Design Document

for

Echo

Version 1.1

Prepared by

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Date:	07/02/2025

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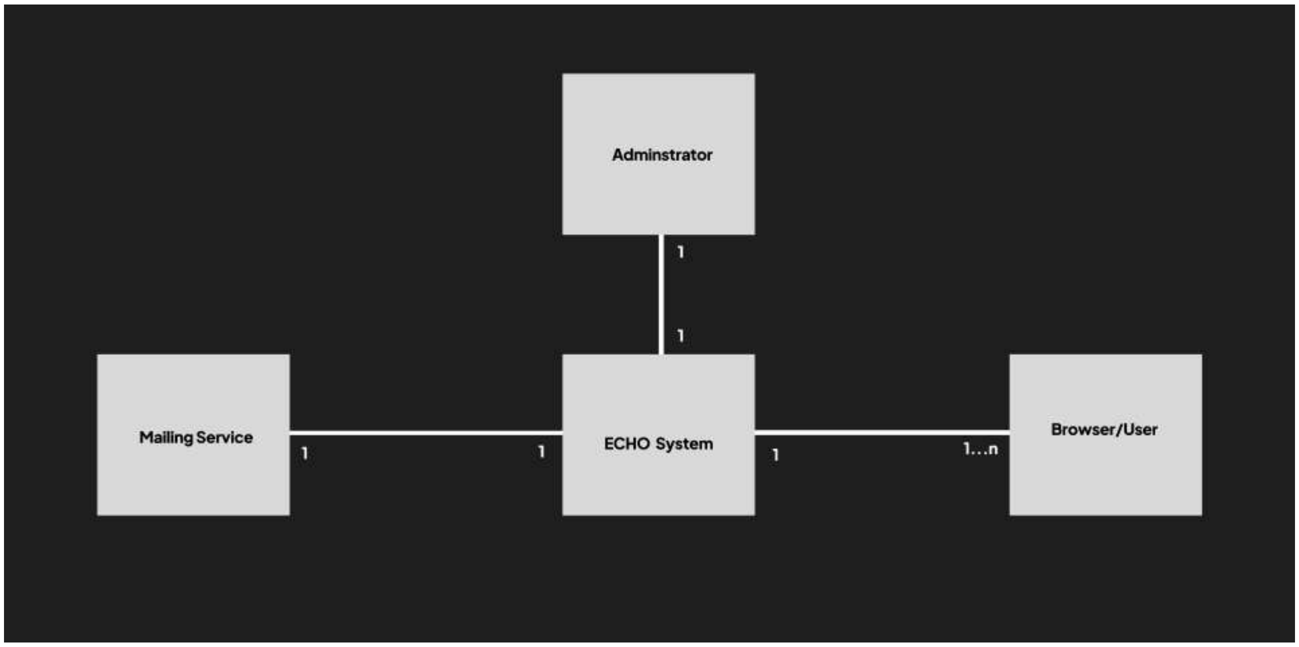
Revisions

Version	Primary Author(s)	Description of Version	Date Completed
v1.1	All Group Members	First version of the Software Design Specification Document.	24/01/25

1 Context Design

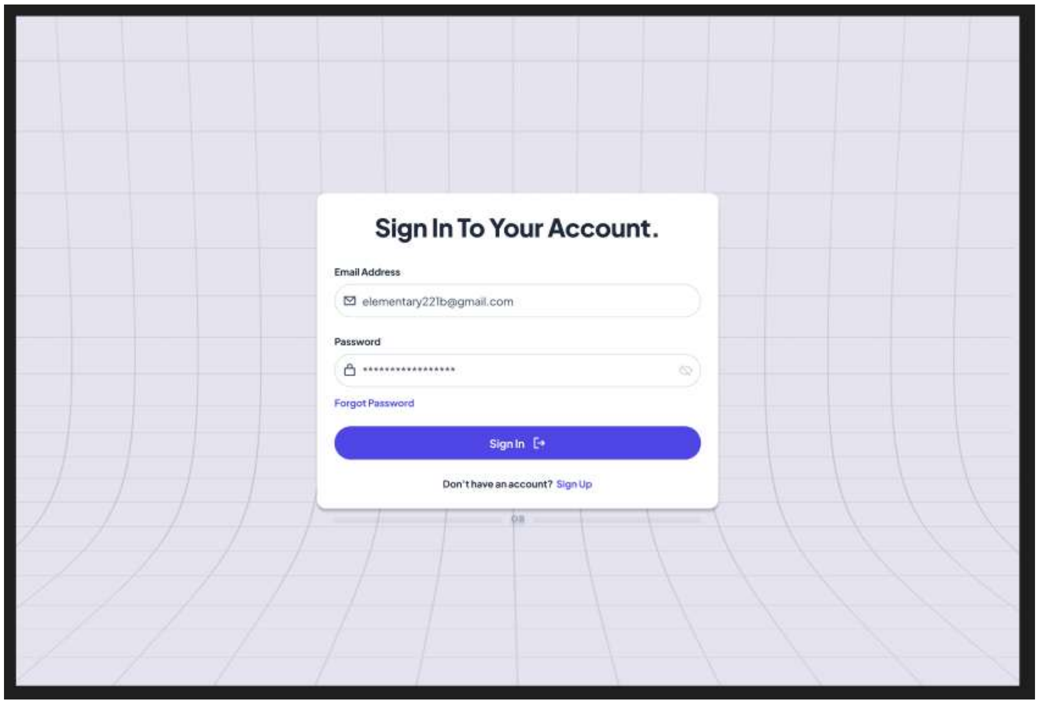
1.1 Context Model

Context model is the high-level representation of our system and how it interacts with external entities.

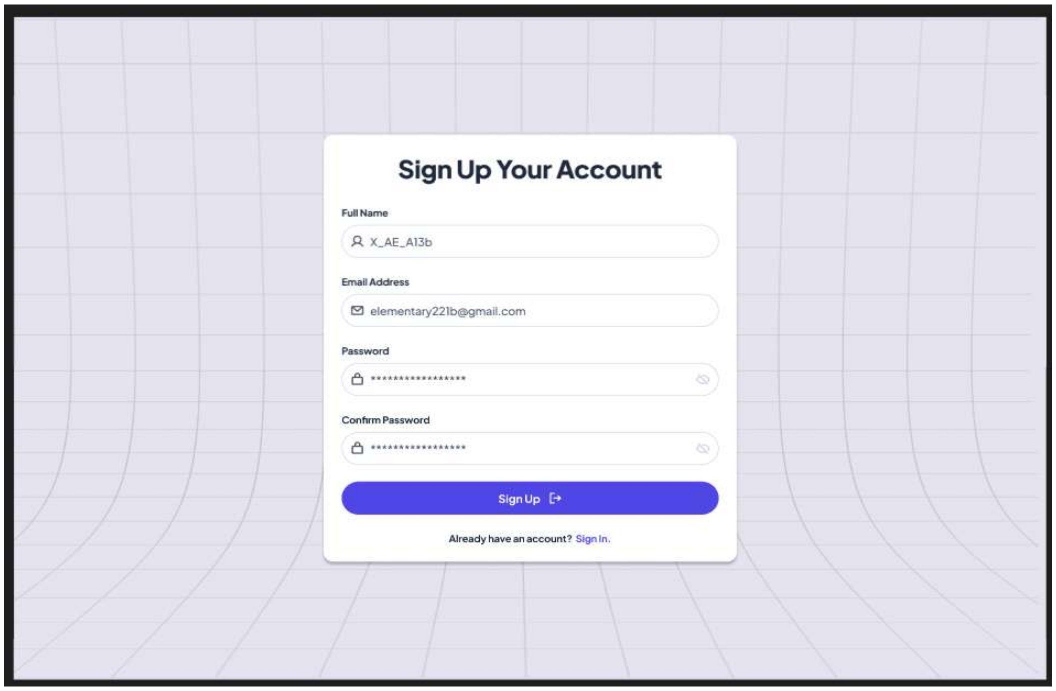


1.2 Human Interface Design

A. Log In Page



B. Sign Up Page



Sign Up Your Account

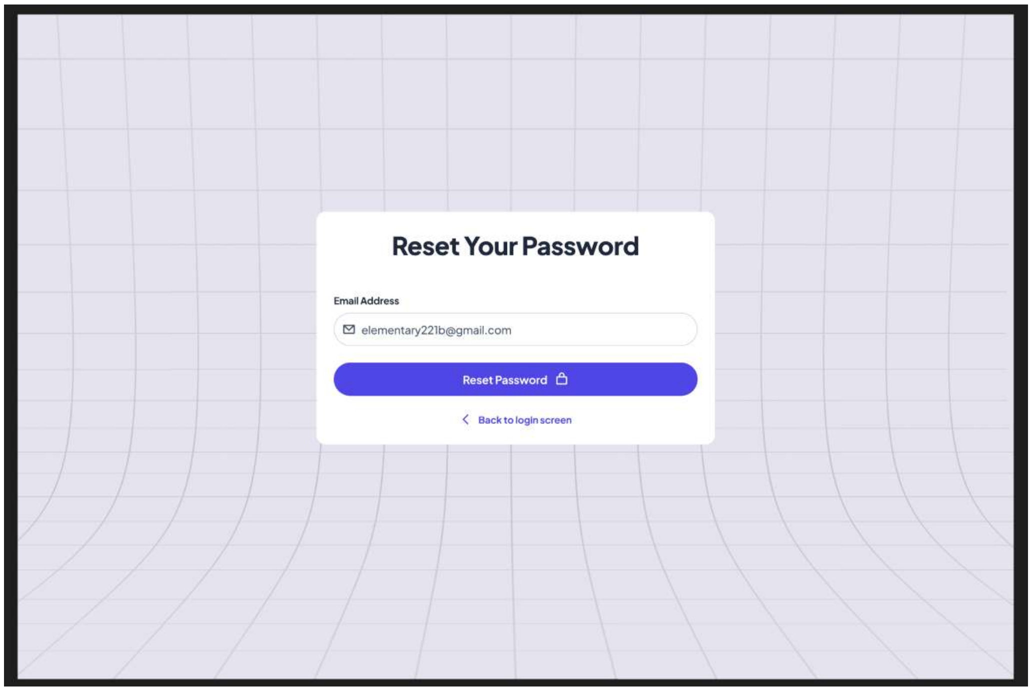
Full Name: X_AE_A13b

Email Address: elementary221b@gmail.com

Password: ****************

Confirm Password: ****************

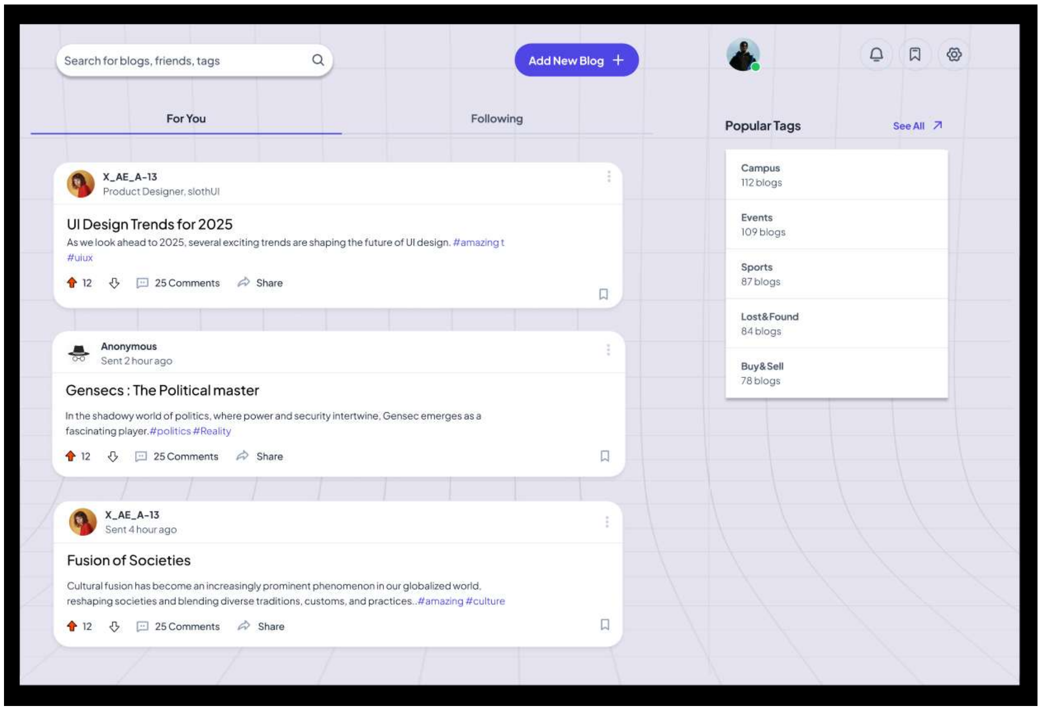
C. Forget Password Page



Reset Your Password

Email Address: elementary221b@gmail.com

D. Home Page



Search for blogs, friends, tags

Add New Blog +

For You | Following

X_AE_A-13
Product Designer, slothUI

UI Design Trends for 2025

As we look ahead to 2025, several exciting trends are shaping the future of UI design. #amazing t #uiux

