

UIU Social Blog

Sabbir Ahmed Siddiquee
Student Id: 012181010

A Project
in
The Department
of
Computer Science and Engineering



Presented in Partial Fulfillment of the Requirements
For the Degree of Master of Science in Computer Science and Engineering
United International University
Dhaka, Bangladesh
June 2021

© Sabbir Ahmed Siddiquee, 2021

Approval Certificate

This project titled "UIU Social Blog" submitted by **Sabbir Ahmed Siddiquee**, Student ID: **012 181 010**, has been accepted as Satisfactory in fulfillment of the requirement for the degree of Master of Science in Computer Science and Engineering in June 2021.

Board of Examiners

1.

Supervisor

Prof. Dr. Mohammad Nurul Huda

Professor and Director of MSCSE
Department of Computer Science & Engineering
United International University (UIU)
Dhaka-1212, Bangladesh

2.

Examiner

Mr. Suman Ahmmed

Assistant Professor
Director, Center for Development of IT Professionals (CDIP)
Department of Computer Science & Engineering
United International University (UIU)
Dhaka-1212, Bangladesh

3.

Ex-Officio

Prof. Dr. Mohammad Nurul Huda

Professor and Director of MSCSE
Department of Computer Science & Engineering
United International University (UIU)
Dhaka-1212, Bangladesh

Declaration

This is to certify that the work entitled “**UIU Social Blog**” is the outcome of the research carried out by me under the supervision of **Prof. Dr. Mohammad Nurul Huda**.

Sabbir Ahmed Siddiquee

ID: 012181010

MSCSE Programme

Department of Computer Science & Engineering (CSE)

United International University (UIU)

Dhaka-1212, Bangladesh

In my capacity as supervisor of the candidate’s project, I certify that the above statements are true to the best of my knowledge.

Prof. Dr. Mohammad Nurul Huda

Professor and Director of MSCSE

Department of Computer Science & Engineering

United International University (UIU)

Dhaka-1212, Bangladesh

Abstract

Do we really think of a world without social networks nowadays? We don't think so. We can't think of a single day without it. Few years back we were not on social networks like we are now. We spend a couple of hours in a single day on social networks. People do lots of things. They chat with friends, share their views, comment on other people's posts, live stream, voice and video calling and much more.

But there are very few social sites specifically focused on the university domain. There is a scope to build a social/blogging platform for an educational institution. Building such a platform can benefit both the institution and the students. Student's will enjoy using their institution's platform having the facilities like connecting to friends, seniors, alumni, teachers whereas they will also get the exciting features of social platforms. For example: chatting, posting, and commenting. If an institution admin wants to publish a notice, everyone associated with the university can get it very easily. Admin will publish/post a notice, everyone can view it and also get a notification.

It can be a great place to share knowledge. Teachers or students can share their knowledge on the platform by publishing articles, and users will get access very easily. There can be a storage of journals/articles/papers published by students/teachers of the institution.

Acknowledgement

At the beginning, I would like to thank the Almighty Allah for bringing me to this beautiful world.

Behind the completion of this project titled “**UIU SOCIAL BLOG** ” I got support from a couple of amazing people. I would like to thank my project supervisor **Prof. Dr. Mohammad Nurul Huda, MSCSE Director, UIU**. His support and guidance really helped me to accomplish this project.

I would also like to thank all the examiners for their support and examining my project.

Furthermore, I would like to express my appreciation and express my tacit respect and honor to all of my friends, family and colleagues who helped me complete this project.

Last but not the least, I would like to acknowledge the support of my wife “**Shamarat Rahman**” whose continuous encouragement helps me a lot for this accomplishment.

Table of Contents

Declaration.....	i
Abstract.....	ii
Acknowledgement	iii
LIST OF TABLES.....	vi
LIST OF FIGURES	vii
1. Chapter 1	1
Introduction	1
1.1 Existing System	1
1.2 Proposed System.....	2
1.3 Objective.....	2
2. Chapter 2	3
Background and Literature Review	3
2.1 UML Design	3
2.2 Database Design	7
3. Chapter 3	11
Methodology.....	11
3.1 Technology	12
3.2 Implementation	13
3.3 Testing	13
4. Chapter 4	16
Results	16
4.1 Landing Interface.....	16

4.2 Forgot Password Page	17
4.3 Home Page.....	18
4.4 Create Post.....	19
4.5 Suggested Users.....	20
4.6 Search Users	21
4.7 Explore Page.....	22
4.8 People Page.....	23
4.9 Alumni Page	24
4.10 Articles Page.....	25
4.11 Notifications Page.....	26
4.12 Message/Conversation Page	26
4.13 Personalized Profile Page	27
5. Chapter 5	28
Conclusions and Future Works.....	28
5.1 Conclusion	28
5.2 Future Work.....	28
References	29

LIST OF TABLES

Table 2.1: User8

Table 2.2: Article8

Table 2.3: Comment9

Table 2.4: Follower.....9

Table 2.5: Like.....9

Table 2.6: Notification.....10

Table 2.7: Post10

LIST OF FIGURES

Figure 2.1: Activity Diagram.....	4
Figure 2.2: Data Flow Diagram.....	5
Figure 2.3: Use Case Diagram.....	6
Figure 2.4: ER Diagram.....	7
Figure 3.1: Agile Methodology	11
Figure 3.2: Black Box Testing.....	14
Figure 3.3: White Box Testing	15
Figure 4.1: Landing Page.....	16
Figure 4.2: Forgot Password.....	17
Figure 4.3: Home Page	18
Figure 4.4: Create Post Modal	19
Figure 4.5: Suggested User List	20
Figure 4.6: User Search	21
Figure 4.7: Explore Page	22
Figure 4.8: People Page	23
Figure 4.9: Alumni List	24
Figure 4.10: Articles Page	25
Figure 4.11: Notification Page.....	26
Figure 4.12: Messages Page	26
Figure 4.13: Profile Page	27

Chapter 1

Introduction

UIU Social Blog (USB) is a social media platform for educational institutions. It's similar to existing social media blogging platforms but domain and context is for educational purposes. By creating an account with the university's official email address in the web application, a user will have access to various features. Like on other social platforms, a user can create a post and publish to the portal. Other users who follow that user will see what he/she posts. A teacher or a student can follow each other. Students can chat with their friends or teacher which makes their communication easier. Users can also like a post, article and comment. Admin users can push articles which all users can see and put a like or comment. These articles will be basically research articles or may be thesis papers. Another great feature is the list of alumni. A user can set his graduation status to complete. Every user has a personalized profile. There is a search box to search user profiles.

In addition, there is a notification system in the application. When someone follows a user, likes his post, comments on posts or even sends a message that user will get real time notifications.

1.1 Existing System

As of now there are lots of social networks like Facebook, twitter, reddit and many more. We can surely use those platforms but not exactly in the educational context. Universities don't have any control over those platforms. Universities don't have much information about what their graduates are doing. Where they are contributing. There is not such a platform where there is easy access to get information about a teacher or student in a specific university. If a student wants to know the current position of the alumni and where they are contributing there is no such central place for that.

1.2 Proposed System

By analyzing the existing systems, I found that there is a great scope to build a social application focusing on academic institutions. In this proposed system only students and teachers having organization email can register to the application. And by registering they will have access to some key features which they will love to have. In this system a user will be able to create a post/article with or without image like any other social network applications. Here the proposed application will mainly focus on the following key points:

- Build a social media web app to facilitate both teachers and students
- Bring teachers and students under one domain
- Make students, teachers communication easy
- Easy access to information (Blog post, article, journals, papers)

1.3 Objective

Analyzing the current education institutional social network model, here I am proposing a modern social network particularly for an educational institution where students can easily connect to their friends, teachers. When a user (teacher/student) will register to this system he'll have a personalized account. A user can only register with the organizational email address which will ensure the users' authenticity. After registering they'll be able to follow other users, see other users' posts. Users can comment, like on posts. They can make their own article/post. They can delete their own posts and comments whenever they want. They can chat with other users, see other users' profile. Admin can post notice/article which all users will be able to see. User can set their graduation status in his profile. Graduated users list will in the alumni section of the application.

