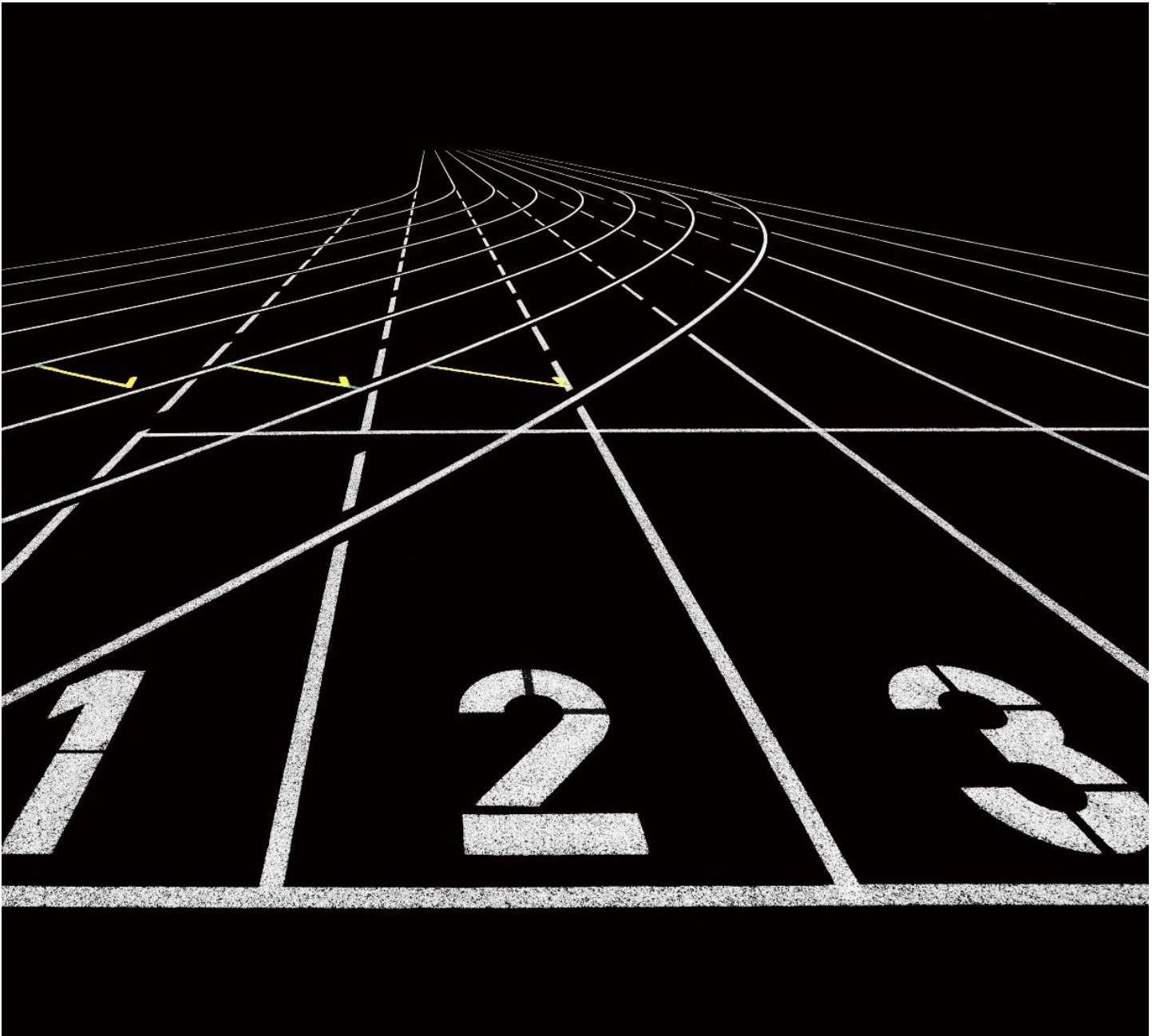


# VIRTUAL VELOCITY

SPRINT 3

SOFTWARE DESIGN PROJECT

2022



## WITS OVERFLOW

In this project you will be designing and implementing an online forum for the school of CSAM, in the vein of other such forums like Stack Overflow. Among other features, users should be able to:

