 Software Engineering Lab

- Programming language: Kotlin and Java
- requires a minimum SDK of 21 or higher, which is equivalent to Android 5.0 Lollipop
- Back End-Technology: Google Firebase Server

Note: In Android, the SDK version is the version of Android that an app is designed to run on, or the API level on which the application is intended to run. The target SDK version (targetSdkVersion) tells Android which compatibility layers to enable to ensure an app runs correctly.

### Design and Implementation Constraints

- Adherence to Android platform guidelines and design principles set by Google to ensure consistency and compatibility across devices. Compatibility with various Android versions and screen sizes, including smartphones, tablets, and foldable devices. Compliance with Google Play Store policies and restrictions regarding content, permissions, and app behavior.
- Designing the app architecture and codebase in a modular and scalable manner to accommodate future growth and changes.
- Proper documentation, version control, and coding standards to facilitate collaboration among developers and maintainability of the codebase.
- Integration with external APIs, SDKs, and services for features like authentication, analytics, push notifications, and social sharing.

### Assumptions and Dependencies

- There will be availability of Internet via 3G, 4G, 5G or Wi-Fi.
- The user of the app should be well acquainted with English Language.
- The user should have valid email address to register into the app.
- Center server of the system must be able to handle all the incoming requests.
- The user should have basic knowledge of android.

## 2.4.3 Specific Requirements

### External Interface Requirements

The Following list present the external interface requirements:

- The product requires very limited graphics usage with simple keyboard for taking the user input.
- The product does not require usage of sound. The hardware and operating system.

### Detailed description of functional requirements

Table shows a template that will be used to describe functional requirements for user.

Purpose	A description of the functional requirements and its reasons.
Inputs	What are the inputs; in what form will they arrive; from what sources can the input come; what are the legal domains of each input
Processing	Describes the outcome rather than the implementation; includes any validity checks on the data, exact timing of operation (if needed), how to handle unexpected or abnormal situations
Outputs	The form, shape, destination, and volume of output; output timing; range of parameters in the output; unit of measure of the output; process by which output is stored or destroyed; process for handling error message produced as output.

### Functional Requirements for Register/Login Screen

Purpose	This Screen provides as an interface for registration or Logging in back into the app.
Inputs	For Registration: email, name, bio, nationality, and password are inputs where email, name and password are required inputs. For Login: email and password are required inputs.
Processing	On register/login request, the request is sent to Google Firebase for processing and waiting for the response.
Outputs	If the response is success, then user is confirmed and logged in the app. Else cause of fail(error) is displayed to the user.

### Functional Requirements for Home Screen

Purpose	This screen is used to display real time posts update from friends, content discovery and social interactions. It also contains Bottom Navigation which contains all the routes to other screens like search, profile, and new post screen.
Inputs	User Profile data, device interaction such as touch gestures, and taps for navigation across different screens. Tap on Post to get expanded Post Screen View.
Processing	Get all posts and format in order to display in visually appealing manner.
Outputs	Display of posts, with images from other users and friends. Options to bookmark and comment on a Post. Navigate to different screens.

**Functional Requirements for Profile Screen**

Purpose	The profile screen serves as a centralized location for users to manage their personal information, interact with their posts, friends.
Inputs	Unformatted User instance from User database with name, bio, profile picture, contact info etc.
Processing	Fetching user profile data, including personal information. Processing and formatting the retrieved data for presentation on the profile screen ensuring a visual appealing and user-friendly layout.
Outputs	Displaying user profile data such as name, bio, profile picture, contact details, nationality, etc. in a visually appealing manner. Content Display and interaction with posts and comments. Displaying list of followers, following, bookmarks, and posts.

**Functional Requirement for Post Screen**

Purpose	The purpose of the expanded post view is to provide users with detailed information and interaction options for a specific post. This view allows users to engage with the content more deeply, including reading longer texts, viewing larger images or videos, and interacting with comments and reactions.
Inputs	Text content of the post, including captions or descriptions. Media content such as images, videos, or links. Information about the user who created the post, including profile picture, username, and bio.
Processing	Rendering of text, images, videos, and other media elements within the expanded view. Responsive design to adapt to various screen sizes and orientations. Processing user interactions such as bookmarks, comments, etc.
Outputs	Display of the post's content in an expanded format, allowing users to view details and media elements. Options to zoom in or out, play videos, or swipe through multiple images. Interactive elements for bookmarking, commenting, sharing the post. Navigation options to return to the feed or explore related user profile.

**Functional Requirement for Add Post Screen**

Purpose	The purpose of the "Add Post" screen is to allow users to create and upload new content, such as text, images, or links, to share with their social network.
Inputs	Text input for composing the post caption or message. Options for uploading images. Interface for selecting media file from the device's gallery or capturing new photos/videos using the camera.
Processing	Handling the uploading of media files to the server, including image and optimization for faster upload speeds.
Outputs	Displaying the newly created post in the user's feed and profile, visible to the intended audience. Providing options to delete the post after it has been published.

