



Design Document

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1. Purpose of the Project

Communication is essential to the human experience and has become ever more important in the information age. Just as the telephone replaced the letter, the internet has dramatically altered the communication landscape of social networking.

The central focus of this project is to create a social networking application which allows users to connect with one another in an intuitive and natural fashion. User interactions are text based, with such actions as direct communication (chat) or posting to a public board type structure (Newsfeed). This document is intended to give a thorough and detailed outline of the project's scope, requirements, and specifications in order to be approved or altered by the client. This includes all functional and non-functional requirements of the application.

The intended audience of the document includes the client, developers, testers, and users, but may be useful to any party which desires to understand the application's functionality and purpose.

2. The Client, Customer and Stakeholders

2.1 The Client

The client is the Spring-2016 CSCI-P465 Instructor and Co-Instructor at Indiana University. The client specified a social networking project which was specified in subsequent meetings and agreed upon. The client goal of this project is to provide an intuitive means of communication between users in a social networking environment.

2.2 Customer

Customers can include any person or persons which wish to utilize modern communication as pertaining to social networking. The project interface is to be non-technical as to allow easy access and use so that users of all ages or technological ability may adequately participate in the product experience.

2.3 Stakeholders

Besides the client, the major stakeholders of this project are the Design team and the Implementation/Testing team. The Design team will lay the foundation of the project architecture and the Implementation/Testing team will carry out the design as specified and test the implementation according to specifications.



3. Users of the Product

Users are individuals who create an account with the social networking application. Once registered, a user may utilize all the features of the project for communication and social networking. A target user base primarily includes those of ages 10-30 and who are fluent in English.

4. Naming Conventions

Client	The client consists of the Spring 2016 CSCI-P465 Instructor and Co-Instructor at Indiana University.
User	A user will have a registered identity in the application which allows them to use the application and connect with other users.
Stakeholder	Any party involved with the development process of the project
Friend	A designation given to a second party from the user which allows communication. Friend status must be requested by one party and accepted by the recipient of the request. After acceptance, the two parties are designated as friends and additional communication functionality is made available.
Chat	A private system of correspondence between friends. This communication can only be read or received by the parties involved.
Inbox	A system which stores text communication sent by the user and received by the user. The inbox will store the data transmitted by the chat system.
Newsfeed	A page which displays public posts made by the friends of the user. These posts are displayed in order of occurrence, with the most recent post being displayed first.
Group	Groups may be created and joined by users. A group has its own page which consists of a Newsfeed specific to group members. Only group members may post to or see the group specific Newsfeed. Additionally, groups may be searched for by users to join.



5. Facts and Assumptions

5.1 Facts

- As of 2014, about 40.4% of the world has access to the internet. That is about about 2.925 billion people.
- Nearly 2.1 billion people have social media accounts.
- In 2015, 73 percent of US Americans had a social network profile, representing a six percent growth compared to the previous year.
- The region with the highest penetration of social media use is currently North America, with 59 percent.

5.2 Assumptions

We assume that the user:

- Knows how to operate a computer properly
- Has experience with the internet and web applications
- Is able to type in English fluently

6. Scope of the Work

For the scope of the work:

- Exchange conversation messages whether private, or group-based
- Post messages on group pages, or the user's board
- Send images within messages and posts

Social media users are interested in being able to send their friends posts with memorable details. Having pictures allows for the users to express their messages in conversations more.