12 · 25 Comments · Share

Anonymous
Sent 2 hour ago

Gensecs : The Political master

In the shadowy world of politics, where power and security intertwine, Gensec emerges as a fascinating player. #politics #Reality

12 · 25 Comments · Share

X_AE_A-13
Sent 4 hour ago

Fusion of Societies

Cultural fusion has become an increasingly prominent phenomenon in our globalized world, reshaping societies and blending diverse traditions, customs, and practices.. #amazing #culture

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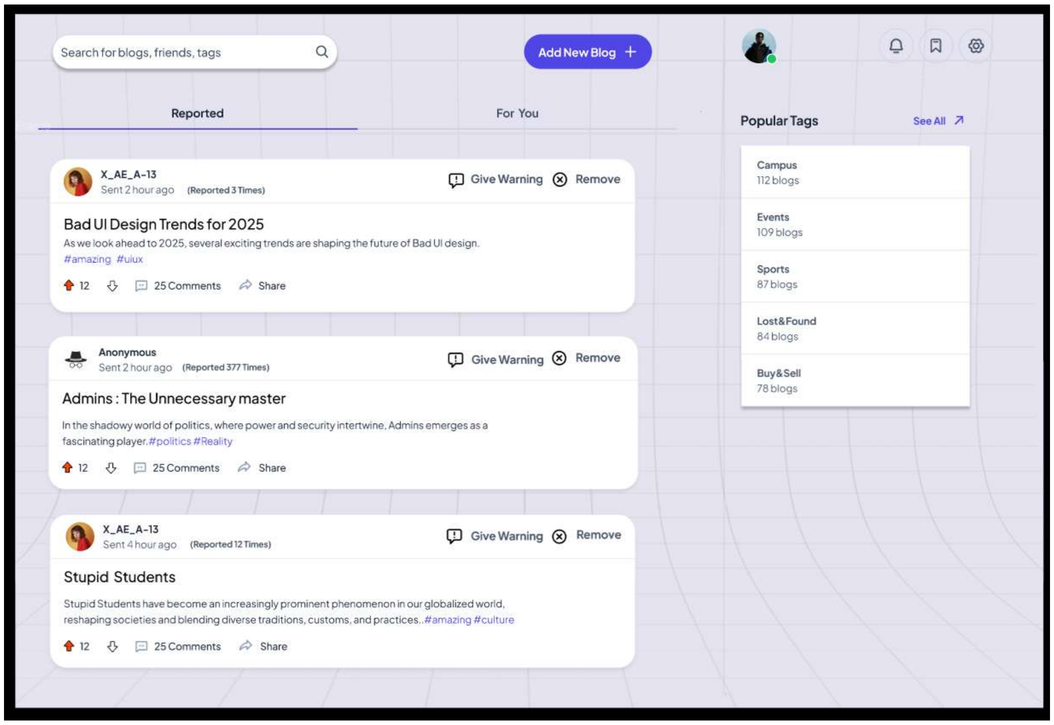
Popular Tags — See All ↗

Campus	112 blogs
Events	109 blogs
Sports	87 blogs
Lost&Found	84 blogs
Buy&Sell	78 blogs

E. Admin Page



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Reported | For You

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Bad UI Design Trends for 2025

As we look ahead to 2025, several exciting trends are shaping the future of Bad UI design. #amazing #uiux

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Admins : The Unnecessary master

In the shadowy world of politics, where power and security intertwine, Admins emerges as a fascinating player. #politics #Reality

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Stupid Students

Stupid Students have become an increasingly prominent phenomenon in our globalized world, reshaping societies and blending diverse traditions, customs, and practices.. #amazing #culture

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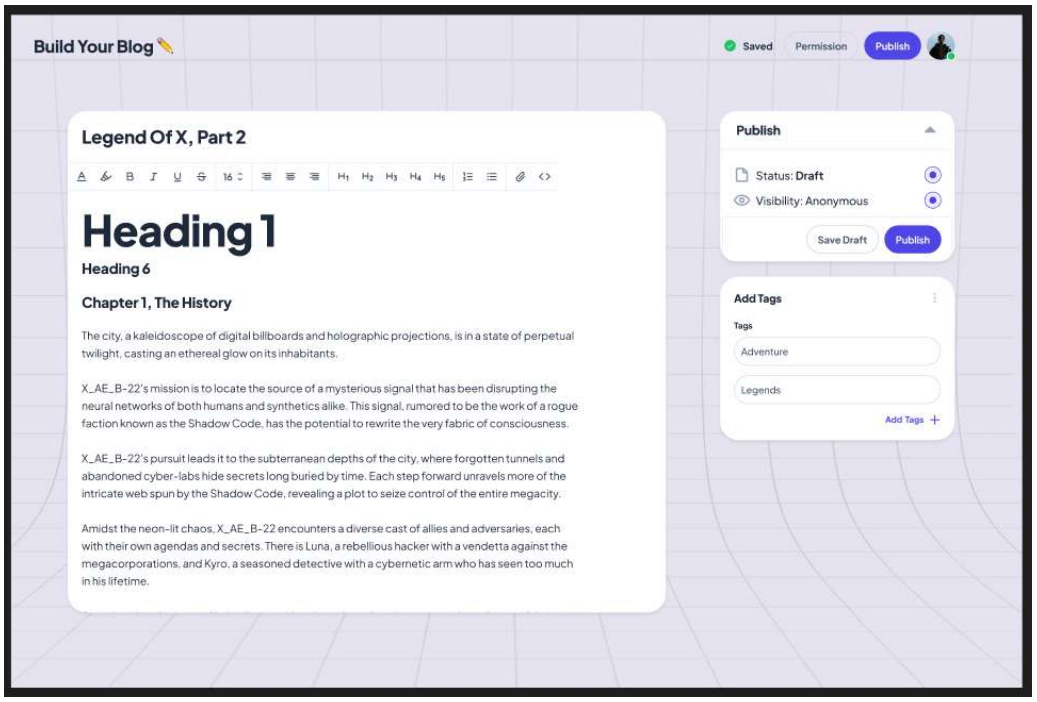
Popular Tags — See All ↗

Campus	112 blogs
Events	109 blogs
Sports	87 blogs
Lost&Found	84 blogs
Buy&Sell	78 blogs

F. Blog Writing Page



Legend Of X, Part 2

Heading 1

Heading 6

Chapter 1, The History

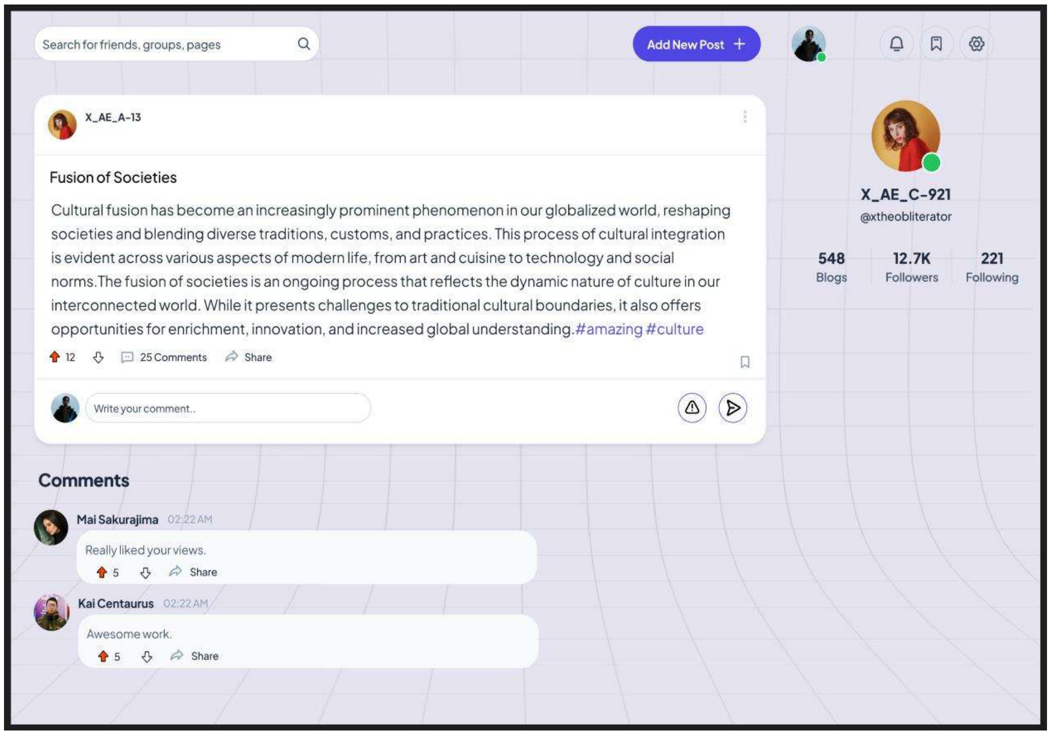
The city, a kaleidoscope of digital billboards and holographic projections, is in a state of perpetual twilight, casting an ethereal glow on its inhabitants.

X_AE_B-22's mission is to locate the source of a mysterious signal that has been disrupting the neural networks of both humans and synthetics alike. This signal, rumored to be the work of a rogue faction known as the Shadow Code, has the potential to rewrite the very fabric of consciousness.

X_AE_B-22's pursuit leads it to the subterranean depths of the city, where forgotten tunnels and abandoned cyber-labs hide secrets long buried by time. Each step forward unravels more of the intricate web spun by the Shadow Code, revealing a plot to seize control of the entire megacity.

Amidst the neon-lit chaos, X_AE_B-22 encounters a diverse cast of allies and adversaries, each with their own agendas and secrets. There is Luna, a rebellious hacker with a vendetta against the megacorporations, and Kyro, a seasoned detective with a cybernetic arm who has seen too much in his lifetime.

G. Single Blog Page



X_AE_A-13

Fusion of Societies

Cultural fusion has become an increasingly prominent phenomenon in our globalized world, reshaping societies and blending diverse traditions, customs, and practices. This process of cultural integration is evident across various aspects of modern life, from art and cuisine to technology and social norms.The fusion of societies is an ongoing process that reflects the dynamic nature of culture in our interconnected world. While it presents challenges to traditional cultural boundaries, it also offers opportunities for enrichment, innovation, and increased global understanding.#amazing #culture

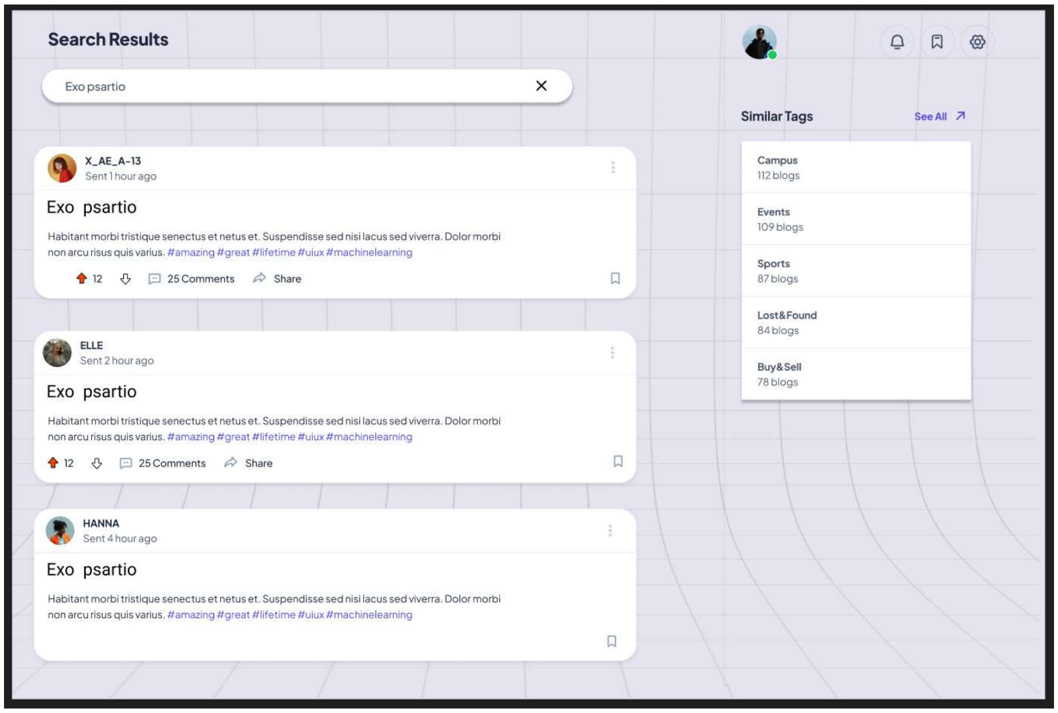
12 25 Comments Share

Comments

Mai Sakurajima 02:22 AM
Really liked your views.
5 Share

Kai Centaurus 02:22 AM
Awesome work.
5 Share

H. Search Result Page



Search Results

Exo psartio

Similar Tags See All

Campus
112 blogs

Events
109 blogs

Sports
87 blogs

Lost&Found
84 blogs

Buy&Sell
78 blogs

X_AE_A-13
Sent 1 hour ago

Exo psartio

Habitant morbi tristique senectus et netus et. Suspendisse sed nisi lacus sed viverra. Dolor morbi non arcu risus quis varius. #amazing #great #lifetime #uiux #machinelearning