**Functional Requirement for Search Screen**

Purpose	The primary purpose of the search screen is to allow users to find and connect with existing users within the social media platform. This feature enables users to discover friends, family, colleagues, or other individuals they may know or want to follow.
Inputs	Text input field for users to enter the email of the person they are searching for. Support for partial or full name matching.
Processing	Implementation of an efficient search algorithm to retrieve relevant user profiles based on the provided query.
Outputs	Display of user profiles matching the search query, including profile pictures, usernames, and brief information. Detailed view of individual user profiles upon selection from the search results (Profile Screen for that user).

**Non-Functional Requirements**

- Accessibility: It should adhere to accessibility standards, ensuring that users with disabilities can navigate and use the app effectively.
- Performance: The app must load quickly. Optimization should be implemented to minimize loading times.
- Compatibility: The app should be compatible with various mobile screens and Android versions.
- Security: The app must prioritize security to protect users' personal information. Secure authentication mechanisms, encrypted connections should be implemented to safeguard data.
- Modularity: The app's codebase should be organized into reusable and independent modules to facilitate easier maintenance and updates. Comprehensive documentation should be provided for developers, administrators, and end-users to understand the app's architecture, APIs, and features.

**Performance Requirement**

- The app should load within a reasonable time frame, typically within a few seconds, to ensure users can quickly access their feed and content.



## 2.5 User Stories and Story Cards

Sno.	Action	Acceptance Criteria
1.	As a user, I want to create a new account, so I can start using the social media app.	User should be able to sign up using email. User must provide an email, name, password, and optional profile information. Upon successful signup show confirmation.
2.	As a user, I want to personalize my profile, so I can show others.	User should be able to upload a profile picture. User must have the option to fill in profile details such as bio, nationality. Profile editing should be intuitive and allow for easy updates.
3.	As a user, I want to post updates and share content with my followers, so I can engage with my network.	User should have a "Compose" button to create new posts. User must be able to share text, images. Posts should be visible in the user's followers' feeds.
4.	As a user, I want to follow other users and discover new content, so I can stay connected and informed.	User should be able to search for users by username. User must have the option to follow/unfollow other users. Also view profile of user.
5.	As a user, I want to engage with content by bookmarking, commenting, so I can interact with others.	User should see options to bookmark, comment posts in their feed. User must be able to view comments on posts.

### User Cards

#001 Register/Login User
As a user, I want to create a new account, so I can start using the app.
Use FRU1 and FRU2 System Functions. <ul style="list-style-type: none"> <li>• Success: Create User instance for app and send acknowledgement to the user.</li> <li>• Failure: Display the failure reason, retry the process of creating user and submit log to android.</li> </ul>

#002 Update User Profile
As a user, I want to personalize my profile, so I can show others.
Use FRU1 and FRU2 System Functions. <ul style="list-style-type: none"> <li>• Success: Create User instance for app and send acknowledgement to the user.</li> <li>• Failure: Display the failure reason, retry the process of creating user and send log in android.</li> </ul>

#003 Post Content
As a user, I want to post updates and share content with my followers, so I can engage with my network.
Use FRP1 System Function <ul style="list-style-type: none"> <li>• Success: Update the user posts list in cloud database and in app across all application. Update Profile Screen.</li> <li>• Failure: Display the failure reason and retry the process.</li> </ul>

#004 Follow User

As a user, I want to follow other users and discover new content, so I can stay connected and informed.

Use FRF5 and FRF1 System Function.