- Ask and answer questions
- Comment on questions and answers
- Vote on questions and answers
- Mark answers as correct (question asker)
- Moderate questions and answers (moderator)
- Earn achievements for participating in the forum

---

# REQUIREMENTS ENGINEERING

## Requirements Gathering : SPRINT 1

Met with the client on where we were informed what the client needed done for the project. 5 user stories were specified.

- A log in screen
- A registration page for admin
- A registration page for users
- A homepage that will have a navigation bar.
- A personal profile page.

## Requirements Analysis : SPRINT 1

There is no need to refine the client's requirements as the realism and feasibility of the requirements are just. The client's requirements for login and the registration user stories are simple and achievable. They focus mainly on data collection during the registration process and data verification during the login in story. No complex or unnecessary functionalities were requested. The client's requested user stories are practical & achievable goals

## Requirements Specification : SPRINT 1

- A log in screen where a user will input their details which will be authenticated before being granted access to the platform
- A registration page for new admins. They will input their relevant information which will be stored on the database
- A registration page for new users. They will input their relevant information which will be stored on the database.
- A homepage that will have a navigation bar on the top left corner
- A personal profile page that will be available when the navigation bar is selected. The personal profile page should have basic information about the user

## **Requirements Gathering : SPRINT 2**

Met with the client on where we were informed what the client needed done for the project. 3 user stories were specified.

- A page to create a post
- Vote on a post
- Sort post on the homepage
- A Homepage to view posts

## **Requirements Analysis : SPRINT 2**

There is no need to refine the client's requirements as the realism and feasibility of the requirements are just. The client's requirements for login and the registration user stories are simple and achievable. They focus mainly on data collection during the registration process and data verification during the login in story. No complex or unnecessary functionalities were requested. The client's requested user stories are practical & achievable goals

## **Requirements Specification : SPRINT 2**

- A log in screen where a user will input their details which will be authenticated before being granted access to the platform
- A registration page for new admins. They will input their relevant information which will be stored on the database
- A registration page for new users. They will input their relevant information which will be stored on the database.
- A homepage that will have a navigation bar on the top left corner
- A personal profile page that will be available when the navigation bar is selected. The personal profile page should have basic information about the user

## **Requirements Gathering : SPRINT 3**

Met with the client on where we were informed what the client needed done for the project. 3 user stories were specified.

- Upload a picture when creating a post
- Click on a post and be directed to a new page containing only information from that individual post

## **Requirements Analysis : SPRINT 3**

There is no need to refine the client's requirements as the realism and feasibility of the requirements are just. The client's requirements for login and the registration user stories are simple and achievable. They focus mainly on data collection during the registration process and data verification during the login in story. No complex or unnecessary functionalities were requested. The client's requested user stories are practical & achievable goals

## **Requirements Specification : SPRINT 3**

- A log in screen where a user will input their details which will be authenticated before being granted access to the platform
- A registration page for new admins. They will input their relevant information which will be stored on the database
- A registration page for new users. They will input their relevant information which will be stored on the database.
- A homepage that will have a navigation bar on the top left corner

A personal profile page that will be available when the navigation bar is selected. The personal profile page should have basic information about the user

## Functional Requirements : Sprint 1

### Business Rules

1. Only current undergraduate or postgraduate students enrolled in the School of CSAM at the University of Witwatersrand can create a profile on the WitsOverflow platform.
2. If you want to use a cell phone number when registering, you must use the cell phone number listed under your student details on the wits self-service portal
3. If you want to use an email address when registering, you must use the student email provided by the university wits self-service portal
4. To create an account if you are not in the school of CSAM you must contact the moderator with a valid reason why you want access the platform. E.g., you are part of a coding interest group
5. People who are not currently studying at the University of Witwatersrand cannot create an account, besides Wits CSAM alumni exclusively