12 25 Comments Share

ELLE
Sent 2 hour ago

Exo psartio

Habitant morbi tristique senectus et netus et. Suspendisse sed nisi lacus sed viverra. Dolor morbi non arcu risus quis varius. #amazing #great #lifetime #uiux #machinelearning

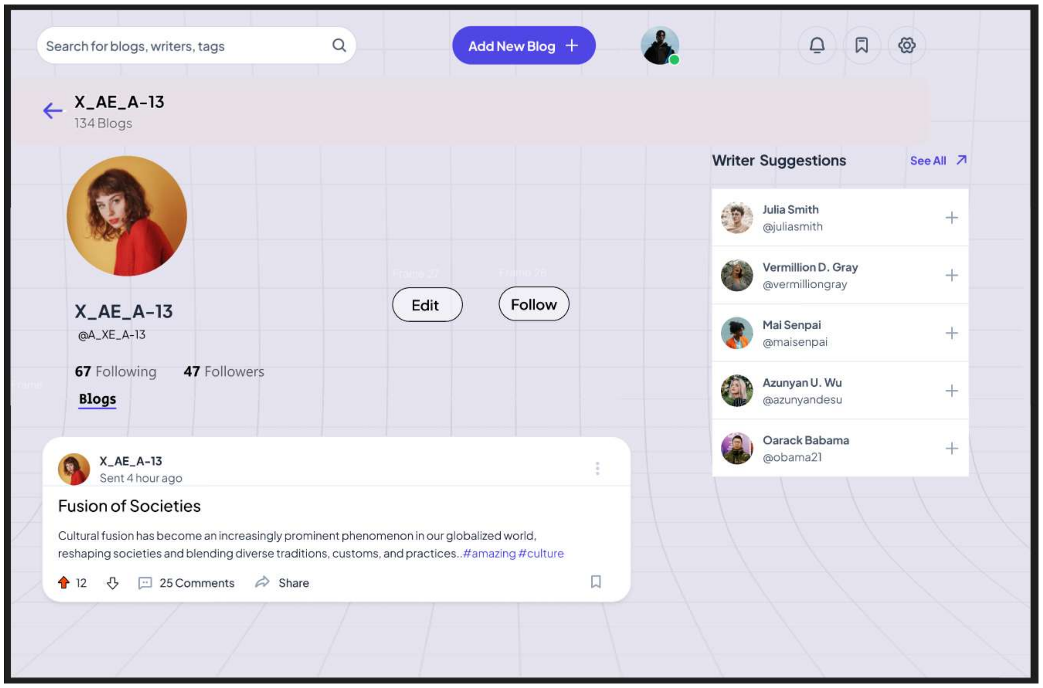
12 25 Comments Share

HANNA
Sent 4 hour ago

Exo psartio

Habitant morbi tristique senectus et netus et. Suspendisse sed nisi lacus sed viverra. Dolor morbi non arcu risus quis varius. #amazing #great #lifetime #uiux #machinelearning

I. Profile Page



Search for blogs, writers, tags

Add New Blog +

X_AE_A-13
134 Blogs

X_AE_A-13
@A_XE_A-13

Edit Follow

67 Following 47 Followers

Blogs

Writer Suggestions See All

Julia Smith
@juliasmith

Vermillion D. Gray
@vermilliongray

Mai Senpai
@maisenpai

Azunyan U. Wu
@azunyandesu

Oarack Babama
@obama21

X_AE_A-13
Sent 4 hour ago

Fusion of Societies

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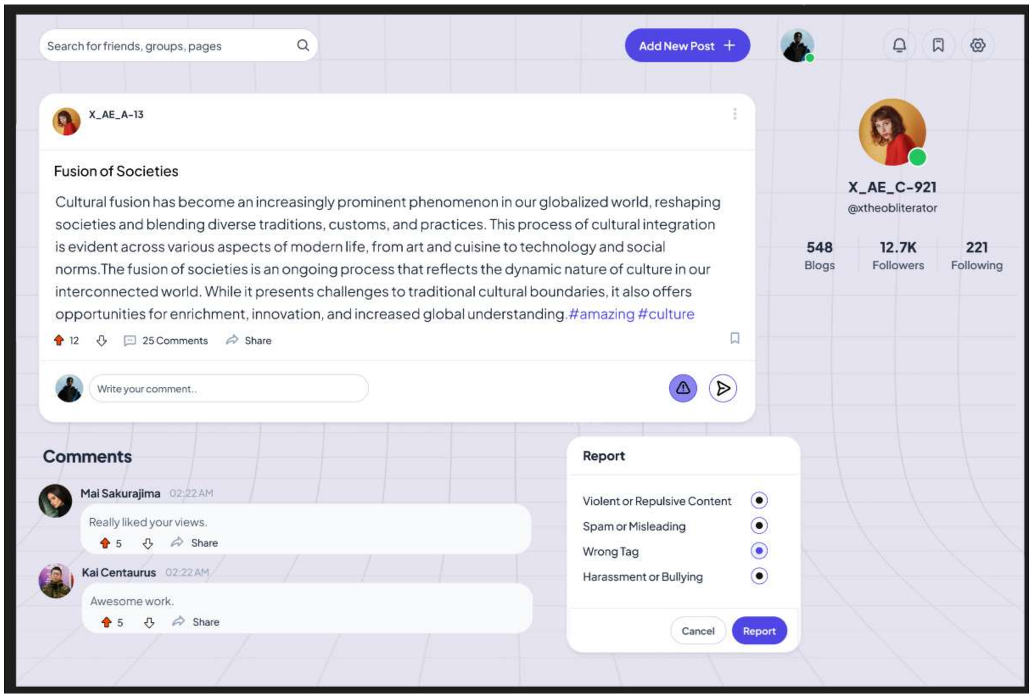
J. Report



Search for friends, groups, pages

Add New Post +

X_AE_A-13

Fusion of Societies

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12 · 25 Comments · Share

Write your comment..

X_AE_C-921
@xtheobliterator

548 Blogs · 12.7K Followers · 221 Following

Comments

Mai Sakurajima 02:22 AM
Really liked your views.
5 · Share

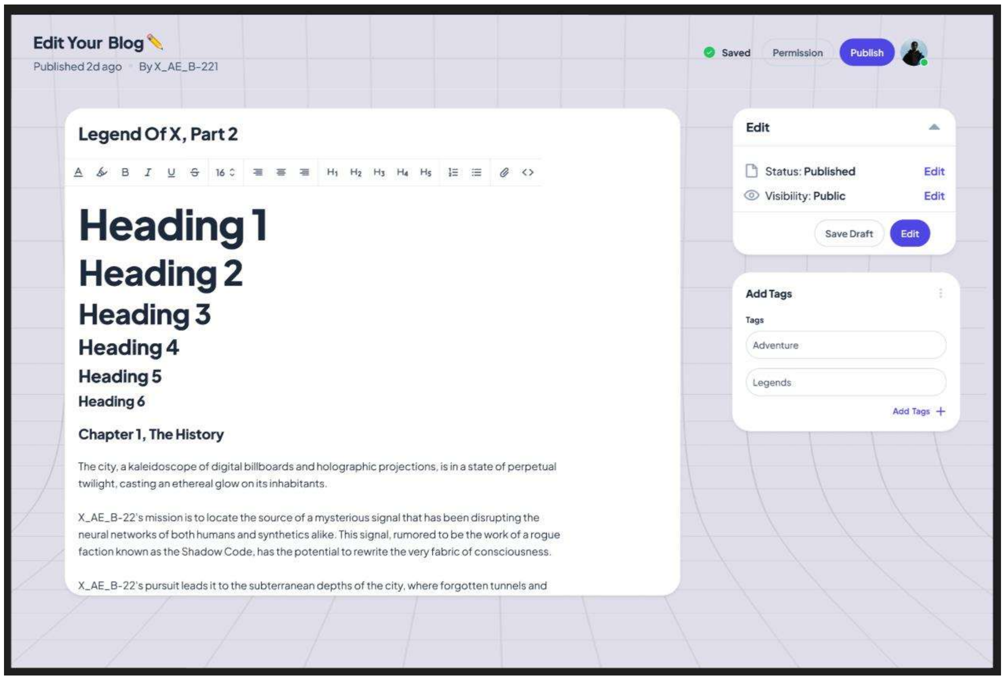
Kai Centaurus 02:22 AM
Awesome work.
5 · Share

Report

Violent or Repulsive Content
Spam or Misleading
[✓ Wrong Tag]
Harassment or Bullying

Cancel · Report

K. Blog Edit Page



Edit Your Blog ✏️
Published 2d ago · By X_AE_B-221

Saved · Permission · Publish

Legend Of X, Part 2

Heading 1
Heading 2
Heading 3
Heading 4
Heading 5
Heading 6

Chapter 1, The History

The city, a kaleidoscope of digital billboards and holographic projections, is in a state of perpetual twilight, casting an ethereal glow on its inhabitants.

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X_AE_B-22's pursuit leads it to the subterranean depths of the city, where forgotten tunnels and

Edit
Status: Published · Edit
Visibility: Public · Edit
Save Draft · Edit

Add Tags
Tags
Adventure
Legends
Add Tags +

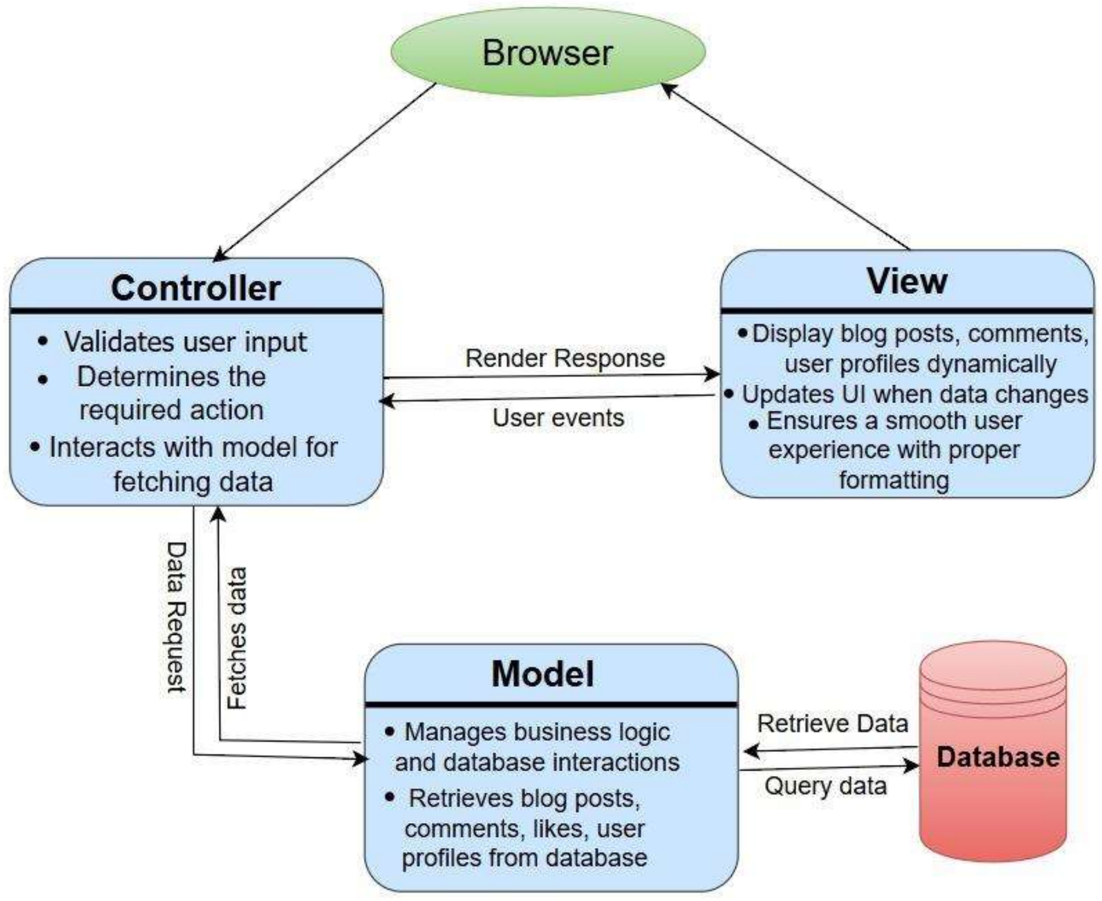
2 Architecture Design

We plan on using a hybrid of Model-View-Controller with Pipe filter architecture for our project ECHO. This is ideal when there are multiple ways to view and interact with data and future requirements are unknown.

In MVC (Model-View-Controller architecture) the model manages data (blogs, votes) ensuring consistency and security. The view dynamically renders the feed, comments, and filters adapting to user preferences. The controller processes actions (eg: publishing, reporting) and enforces rules (validating reports). This is crucial for our project as it simplifies collaboration between frontend & backend teams. This ensures testability which is much needed in a platform blending accountability (user profiles) and anonymity.