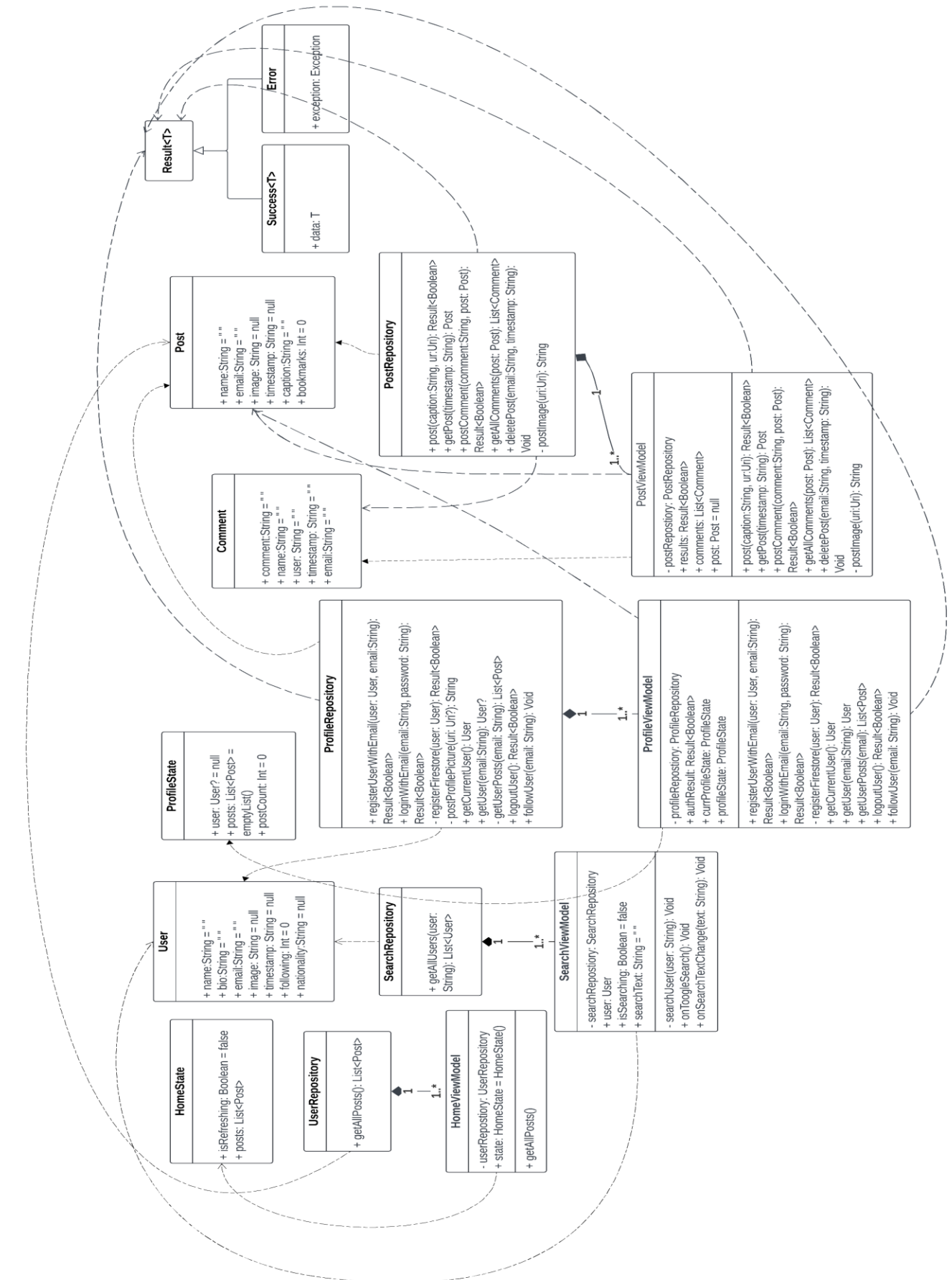
- Success: Send Follow Request to the user and update followers list in User instance.
- Failure: Display the failure reason.

#005 Bookmark and Comment

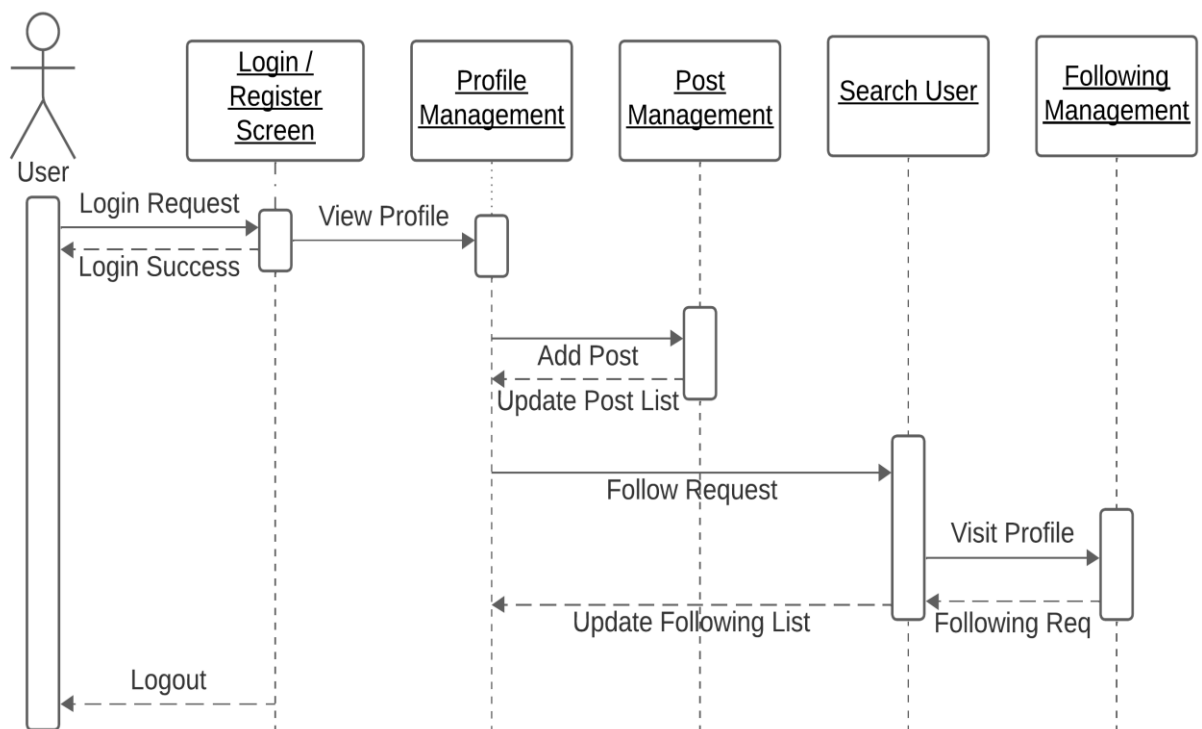
As a user, I want to create a new account, so I can start using the social media app.