### Authentication

1. The first page that should be displayed when a user opens the app, is a page with a login button (for users who already have accounts), and a “register” button for new users.
2. When a user presses the **login button**, they are directed to **log in** screen which will accept 2 text input values namely the user’s email address/phone number and the password from associated with their account. After entering the password, the user must press the **sign in** button which verify the username and password entered with the information in the database. If the information is correct, the user is granted access to the home page. Otherwise, they’ll be prompted with a text “**incorrect username or password**”. If the one of the text input fields is left blank, a prompt will be returned stating “**please enter username/password**”. During login process a check box is available for “save password” which saves the password for future login so that the user does not having to enter their password every time they login to the platform.

## Non-functional Requirements

### Security:

To prevent unauthorized access to the WitsOverflow app the system will require users to create accounts to gain access to the application. The registration process will require one’s cellphone number, email address and their preferred password. This information will be stored in the database and will be use later to authenticate users and grant them access to the platform. The system requires user to create a strong password (**1 Upper case letter,1 symbol,1 lower case letter, and a minimum of 8 letters**) for the password to be acceptable. This is to ensure that a user’s password is not easy to guess, and someone else’s credentials cannot be used to gain access to the platform. The system will lock the user's account after 3 login failed attempts to protect the user's information. A user can choose to save password in order to grant access next time when using the app without entering details

## Functional Requirements : Sprint 2

### Business Rules

1. In order to create a post, you must have registered and be signed into Wits Overflow
2. In order to view posts, you must have registered and be signed into Wits Overflow
3. In order to vote on posts, you must have registered and be signed into Wits Overflow

## Non-functional Requirements

### Portability:

Our system works in an effective way in different environment, works even on the latest phone model as it did in the previous one, it is highly portable.

### Compatibility

Compatibility on our app allows us to work in different system, it allows people who have different operating systems use the same application

### Reliability

Our application is very reliable as it works in the same efficiency after some extensive use. The system runs for a long time without failure under predefined conditions

### Usability

It is very easy to use our application since same elements are grouped into one. Users can easily navigate our interface, one can easily find pages such as profile, settings, posts, etc. it is easy for users to find features and what it can do.

### Localization

Our system falls in line with context, and it is language sensitive and spelling when one is asking questions and answering them.

## Functional Requirements : Sprint 3

### Business Rules

1. When you click on a post, it opens a window that only has that post and shows the post, user who posted, number of upvotes and down votes, tags, post title and attachments if there are any
2. When a user is creating a post they must include tags, post title, post, and attachments if there are any

### Functional Requirements

1. From the list of posts on the home page, a user must be redirected to a new page when they click a certain post. This page will have the details of the post selected by the user.
2. When a user creates a post, the create post page will have a button which allows the user to upload a picture when clicked.

### Non-functional Requirements

#### Portability:

Our system works in an effective way in different environment, works even on the latest phone model as it did in the previous one, it is highly portable.

#### Compatibility

Compatibility on our app allows us to work in different system, it allows people who have different operating systems use the same application

#### Reliability

Our application is very reliable as it works in the same efficiency after some extensive use. The system runs for a long time without failure under predefined conditions