7. Scope of the Product

The scope of the Product is:

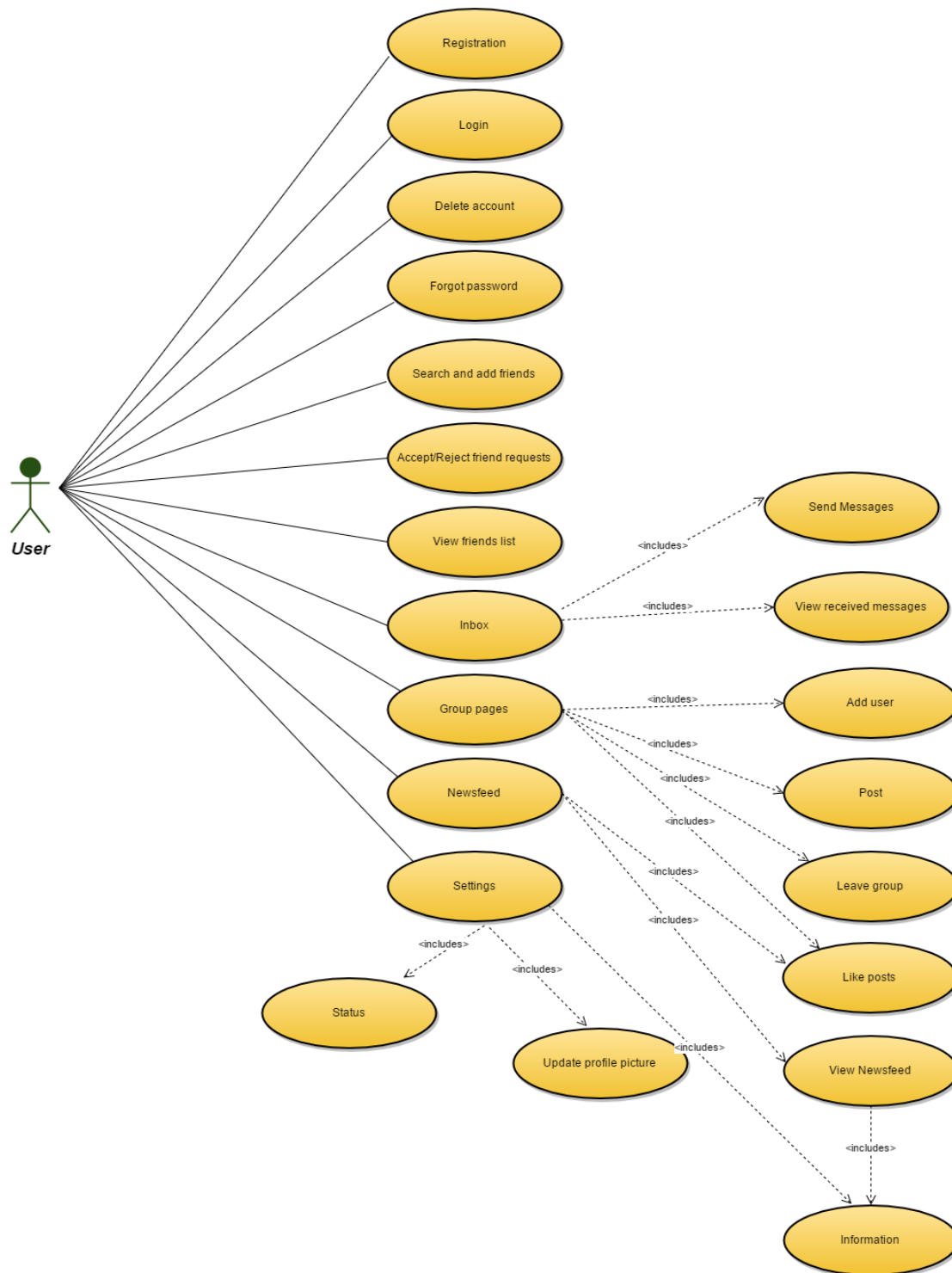
- The user will register with the application before using the application.
- The application will allow the user to log into their account, chat (text), view inbox, group chat, read news feed (text), view/edit group pages, and search for friends
- The application will allow for the user to have message conversations with other users using the application
- This application provides the convenience of allowing the user to send images and links within messages
- The application allows for the user to set up group pages, add new friends, remove friends, and message friends
- The Instant Messaging server will make sure that the users logging in are matched correctly with the password that was entered.

