National University of Computer and Emerging Sciences

Project Name

Social Media Platform

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Abstract

Pakistan has a total population of about 200 million out of which 45 million people use the internet and around 40 million active social media users per month, which is 20% of the total population. Most commonly used social media sites in Pakistan include Facebook, Instagram, YouTube and WhatsApp. As all these social media platforms are international that is why we do not have any control over them. They gather data from our users and use that data for targeted marketing. Pakistan spend over $100 million on social media advertisements which utilizes their own data to target audiences. Another problem with data is that it is in the hands of others which they can utilize in any possible way to harm our sovereignty. Another issue for not having our own social media is that we cannot restrict users to post blasphemous or anti-national content. The solution for these problems is that we are going to build our own social media platform which will provide us complete control on our data and we do not have to spend millions of dollars to foreign social media companies. Having our own social media platform will help us prevent spreading of content which is prohibited in our country.

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1 Introduction

1.1 Significance of the Project

The problem here is that we are using these social media platforms on a daily basis and are providing our data to these social media sites which uses this data for marketing purposes. This means that our data is not in our control. This could be used against us for any particular harmful reason. Another thing is that as we use international social media platform, we do not have control on what people post on social media platforms. We do not have the authority to remove particular content which is against our national or cultural values.

1.2 Description of the Project

This project aims to develop our own social media platform which provide us complete control on our data and we do not have to spend millions of dollars to foreign social media companies. The project has all modern features of successful social media platforms. We are going to develop a social media platform which helps the user to maintain separate profiles for friends, family and business. The user could also make customizable circles for specific purposes **Social Networking Privacy**. The users would be able to grow their circles and securely chat with their connections and can share and create posts in any of their circles.

1.3 Background of the Project

As of May 2019, the total population of the world is about 7.7 billion, out of which 4.4 billion people uses internet. There are about 3.5 billion social media users **world Internet usage**. The most commonly used social media platforms include Facebook, WhatsApp, YouTube, WeChat, Twitter and Instagram. These social media platforms gather user data and then use this data for targeted marketing to generate their revenue **PASwebsite**. Pakistan has a total population of about 220 million and has around 50 million active social media users. Pakistan spends around 100 million US dollars on social media advertisement.

2 Requirement Analysis

2.1 Dependencies and Constraints

2.1.1 System Dependencies

- System needs all the software dependencies like Browser to the run this application
- User should be able to Login and Verify Email.
- User must have a valid email for account registration.
- User must be knowledgeable for using Browser.

2.1.2 System Constraints

- This platform (Website) supports on all browser which supports HTML5 language.
- This Platform supports only English language.
- This Platform requires certificates issued by any valid certificate authority.
- This Platform is preferably design on desktop version but can be responsive to Mobile Browser.

2.2 System Feasibility

2.2.1 Technical Feasibility

Considering technology the project is highly feasible as most of the technologies we are using to develop this project are open source and easily accessible and there are no limitations as far as technology goes.

2.2.2 Economic Feasibility

As far as economic feasibility goes the initial development of the project will not require a big budget as most of the tools are open source and free and the hardware will be provided by the university.

2.2.3 Schedule Feasibility

Considering the time available we will try our best to deliver most of the features provided in the scope of the project. We will deliver a basic platform which we will continue to develop further. So with the passage of time the project will get enriched with modern features.

2.3 Functional Requirement

2.3.1 System Feature: User Registration

User can register for an account using his email address when there is no existing account stored with the user's email-id in the database. The user can provide details such as Full name, email address, birth date and password. All fields are required to proceed to verification step. Contact number must be 11-digit numeric field. Password must be complex and should be at least 8 characters long, including at least one capital letter, a number and a special character. User then will verify his identity via user's own email account.

2.3.2 System Feature: Login

In order to login into application, user must be registered. User will enter the email address and password for login. The md5 password hashmap will be matched with the hashmap in database in order for authentication of user. If three attempts of password are wrong then a Captcha will appear.

2.3.3 System Feature: Edit Profile information

user can add his profile details such as his languages, gender, profile pic, cover photo, about section and his personal interests. These fields can also remain empty. User must be logged into the application and his account must be a verified account to be able to add personal information.

2.3.4 System Feature: View Profile

User can see others profiles who are added as his connections. For Family circle user should need to add user first to see their profile.

2.3.5 System Feature: View Notification

User can get notification of messages, activity related to user such as who viewed user profile, added or accepted the request.

2.3.6 System Feature: Add User as Circle

User can send requests to other registered users within their respective circle. User can send request in order to get accepted or rejected to other registered users. User can search for user and then can send request to them. User can also add his family member who has joined Circle.

2.3.7 System Feature: Search User

User can search for his or her friends, family or business colleagues who are registered on this platform. User can put the name of their contact in the search bar and search after which the system results will display all the registered user from the database on the website in a particular circle by the searched name.

2.3.8 System Feature: Post

Registered user can share posts with his circle. The post can be plain English text with a single image or multiple images. User can enter the post in the designated text area and on clicking post button, should be visible to the user and his circle.

2.3.9 System Feature: Chat

User can start conversation with any of his connections via Chat box in a particular circle. The other user will be notified that someone started conversation within his or her connection and chat will be transfered to the other user.