#### Usability

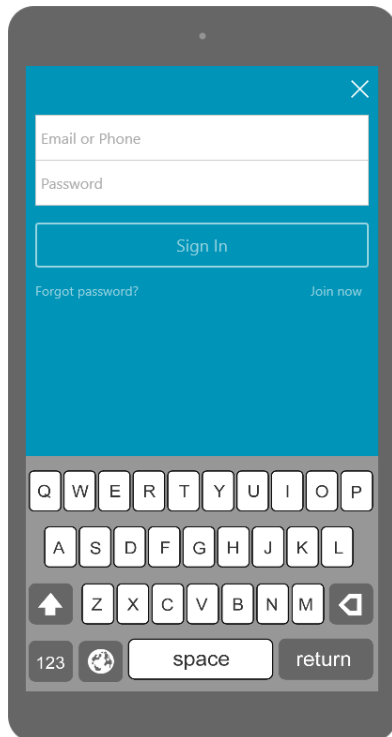
It is very easy to use our application since same elements are grouped into one. Users can easily navigate our interface, one can easily find pages such as profile, settings, posts, etc. it is easy for users to find features and what it can do.

#### Localization

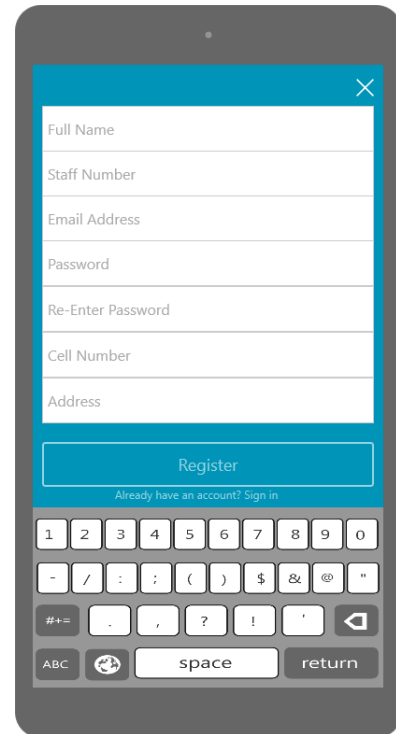
Our system falls in line with context, and it is language sensitive and spelling when one is asking questions and answering them.



## On-Screen Requirements : Sprint 1

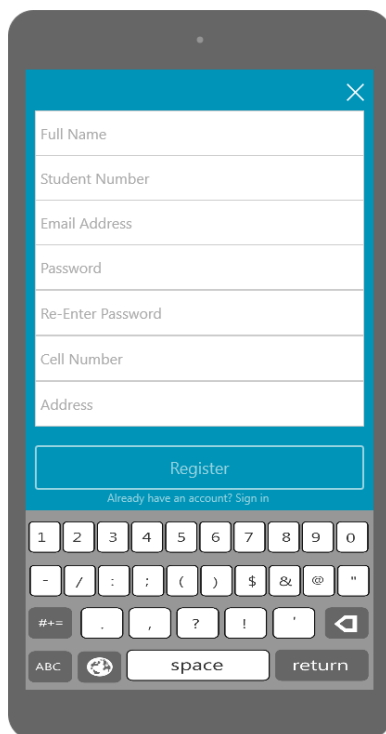


A mobile app mockup for a 'Sign In' screen. The screen has a blue header with a close button (X). Below the header are two input fields: 'Email or Phone' and 'Password'. A blue 'Sign In' button is positioned below the input fields. At the bottom of the form area, there are two links: 'Forgot password?' and 'Join now'. A standard QWERTY keyboard is visible at the bottom of the screen.



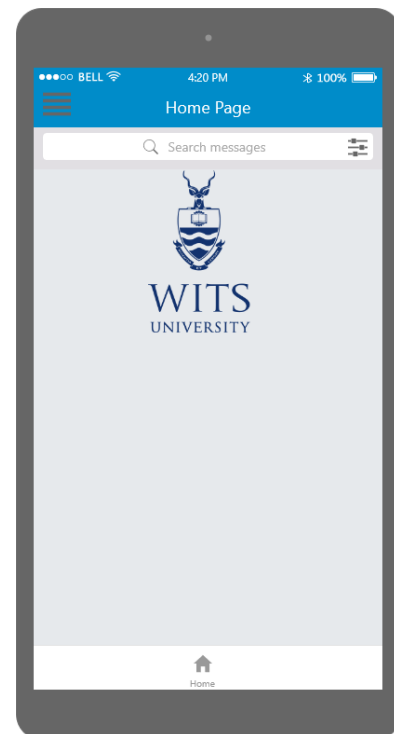
A mobile app mockup for a 'Register' screen. The screen has a blue header with a close button (X). Below the header are several input fields: 'Full Name', 'Staff Number', 'Email Address', 'Password', 'Re-Enter Password', 'Cell Number', and 'Address'. A blue 'Register' button is located below the input fields. Below the button is a link: 'Already have an account? Sign in'. A numeric keypad is visible at the bottom of the screen.