6. Use Case

A use case attempts to give an account of the interactions between an actor (a human or an external system) and the application. In all the use cases listed below, the actor is the messenger. The following would be the list of use cases of the Instant Messaging application:

Primary Actor	Uses Cases
USER	US-1 Registration US-2 Delete account US-3 Login US-4 Forgot password US-5 Logout US-6 Search for friends and send Requests US-7 Accept/Delete friend requests US-8 Friends list US-9 View Newsfeed US-10 Like posts in Newsfeed US-11 View Inbox US-12 Send message from Inbox US-13 Create group page/Add user to group page US-14 Leave a group page US-15 Change Profile Settings US-16 Information Page

8.1 Use Case Diagram



Web application/server use case diagram



7. User Scenarios

US-1 Registration

ID and Name: Registration			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User, Server		
Description	User creates an account by filling up a sign up form. The User enters his/her first name, last name, date of birth, email-id, password and profile picture.		
Trigger	User clicks on the signup button on the welcome screen.		
Pre-condition	User has accessed the application.		
Post-condition	A record is made for the User in the server. The user should login again using email-id (user name) and password		
Steps	<ol style="list-style-type: none">1) User clicks on the signup button on the welcome screen.2) The application sends a sign-up form window.3) User fills up the form (first name, last name, date of birth, email-id, password and profile picture) and submits it.4) The details provided by the User are stored in the server.		
Exceptions	<ul style="list-style-type: none">• User account already exists, username is already in use, or password is too weak.• Application closes due to lack of memory or Web Browser closes.		
Expected Output	The Server creates an entry/record for the new User.		



US-2 Delete account

ID and Name: Delete account			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User		
Description	User deletes account.		
Trigger	User clicks on the SETTINGS button in the Homepage. Once there, the User clicks on the DELETE MY ACCOUNT button.		
Pre-condition	User has been logged into the application by the server and is in Homepage.		
Post-condition	User has deleted his/her account.		
Steps	<ol style="list-style-type: none"> 1) User goes to the Homepage. 2) User clicks on the SETTINGS button. 3) User clicks on the DELETE MY ACCOUNT. 		
Exceptions	<ul style="list-style-type: none"> • Server is down and not reachable. • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The user has successfully deleted his/her account.		



US-3 Login

ID and Name: Login			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User, Server		
Description	User logs into the application with username and password.		
Trigger	User clicks the login button in the welcome screen.		
Pre-condition	User opens the w and clicks the login button.		
Post-condition	Server logs in the User.		
Steps	<ol style="list-style-type: none"> 1) User sends LOGIN request to the server. 2) Server responds back requesting for login credentials. 3) User sends login credentials. 4) IF login credentials are verified <ul style="list-style-type: none"> • THEN Server logs in the User • ELSE Server throws an error “INVALID login credentials” 		
Exceptions	<ul style="list-style-type: none"> • INVALID login credentials were provided by the User. • Server is down and not reachable. • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The User has a record in the server and hence he/she logs into the application		



US-4 Forgot password

ID and Name: Forgot password			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User, Server		
Description	User has forgotten his/her password and wants to reset it.		
Trigger	User clicks on forgot password in the login page.		
Pre-condition	User has forgotten his/her password.		
Post-condition	User successfully changed the password and logged into his/her account		
Steps	<ol style="list-style-type: none"> 1) User clicks on forgot password in the login page. 2) The application asks for security question. 3) When user enters correct answer he can enter a new password. 4) The new password will be updated in the database. 5) The user now logs in using his/her new password 		
Exceptions	<ul style="list-style-type: none"> • Password is too weak. • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The user successfully changed his/her password.		



US-5 Logout

ID and Name: Logout			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User, Server		
Description	User will exit the application.		
Trigger	User clicks the logout button.		
Pre-condition	The User has been logged into the application by the server.		
Post-condition	The User is asked for confirmation. The user will be logged out of the application by the server if user confirms.		
Steps	1) User clicks the logout button 2) Application closes		
Exceptions	<ul style="list-style-type: none"> • Server is down and not reachable. • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The User has been logged out of the application by the server.		