They'll be able to share their knowledge. They can get easy access to educational resources posted by others, and chat with their friends and teachers. So, the idea is to build a cross browser mobile friendly responsive social platform for an institution which will facilitate the institution in many ways.

Chapter 2

Background and Literature Review

Since there are very few social applications focused on the educational domain **UIU Social Blog (USB)** comes to facilitate this domain. It connects all teachers and students on the same platform. It's basically designed to make a bridge between all teachers, students and alumni for making the communication easy between them. Apart from that this application has the most common social networking application's features. **USB** can be a good platform for knowledge sharing for both teachers and students. In this application users can create articles with attachments which is really helpful for others. Since nowadays we are mostly used to some common features like posting, commenting and nonetheless liking, this application is also built keeping that in mind. Easy communication is a must in this era. And considering that **USB** has an instant chatting feature built in which will help all users to communicate with each other easily. To make things even more interactive there is a notification system in this application to notify users on different activities.

2.1 UML Design

UML (Unified Modeling Language) is a standard dialect for indicating, visualizing, developing, and recording the artifacts of computer program frameworks.

2.1.1 Activity Diagram

Activity Diagram is fundamentally a flowchart to address the stream starting with one movement then onto the next action. The action can be depicted as an activity of the framework. The essential reason for this diagram is to catch the powerful conduct of the framework. It is additionally called object-arranged flowchart.

This UML diagram centers around the execution and stream of the conduct of a framework rather than execution. This diagram comprises exercises that are activities that apply to socially demonstrating innovation.

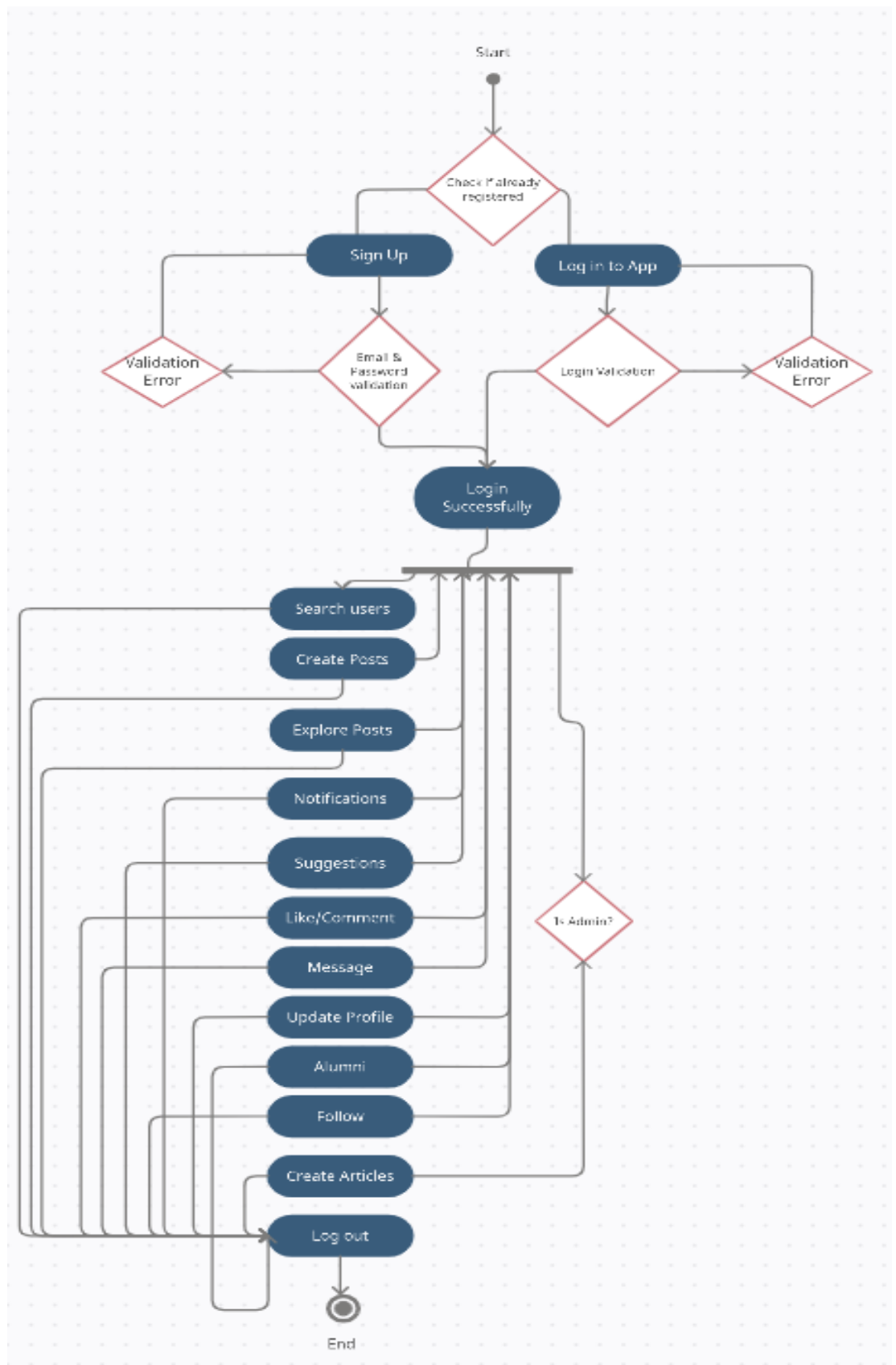


Figure 2.1: Activity Diagram

2.1.2 Data Flow Diagram

A Data Flow Diagram (DFD) is a renowned way to represent the data or information flows within a system. A neat and clear DFD can depict a good amount of the system requirements graphically. It can be manual, automated, or a combination of both.

