Software Design Document

ConnectU

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Contents

Chapter 1

Introduction

1.1 Purpose of the document

This Software Design Document (SDD) serves as a comprehensive guide to the architecture, functionality, and implementation details of our application. By defining the system's functional and technical specifications, illustrating expected behaviors, and justifying design decisions the SDD ensures a shared understanding of the software's intricacies. It serves as a crucial reference point throughout the development lifecycle, fostering effective communication, and ensuring smooth software implementation and maintenance.

1.2 Scope of the Project

ConnectU is a social media online platform where users are able to interact with one another, can add friends, exchange images and videos, leave comments, and more. This social media application has a wide variety of features and functionalities designed to enhance communication and collaboration in the digital communication space.

The project includes, a user-friendly front-end interface created using ReactJS and its different libraries along with HTML and CSS, and a well-integrated back-end built using ExpressJS framework and NodeJS. All the user's data is stored in the database i.e. MongoDB database. Main feaures of the project is the real-time sharing of comments, images, videos and other resources. The main objective of developing this application is to collaborate to the world of social media, developing interactive and user-friendly application, allowing people around the globe to connect with each other.

1.3 Definitions/Abbreviations

- **HTML:** Hyper Text Markup Language user to structure the website.
- **CSS:** Cascading Style Sheet use for desiginig purpose on the front-end.
- **SRS:** is an abbreviation for Software Requirements and Specification, which is a document that outlines the needs of a software system.

- **User:** an entity registered on the application database using the features of the app.
- **NodeJS:** is a cross-platform, open-source JavaScript run-time environment that runs JavaScript code outside a web browser.
- **ExpressJS:** is a back end web application framework for building RESTful APIs with NodeJS.
- **ReactJS:** is a free and open-source front-end JavaScript library for building user interfaces based on components.
- **JavaScript:** is a scripting language for creating dynamic web page content.
- **Mongodb:** provides a straight-forward, schema-based solution to model your application data
- **SQA:** Software Quality Assurance, is a means and practice of monitoring all software engineering processes, methods, and work products to ensure compliance against defined standards.

1.4 References

1.5 Overview of the document

The Software Design Document (SDD) unfolds in a structured manner. Chapter 2, Object-Oriented Design, employs a Class Diagram and Data Dictionary to elucidate system structures. Chapter 3 navigates Functional Modeling through Data Flow Diagrams, revealing the intricate flow of data within the software. Behavioral Modeling takes center stage in Chapter 4, employing State Transition Diagrams to articulate dynamic system responses. Finally, Chapter 5 delves into Interaction Modeling, presenting Use Case and Sequence Diagrams that capture the nuanced interplay between users and the software. This comprehensive structure ensures a holistic understanding of the software's architecture, functionality, and dynamic behavior throughout the document.

Chapter 2

Object-Oriented Design

2.1 Class Diagram

In this class diagram for our social media app, three fundamental classes define the core interactions and entities within the platform: User, Friend, and Post. The ”User” class serves as the central entity, encapsulating user-specific information such as a unique identifier, name, friends, password, and profile details. Users can establish connections through the ”Friend” class, which represents the friendship relationship with attributes like a unique friend ID and status indicators for pending, accepted, or declined connections. The ”Post” class captures the content shared on the platform, including a unique post ID, textual or multimedia content, timestamps, and engagement metrics like likes and comments. Users interact with posts through methods like liking and commenting. This class diagram provides a concise representation of the key elements in a social media app, illustrating how users connect and share content through the platform’s fundamental classes and their associated attributes and methods.