2.3.10 Use Cases

Figure 1: Use Case Diagram

Create Account		
Id:	1	
Actors: Admin, User		
Feature: To RegisterUser for the Website		
Pre-condition:	User should be new and has valid email for the platform	
Scenarios		
Step#	Action	Software Reaction
1.	Provide Information	Validate the information
2.	Verifies email	Check verification
Alternate Scenarios: User input already existing username and tries to register		
1a: System Failed to Register the user		
Post Conditions		
Step#	Description	
	User registered to platform	
	User failed to registered the platform	
Use Case Cross referenced	Login, Setting up Profile	

Table 1: UseCase - User Registration

Login		
Id:	2	
Actors: Admin, User		
Feature: To Login the User for the Website		
Pre-condition:	User should have valid password for the platform	
Scenarios		
Step#	Action	Software Reaction
1.	Provide Information	Validate the details
2.	Click to Login Button	Login
Alternate Scenarios: User input password or email and tries to login		
1a: System Failed to Login the user		
Post Conditions		
Step#	Description	
	User Login to platform	
	User failed to Login the platform	
Use Case Cross referenced	View Newsfeed, View Profile, Setting up Profile, View Notification, Create Post	

Table 2: UseCase - SignIn

Logout		
Id:	3	
Actors: Admin, User		
Feature: To Logout the User from the Website		
Pre-condition:	User should be logged in to the platform	
Scenarios		
Step#	Action	Software Reaction
1.	Click on Logout Button	Closed the session from the database
Alternate Scenarios: User already Logged		
1a: User won't be able to see the main screen of the platform		
Post Conditions		
Step#	Description	
	User Logged out from the platform	
Use Case Cross referenced	-	

Table 3: UseCase - SignOut

Add new Circle		
Id:	4	
Actors: Admin, User		
Feature: To Add the new Profile of user for the Website		
Pre-condition:	User should be authenticated in the platform	
Scenarios		
Step#	Action	Software Reaction
1.	Provide Information	Validate the information
2.	Click Add button	Add new Circle
Alternate Scenarios: User input invalid information		
1a: System Failed to Add new Profile of the user		
Post Conditions		
Step#	Description	
	User Add new Circle to platform	
	User failed to add new circle to the platform	
Use Case Cross referenced	View Profile, Edit Profile, Add people to Profile	

Table 4: UseCase - Add new Profile

View Profile			
Id:	5		
Actors: Admin, User			
Feature: To view profile of the Users in the Website			
Pre-condition:	User should have the Profile added in the platform		
Scenarios			
Step#	Action	Software Reaction	
1.	Clicks on View Profile or user name	Retrieves information of the profile or user name	
Alternate Scenarios: User search for invalid user.			
1a: System Failed to show the user profile			
Post Conditions			
Step#	Description		
	User view the profile in the platform		
	User cannot view the profile in the platform		
Use Case Cross referenced		View information, View Timeline, View Photos, Send Message	

Table 5: UseCase - View Profile

Edit Profile Info		
Id:	6	
Actors: Admin, User		
Feature: To Edit Information about the User for the Website		
Pre-condition:	User should have created the circle or is new to the platform	
Scenarios		
Step#	Action	Software Reaction
1.	Provide Information	Validate the information
2.	Click on Update	Save to the Database
Alternate Scenarios: User input invalid information and tries to update		
1a: System Failed to Edit the user profile information		
Post Conditions		
Step#	Description	
	User edit the profile to platform	
	User failed to edit the profile	
Use Case Cross referenced	View Information	

Table 6: UseCase - Edit Profile Info

Create Post		
Id:	7	
Actors: Admin, User		
Feature: To Post or Share to the newsfeed of the Website		
Pre-condition:	User should be Logged In to the platform	
Scenarios		
Step#	Action	Software Reaction
1.	Provide text, image, video, file	Check file size, words in the text
2.	Click on Post	Save the Post to the database and refresh the feed page
Alternate Scenarios: User input irrelevant material or the file size exceeds the limit		
1a: System Failed to post in the newsfeed		
Post Conditions		
Step#	Description	
	User Post to platform	
	User failed to Post to platform	
Use Case Cross referenced	View Newsfeed	

Table 7: UseCase - Create Post

Chat		
Id:	8	
Actors: Admin, User		
Feature: To send message/mail to other users		
Pre-condition:	User should be Logged-In and is in a connection of the other user	
Scenarios		
Step#	Action	Software Reaction
1.	Click on Send Message	Check if the user is in the connection or not
2.	Create mail/message and send	Sends to the other user
Alternate Scenarios: User tries to send mail/message user who is not in the connection of the user		
1a: System Failed to send the message		
Post Conditions		
Step#	Description	
	User sends message	
	User failed to send message	
Use Case Cross referenced	View Message	

Table 8: UseCase - Chat

Search		
Id:	9	
Actors: Admin, User		
Feature: To search users, posts in the Website		
Pre-condition:	User should be Logged in to the platform	
Scenarios		
Step#	Action	Software Reaction
1.	Input Search field	Validate the information from the database
2.	Click on Search	Retrieve from the database
Alternate Scenarios: User input is not found in the database		
1a: System Failed to find the user or post		
Post Conditions		
Step#	Description	
	User Found the search field	
	User failed to find the search field	
Use Case Cross referenced	View Post, View Profile	

Table 9: UseCase - Search

2.4 Non Functional Requirements

2.4.1 Performance Requirements

- System must be able to handle a traffic around bunch of users at the same time
- System must be fast. System should not be hung-up with the increase in the number of users.
- System should be responsive in order to respond to the multiple user actions.

2.4.2 Security Requirements

- During registration, email address of user must be verified.
- Password must be complex with at least 8 characters, containing one upper case, a digit and a special character.
- System must store a Password hash value in database for authentication.
- We will be transporting all the data via HTTPS i.e. via using SSL certificates hence the data is going to encrypt during transmission and securing the user personal information.