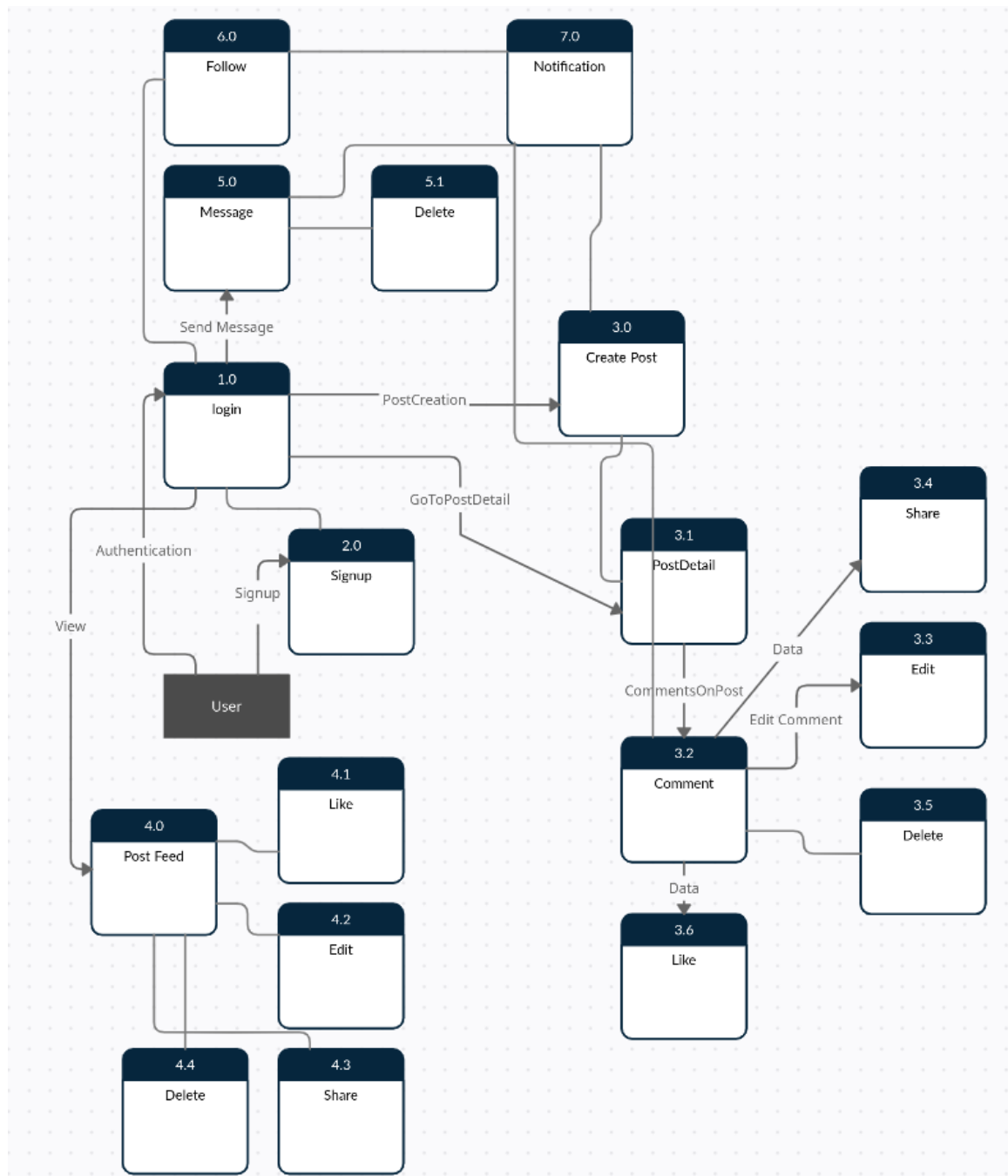


Figure 2.2: Data Flow Diagram

2.1.3 Use Case Diagram

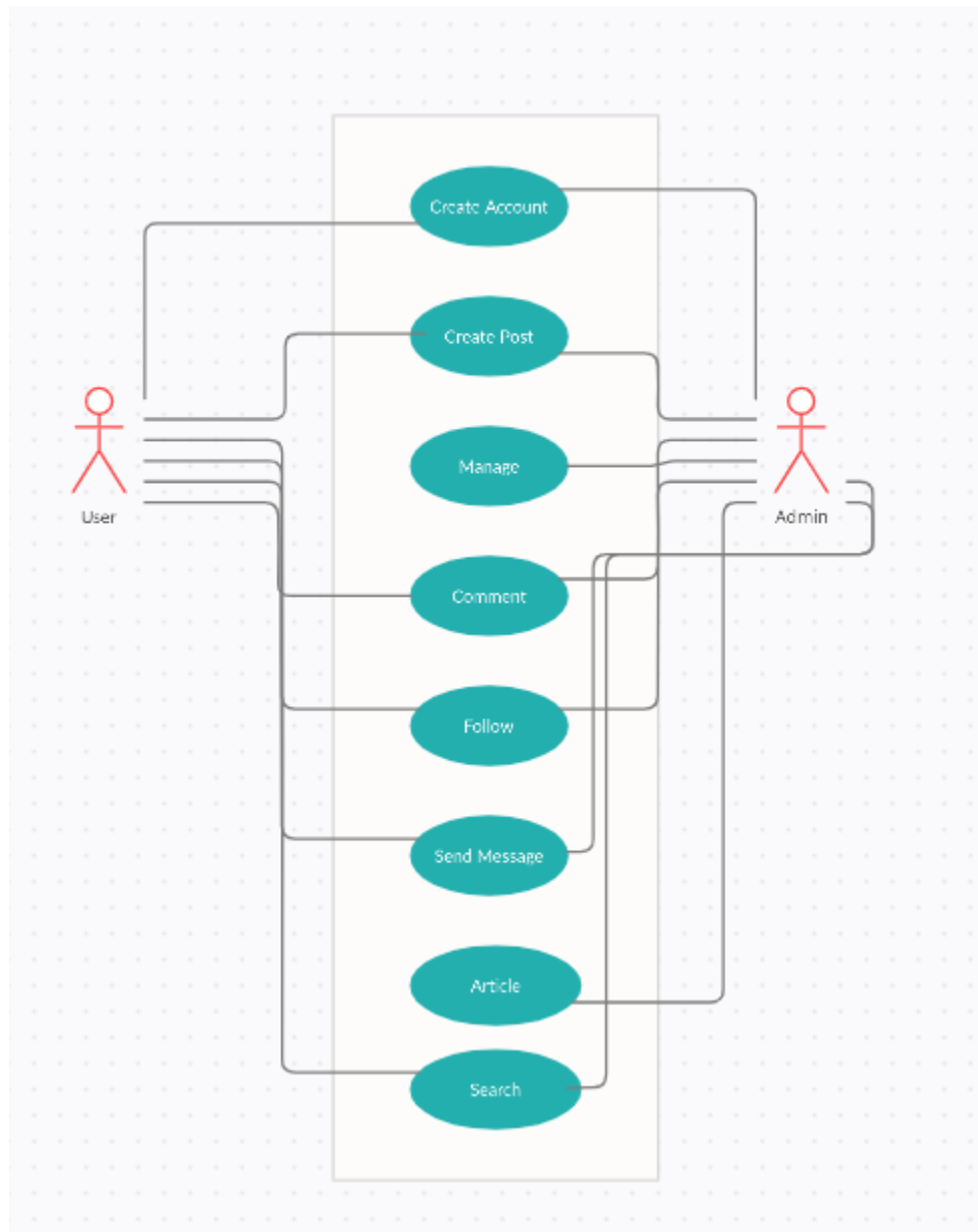


Figure 2.3: Use Case Diagram

2.2 Database Design

Database is one of the most important parts of any dynamic software application system. Non-relational database MongoDB is used in this project.

2.2.1 ER Diagram

ER Diagram represents Entity Relationship Diagram, otherwise called ERD is a Diagram that represents the relationship of element sets put away in an information base. All in all, ER Diagrams help to clarify the coherent design of information bases.