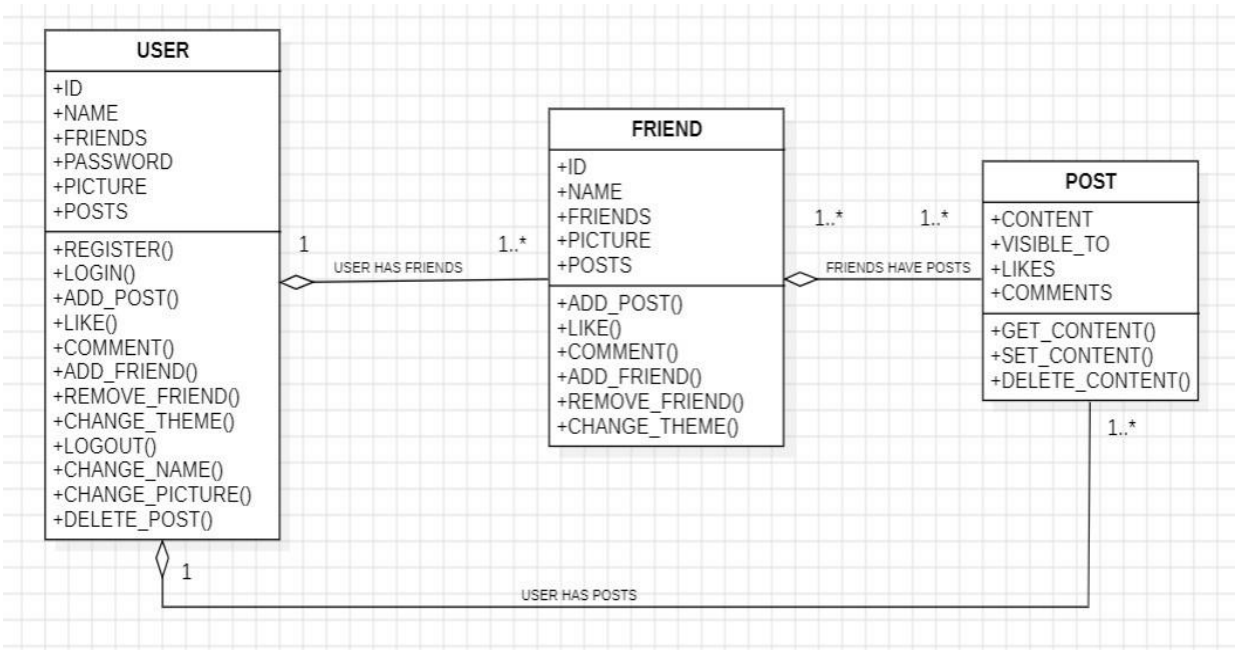

Figure 2.1: Use Case Diagram

2.2 Data Dictionary

Method	Description	Example Values
REGISTER	Register a new user account	REGISTER("JohnDoe", "johndoe@example.com", "password123")
LOGIN	Log in to the user account	LOGIN("johndoe@example.com", "password123")
ADD POST	Add a new post to the user's profile	ADD POST("Hello, World!", "2024-01-02 15:30")
LIKE	Like a post by providing the post ID	LIKE(123)
COMMENT	Add a comment to a post	COMMENT(456, "Great post!")
ADD FRIEND	Add a user to the friend list	ADD FRIEND(789)
REMOVE FRIEND	Remove a user from the friend list	REMOVE FRIEND(789)
CHANGE THEME	Change the user's theme preference	CHANGE THEME("Dark")
LOGOUT	Log out from the current user account	LOGOUT
CHANGE NAME	Change the user's display name	CHANGE NAME("JohnDoe123")
CHANGE PICTURE	Change the user's profile picture	CHANGE PICTURE("/images/newprofile.jpg")
DELETE POST	Delete a post by providing the post ID	DELETE POST(123)
ADD POSTO	Add a post with options (e.g., privacy settings)	ADD POSTO("Private post", "2024-01-02 16:45", "private")
GET CONTENT	Retrieve content based on specific criteria	GET CONTENT("2024-01-02")
SET CONTENT	Set or update content information	SET CONTENT(789, "New content")
DELETE CONTENT	Delete specific content by providing the content ID	DELETE CONTENT(456)

Table 2.1: Data Dictionary for the ConnectU

Chapter 3

Functional Modeling

3.1 Data Flow Diagrams

3.1.1 Level O

At the highest level, the social media app's Level 0 DFD outlines the system's main process 'User'. The data flows connecting users, the app, and the database.

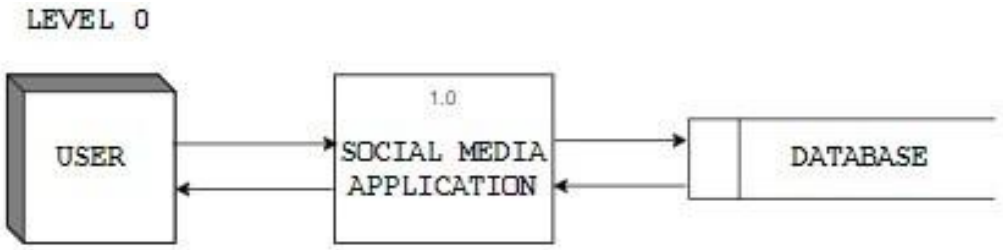

Figure 3.1: DFD Level 0

3.1.2 Level 1

Breaking down the processes from Level 0,to Level 1 DFD provides more detail. ”User Interaction” expands into sub-processes like ”Post” and ”Interaction with Friends,” with data stores representing user credentials, posts, and friend connections.