US-6 Search for friends and send Requests

ID and Name: Search for friends and send Requests			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User A, User B		
Description	User A searched for User B and sent friend request		
Trigger	User A clicks on the SEARCH ICON from the MENU option and then types the first and last name of User B.		
Pre-condition	User has been logged into the application by the server and is in the application homepage.		
Post-condition	User A has searched and either found and sent a friend request to User B or not found User B.		
Steps	<ol style="list-style-type: none"> 1) User A clicks on the SEARCH ICON 2) User A then types the name of user B 3) User A gets list of all person's with name B. 4) User A can view the details of all the users (profile picture, email-id and status) 5) After identifying correct person, User A sends a friend request to user B. 		
Exceptions	<ul style="list-style-type: none"> • User B has blocked User A. • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	User A was successfully able to find and send friend request to User B.		



US-7 Accept/Delete friend requests

ID and Name: Accept friend requests			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User A, User B		
Description	User A adds User B to his/her friend list.		
Trigger	User B sends friend request to user A.		
Pre-condition	<ul style="list-style-type: none"> User A has been logged into the application and is in the home page. The friends icon has lit up on user A's homepage 		
Post-condition	User A has added User B to his/her friend list and is now able to chat, check his/her status updates/profile picture, etc.		
Steps	<ol style="list-style-type: none"> 1) User A clicks on Friends icon 2) User A can view the details of all the users (profile picture, email-id and status) 3) User A clicks on the accept button or reject button. 4) If accepted user B is now listed in User A's friend list. 		
Exceptions	<ul style="list-style-type: none"> User B has blocked User A. User B has deleted his/her account. Application closes due to lack of memory or Web Browser closes. 		
Expected Output	User B appears in User A's friend list if accepted.		



US-8 Friends list

ID and Name: Friends list			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User		
Description	User views/delete friends from his/her friend's list.		
Trigger	User clicks on Friends button.		
Pre-condition	User has been logged into the application and is in the home page.		
Post-condition	<ul style="list-style-type: none"> User has viewed/deleted friends from his/her friend's list. If the user clicks on the view button, he will be redirected to the user's information page. If the user clicks on the delete button, the respective user is removed from his/her friends list. 		
Steps	<ol style="list-style-type: none"> User A clicks on Friends icon. User A can view the details of all the users (profile picture, email-id and status) User A can click on the view/delete button. 		
Exceptions	<ul style="list-style-type: none"> Application closes due to lack of memory or Web Browser closes. 		
Expected Output	User A has viewed/deleted User B.		



US-9 View Newsfeed

ID and Name: View News-Feed			
Created by:	Project group 2	Date Created:	3/4/2016
Primary Actor	User		
Description	User views notifications from the newsfeed.		
Trigger	User scrolls on the newsfeed to view the latest notifications.		
Pre-condition	User has been logged into the application by the server and is in the application homepage.		
Post-condition	User views the notifications of the recent activities performed by his/her friends.		
Steps	1) User logs into his/her account. 2) User views notifications of latest activities.		
Exceptions	<ul style="list-style-type: none"> Application closes due to lack of memory or Web Browser closes. The number of notifications has exceeded the maximum allowed limit (50). 		
Expected Output	The User has successfully viewed the notifications.		



US-10 Like posts in Newsfeed

ID and Name: Like posts in Newsfeed			
Created by:	Project group 2	Date Created:	3/9/2016
Primary Actor	User		
Description	<p>User views posts on newsfeed and decides to like particular post/posts.</p> <p>Note: When user X clicks the like button, a comment stating that user X likes the post will be added. "User X" will be hyperlinked to user X's information page.</p>		
Trigger	User scrolls on the newsfeed and clicks on the like button of particular post.		
Pre-condition	User has been logged into the application by the server and is viewing the posts		
Post-condition	User has liked the posts.		
Steps	<ol style="list-style-type: none"> 1) User hits the like button. 2) Comment stating that user X likes the post will be added. 3) When user X (hyperlink) is clicked, it will redirect to information page (containing profile picture, status and Email-id) of user X 		
Exceptions	<ul style="list-style-type: none"> • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The User has successfully liked the post.		