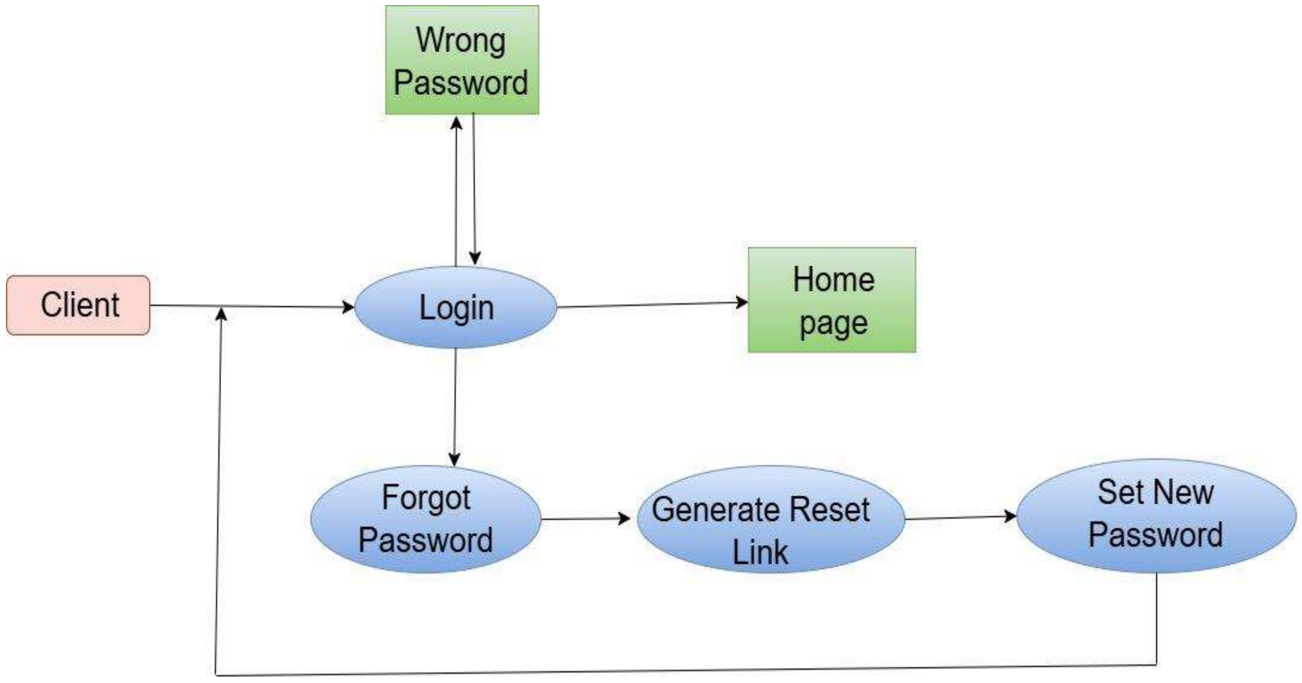
Pipe filter is good at tasks like tag-based filtering, spam detection and it does this through discrete, reusable filters. This lets us update filters without disrupting MVC filters which ensures scalability. Overall, this combination ensures our platform is adaptable, and efficient in meeting both current demands and future growth.

ARCHITECTURAL DESIGN

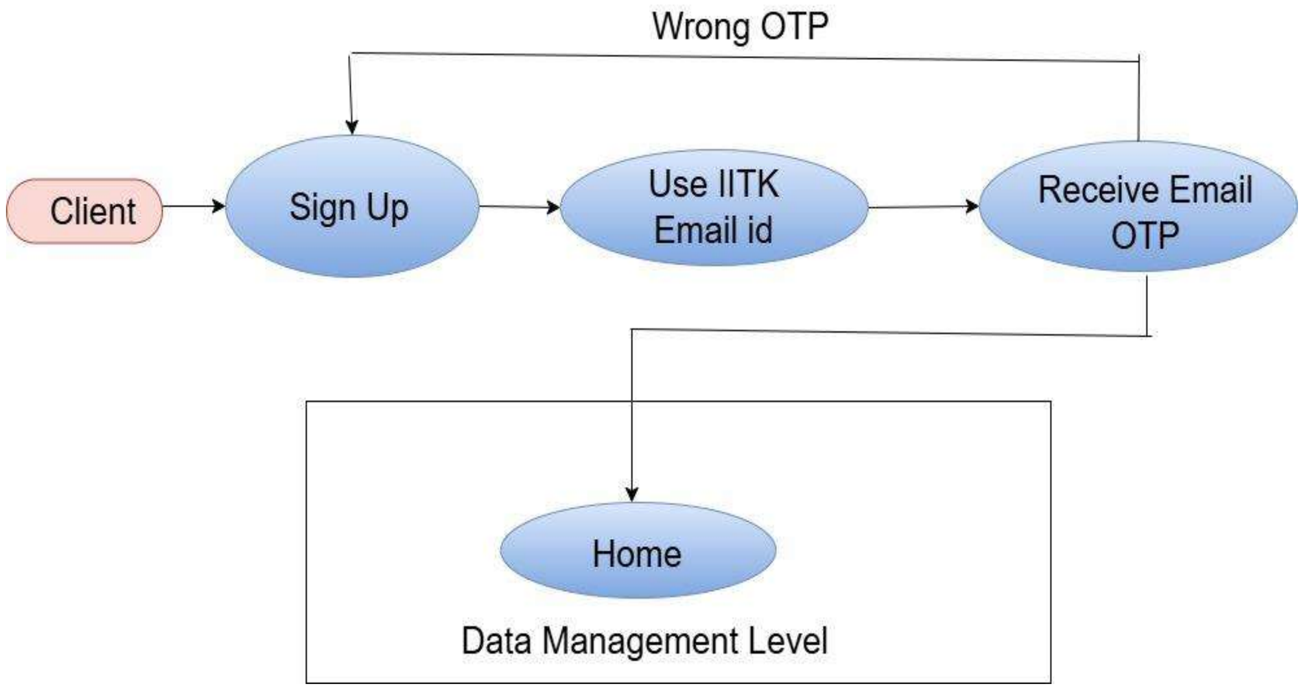

Browser
Controller
• Validates user input
• Determines the required action
• Interacts with model for fetching data
View
• Display blog posts, comments, user profiles dynamically
• Updates UI when data changes
• Ensures a smooth user experience with proper formatting
Render Response
User events
Data Request
Fetches data
Model
• Manages business logic and database interactions
• Retrieves blog posts, comments, likes, user profiles from database
Retrieve Data
Query data
Database

2.1 AUTHENTICATION LAYER

i)*Pipe filter architecture for login and password reset.*

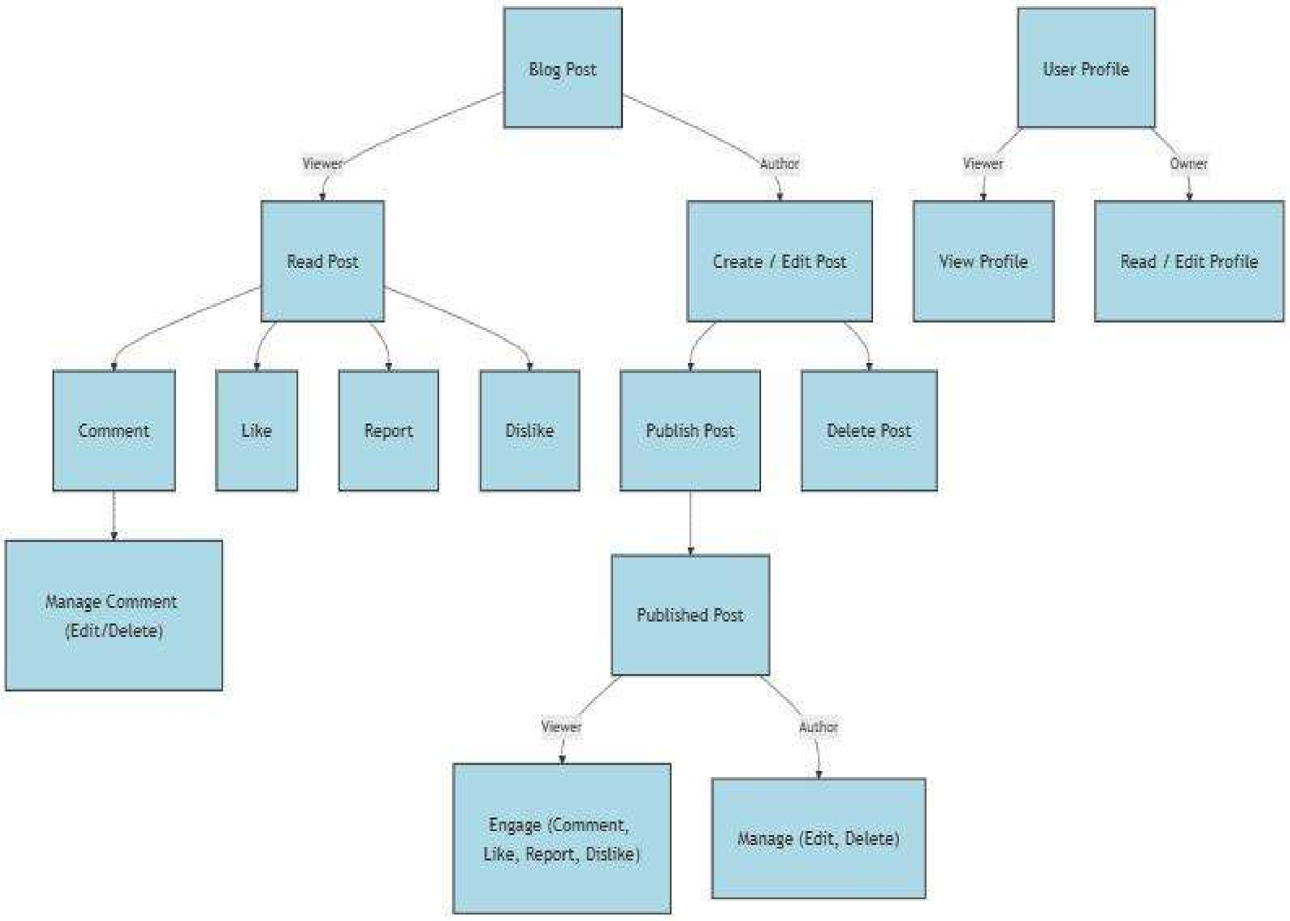


ii)Pipe filter architecture for signup.



2.2 DATA MANAGEMENT LAYER

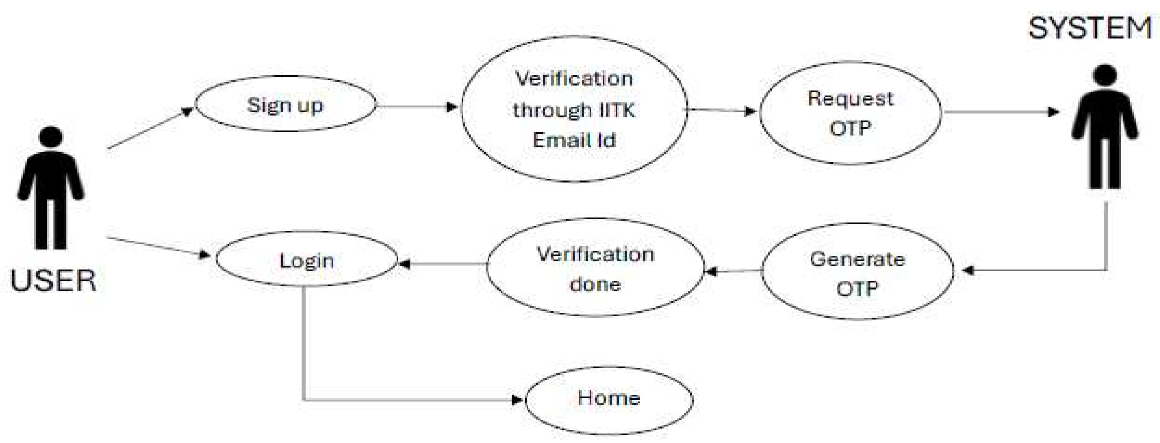
i)Pipe filter architecture of flow of system data.