Use FRP3 and FRC1 System Function.

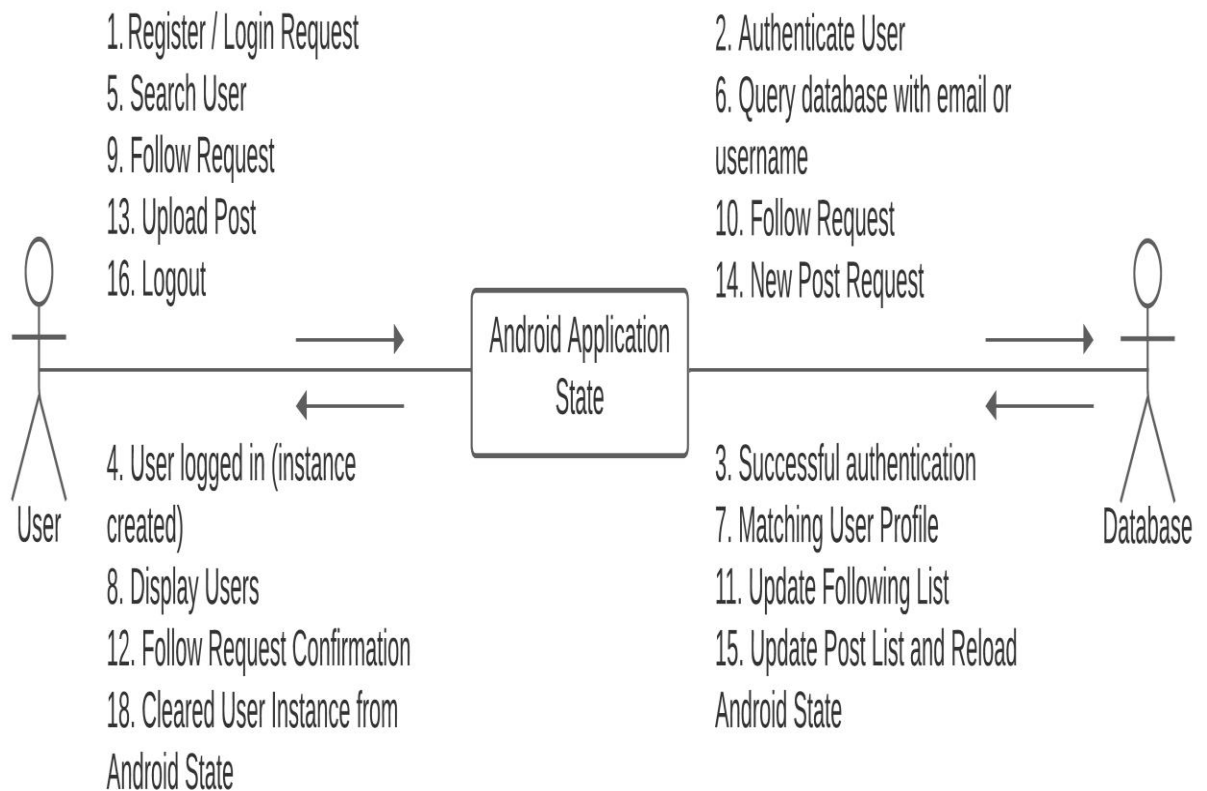
- Success: Bookmarks will be stored locally on the device and can be viewed from profile screen. Comments can be added and are associated with post.
- Failure: Display the failure reason and retry the process.