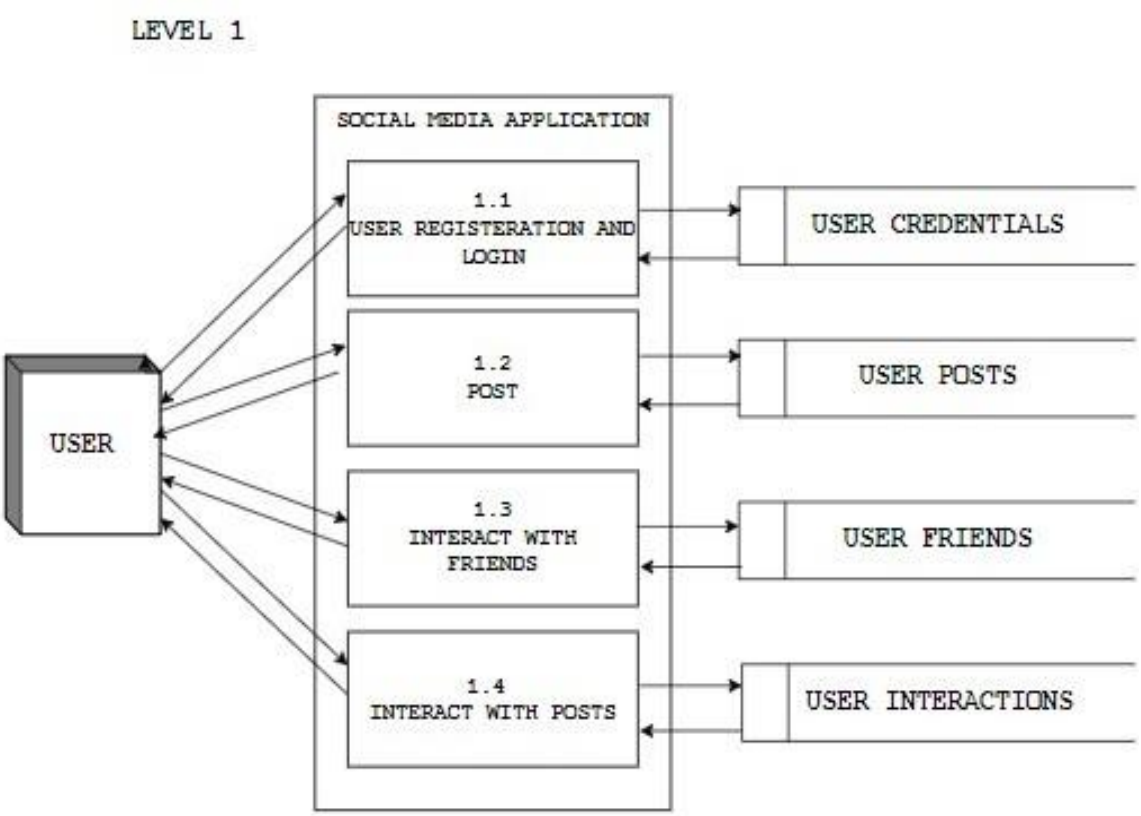

Figure 3.2: DFD Level 1

3.1.3 Level 2

At the most detailed level, Level 2 DFD delves into specific tasks within sub-processes. For ”Post,” this includes tasks like ”Like Post ” and ”Add comment,” emphasizing data flows and data stores for draft posts or media uploads. This level provides a comprehensive view of data processing within each major function of the app.