3 Design and Specification

3.1 System level Architecture

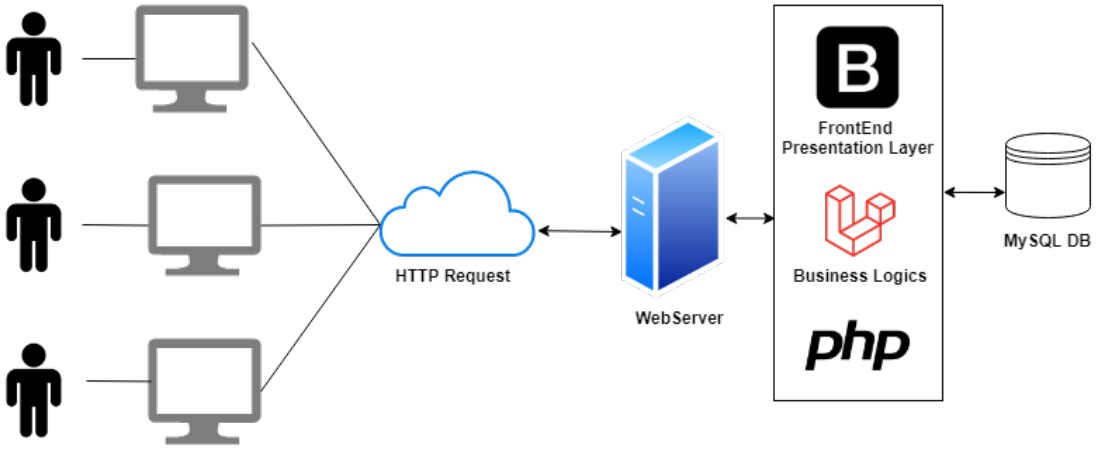

Figure 2: System level Architecture

3.2 Layered Architecture

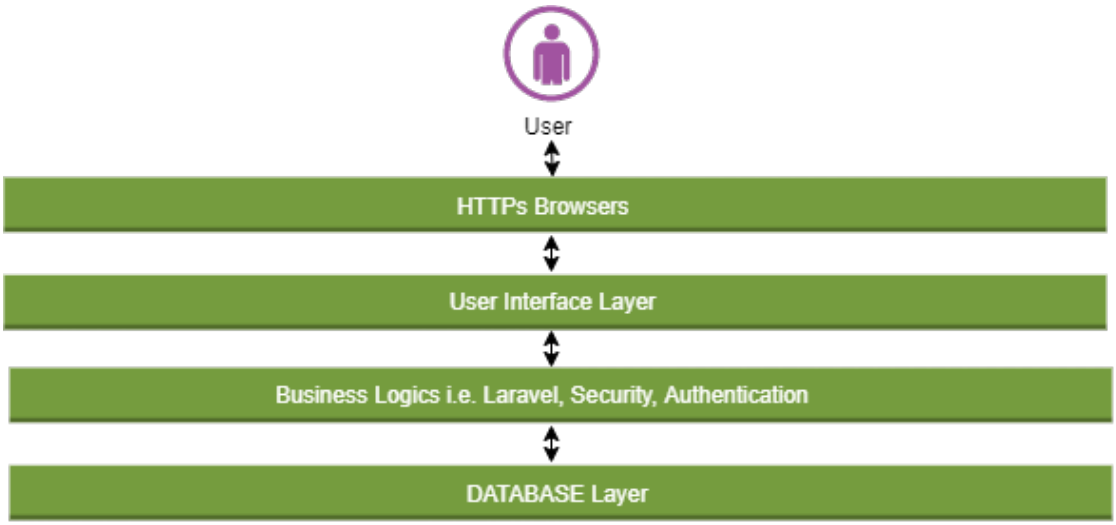

Figure 3: Layered Architecture

3.3 Recommendation Model

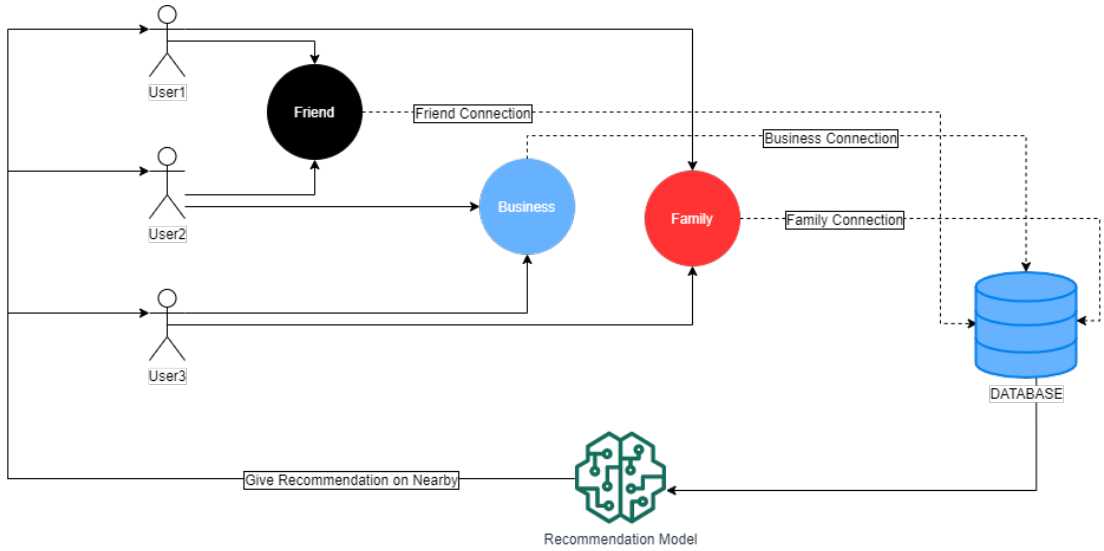

Figure 4: Recommendation Model

3.4 Detailed System Design

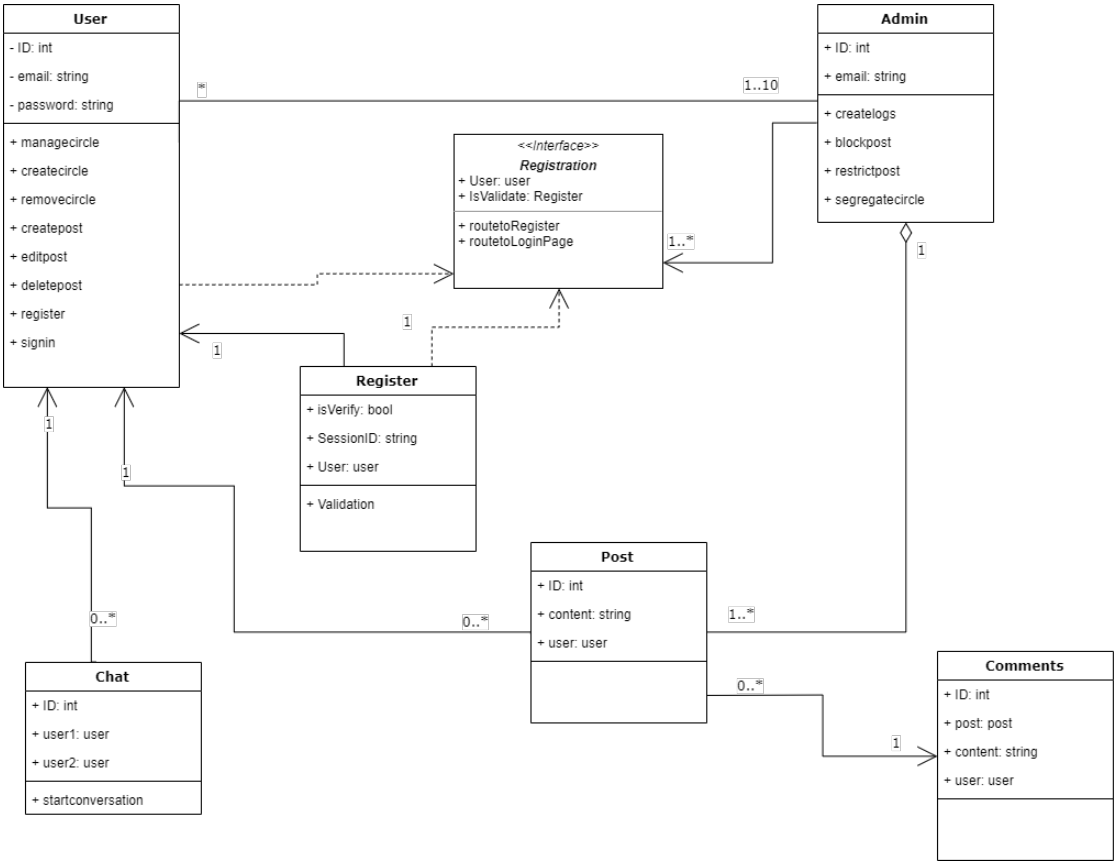

Figure 5: Class Diagram

3.5 Database Design

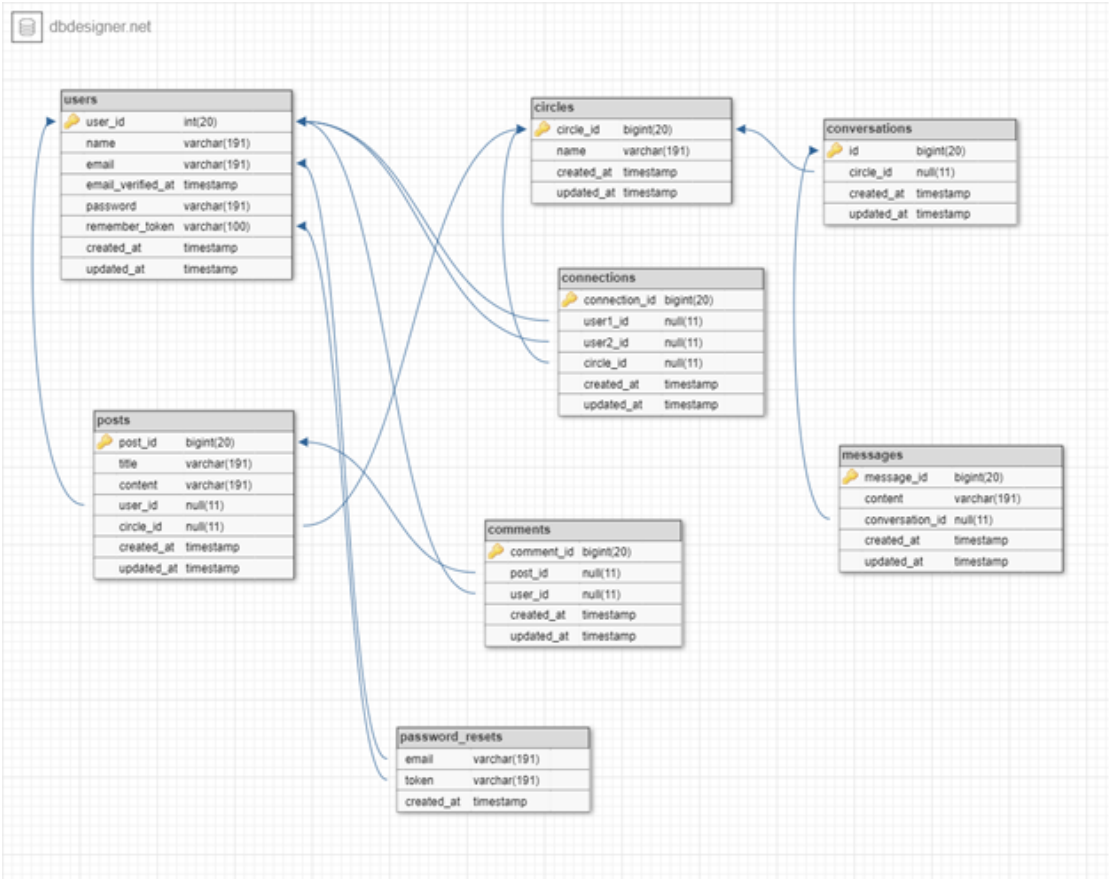

Figure 6: Database Design

3.6 Data Dictionary

Column	Type	Null	Default
circle_id (Primary)	bigint(20)	No	
name	varchar(191)	Yes	-
created_at	timestamp	Yes	-
updated_at	timestamp	Yes	-

Table 10: DataDictionary - Circle

Column	Type	Null	Default
business_user_id (Primary)	bigint(20)	No	
b_name	varchar(191)	No	
b_phone	varchar(191)	No	
b_email	varchar(191)	No	
image	varchar(191)	No	default.png
cover_image	varchar(191)	No	default.png
user_id	int(11)	Yes	-
created_at	timestamp	Yes	-
updated_at	timestamp	Yes	-