Registration For User



A mobile app mockup for a 'Registration For Admin' screen. The screen has a blue header with a close button (X). Below the header are several input fields: 'Full Name', 'Student Number', 'Email Address', 'Password', 'Re-Enter Password', 'Cell Number', and 'Address'. A blue 'Register' button is located below the input fields. Below the button is a link: 'Already have an account? Sign in'. A standard QWERTY keyboard is visible at the bottom of the screen.

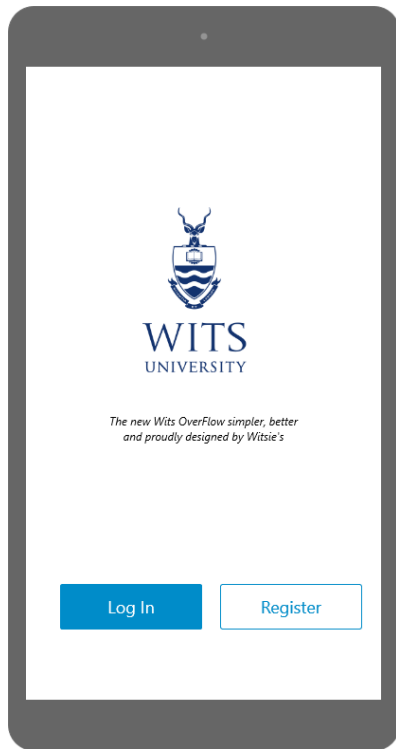
Registration For Admin



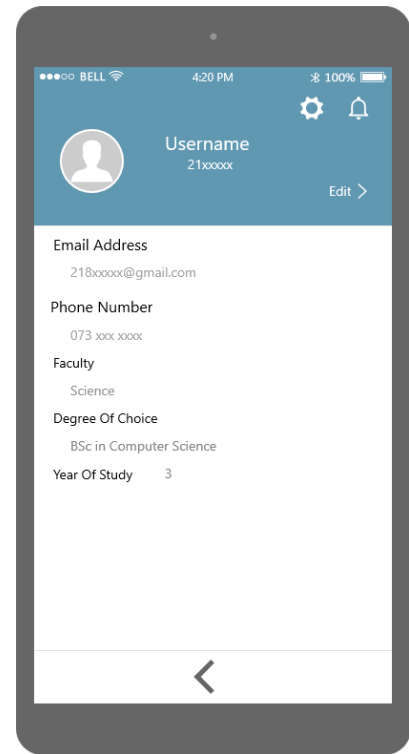
A mobile app mockup for a 'Home Page'. The screen has a blue header with a hamburger menu icon on the left and the text 'Home Page' in the center. Below the header is a search bar with the placeholder text 'Search messages'. The main content area features the WITS University logo, which includes a crest and the text 'WITS UNIVERSITY'. At the bottom of the screen is a white bar with a home icon and the text 'Home'.