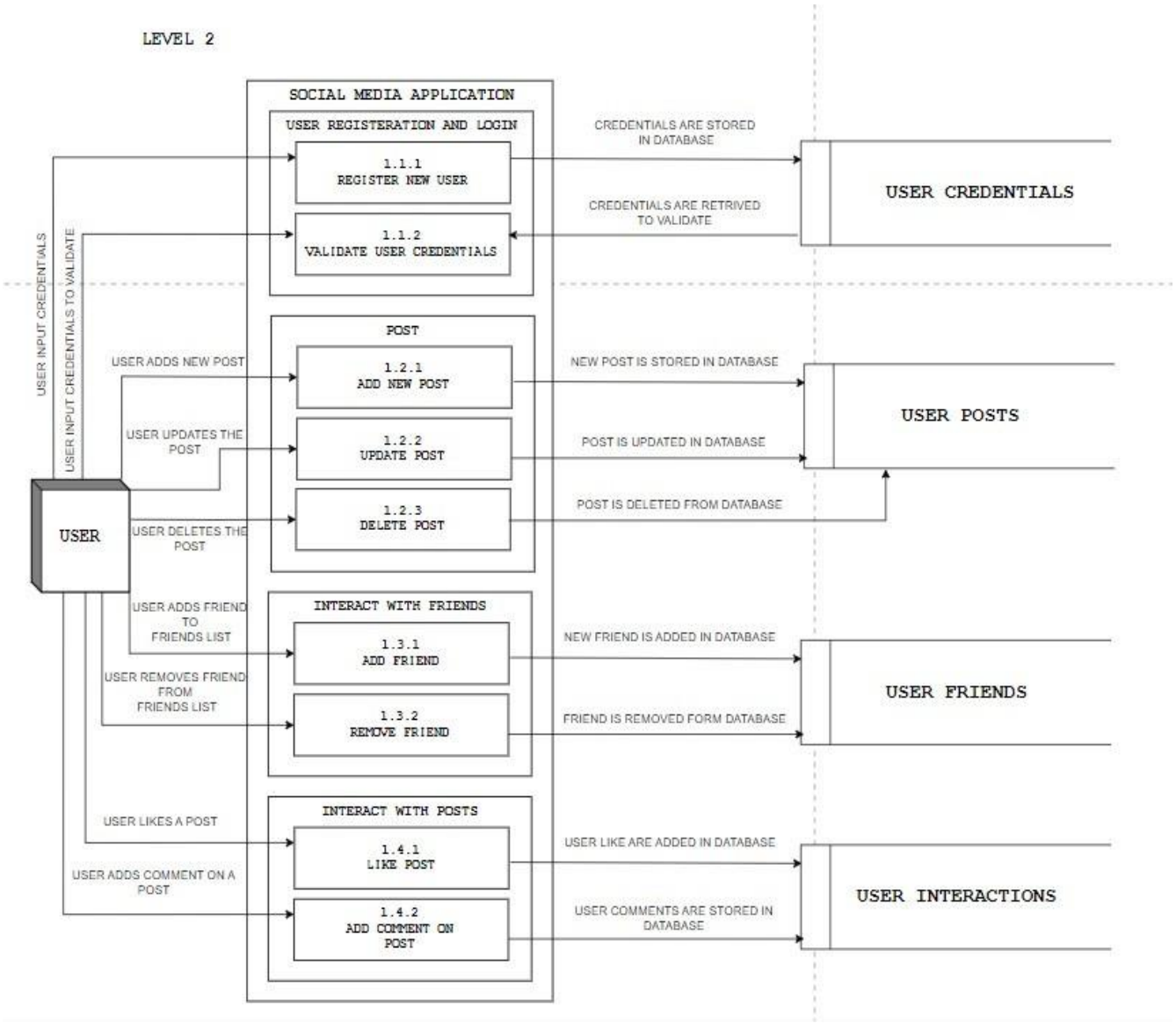

Figure 3.3: DFD Level 2

Chapter 4

Behavioral Modeling

4.1 State Transition Diagram

The state chart diagram provides a high-level overview of the different states the ”Our Social Media App” can be in and the transitions between these states. The app begins in the ”Unauthenticated” state, transitioning to an ”Authenticated” state upon successful login. Within the ”Authenticated” state, users can move between an ”Active” state and specific sub-states, such as customizing their profile, sharing a post, or interacting with a post. The diagram outlines the flow of user activities, representing the dynamic behavior of the social media app as it responds to user actions and transitions through various states. This visualization captures the app’s lifecycle and key user interactions, offering insights into the overall user experience.