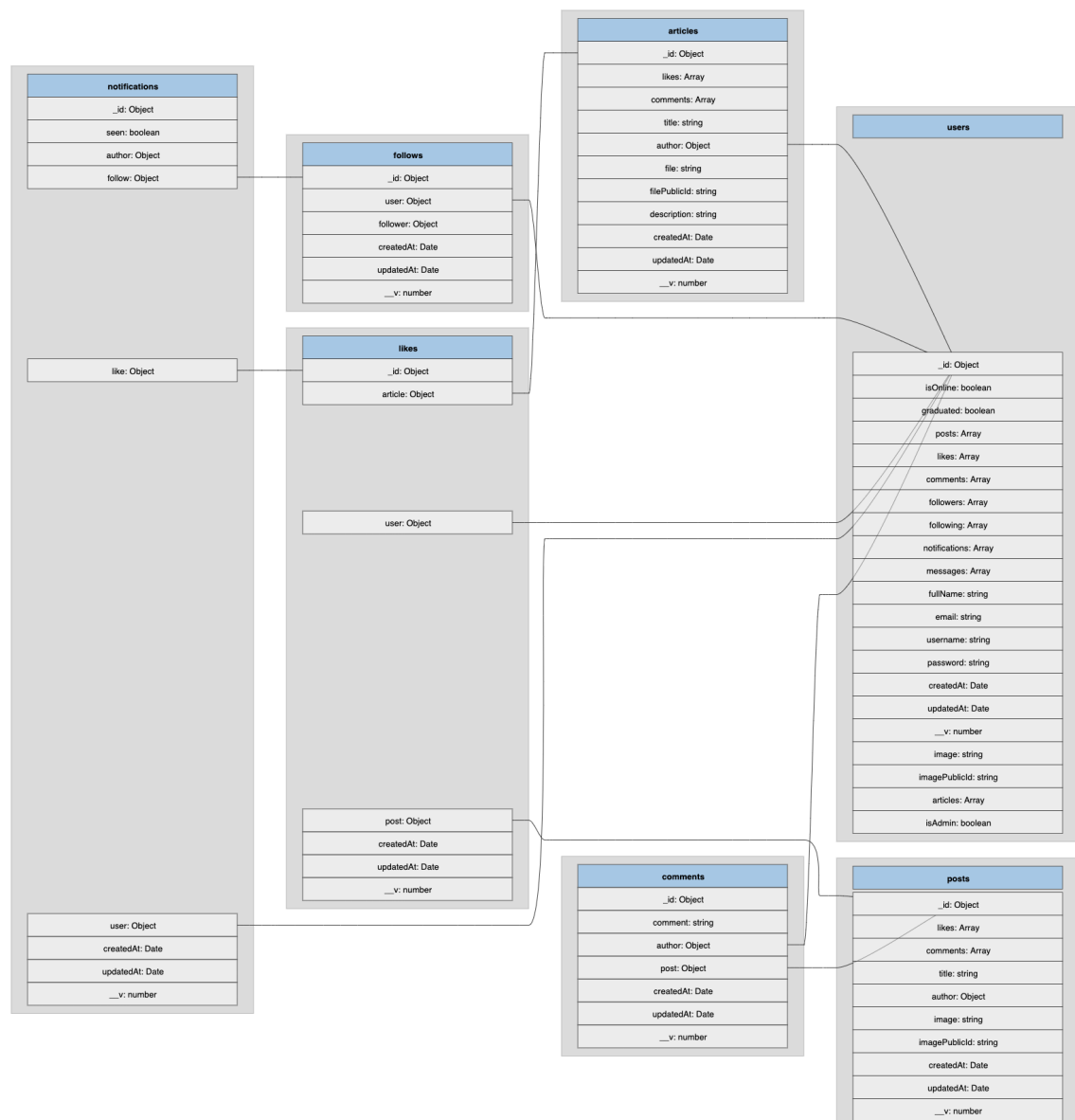


Figure 2.4: ER Diagram

2.2.2 Tables

All documents/tables' details are as follows:

User Table: This table represents the user information.

Table 2.1: User

Name	Type
id	Object ID
isOnline	Boolean
graduated	Boolean
posts	Array
likes	Array
comments	Array
followers	Array
following	Array
notifications	Array
messages	Array
fullName	String
email	String
username	String
password	String
createdAt	Date
updatedAt	Date
image	String
imagePublicId	String
articles	array

Article Table: This table represents the article information.

Table 2.2: Article

Name	Type
id	Object ID
likes	Array
comments	Array
title	String
author	Object ID
description	String
createdAt	Date
updatedAt	Date

Comment Table: This table represents the comment information.

Table 2.3: Comment

Name	Type
id	Object ID
comment	String
post	Object ID
author	Object ID
createdAt	Date
updatedAt	Date

Follower Table: This table represents the follower information.

Table 2.4: Follower

Name	Type
id	Object ID
user	Object ID
follower	Object ID
createdAt	Date
updatedAt	Date

Like Table: This table represents the like information.

Table 2.5: Like

Name	Type
id	Object ID
user	Object ID
article	Object ID
post	Object ID
createdAt	Date
updatedAt	Date

Notification Table: This table represents the notification information.

Table 2.6: Notification

Name	Type
id	Object ID
seen	Boolean
author	Object ID
user	Object ID
follow	Object ID
like	Object ID
post	Object ID
comment	Object ID
article	Object ID
createdAt	Date
updatedAt	Date

Post Table: This table represents the post information.

Table 2.7: Post

Name	Type
id	Object ID
likes	Array
comments	Array
title	String
image	String
imagePublicId	String
author	Object ID
createdAt	Date
updatedAt	Date

Chapter 3

Methodology

Agile is an iterative approach to project management and software development that helps teams deliver value to their customers faster and with fewer headaches. Instead of betting everything on a "big bang" launch, an agile team delivers work in small, but consumable, increments. Requirements, plans, and results are evaluated continuously so teams have a natural mechanism for responding to change quickly. But it's an individual project and so it has no team, still **Agile Methodology** is followed.



Figure 3.1: Agile Methodology

3.1 Technology

Frontend:

- **React:** is an open-source, front end, JavaScript library for building user interfaces or UI components.
- **Apollo Client:** A GraphQL frontend client to communicate with Backend GraphQL API
- **Styled Component:** A react library to apply style to the web application

Backend:

- **Express:** A NodeJS framework to build server-side API
- **GraphQL:** GraphQL is an open-source data query and manipulation language for APIs, and a runtime for fulfilling queries with existing data
- **MongoDB:** A NoSQL Database program used in this project
- **Apollo Server:** is an open-source, GraphQL server that communicates with any GraphQL client, parse GraphQL query and build GraphQL API
- **Cloudinary:** CDN service to host and deliver images
- **AWS S3:** Amazon S3 service to host and deliver files

Other Tools:

- **creately.com:** Diagram drawing tool

3.2 Implementation

UIU Social Blog is a Web Application. Since it consists of two applications (Frontend and Backend), it requires two web servers. Both the frontend and backend are based on node runtime. Any operating system having node server running can run this application.

When these two frontend and backend applications are hosted, this application can be accessed from anywhere in the world in a browser through internet connection.

3.3 Testing

Software testing can be stated as the process of verifying and validating that a software or application is bug free, meets the technical requirements as guided by its design and development and meets the user requirements effectively and efficiently with handling all the exceptional and boundary cases. So testing is a very important part of a software development cycle. And that is why this application is well tested and updated or fixed issues according to testing results

We can divide software testing in two steps. One is **Verification** and the other is **Validation**.

Verification ensures that we are building features correctly whereas validation ensures what we are building is correct. These can be stated in a simpler form like below:

Verification: “Are we building the product, right?”

Validation: “Are we building the right product?”

We can classify Software Testing in two broadly types:

Manual Testing: Manual testing basically means testing a software manually without using any automation testing tools. Here the software tester acts as an end-user to check if the software is working as expected and if there are any bugs.

Software tester makes a test plan, test cases and test scenarios and according to that he tests the software to find any unexpected behavior.

Automation Testing: It's also known as test automation. Basically, this testing involves automation of a manual process. In this process testers write test scripts according to their test plan, test cases or test scenarios and use another testing software tool to run the scripts.

There are two different techniques of software testing:

Black Box Testing: The method of testing in which the analyzer doesn't approach the source code of the product and is directed at the product interface without worrying with the inner legitimate design of the product is known as black box testing.

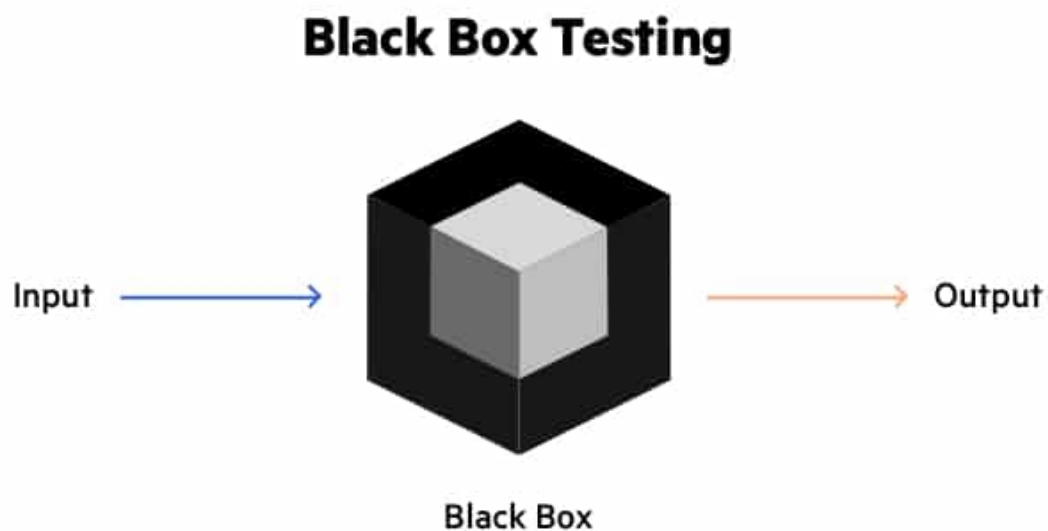


Figure 3.2: Black Box Testing

White-Box Testing: The procedure of testing in which the analyzer knows about the inner functions of the item, approaches its source code and is led by ensuring that all inside tasks are performed by the determinations is known as white box testing.