Table 11: DataDictionary - Business User

Column	Type	Null	Default
comment_id (Primary)	bigint(20)	No	
post_id	int(11)	Yes	-
user_id	int(11)	Yes	-
created_at	timestamp	Yes	-
updated_at	timestamp	Yes	-

Table 12: DataDictionary - Comments

Column	Type	Null	Default
convo_id (Primary)	bigint(20)	No	
post_id	int(11)	Yes	-
user_id	int(11)	Yes	-
created_at	timestamp	Yes	-
updated_at	timestamp	Yes	-

Table 13: DataDictionary - Conversations

Column	Type	Null	Default
id (Primary)	bigint(20)	No	
connection	text	No	
queue	text	No	
payload	longtext	No	
exception	longtext	No	
failed_at	timestamp	No	CURRENT_ TIMESTAMP

Table 14: DataDictionary - Failed Jobs

Column	Type	Null	Default
family_user_id (Primary)	bigint(20)	No	
f_name	varchar(191)	No	
f_phone	varchar(191)	No	
f_email	varchar(191)	No	
image	varchar(191)	No	default.png
cover_image	varchar(191)	No	default.png
email_verified_at	timestamp	Yes	
user_id	int(11)	Yes	
created_at	timestamp	Yes	
updated_at	timestamp	Yes	

Table 15: DataDictionary - Family User

Column	Type	Null	Default
message_id (Primary)	bigint(20)	No	
content	varchar(191)	Yes	
conversation_id	int(11)	Yes	
created_at	timestamp	Yes	
updated_at	timestamp	Yes	

Table 16: DataDictionary - Messages

Column	Type	Null	Default
email	varchar(191)	No	
token	varchar(191)	No	
created_at	timestamp	Yes	NULL

Table 17: DataDictionary - Password Reset

Column	Type	Null	Default
post_id (Primary)	bigint(20)	No	
title	varchar(191)	Yes	NULL
content	varchar(191)	Yes	NULL
user_id	int(11)	Yes	NULL
circle_id	int(11)	Yes	NULL
created_at	timestamp	Yes	NULL
updated_at	timestamp	Yes	NULL

Table 18: DataDictionary - Posts

Column	Type	Null	Default
user_id (Primary)	bigint(20)	No	
name	varchar(191)	No	
phone	varchar(191)	No	
email	varchar(191)	No	
image	varchar(191)	No	default.png
cover_image	varchar(191)	No	default.png
email_verified_at	timestamp	Yes	NULL
password	varchar(191)	No	
remember_token	varchar(100)	Yes	NULL
created_at	timestamp	Yes	NULL
updated_at	timestamp	Yes	NULL