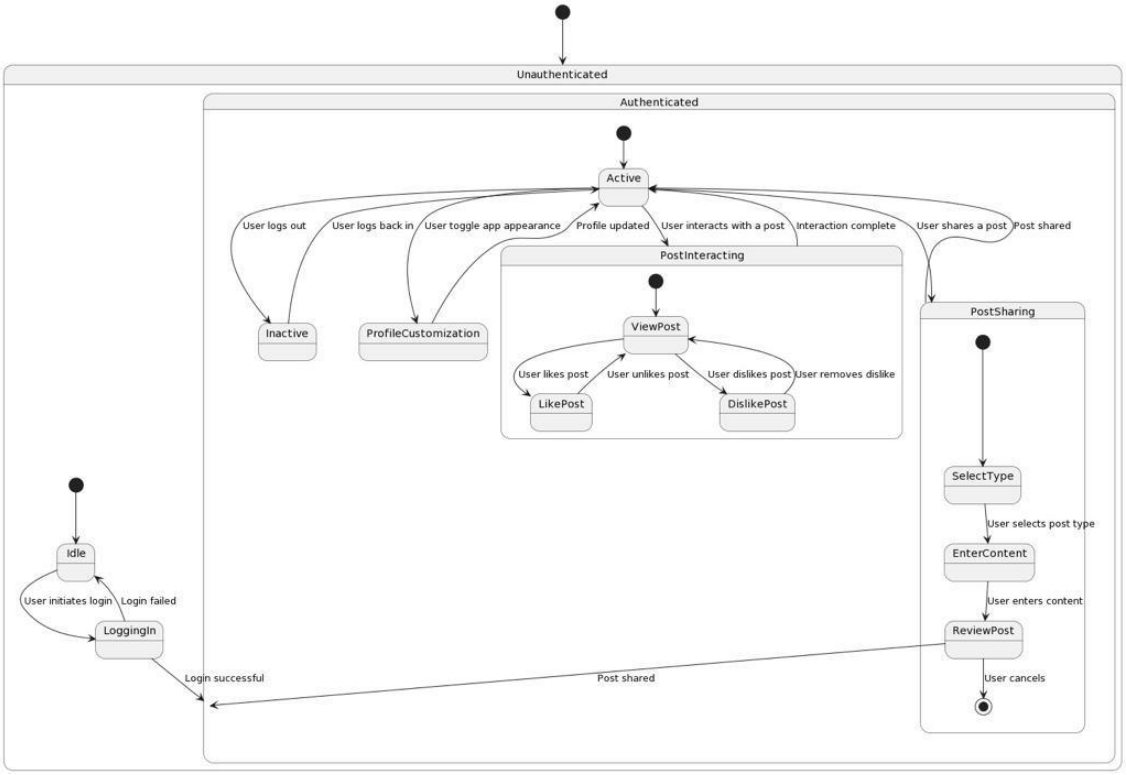

Figure 4.1: State Transition Diagram

Chapter 5

Interaction Modeling

5.1 Use Case Diagram

The use case diagram that follows lists the main participants and the specific use cases that they are working on, and it illustrates the many features and interactions that make up ConnectU.

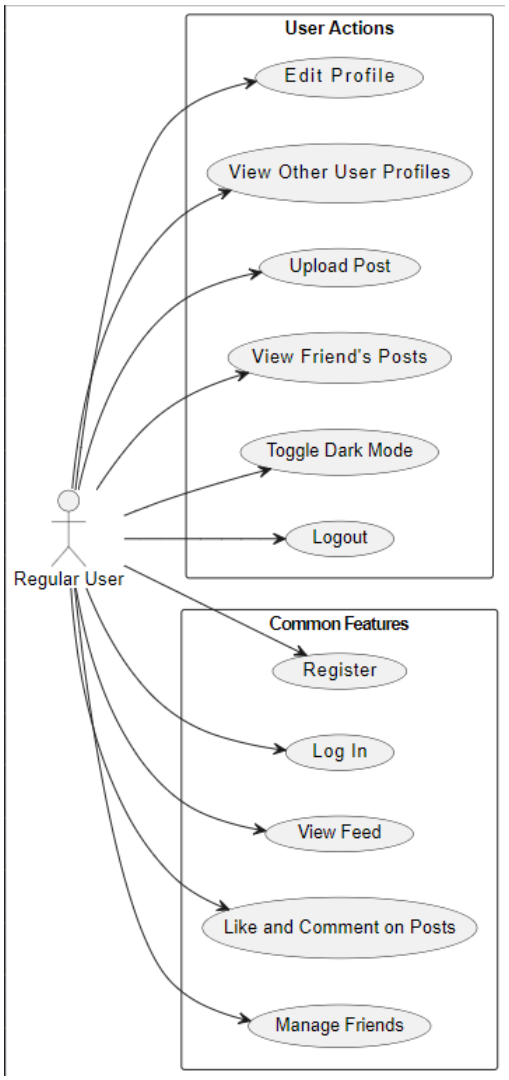

Figure 5.2: Use Case Diagram

5.2 Sequence Diagram

The sequence diagram illustrates the flow of interactions within the ”ConnectU App” as users engage with various features. Users begin by opening the app and logging in, where credentials are verified. Once authenticated, they can customize their profiles, share posts (text, images, or videos), and interact with posts by liking or disliking them. The app communicates with a database to save and retrieve posts. Users can also view profiles and log out when finished. This simplified representation captures the core user actions and the corresponding system responses in the social media app, showcasing the key functionalities of profile management, content sharing, and post-interaction.