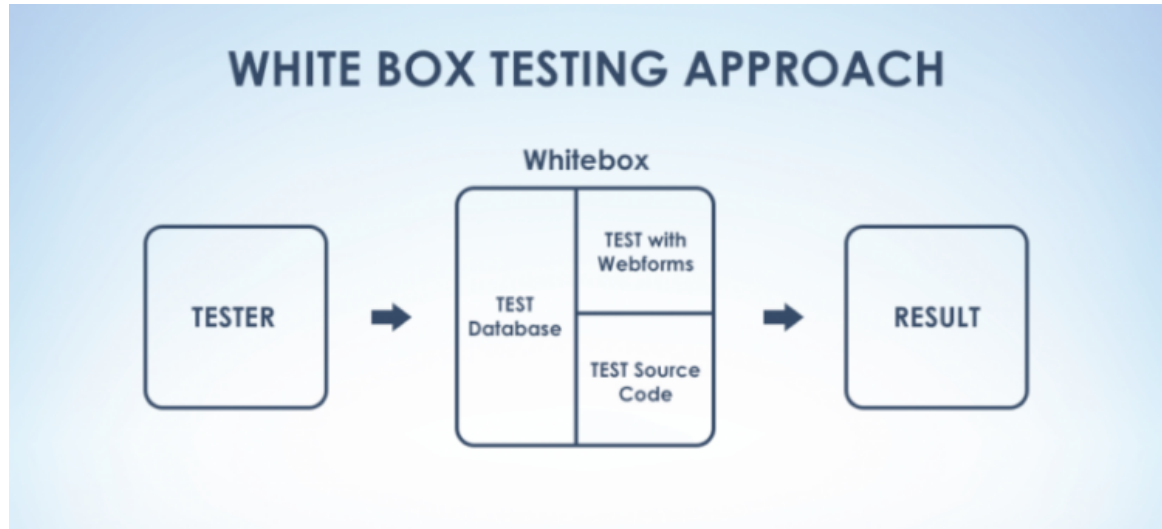


Figure 3.3: White Box Testing

Chapter 4

Results

4.1 Landing Interface

It's the starting or landing page to login or signup to UIU SOCIAL BLOG. From here new users can create an account and existing users can login to the system.

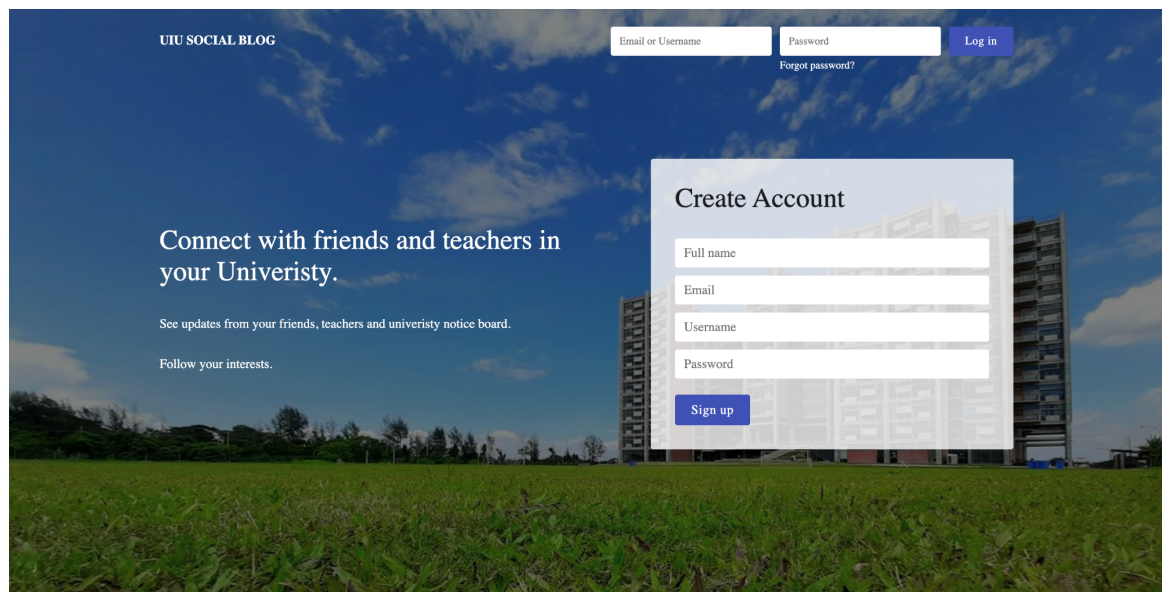


Figure 4.1: Landing Page

4.2 Forgot Password Page

If a user forgets his password, he can recover it from the **Forgot Password Page**. Users can access this page from the landing page by clicking on the forgot password link just below the login form.

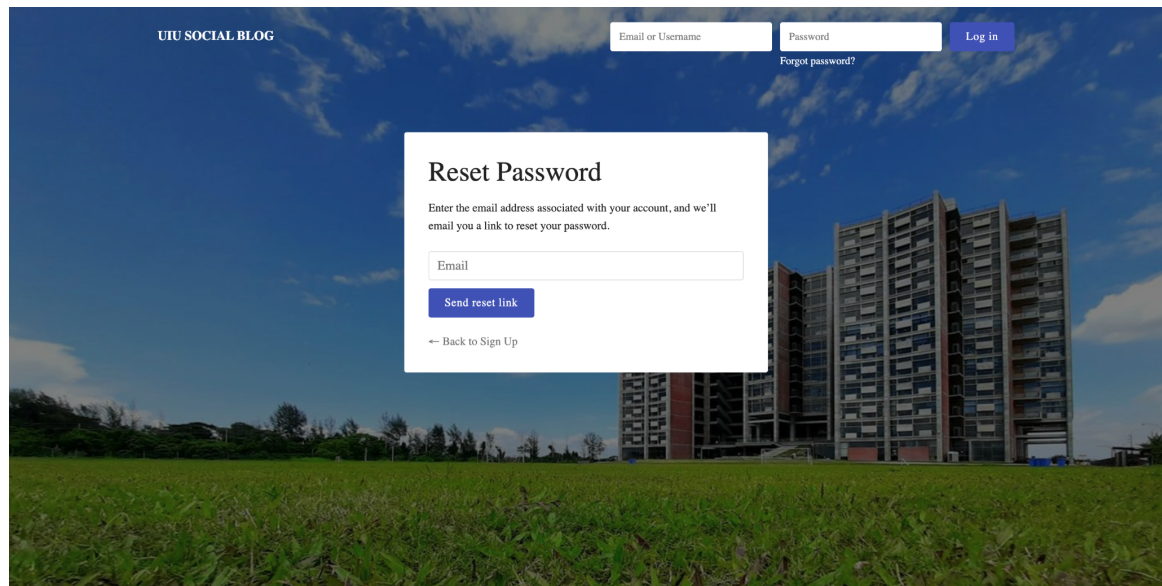


Figure 4.2: Forgot Password

4.3 Home Page

This is where a user will be redirected to just after login. Users will find posts created by him as well as by other users here.