Table 19: DataDictionary - Users

3.7 Application Design

3.7.1 Sequence Diagram

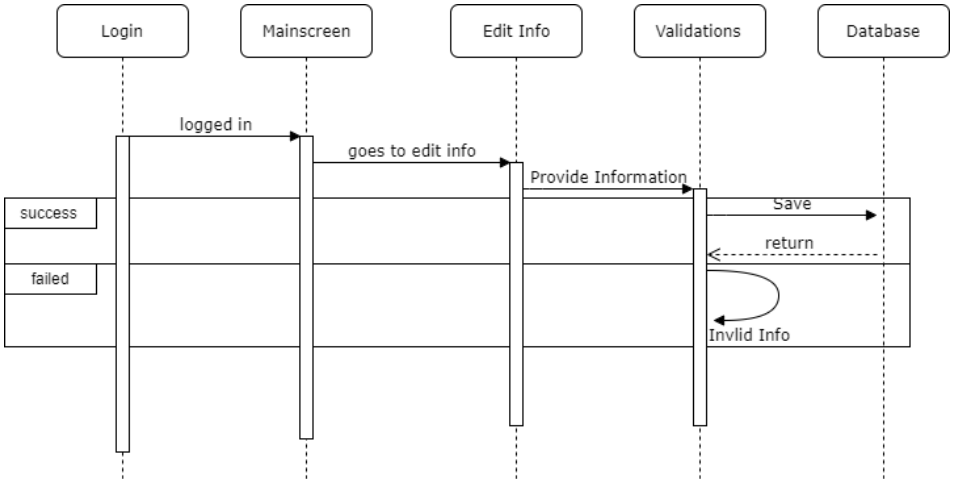

Figure 7: SequenceDiagram - Edit Info

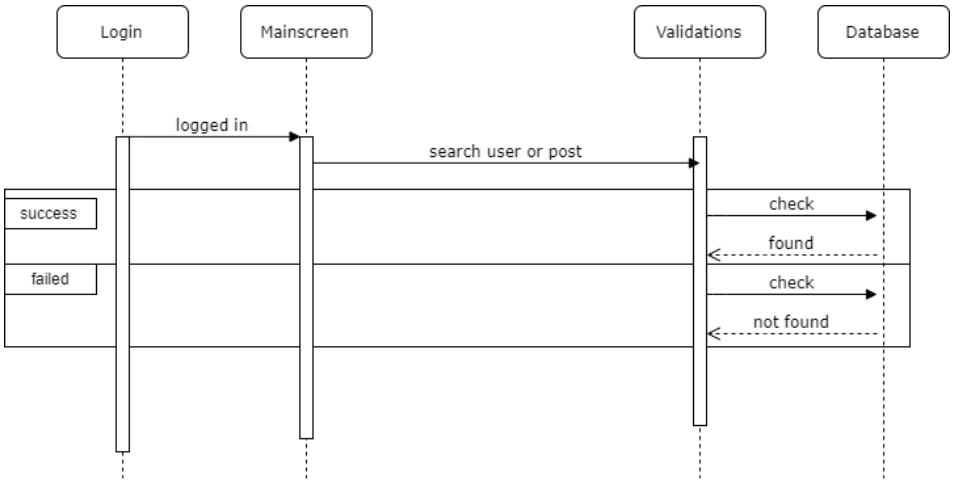

Figure 8: SequenceDiagram - Search User

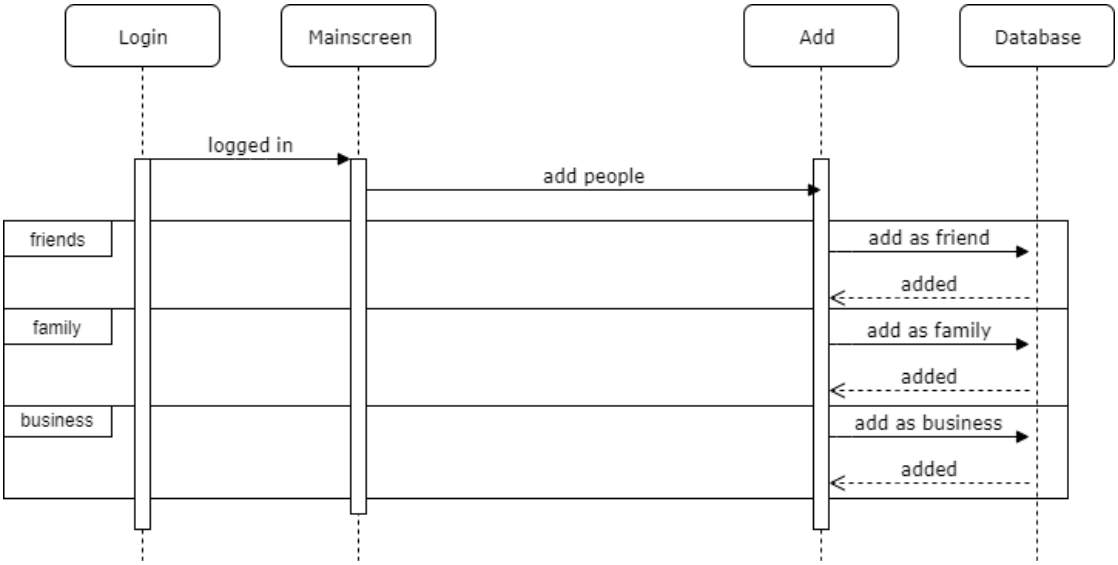

Figure 9: SequenceDiagram - Add User

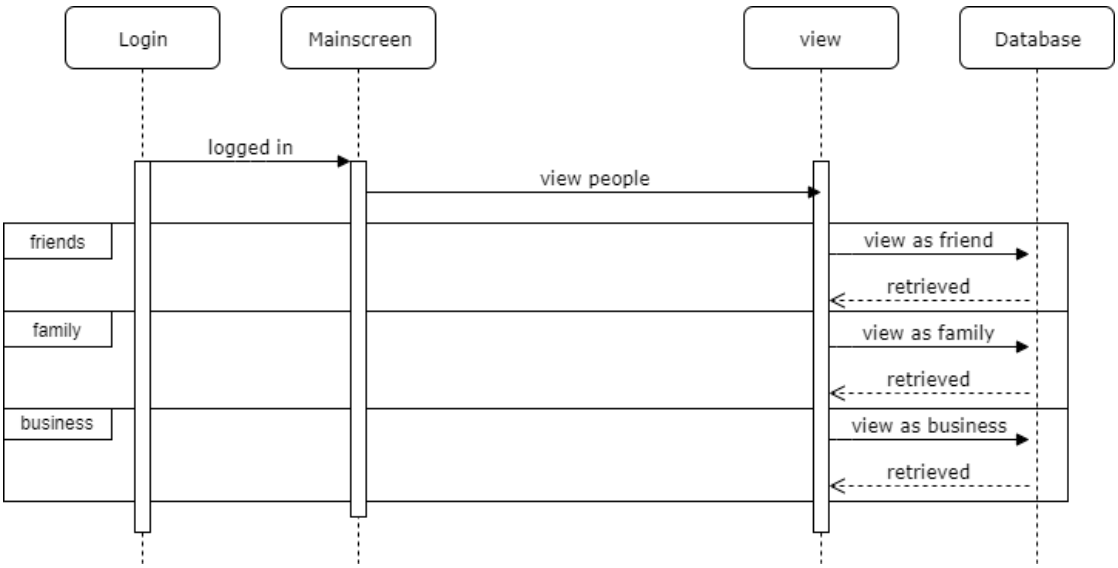

Figure 10: SequenceDiagram - View User

3.7.2 State Diagram

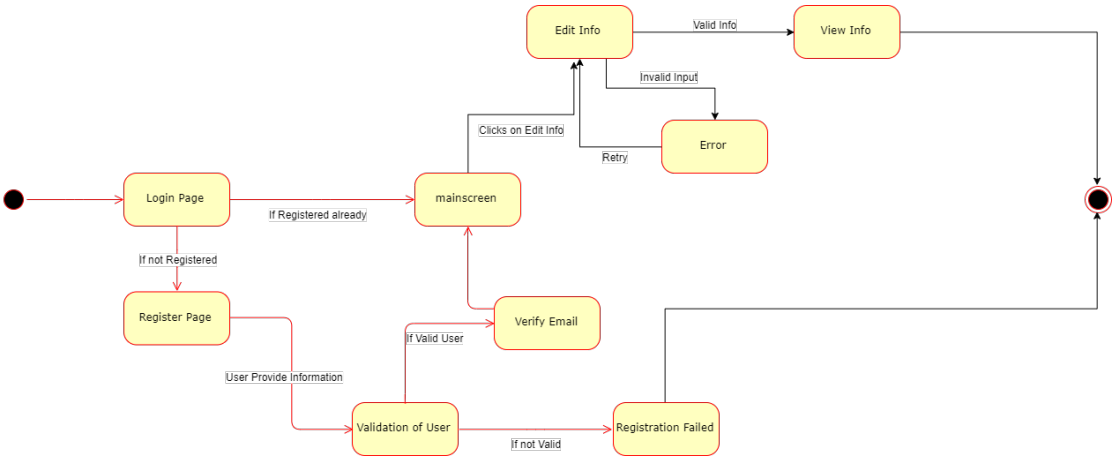

Figure 11: StateDiagram - Edit Info

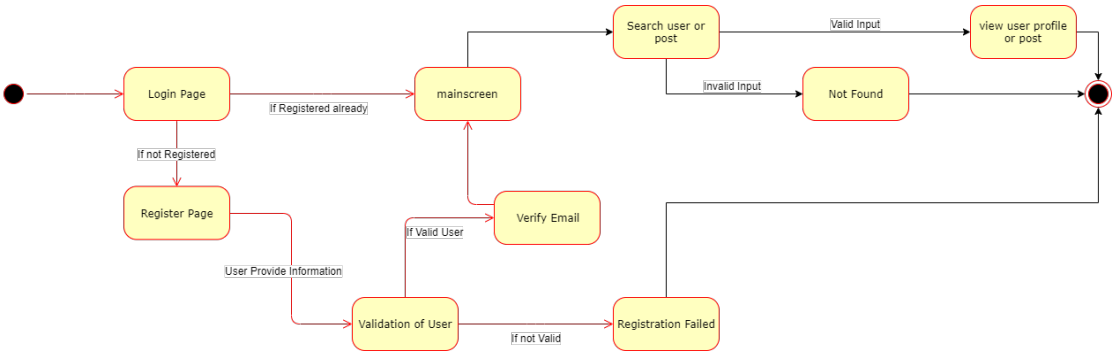

Figure 12: StateDiagram - Search User

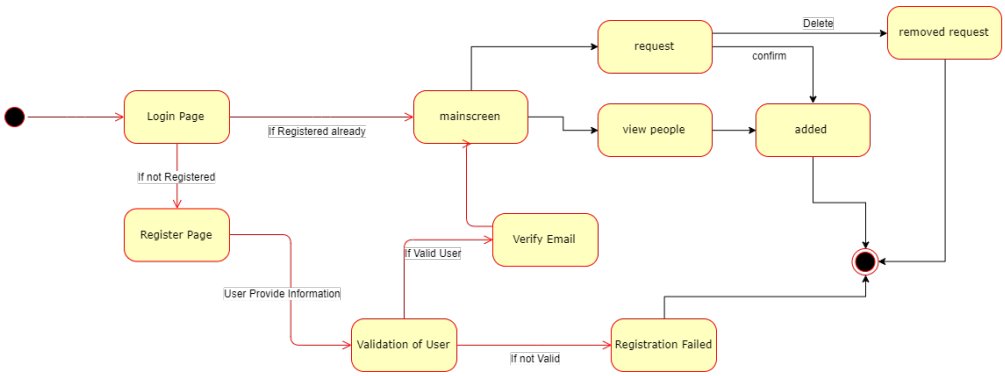

Figure 13: StateDiagram - Add User

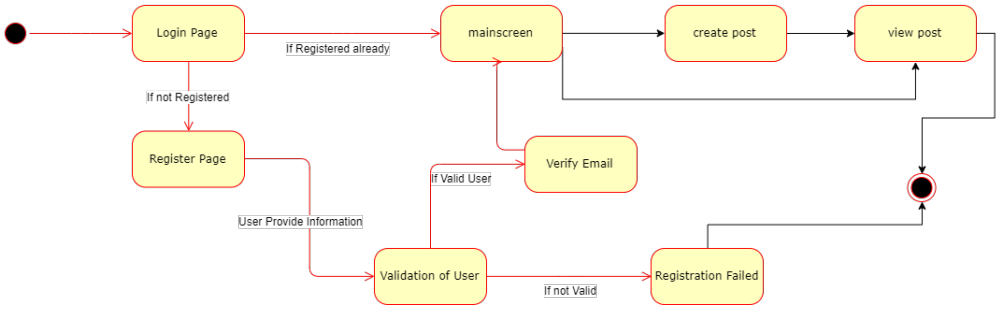

Figure 14: StateDiagram - Posts

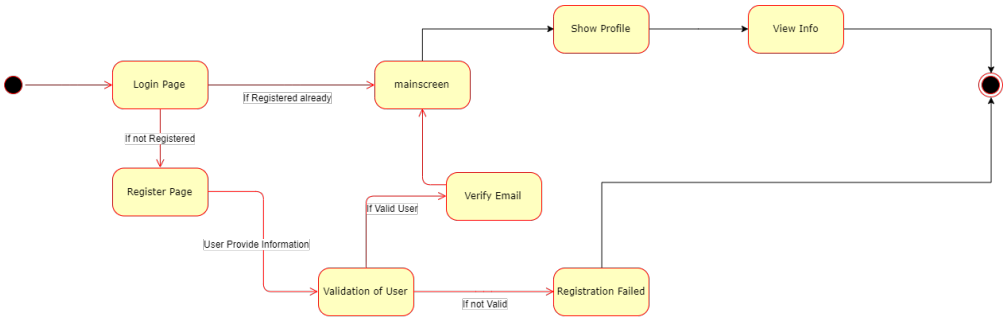

Figure 15: StateDiagram - View User

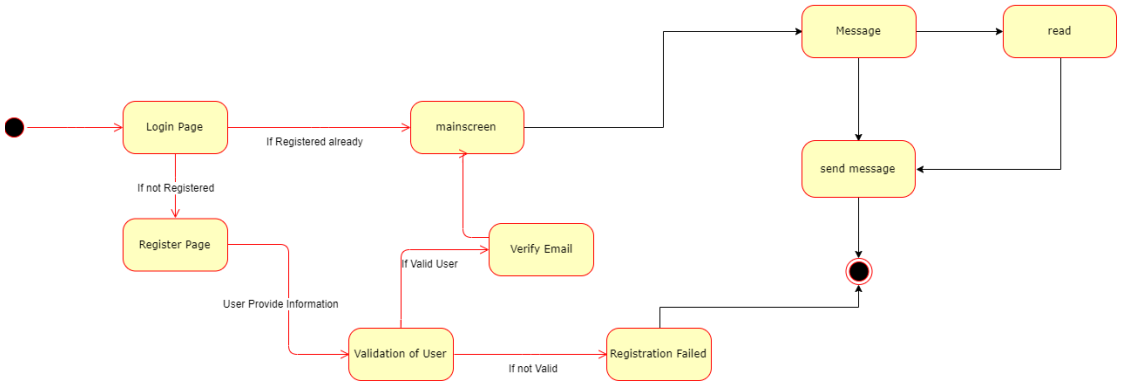

Figure 16: StateDiagram - Chat

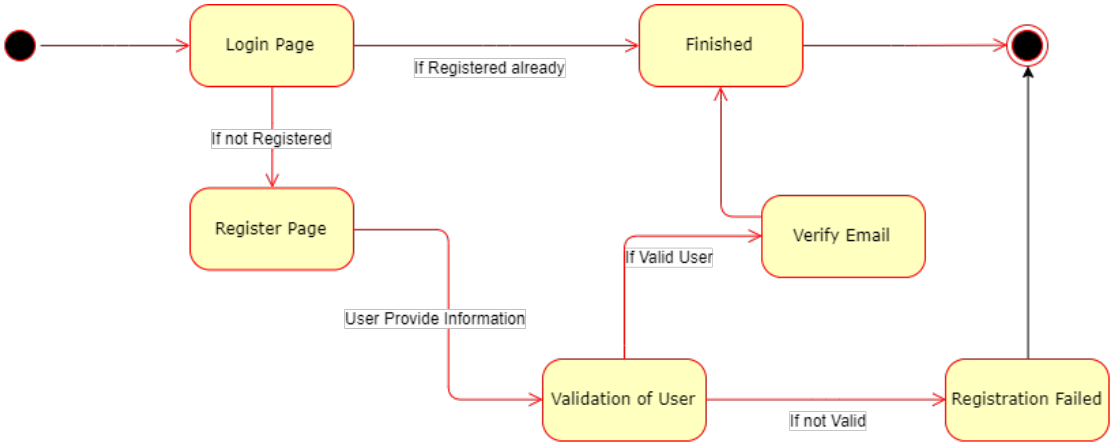

Figure 17: StateDiagram - Registration

4 Implementation

4.1 Use of Laravel Framework

For our project we used Laravel, which is a framework of PHP. It is one of the most common frameworks for PHP programming language out there in the market used for a wide range of software development projects. Laravel simplifies development process by easing common tasks used in the majority of web application projects, including authentication, sessions, and caching.

4.2 MySQL

MySQL is great when it comes to complex relationships amongst different tables. Password encryption is also very convenient with MySQL. Since our website had tables with defined attributes for every user, choosing MySQL seemed the most suitable.

4.3 HTML and CSS + Bootstrap

We have used Bootstrap for our front-end development, Bootstrap is a free and open-source CSS framework for responsive, front-end web development. It contains CSS and JavaScript based design templates for forms, buttons, navigation, typography and many more components for interfaces.

4.4 Assumptions and Dependencies