US-11 View Inbox

ID and Name: View Inbox			
Created by:	Project group 2	Date Created:	3/9/2016
Primary Actor	User		
Description	Inbox contains the messages sent and received by the user.		
Trigger	User clicks on the Inbox button to view the messages.		
Pre-condition	User has been logged into the application by the server and is in the application homepage.		
Post-condition	User has viewed the messages from the Inbox.		
Steps	<ol style="list-style-type: none"> 1) User clicks on the Inbox button on the Homepage. 2) User clicks on the message to view. 		
Exceptions	<ul style="list-style-type: none"> • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The User has successfully viewed the message from his/her Inbox.		



US-12 Send message from Inbox

ID and Name: Send message from inbox			
Created by:	Project group 2	Date Created:	3/9/2016
Primary Actor	User A, User B, Server		
Description	User A sends a message to User B via the Inbox.		
Trigger	User A goes to the Inbox tab. Once there, the User clicks on User B's name and enters the email window. From there on, User A types and sends messages to User B.		
Pre-condition	User A has been logged into the application by the server and is in Inbox.		
Post-condition	User A has sent message(s) via Inbox to User B.		
Steps	<ol style="list-style-type: none"> 1) User A goes to the Inbox tab. 2) User A clicks on User B's name and enters the email window. 3) User A types the message in the text box and clicks on the arrow button. 4) Server receives the message and sends the message to User B. 		
Exceptions	<ul style="list-style-type: none"> • User B has blocked User A. • User B has deleted his/her account. • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	User A has sent messages to User B through the Inbox.		



US-13 Create Group page and Add profile picture/Add users to group page

ID and Name: Create Group Page and Add profile picture/Add users to group page			
Created by:	Project group 2	Date Created:	3/9/2016
Primary Actor	User		
Description	<p>User creates a group page. Adds a group picture and other Users from his/her friend list.</p> <p>Visibility: This group page can be viewed by only the existing members of the group.</p>		
Trigger	The user clicks on the CREATE GROUP PAGE button and adds group picture, users to the group.		
Pre-condition	User (the one who wants to create the group page) has been logged into the application by the server and is in the home page.		
Post-condition	User creates a new group page and adds group picture, members to it.		
Steps	<ol style="list-style-type: none"> 1) User goes to the home page 2) User clicks on the NEW GROUP PAGE button 3) User types in the name of the group and clicks on the NEXT button. 4) User clicks on the CREATE button. 5) User adds a group picture. 6) User adds users to the group. 		
Exceptions	<ul style="list-style-type: none"> • The number of group members has exceeded the maximum allowed limit (50). • Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The user creates a new group page and adds group members from his/her contact list.		



US-14 Leave a group page

ID and Name: Leave a group page			
Created by:	Project group 2	Date Created:	3/9/2016
Primary Actor	User		
Description	User exits a group page.		
Trigger	User clicks and holds on the group page that he wants to leave and then clicks on the EXIT GROUP PAGE.		
Pre-condition	User has been logged into the application by the server and is in the group page.		
Post-condition	User has left the selected group page and the remaining members of the group will be notified of this activity.		
Steps	<ol style="list-style-type: none"> 1) User clicks the group page that he wants to leave. 2) User enters the group 3) User clicks on the EXIT GROUP PAGE button. 4) Remaining group members are sent notifications about this activity. 		
Exceptions	Application closes due to lack of memory or Web Browser closes.		
Expected Output	The User has successfully left the group page.		