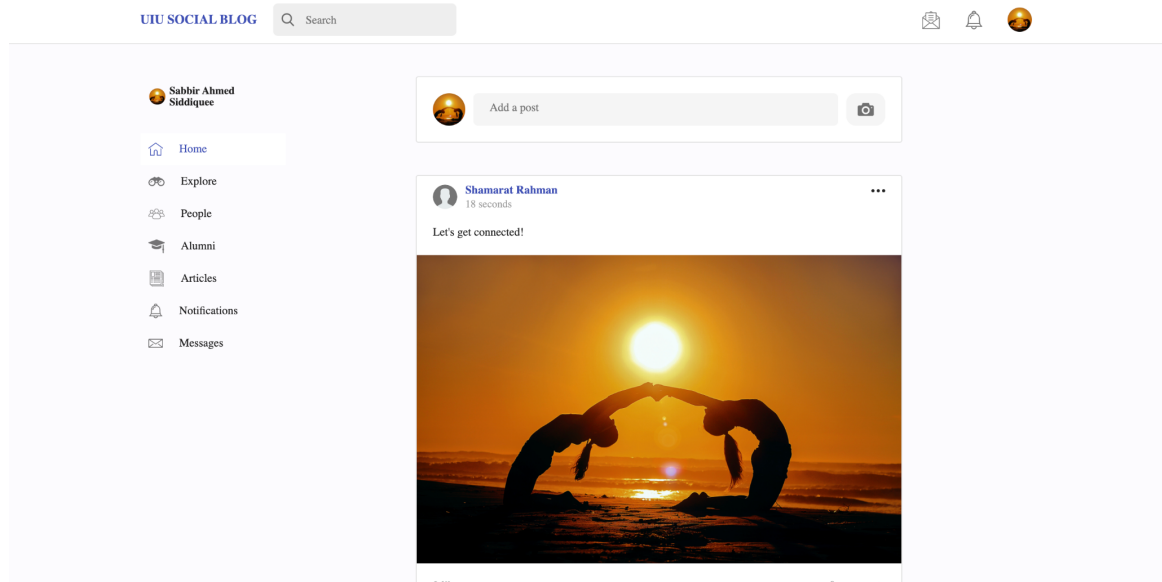
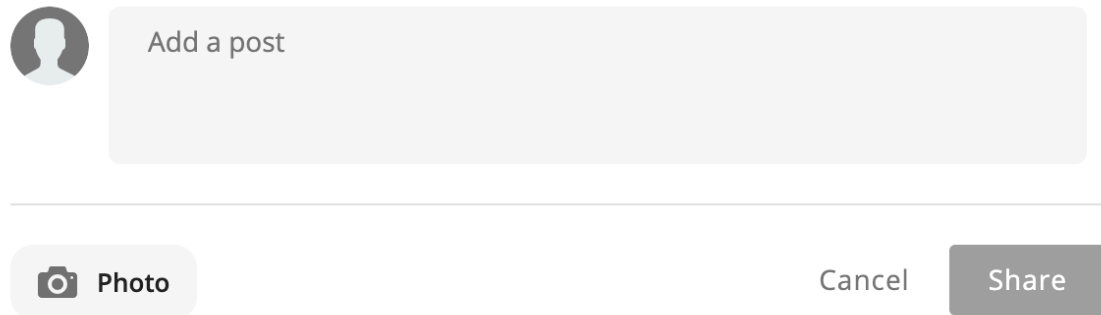


Figure 4.3: Home Page

4.4 Create Post

Users can create a post with or without a photo attachment from the home page **Add Post** form.



The image shows a 'Create Post' modal form. It features a circular profile picture placeholder on the left. To its right is a large, light gray rectangular text input area with the placeholder text 'Add a post'. Below the input area is a horizontal line. At the bottom left, there is a button with a camera icon and the text 'Photo'. At the bottom right, there are two buttons: 'Cancel' and 'Share'.

Figure 4.4: Create Post Modal

4.5 Suggested Users

Users will be able to find a list of randomized suggestions for other users to follow from the right sidebar.

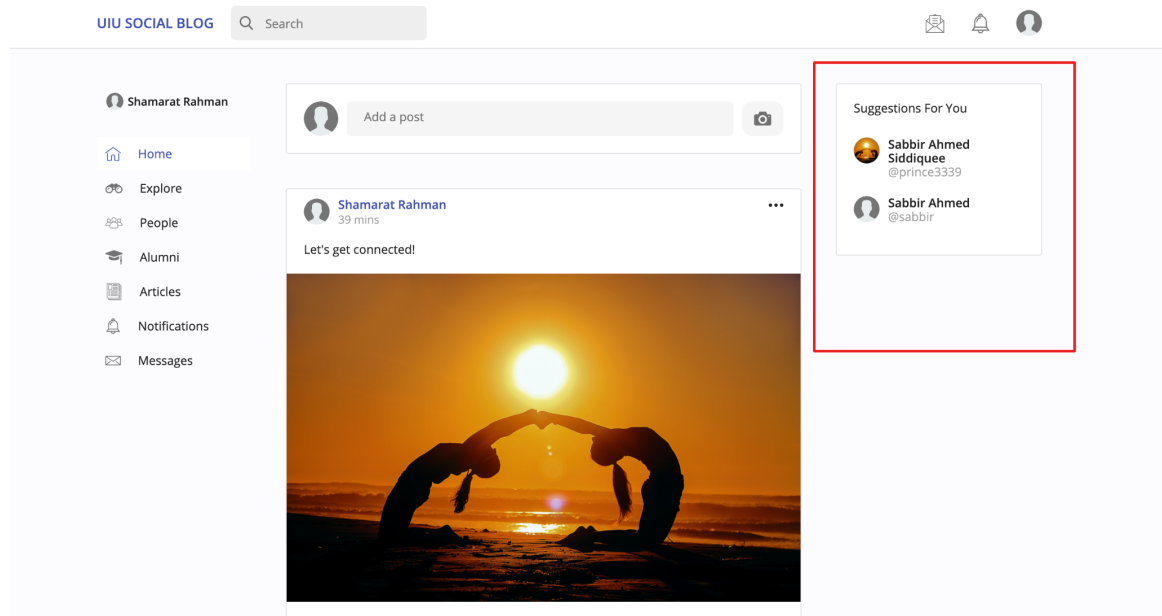


Figure 4.5: Suggested User List

4.6 Search Users

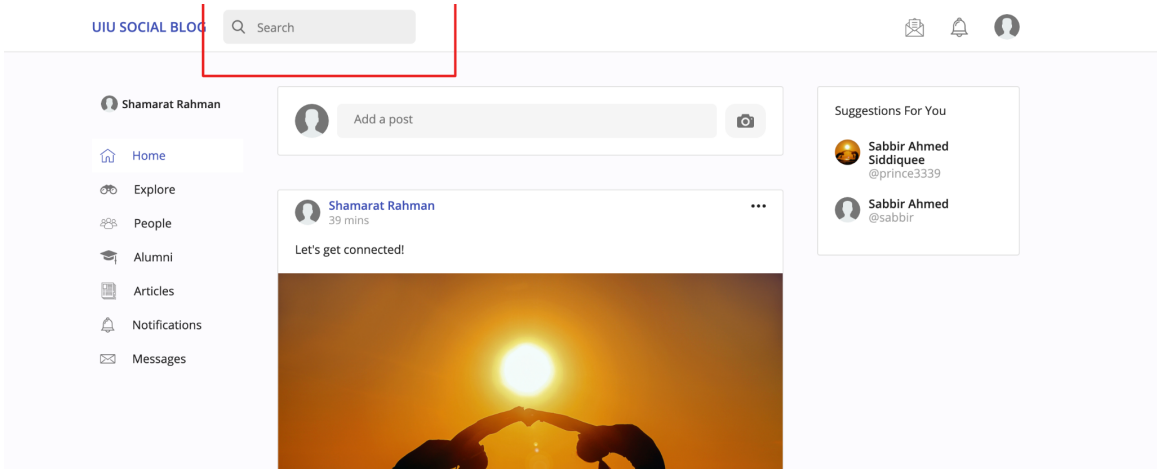


Figure 4.6: User Search

4.7 Explore Page

Users can explore posts created by other users in the explore section.

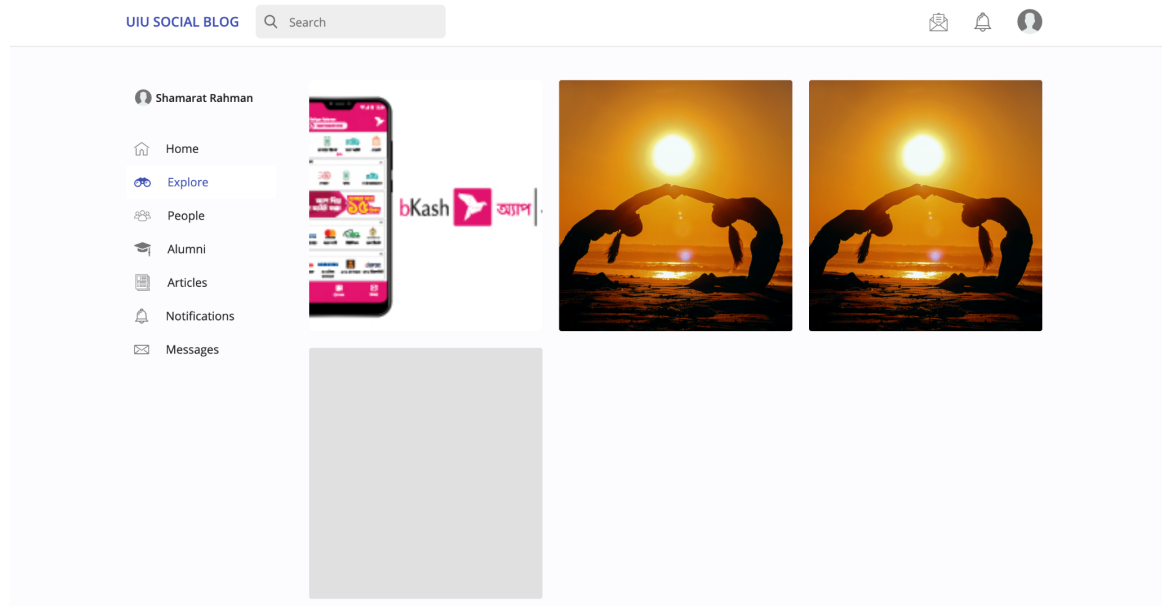


Figure 4.7: Explore Page

4.8 People Page

Users can explore other users' lists to get connected. By following other users, a user will get updates from them.