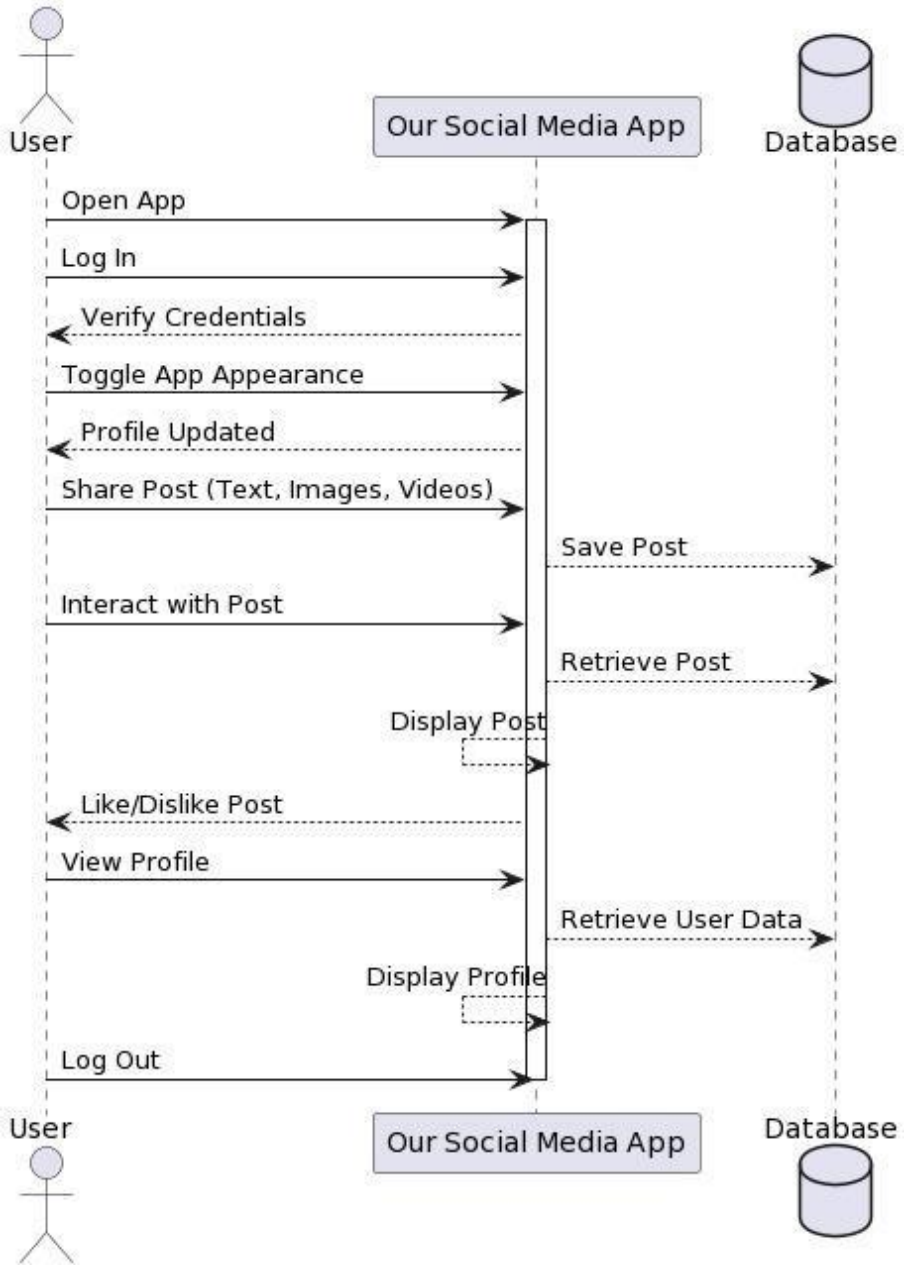

Figure 5.2: Sequence Diagram