Home Page

## On-Screen Requirements : Sprint 1

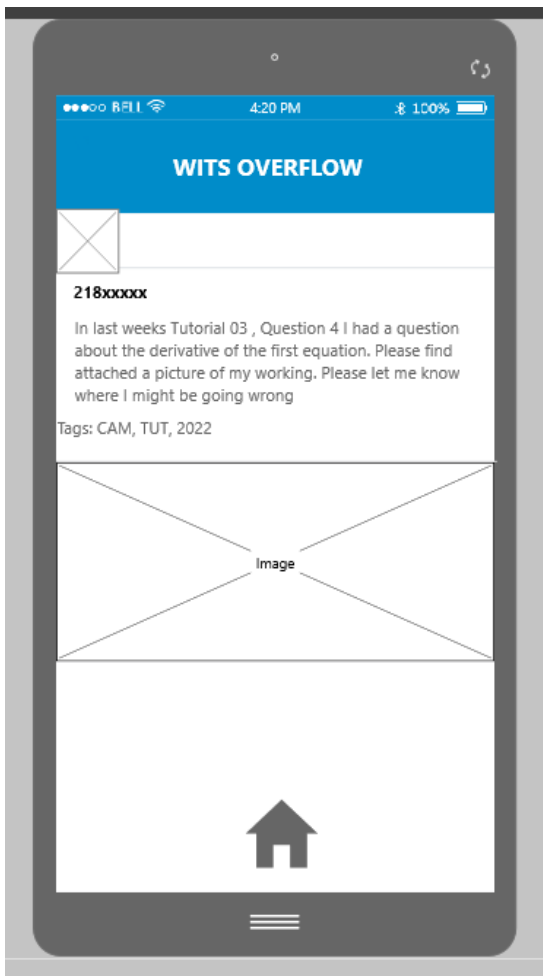


Start

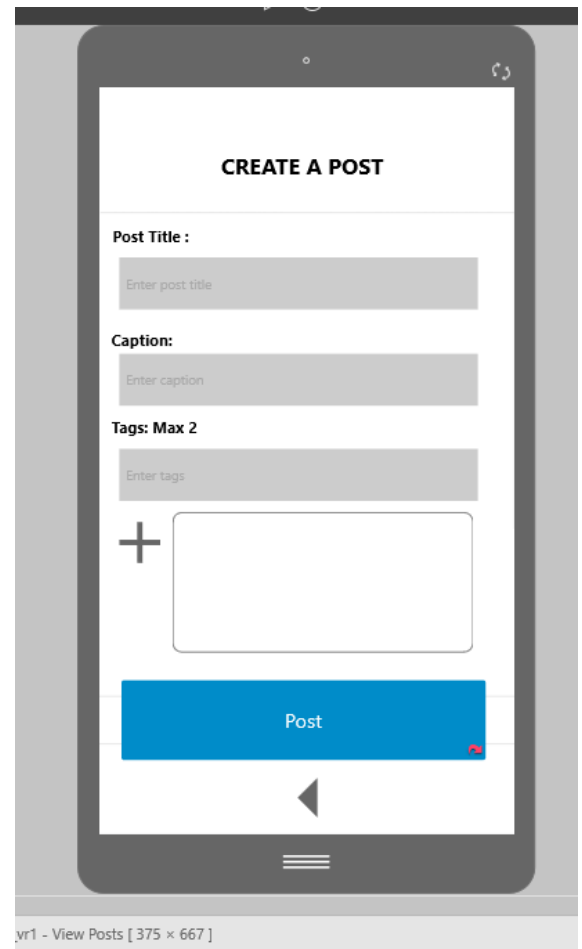


Personal Profile

## On-Screen Requirements : Sprint 3

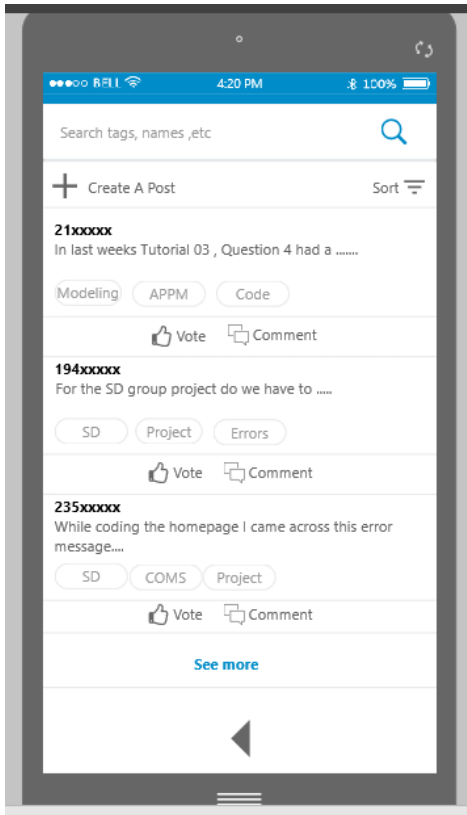


View Post In Detail

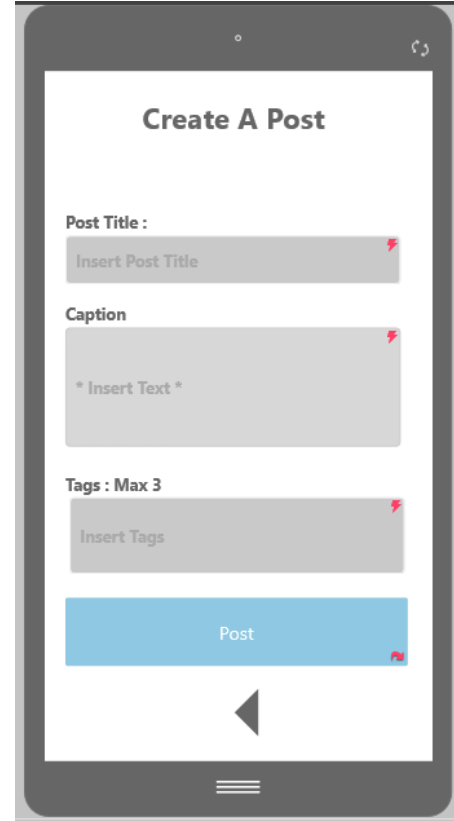


Uploading A Picture

## On-Screen Requirements : Sprint 2



Home Page With Posts



Creating A Post

## User Stores & Respective User Acceptance Tests : Sprint 1

Requirements	User Stories	User Acceptance Test	Functional Requirements
Login Page	As a user who already has an account, I want to be directed to a login page and login, so that I can continue from where I left of without having to create an account again.	Given I am currently logged out from the application, When I fill in a correct username/email and password and press the login button, Then I should get logged into the application.	The system must check if there entered username and password are present in the database and belong to the same person
Admin Registration Page.	As a new and potential <b>admin user</b> , I want to be able to see the admin registration page and register an account, so that I can start using the application from the <b>admin user</b> side	Given I am a new potential <b>admin user</b> without an account, When I fill in my correct registration details and press the register/sign up button, then my <b>admin account</b> should be created, and I can start using the application.	The system must allow admin user to provide their details for registration of their account.  The system must be able to store the admins account details in the database for admin users.
User Registration Page	As a new user, I want to be able to see the registration page and register an account, so that I can start using the application.	Given I am a new user without an account, When I fill in my correct registration details and press the register/sign up button, then my account should be created, and I can start using the application.	The system must allow user to provide their details to register their account.  The system must be able to store the user's account details in the users' database.
Homepage with navigation tab.	As a logged in user, I want to be able to see a homepage with a navigation bar, so that I can navigate to different places of the application.	Given that I am logged in the application, When I go to the homepage, Then I should see a navigation bar that will redirect me to different pages of the application.	The system must be able to direct the user to the pages/interfaces they wish to see/use.  The system must be able to take the user to the previous page(s).
Personal Profile Page.	As a logged in user, I want to be able to see my profile page, so I can see, read and or update information about my account.	Given that I am logged in and I am on the homepage, When I press the label of Profile Page on the navigation bar, Then I should be redirected to the personal profile page where I can see information about my account.	The system must display the user's account details.  The system must allow the user to update their account information.  The system must allow the user to delete their account.