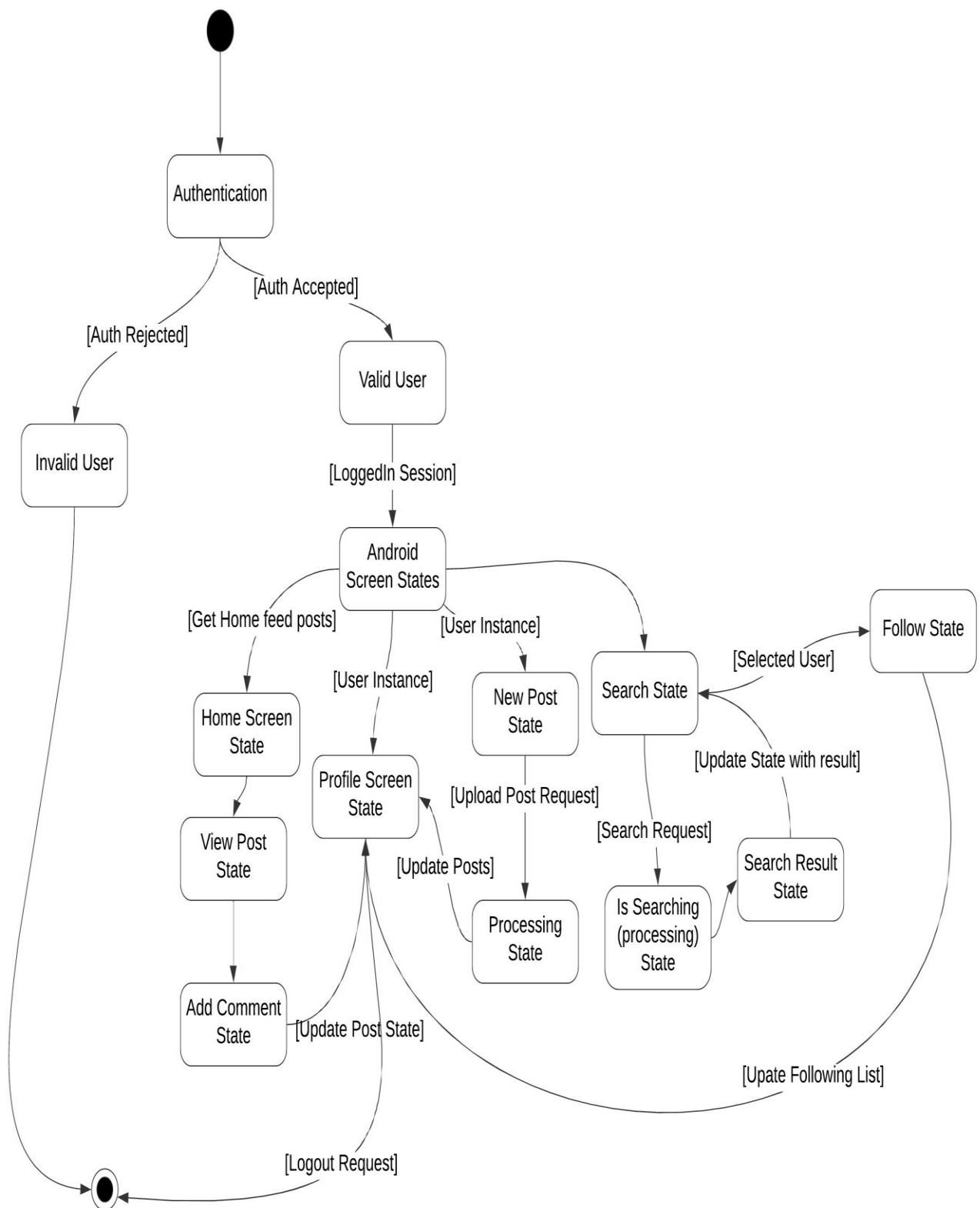
### 3.2 Sequence Diagram



### 3.3 Collaboration Diagram

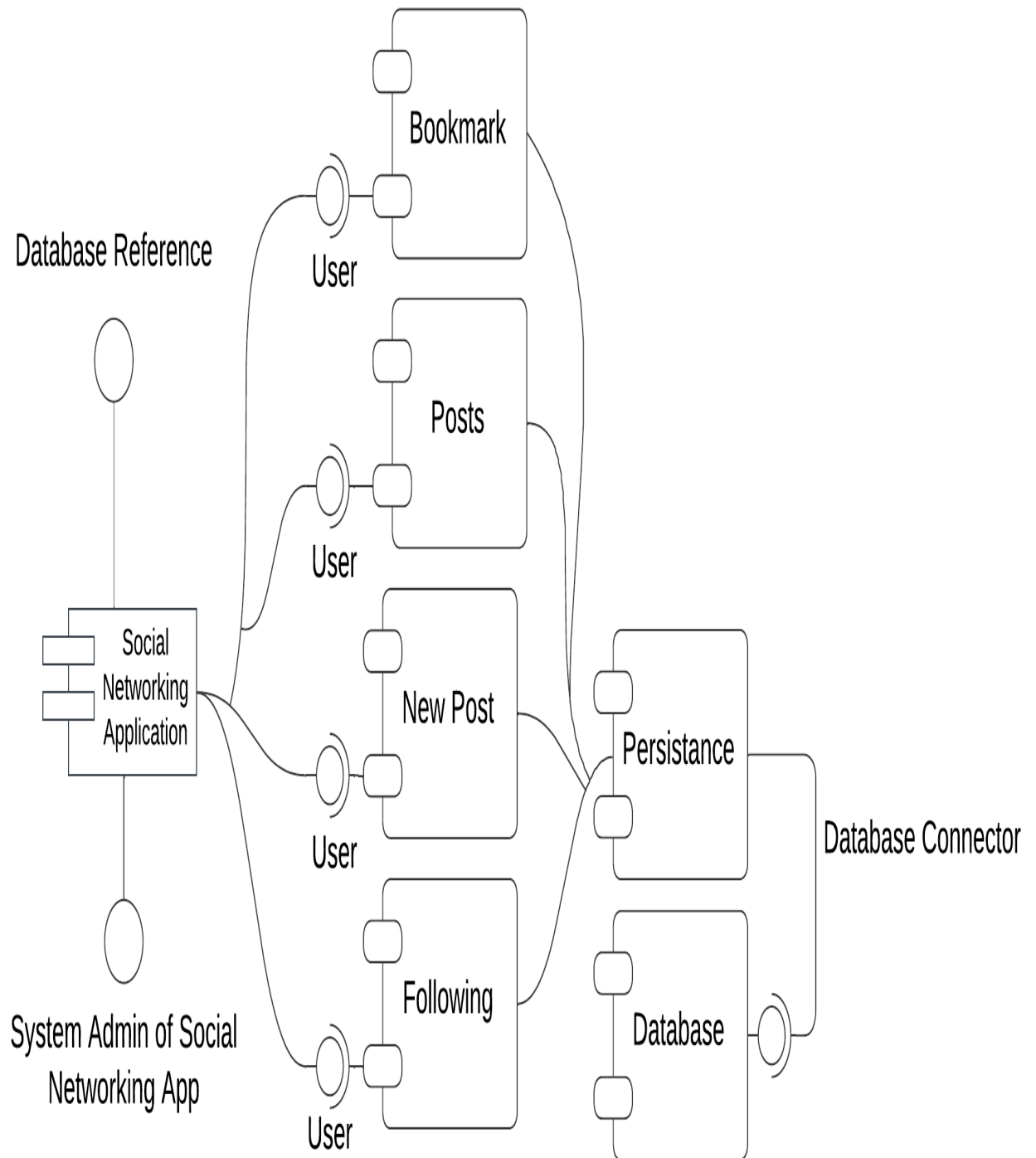


## 3.4 State Chart Diagram

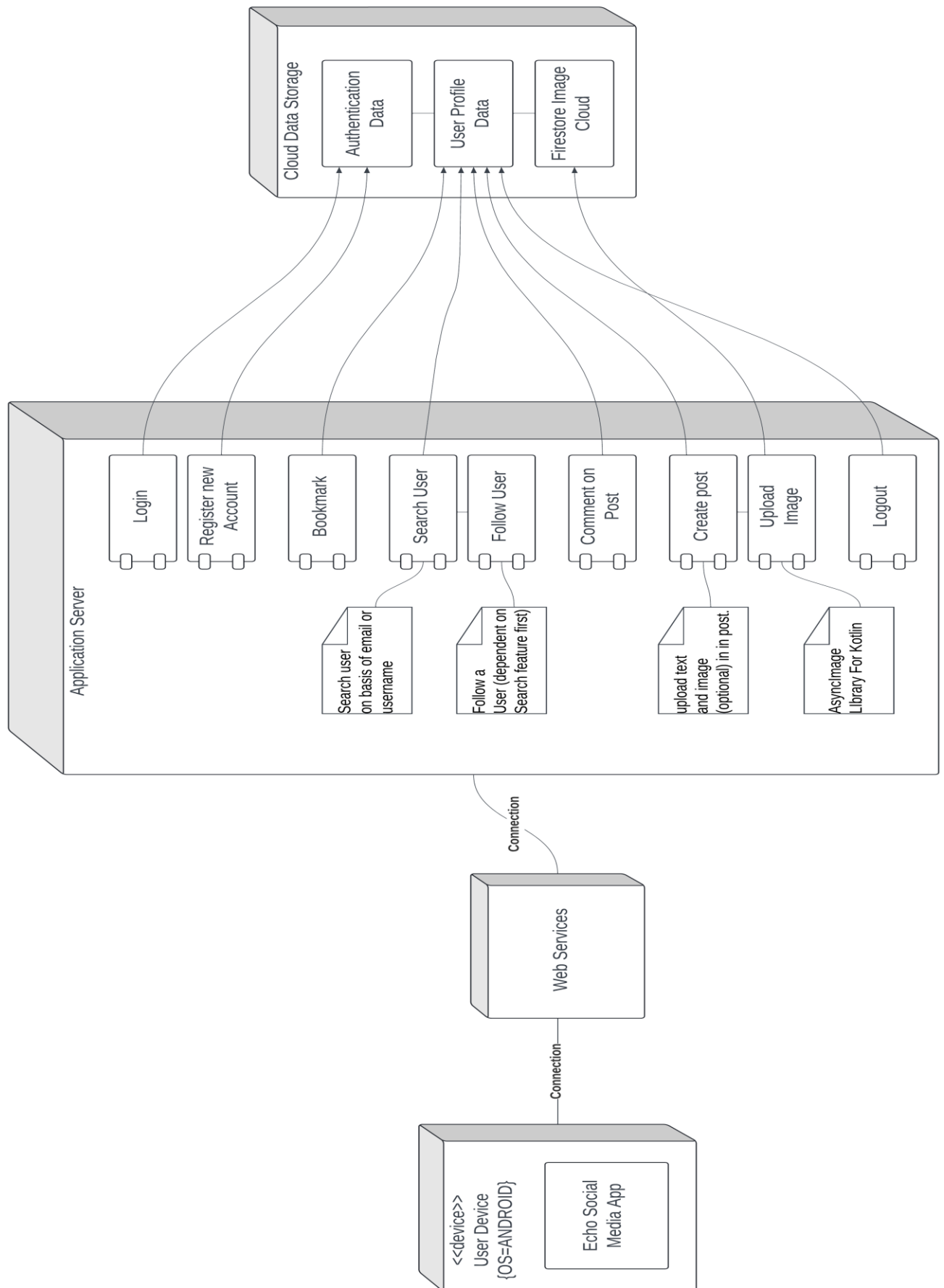


## 4 Implementation

### 4.1 Component Diagram

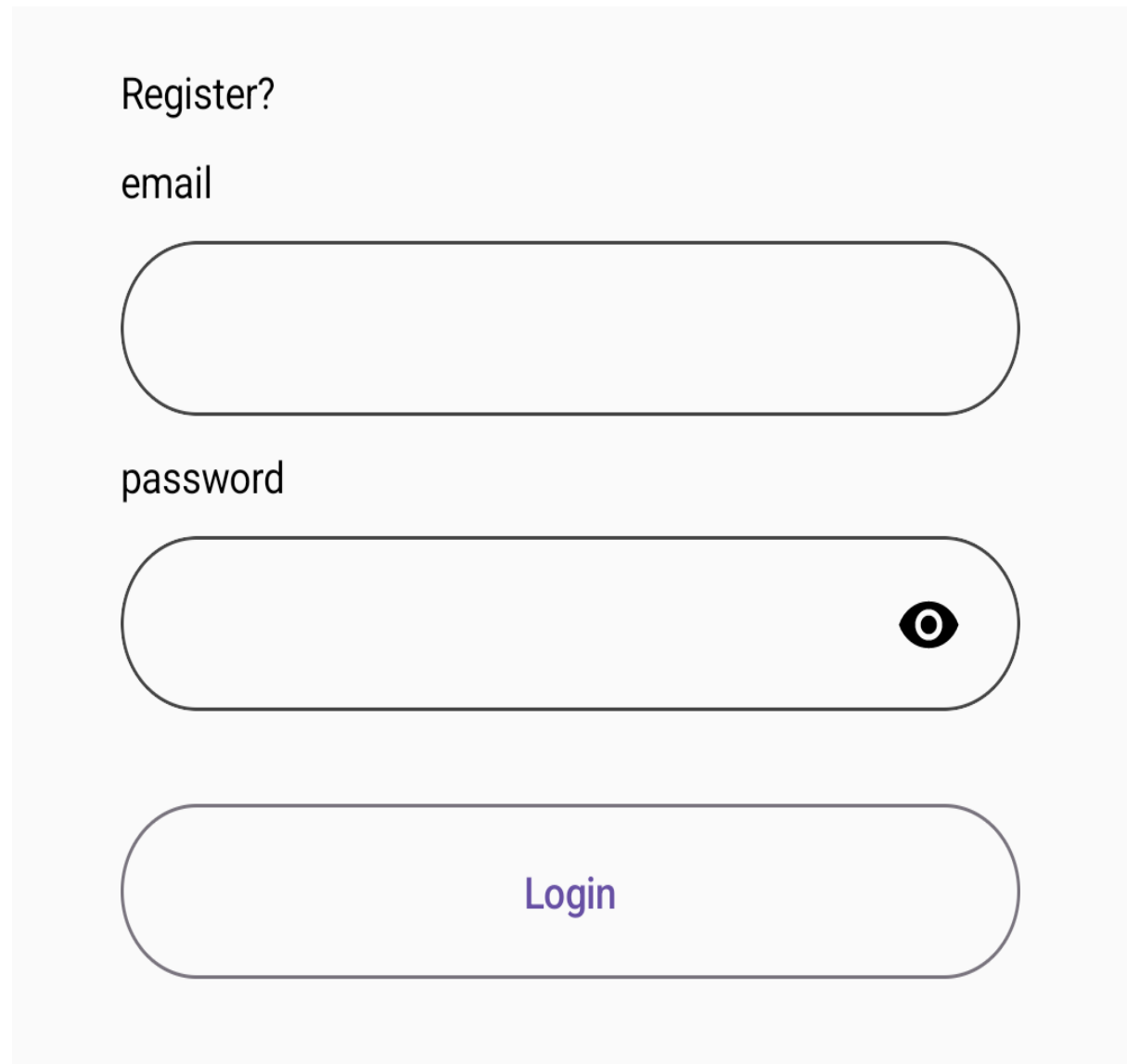