US-15 Change Profile Settings

ID and Name: Change Profile Settings			
Created by:	Project group 2	Date Created:	3/9/2016
Primary Actor	User		
Description	The user can change his settings: profile picture and status.		
Trigger	User clicks on the Settings button to change his/her settings.		
Pre-condition	User has been logged into the application by the server and is in the settings page.		
Post-condition	User has changed his/her settings as desired.		
Steps	1) User clicks on the Settings button on the Homepage. 2) User changes his profile picture/status as desired.		
Exceptions	<ul style="list-style-type: none"> Application closes due to lack of memory or Web Browser closes. 		
Expected Output	The User has successfully changed his profile settings.		



US-16 Information Page

ID and Name: Information Page			
Created by:	Project group 2	Date Created:	3/9/2016
Primary Actor	User A, User B		
Description	The information page contains basic information about the user which will include a display picture, status and email-id.		
Trigger	User B clicks on User A (hyperlinks present in Search/Newsfeed/Comments) to view his/her information page.		
Pre-condition	User B has been logged into the application.		
Post-condition	User B has landed on User A's information page.		
Steps	1) User B clicks on the hyperlink button. 2) User B views User A's information page.		
Exceptions	<ul style="list-style-type: none"> Application closes due to lack of memory or Web Browser closes. 		
Expected Output	User B has successfully viewed User A's information.		



10. Functional Requirements

- FR-1** During registration, a user will be given a username and password for authentication.
- FR-2** The user should be able to login using the registered username and password.
- FR-3** Users will be able to change their username/password.
- FR-4** Users can search for friends, send, accept and delete friend requests.
- FR-5** The Social Networking service will support individual text messaging.
- FR-6** It will support group text messaging.
- FR-7** User can view his/her inbox, to check all the message history.
- FR-8** Users can send/receive messages to/from users in his/her contact list and groups.
- FR-9** Users can send messages to users even if they are not online.
- FR-10** A user should be able to see message details such as sender related details, delivery time, etc.
- FR-11** Users can be part of more than one group page at any point of time.
- FR-12** Users should be able to leave a group page at will.
- FR-13** Users can view newsfeed, which gives notifications of all current activities.
- FR-14** The Social Networking service will inform users of the maximum message size (number of characters) per message at 160 characters.
- FR-15** It should maintain the order in which messages are received.
- FR-16** It should be capable of notification in the case of a received message, message delivery failure, acknowledgement for sent message, etc.
- FR-17** It should inform users when someone has joined or left a group page.
- FR-18** It will set a limit to the maximum number of messages that can be stored in the Inbox at 200 messages.
- FR-19** It will not allow duplicate contact names.
- FR-20** It will set a limit to the maximum number of users in a group page at 50 members.



11. Non-functional requirements

11.1 Usability

The user interface is a lot like the Facebook web application. It is designed to be user-friendly, and in order to do this, the web application's features were made to be familiar to Facebook users. The resolution for the web application is appropriated to provide for appropriated spacing from one feature to another, so that navigating between features is simplistic.

11.2 Performance

First the web application will require that the user logs into their account, but first their password must be authenticated for their username. Once that is complete, the user will be able to explore the features of the web application, such as sending a private message, or making a post to a group page.

a. Resources/Response Time

The Instant Messaging application should use minimal resources and have quick response times. This non-functional requirement can be tested by checking the total size of the folder in which the application is installed. Whereas, for the RAM, we can check the physical memory in the Android Task Manager.

b. Security

In order to ensure that the web application is secure, there is password authentication. So, if the user that tries to log in inputs a password for a username that is incorrect, that user will not be able to log into the account for that try. The user will keep having to try to log into the account until the correct password has been submitted for the corresponding username.

c. Reliability

The server is responsible for establishing connections and applying translation algorithms.

11.3 Cost

This web application is provided for free, given the users are already equipped with a standard computer and a means for an internet connection. If the potential user is not equipped with these, then they would have to be purchased.

a. Risk

The web application may not be as useful as other well-made and free social media web applications.



b. Software Compatibility

An internet browser should be installed onto the computer that is being used to access the web application.

c. Protection

The web application should be able to be run with other web browsers open, as this web application will not take up an extreme amount of CPU.