## User Stores & Respective User Acceptance Tests : Sprint 2

Requirements	User Stories	User Acceptance Test	Functional Requirements
Create a post	As a logged in user, I want to be able make a new post which has a title, tag and the actual post, so that other users can also be able to find my post easily by clicking on a tag.	Given that I've logged into the application, at the homepage I should see a plus button which when I click, I should be able to make a new post.	Home page has a plus "+" button at the bottom for a user to add a new post. When the plus button is pressed, it redirects the user to a new page where the user will create their post
List all posts	As a logged in user, I want to be able to see a list of posts on homepage, so that I can easily find any type of post I'm looking for.	Given I am a new potential <b>admin user</b> without an account, When I fill in my correct registration details and press the register/sign up button, then my <b>admin account</b> should be created, and I can start using the application.	After a successful login. The home page is displayed. The home page has a list of existing posts that a user can stroll through
Sort posts	As a logged in user, I want to be able to sort all the posts, so that I can easily find certain posts I'm looking for.	Given I have logged into the app, I should be able to see a sorting button which will then let me choose among using earliest, latest, most up votes and most down votes.	The home page has a "sort" button, which will provide the user with options to sort the posts depending on the number of up votes, down votes, date created when pressed. For instance if the option to sort with UP votes is selected, the post with the highest number of UP votes will be displayed first and the one with the least number of UP votes last.
Vote on posts	As a logged in user, I want to be able to vote on the posts I'm seeing, so that other users can know how helpful a certain post was.	Given that I have logged into the app, I should also see voting icons close to posts which will be for upvoting a post or downvoting its helpfulness.	A post on the homepage has an UP vote button and a DOWN vote button. If the user clicks the UP vote button on a particular post, the number of UP votes will increase by 1. If the user clicks the DOWN vote button, the number of DOWN votes should increase by 1.

## User Stores & Respective User Acceptance Tests : Sprint 3

Requirements	User Stories	User Acceptance Test	Functional Requirements
Upload A Picture	As a logged in user on the post section, I want to be able to add a picture alongside my post ,so that other users can be able to see my code and help easily.	Given that I've logged into the application, at the post creation page, I should be able to see a picture upload button which when clicked let me access my laptop's storage & let me choose a picture to upload. This picture will be visible alongside my post	The system should reject picture with size of more than 5MB. The system should upload the picture to the database along with the post under the max speed of 5 seconds. The system should allow a max of (1) picture to be uploaded. The user should be able to just drag the picture into some <a href="#">panel / box</a> , to upload it
Click A Post	As a logged in user on the homepage, when I select a post I want to be directed to the page where only the selected post will be visible, so that I can view the post in detail, as it shows the caption, post and attachment.	Given that I've logged into the application, when I click on a post, I should be taken to a new page to view the post in more detail.	The system should fetch post details from database within 5 seconds. The system should allow more than one user to access post details at the same time The system should be able to manage traffic(users accessing the same post)

## Software Architectural Style for The System:

A multi-tier (3-tier) architectural style will be used for the software-to-be. The 3-tier architectural style organises software components into 3 logical tiers. The 3 logical tiers will be:

1. The **presentation tier** – the user interface (UI)
2. The **application tier** – this is where the data is processed
3. The **data tier** – the database management system (DBMS) which is where data processed by the application is managed and stored.

Why this architectural style chosen?

1. Faster development: Each tier can be developed simultaneously; this will allow the team to meet the client's time deadlines for a functional final product.
2. Improved Reliability: This style will satisfy the client's needs for a functional and reliable system. The performance of a tier is less likely to be affected by the failure of a separate tier.
3. Scalability: Tiers can be scaled independently