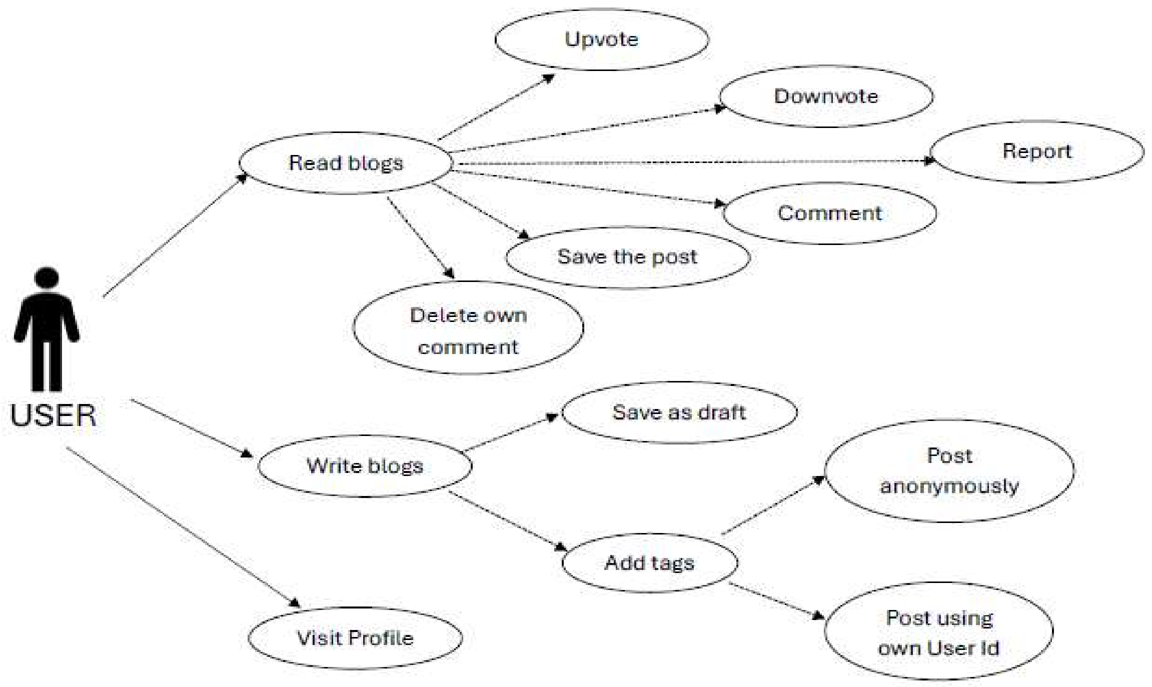
3 Object Oriented Design

3.1 Use Case Diagram

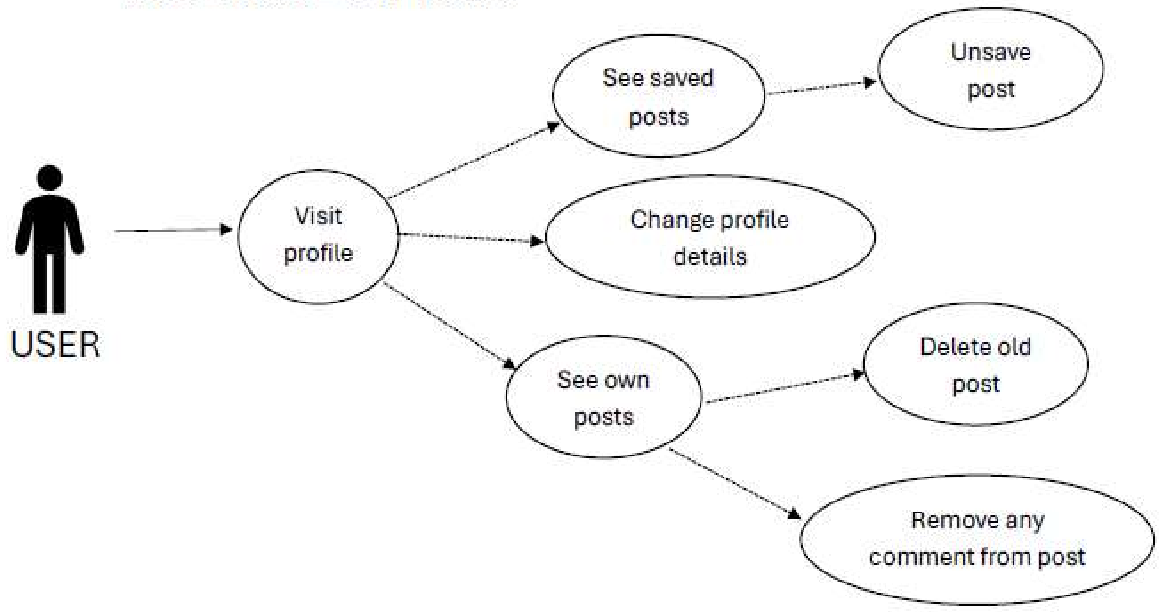
#USE CASE 1 : Authentication



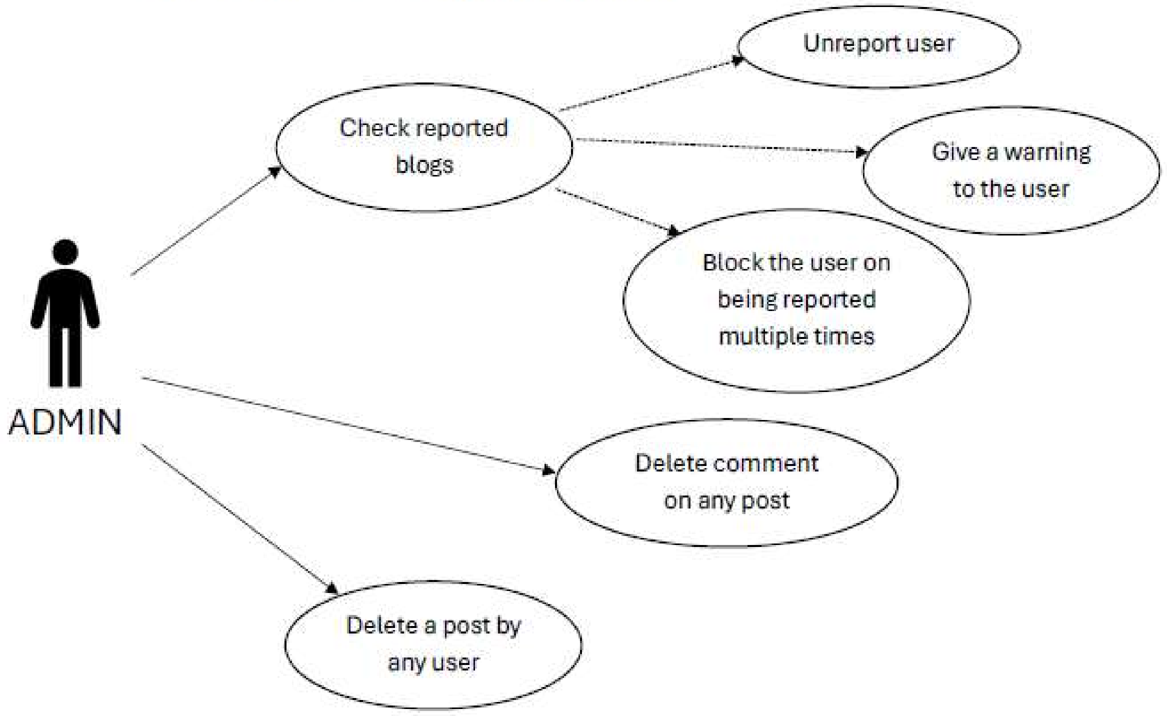
#USE CASE 2 : Home



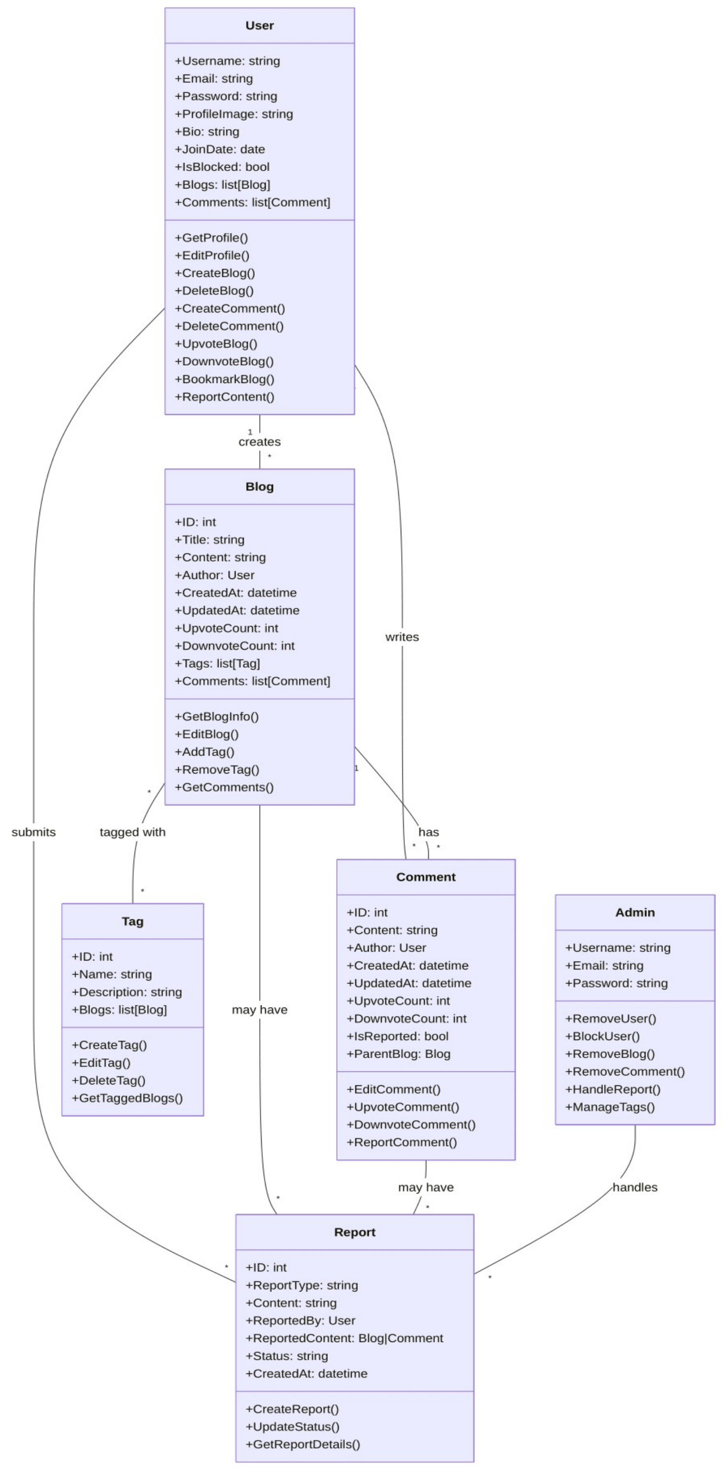
#USE CASE 3 : Profile



#USE CASE 4 : Administrator

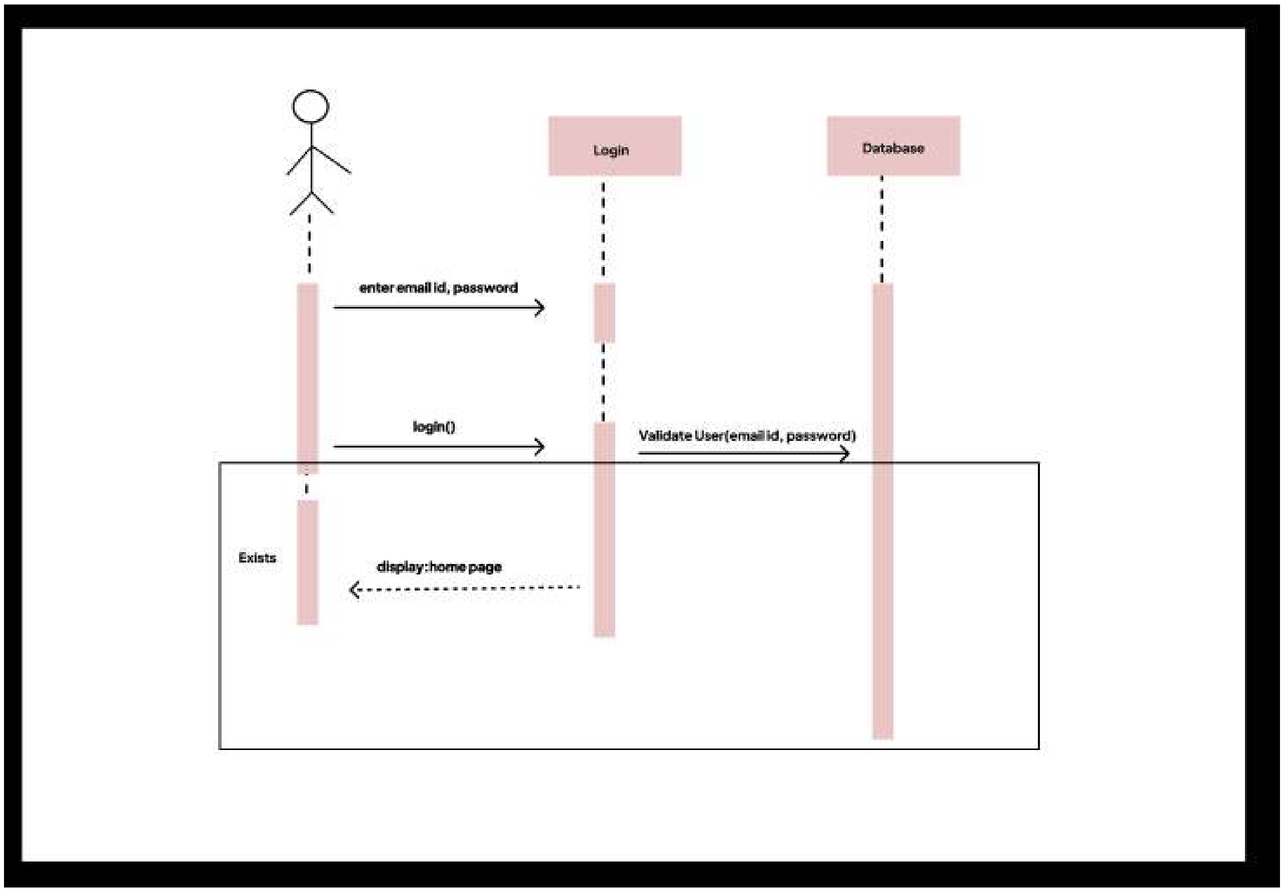

ADMIN
Check reported blogs
Unreport user
Give a warning to the user
Block the user on being reported multiple times
Delete comment on any post
Delete a post by any user