We have followed the waterfall process model for our project and analyses all our requirements in the initial stage only. However, at some point there might be some changes in the requirements, which can make our implementation difficult especially during the design phase. Hence, we have assumed that all our requirements are complete and will not change during the process.

4.5 Risks and Volatile Areas

We have made the assumption of keeping the requirements constant during the development phase and we are using the existing frameworks for development. This

can cause a risk later if there is any update thereby making our app incompatible with the latest technologies. Risk is also associated with the integration of different components. As our work follows a non-iterative process where users of the system will not completely interact with the system,there is a chance that the design may not fulfill user requirements completely. Moreover, since components will be designed individually in sequence,there is a possibility that one might be dependent on the other adding potential risks during development.

5 Testing

5.1 Test on Data

5.1.1 White Box Testing

- We have manually tested the different modules of the web application.
- Path Testing: we verify all the paths in the program source code, by covering as we cover many cases as seems possible.
- Negative API Testing: We have also tested our Website by providing invalid parameters to call different methods.

5.1.2 Black Box Testing

- We checked the system for every component output when null value is submitted to a field.
- We checked the system output when any quantity of data is submitted to it.
- We checked the system output when invalid data is entered in the application.
- Our system is checked when we enter corrupted or illegal value as our output.
- We have tested the data is meeting any boundary value conditions which gives correct output.
- We also tested our data that can be qualifying our equivalence partition.

5.2 Unit Testing