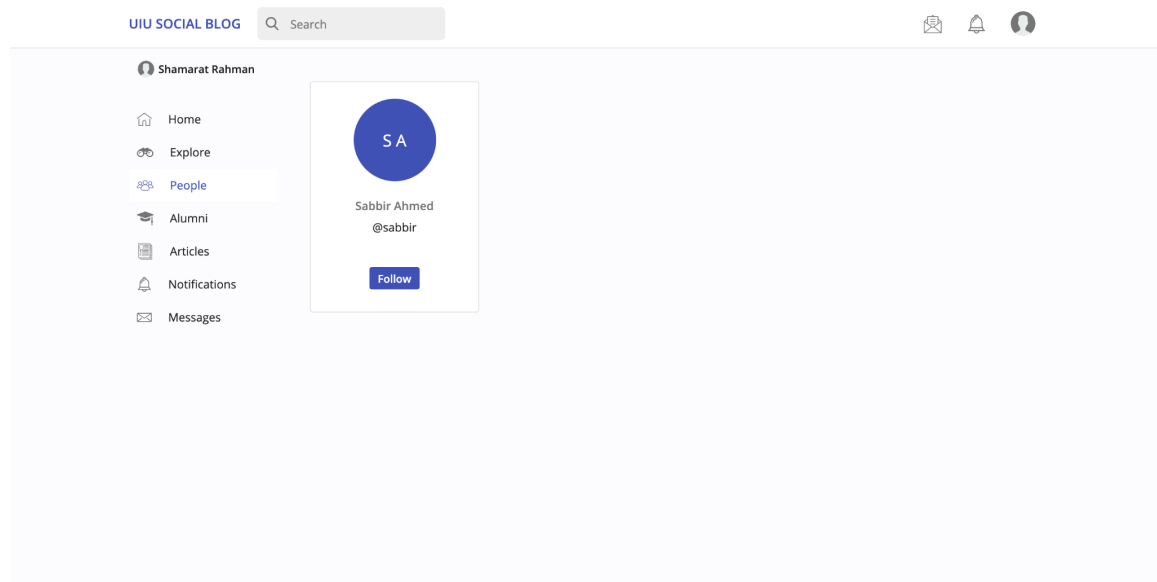


Figure 4.8: People Page

4.9 Alumni Page

Users can find a list of users who have completed their graduation. And they can get connected from here.

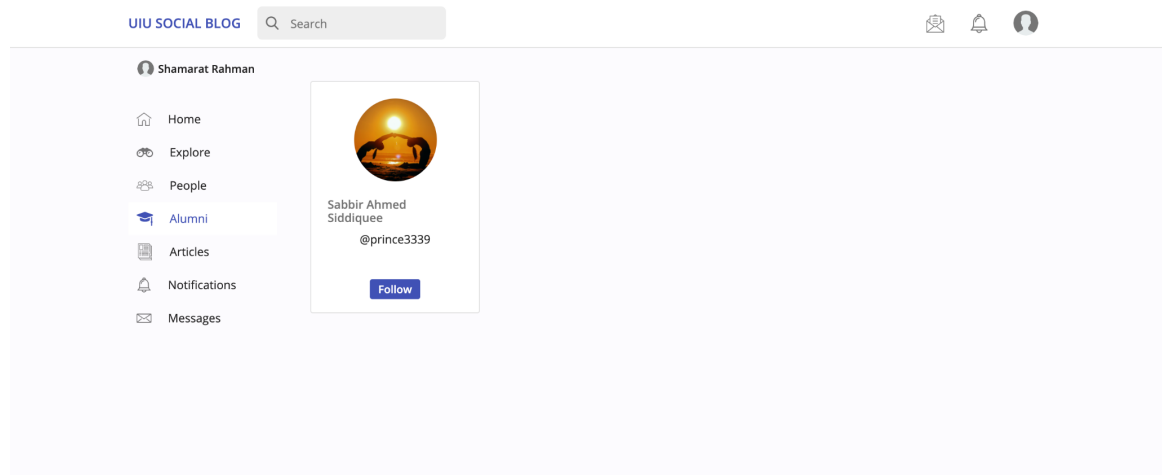


Figure 4.9: Alumni List

4.10 Articles Page

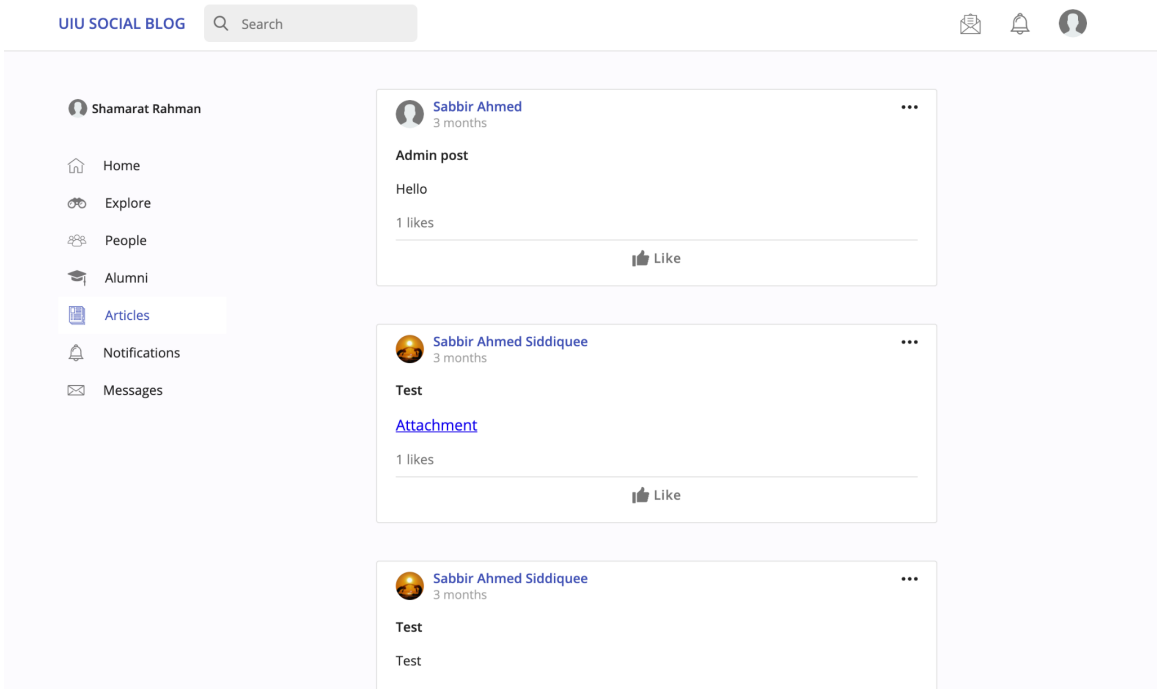


Figure 4.10: Articles Page

4.11 Notifications Page

Different types of notifications are listed here.