3.2 Class Diagrams

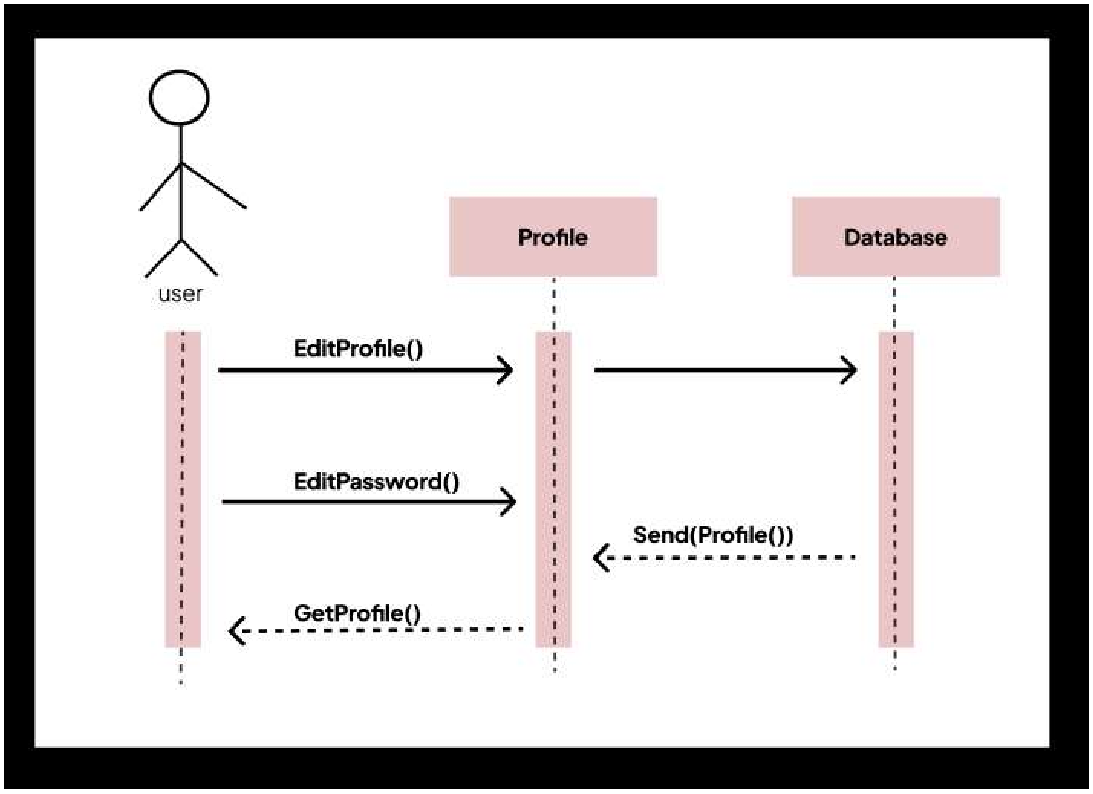


3.3 Sequence Diagrams

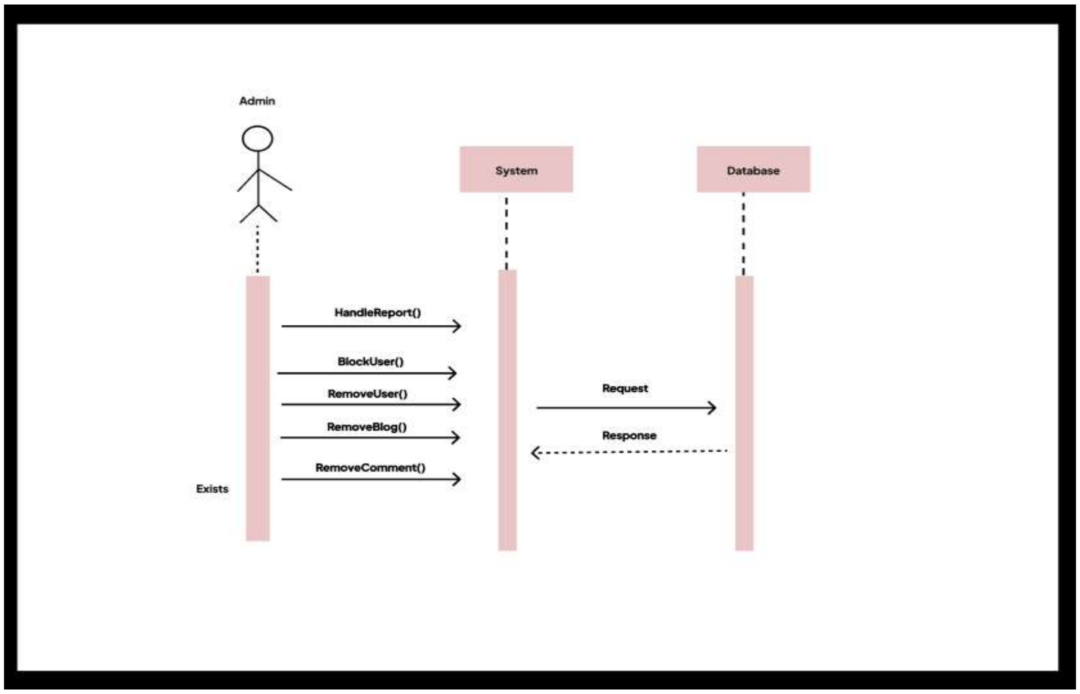
3.3.1 Authentication



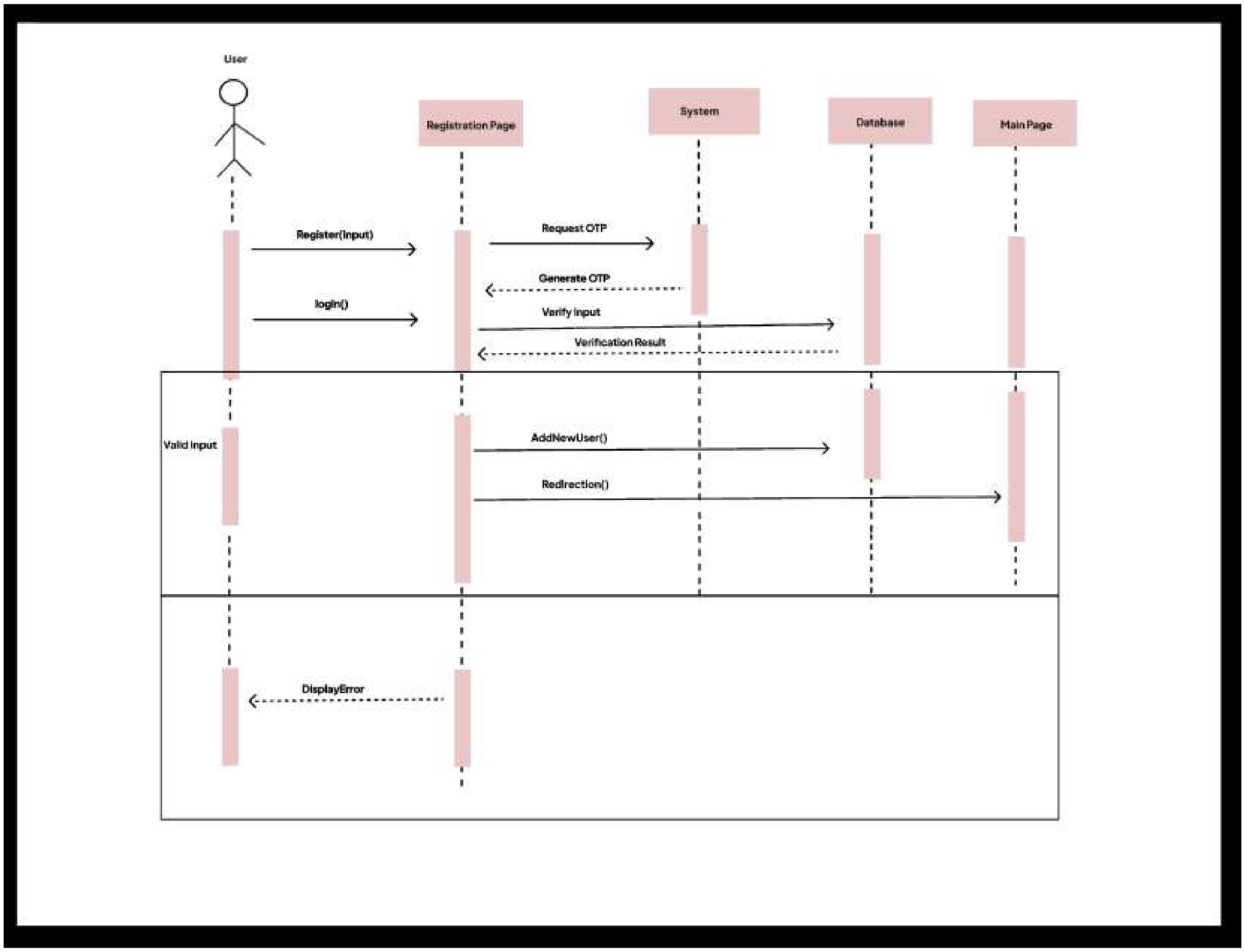
3.3.2 Edit Profile



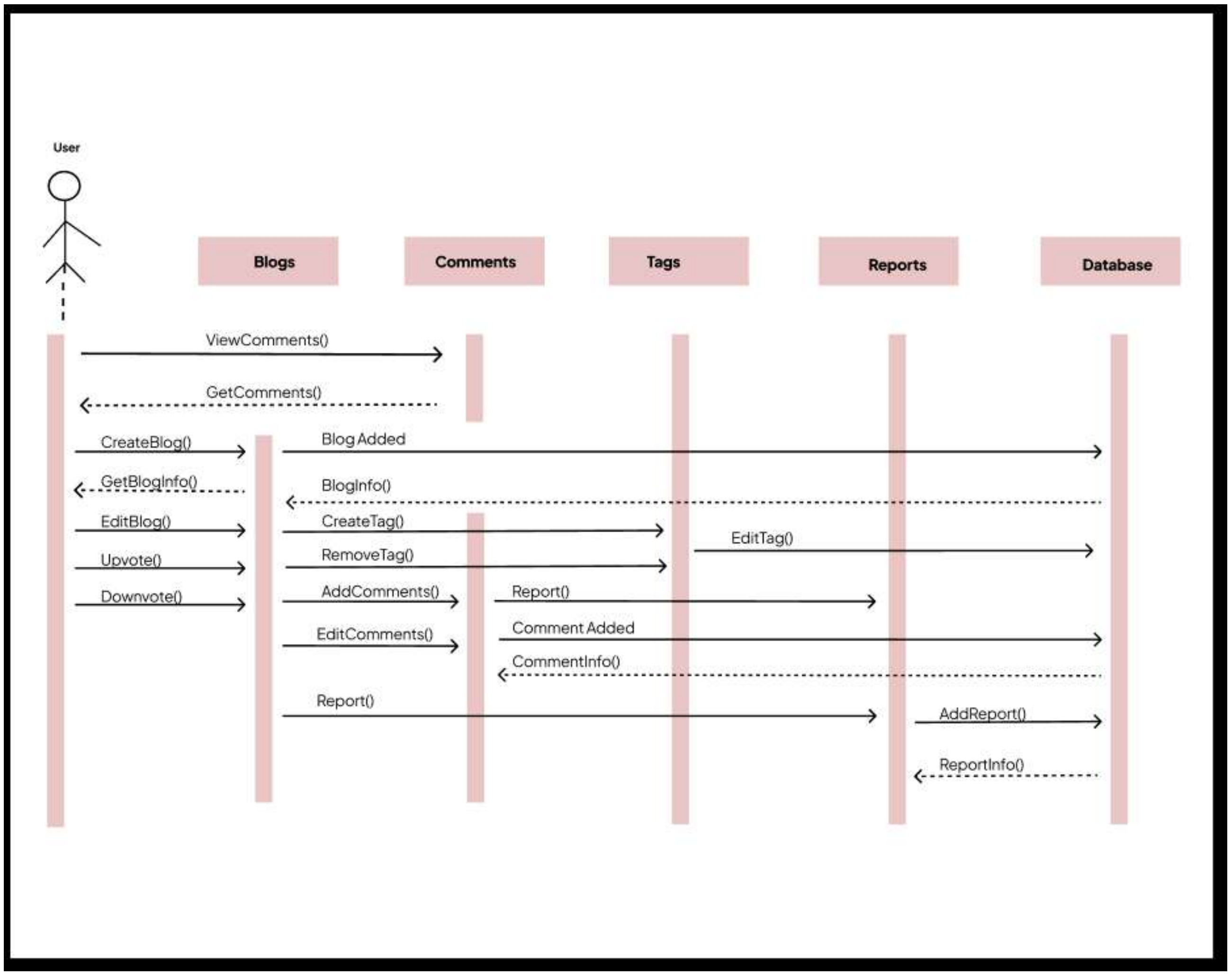
3.3.3 SYSTEM-ADMIN INTERACTION



3.3.4 USER REGISTRATION

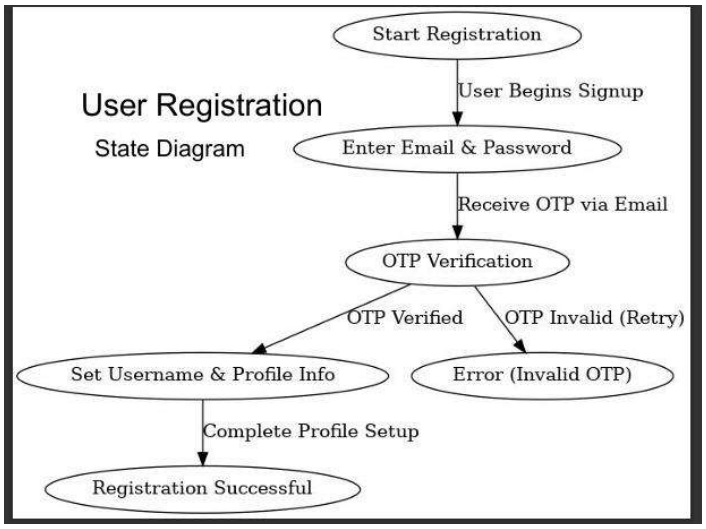


3.3.5 User-System Interaction

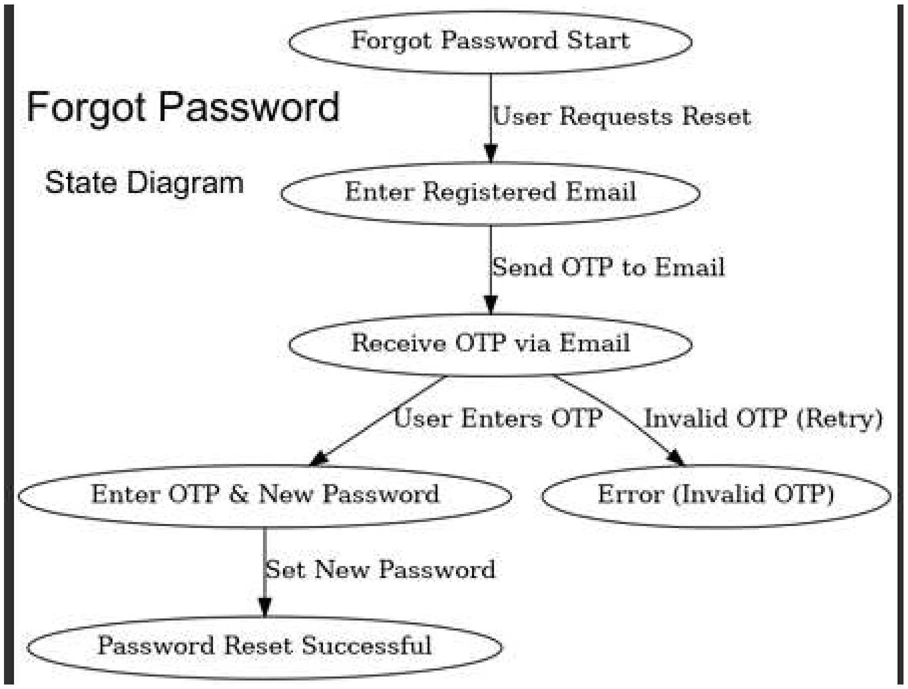


3.4 State Diagrams

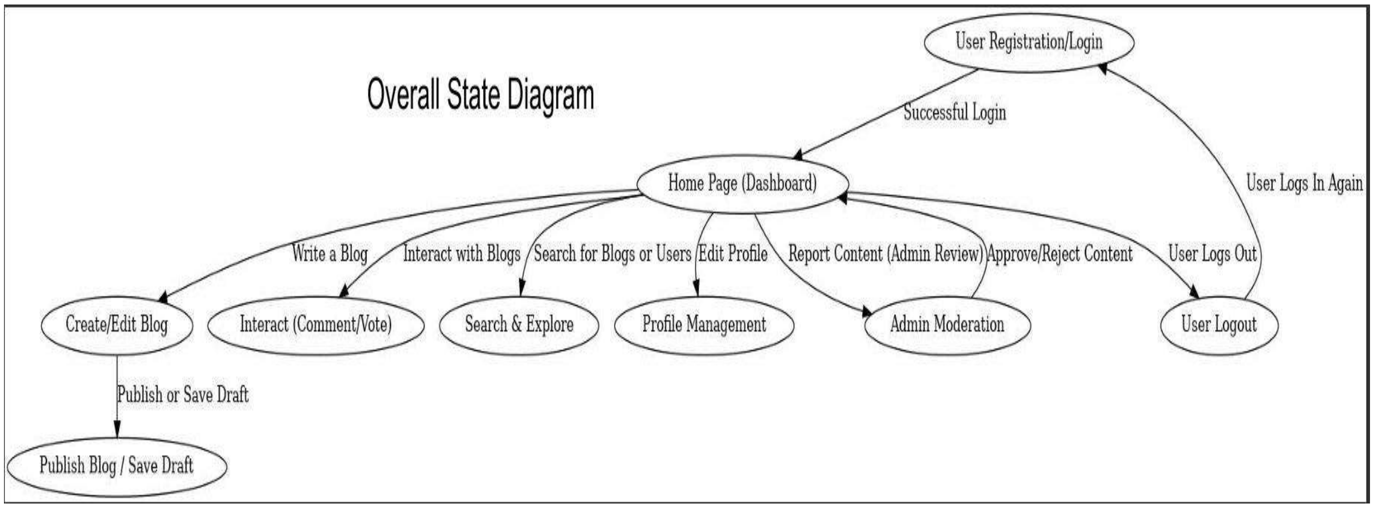