## 4.2 Deployment Diagram



### 4.3 Screenshots

#### Register




A screenshot of a registration form on a light gray background. The form consists of three main elements: a text label 'Register?', an email input field, a password input field with a toggle icon, and a login button.

Register?

email

password



Login

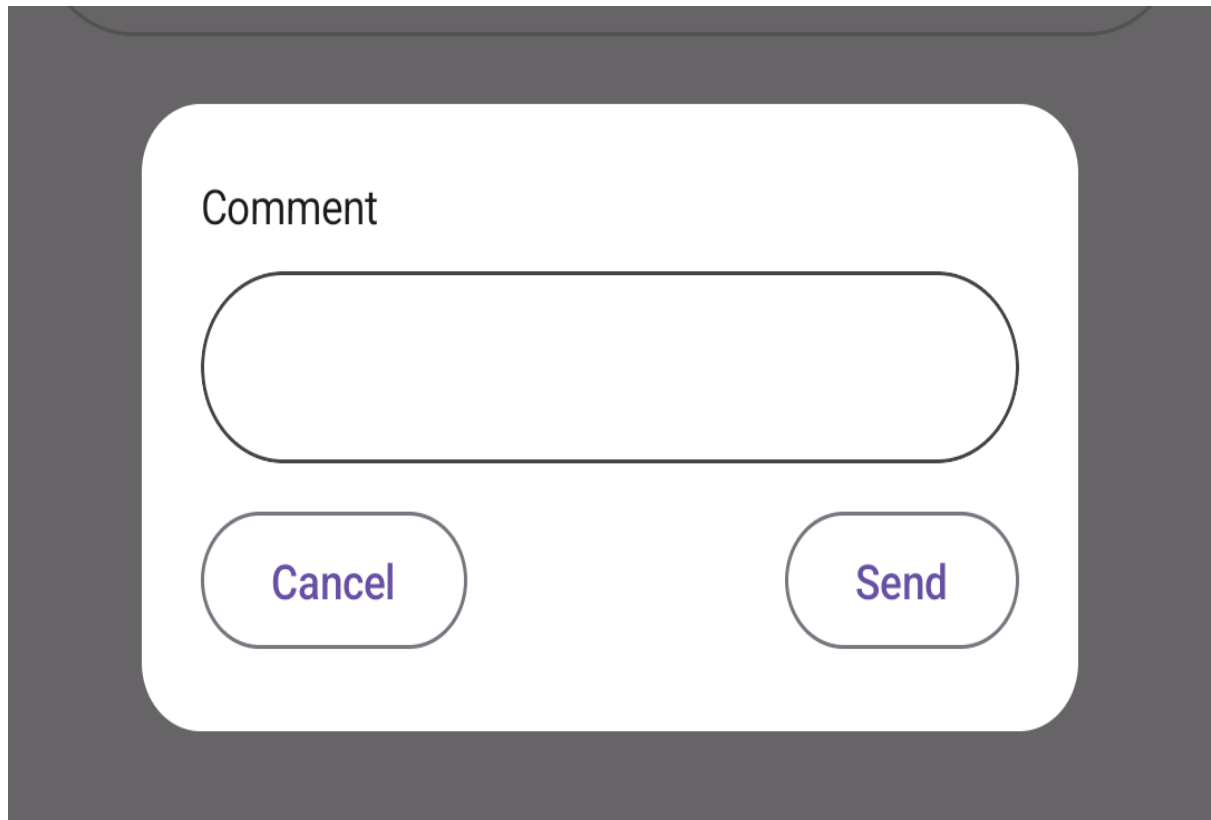


## Add post

Caption

Add Image


**Comment**



The image shows a modal dialog box for adding a comment. It has a dark gray title bar at the top. The main content area is white with rounded corners. At the top of this area is the label "Comment". Below the label is a large, empty, rounded rectangular text input field. At the bottom of the dialog are two buttons: "Cancel" on the left and "Send" on the right. Both buttons are white with rounded corners and a thin gray border. The text on the buttons is a dark purple color.





Searching

 **Search**

Search

nothing





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