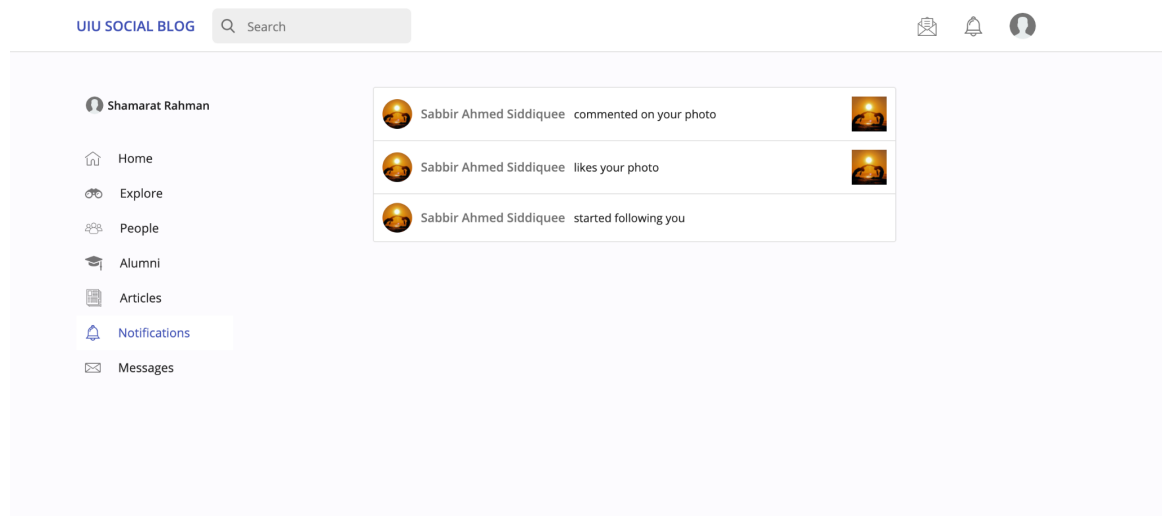


Figure 4.11: Notification Page

4.12 Message/Conversation Page

Users can chat with other users. They can visit the message window from users' profile, top navbar or even from the left sidebar.

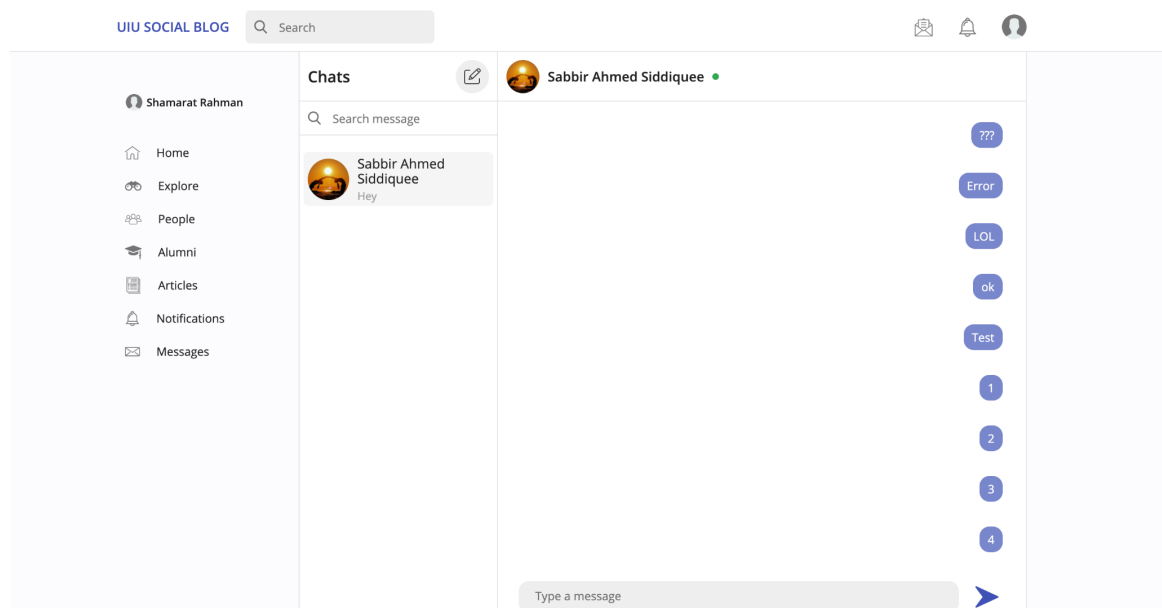


Figure 4.12: Messages Page

4.13 Personalized Profile Page

Any user can visit another user's profile page to know more about him. And he/she can start communicating with him from their profile page. Apart from that users can update their cover photo or profile photo and update his/her graduation status.

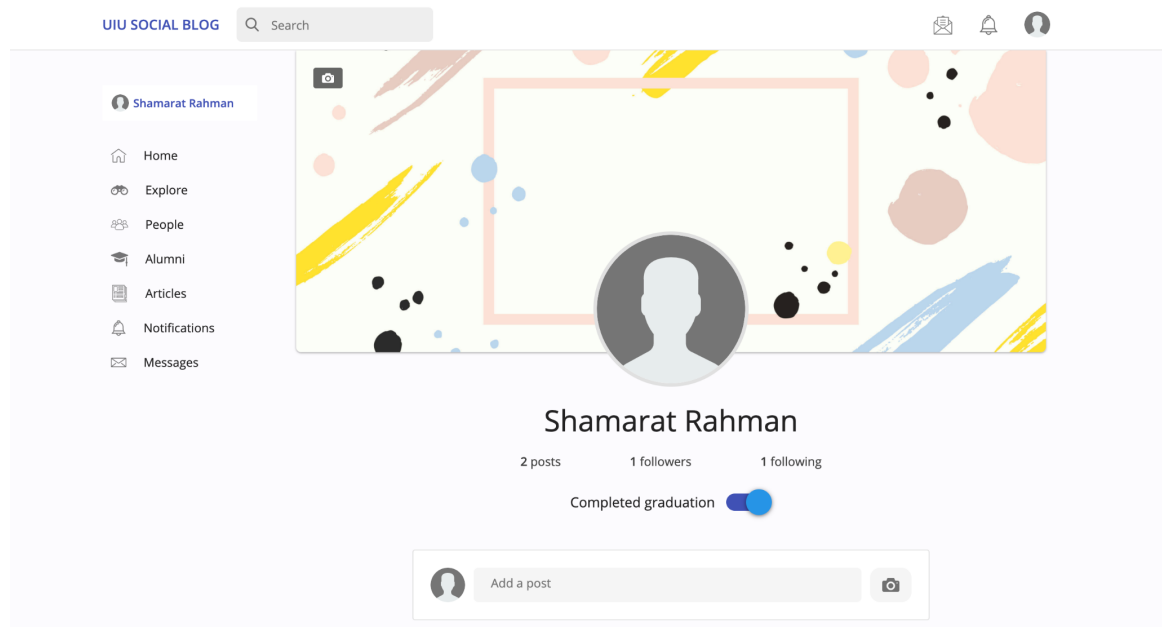


Figure 4.13: Profile Page

Chapter 5

Conclusions and Future Works

5.1 Conclusion

This application is developed mainly to connect both teachers and students under a single online platform. It aims to fulfill the gap between them. Another special focus point is it will make users feel like they are using a social networking platform since it has the most common social network application's features.

5.2 Future Work

I have plans to take this project to the next. It's the first version of this application. I would like to update the user interface to make it more user friendly and modern. I will make it more secure. In the future I'll develop an android and iOS mobile application for this project which is a must in this era. Apart from that, I will add more advanced features. And it's really necessary to have a complete admin dashboard.

References

- [1] Alexander, Bryan. "Social networking in higher education." The Tower and the Cloud (2008): 197-201.
- [2] Issa, Tomayess, Pedro Isaias, and Piet Kommers. Social networking and education. New York, Springer, 2016.
- [3] Helen, Vakhnenko "Create Social Networking Site, Tips and Tricks", <https://agilie.com>, 2018
- [4] Promotion, "The Technology behind the social network", <https://www.itpro.co.uk>, 2014
- [5] Little, Judith Warren. Social network theory and educational change. Harvard Education Press, 2010.
- [6] Beau Carnes, "Use React and GraphQL to Make a Full Stack Social Network", <https://freecodecamp.org>, 2020
- [7] Adnan, "Social Network Site in NodeJS and MongoDB", <https://adnan-tech.com>, 2020
- [8] "UML Diagram", <https://creately.com>