3.4.1 User Registration



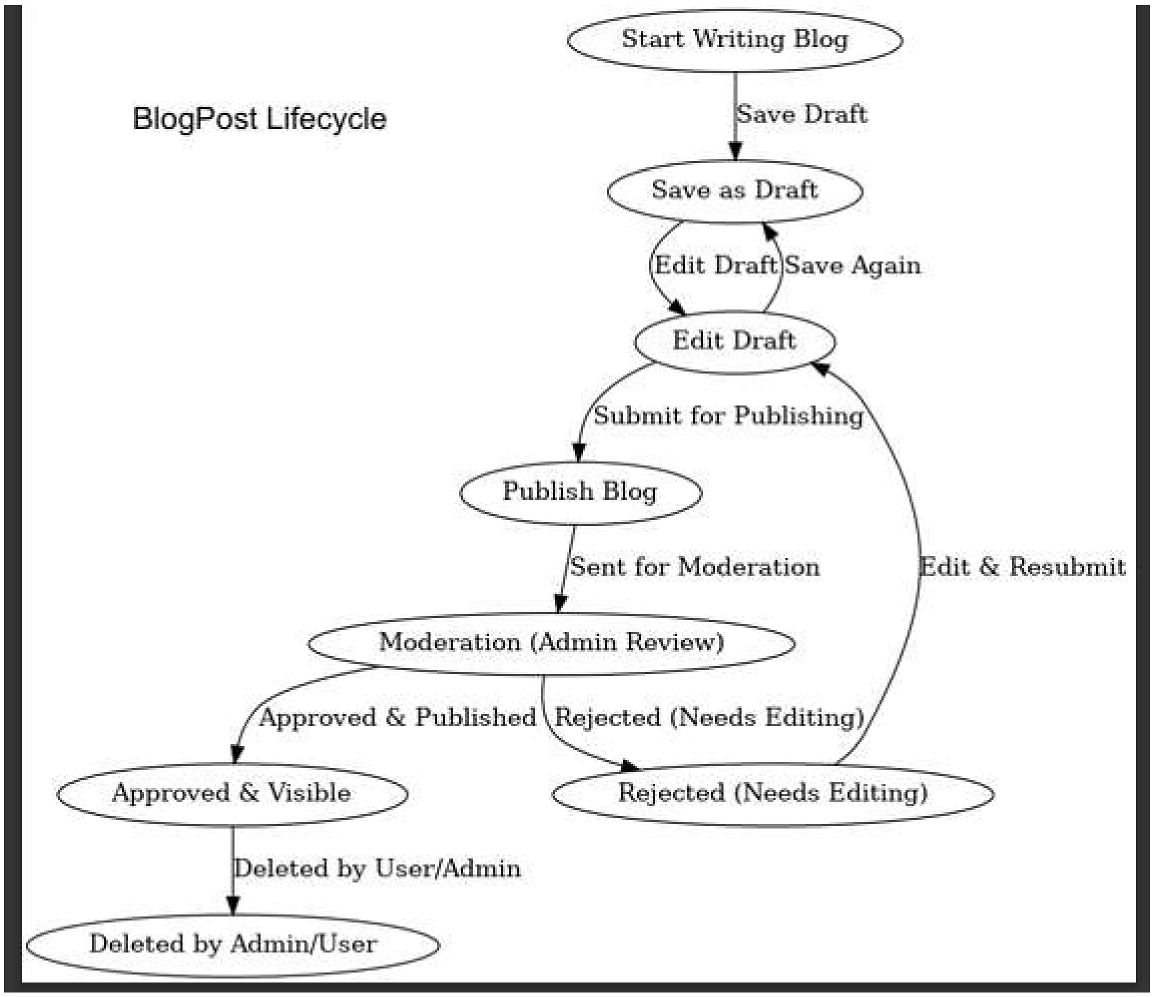
3.4.2 Forgot Password



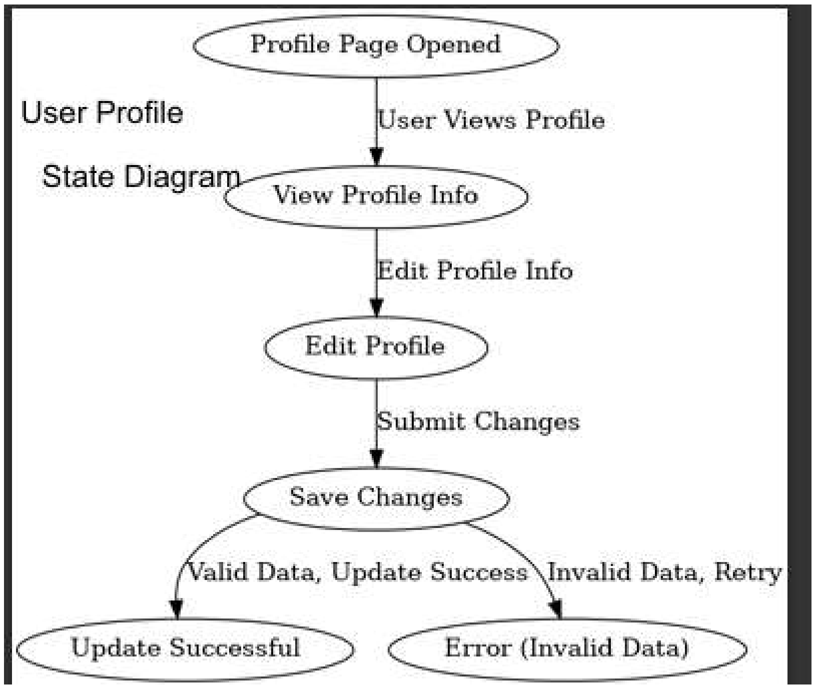
3.4.3 Overall State Diagram



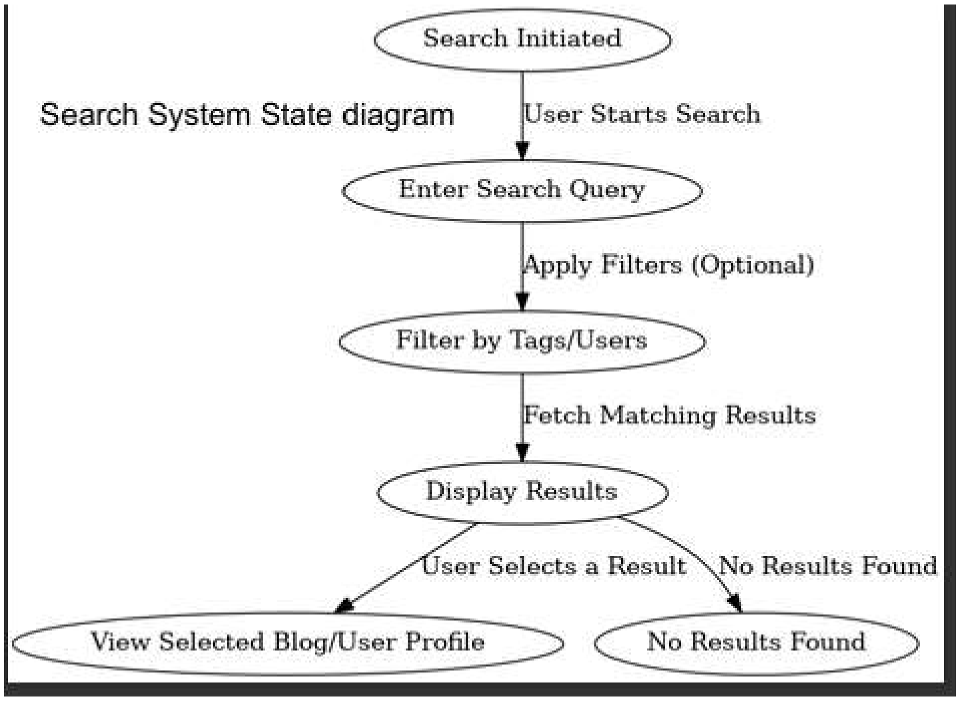
3.4.4 Blog Post Lifecycle



3.4.5 User Profile



3.4.6 Search System State Diagram



4 Project Plan

4.1 SYSTEM DESIGN AND ARCHITECTURE

- **LOGIN/SIGNUP PAGE:**

  It is a simple form for login/signup into user's account using email, username and password.