As we all known that unit testing can be done manually.Unit testing is a type of software testing service where each and every individual units or components of a software should be tested and verify our output.We can first performed it by individually we tested our each and every component individually The purpose is to validate that each unit of the software code performs as expected and we received required output which should be given. . We did in its process at the beginning by Software Design Life Cycle , Software Testing Life Cycle, VV Model.

Unit testing is the first level of testing done before we are ready to integrate our Component.

5.3 System Testing

Concluding, we did system testing on our integrated system that ensures our integrated system is working perfectly as an independent System. The system testing helps us to check the end-to-end system specifications. Our system is actually a web application so we make sure that it works properly in all possible conditions. Ultimately, the software is virtually connected to other software/hardware systems. The main reason behind System Testing is to exercise the full computer-based system.

6 Conclusions

We have made a social media platform, Circle. Our social media platform has three segregated profiles for users to manage their friends, family and businesses. Our motivation for this project is to provide complete privacy and data protection to our users. We have implemented basic functionality such as messaging, posts, update statuses, add connections etc. we have also implemented a recommendation model to recommend our users to add new connections. As it is an ongoing project we will be adding more functionality in the future.

6.1 Future Work

As it is an ongoing project, we will be implementing video streaming and audio and video call features. We will also be adding pages and groups for users to run and manage their interests. We will also be providing marketing functionality for our users so that they can promote their brands and businesses.

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