- **HOME PAGE:**

  It is the homepage where blog posts appear in a featured order. It includes blog titles, any comments, and options to take actions like reading more or interacting with the blogs, allowing users to explore content easily

- **PROFILE PAGE:**

  It is the page that contains user-specific details, such as their profile picture, followers and published blogs.

- **SINGLE BLOG PAGE:**

  It displays a full blog post with its title, content, upvotes, downvotes, comments section, and other options.

- **BLOG WRITING PAGE:**

  It is the writing page where writer can create and write new blog posts. It provides a space to add your title, content, and other details before publishing.

- **SEARCH PAGE:**

  It displays results whenever users enter keywords in the search bar. User can search for tags, blog titles and usernames.

- **ADMIN PAGE:**
  It displays the admin's dashboard for managing users, configuring settings, and monitoring performance through reports and alerts.

4.2 FRONTEND DEVELOPMENT

The frontend is the client-side component of the website that handles the user interface, user interactions, and data presentation. It ensures that users can seamlessly interact with the website, view content, and perform actions such as creating blogs, liking, and commenting. The frontend communicates with the backend through APIs to fetch and display data dynamically.

Key Components of Frontend Development:

4.2.1.1 HTML (Hyper Text Markup Language)

HTML is the foundation of web pages. It structures content and elements, such as headings, paragraphs, links, and images. HTML creates the basic skeleton of website.

4.2.1.2 CSS (Cascading Style Sheets)

CSS is used to style HTML elements. It controls the design, including colors, fonts, spacing, and positioning. It styles the blog posts, profile pages and other interfaces.

- **JavaScript (JS)**

JavaScript makes websites interactive by adding behavior. It allows to update content dynamically, and handle user inputs. It handles user interactions such as liking a blog, posting comments, following/unfollowing users, and dynamically loading blogs without refreshing the page.

Library for Frontend Development

4.2.2.1 React Library

React is great for building a website because it's fast, modular, and easy to manage. It helps to create reusable components like blogs, comments, and profiles. Data can be managed using Hooks or Redux and fetch posts with Axios or Fetch API. WebSockets will allow real-time updates for likes and comments.

4.3 BACKEND DEVELOPMENT

The backend is the server-side component of the website that handles data processing, business logic, database interactions, and API management. It ensures that the front-end (user interface) can communicate with the database and other services seamlessly.

Components of Backend Development

- **Server Setup:**
  - A server is required to host the backend application. It will handle requests from the front-end, process them, and send back responses.
- **Tools/Frameworks**:
  - Node.js (with Express.js)
- **Database:**
  - The database stores all the data, such as user profiles, posts, comments, likes, and followers.
  - Database:
    - NoSQL Database: MongoDB (for flexible, unstructured data).
- **APIs (Application Programming Interfaces):**
  - APIs act as a bridge between the front-end and back-end. They define how the front-end can request data or perform actions.
- **API Types**:
  - RESTful APIs.
- **Authentication and Authorization:**
  - Ensures that users can securely log in and access their data.
  - JWT (JSON Web Tokens)

4.4 INTEGRATION

It is the process of connecting the frontend (user interface) with the backend (server, database, and APIs) to ensure seamless data flow and user interaction. Integration ensures that users can log in, create posts, interact with content, and view real-time updates.

Key Aspects of Integration

- **API Communication:**
  The frontend (React) interacts with the backend (Node.js/Express) using different APIs.
- **User Authentication:**
  Secure login and signup with JWT or OAuth, allowing users to access their accounts.
- **Data Fetching:**
  The frontend fetches data (blogs, likes, comments) from the backend using API, and displays it dynamically.
- **Error Handling & Security:**
  Backend responses are validated, and then the frontend displays appropriate messages for errors like failed login attempts or invalid data submissions.

4.5 TESTING

Testing and debugging are crucial steps in the development process to ensure the website functions smoothly, is secure, and provides a seamless user experience.

Debugging Frontend

Frontend debugging ensures that the user interface, interactions, and API communication work smoothly. It involves identifying and fixing issues related to UI rendering, API calls, and event handling.

Debugging Backend

Backend debugging involves identifying issues in server logic, API responses, database queries, and overall system performance. It ensures data processing is accurate, secure, and optimized.

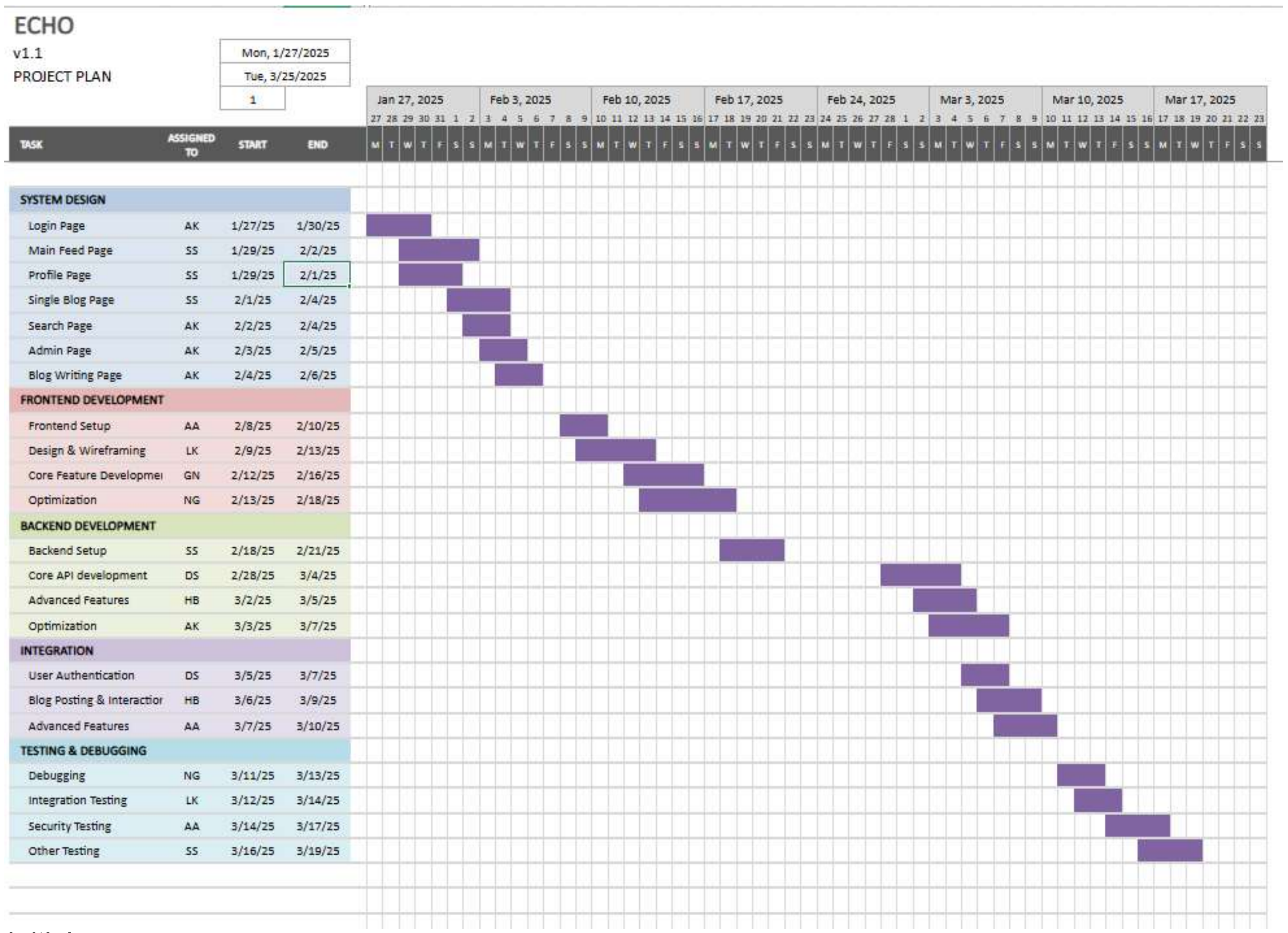
Integration Testing

Integration testing verifies that the frontend and backend communicate correctly, ensuring seamless user interactions and data flow. It ensures that API endpoints return the correct responses and the frontend processes them properly.

Security Testing

Security testing ensures that the website is protected against threats, vulnerabilities, and attacks that could compromise user data, authentication, or system integrity.

4.6 Project Timeline



ECHO

v1.1

PROJECT PLAN

Mon, 1/27/2025

Tue, 3/25/2025

1

TASK	ASSIGNED TO	START	END
SYSTEM DESIGN			
Login Page	AK	1/27/25	1/30/25
Main Feed Page	SS	1/29/25	2/2/25
Profile Page	SS	1/29/25	2/1/25
Single Blog Page	SS	2/1/25	2/4/25
Search Page	AK	2/2/25	2/4/25
Admin Page	AK	2/3/25	2/5/25
Blog Writing Page	AK	2/4/25	2/6/25
FRONTEND DEVELOPMENT			
Frontend Setup	AA	2/8/25	2/10/25
Design & Wireframing	LK	2/9/25	2/13/25
Core Feature Developme	GN	2/12/25	2/16/25
Optimization	NG	2/13/25	2/18/25
BACKEND DEVELOPMENT			
Backend Setup	SS	2/18/25	2/21/25
Core API development	DS	2/28/25	3/4/25
Advanced Features	HB	3/2/25	3/5/25
Optimization	AK	3/3/25	3/7/25
INTEGRATION			
User Authentication	DS	3/5/25	3/7/25
Blog Posting & Interactior	HB	3/6/25	3/9/25
Advanced Features	AA	3/7/25	3/10/25
TESTING & DEBUGGING			
Debugging	NG	3/11/25	3/13/25
Integration Testing	LK	3/12/25	3/14/25
Security Testing	AA	3/14/25	3/17/25
Other Testing	SS	3/16/25	3/19/25

Initials:
AK- Aryan Kumar
SS- Someshwar Singh
LK- Lokesh Kumar & lavish Kanva(both)
GN- Govind Nayak
DS- Durbasmriti Saha
NG- Nishanth Gone
AA- Ansh Adarsh
HB- Harsh Bhati

Appendix A - Group Log

DATE	TIME	MEMBERS PRESENT	DESCRIPTION
26 January, 2025	6 P.M.	Aryan, Nishanth, Harsh, Govind, Lavish, Durba, Someshwar, Lokesh	Meet with the TA, we discussed the document preparation and planned the project, covering the key steps and necessary details for smooth execution.
26 January, 2025	10 P.M.	Aryan, Nishanth, Govind, Lavish, Durba, Lokesh, Someshwar, Ansh	We had an online meeting to go over the documentation and make sure everyone was clear on the details. We also talked about gathering the sources needed to complete the document.
31 January, 2025	7 P.M.	Aryan, Nishanth, Harsh, Govind, Lavish, Durba, Lokesh, Ansh, Someshwar	We distributed the work among the team members by forming small groups. These groups will collaborate to integrate their work and ensure everything comes together seamlessly
01 February, 2025	10 P.M.	Aryan, Nishanth, Harsh, Govind, Lavish, Durba, Lokesh, Someshwar, Ansh	Online meet with the TA, where he assisted with the setup for frontend development. After that, we assigned specific tasks to each team member to ensure everything gets completed
02-06 February, 2025		Respective Group Members	Held several online meetings among small groups to track progress within them, making sure everything was on track and running smoothly.