



Software Engineering Focus

Final Deliverable

Project Title:

University Social App

Team Members: Sebastian Aviles, Rebeca Gonzalez, Arquimides Cala, Justin Venegas, Rogelio Lopez

Product Owner(s): Rogelio Lopez

Mentor(s): N/A

Instructor: Masoud Sadjadi

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Abstract

This document presents the information necessary to gain a good understanding of the 2023 Spring Semester for Capstone 2 Computer Science, the group as a collective had been assigned with a general topic of a University Social App to begin development. The idea was broad until settled on a combination of Instagram and Tinder for specifically University students that would allow for more campus life to be involved. Throughout this document the topics of our group's development, thought process, implementation, testing, installation, maintenance, and appearance of the University Social app can be found within this document. The application was created with use of Flutter, VsCode, Back4app, Android Studio, as well as Xcode.

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Introduction

Current System

The app is currently in development and ultimately not all user stories were completed in the time estimated, the app aims to provide a platform for users to connect with new people and share their thoughts, ideas, and experiences. To verify the project ideally, the team would plan to use a combination of methods, including feedback from peers, testing tools, user testing, and consulting with their advisor. There was a lot of progress accomplished after the tasks were split into separate teammates. There is a lot of potential and work within this app for the FIU community.

Purpose of New System

The main issue being, more students are taking online classes since covid hit and there are less social activities going on in Campus. Also many students go to campus, take their classes and then leave. To allow university students to interact with one another with ease and comfortability, with like minded individuals. The solution was to create a social media app for said university students. There exists a lack of student's campus life, academic involvement, extracurricular activities where the hopes of this app will help increase those interactions.

User Stories

Implemented User Stories

User story ID	GitHub Branch	Description	Assignee
#000	Master first commit	As a user, I want to access the app from multiple operating systems like my computer and my phone (apple or iphone).	Rebeca Gonzalez Rogelio Lopez
#001	AuthLogIn	As a user, I want to log in with stored personalized credentials.	Rebeca Gonzalez Rogelio Lopez
#002	AuthLogIn	As a user, I want to sign up with personalized credentials for later use.	Rebeca Gonzalez Justin Venegas
#003	Messages	As a user, I want to message users that are my friends.	Rebeca Gonzalez Sebastian Aviles
#004	EditProfile	As a user, I want to edit my profile to maintain an updated image of myself.	Rebeca Gonzalez Arquimides Cala
#002B	AuthLogIn	As a developer I want to get information from the users such as age, name, sex and school in the sign up screen.	Rebeca Gonzalez Sebastian Aviles
#003B	Messages	As a developer I would like to get the messaging feature to be complete with database functionality	Rebeca Gonzalez Sebastian Aviles
#001B	AuthLogIn	As a developer I want to redesign the UI for the login and sign up page	Rebeca Gonzalez Justin Venegas

Pending User Stories

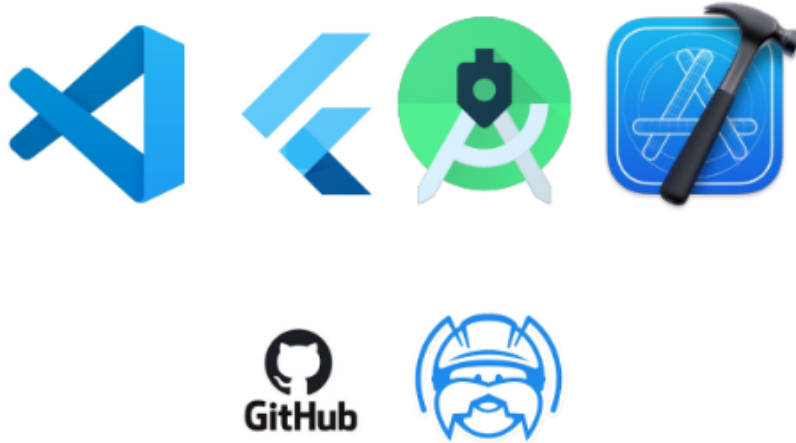
- As a user, I would want to be able to create a group chat with multiple people
- As a user, I would want to be able to send a service videos/images
- As a user, I would want to be able to recover/change my password to my account
- As a developer I would want terms and condition that allows for safe and responsible usage of the product
- As a developer I would like to get all functionalities working in unison together
- As a developer I would like for connections to be based on similar interest and major
- As a developer I would like for location or distance from another user to be displayed while matching with another student
- As a user I want to be able to post a message with time created displayed.
- As a user, I want to have a home page map

Project Plan

This section describes the planning that went into the realization of this project. This project incorporated the agile development techniques and as such required the sprints to be planned. These sprint plannings are detailed in the section. This section also describes the components, both software and hardware, chosen for this project.

Hardware and Software Resources

The following is a list of all hardware and software resources that were used in this project:



- *VSCode*
- *Flutter*
- *Android Studio*
- *Github*
- *Back4App*
- *Xcode*
- *Dart*
- *Mac/Windows*

Sprints Plan

Sprint 1

Sprint Planning Meeting Minutes: 1/17/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After discussion, the velocity of the team was estimated to be 4

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- *User Story 101 General (4 points)*
 - *Learn Flutter*
 - *Install Required Software.*
 - *Brainstorm Class diagrams.*
 - *Research the best database.*

The team members indicated their willingness to work on the following user stories.

- *All team members*
 - *101 General*

Sprint 2

Sprint Planning Meeting Minutes: 1/30/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After discussion, the velocity of the team was estimated to be 4

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- *User Story 101 General (4 points)*

- *As a developer, I want to learn more Flutter, so that is easier to implement any desired functionalities*
- *As a developer, I want to work in login page of the app, so the users are able to login*
- *As a developer, I want to work in sign up page of the app, so the users are able to create an account*
- *As a developer, I want to connect the app to the database, so I can save the information of the users*
- *As a developer, I want to sync the github repository across the team*

The team members indicated their willingness to work on the following user stories.

- *All team members*
 - *101 General*

Sprint 3

Sprint Planning Meeting Minutes: 2/13/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After discussion, the velocity of the team was estimated to be 4

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- *User Story 101 General (15 points)*
 - *As a developer, I want to learn more Flutter, so that is easier to implement any desired functionalities*
 - *As a developer, I want to finish login page of the app, so the users are able to login*
 - *As a developer, I want to finish sign up page of the app, so the users are able to create an account*

The team members indicated their willingness to work on the following user stories.

- *All team members*
 - *101 General*

Sprint 4

Sprint Planning Meeting Minutes: 3/6/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After discussion, the velocity of the team was estimated to be 4

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- *As a developer, I want to finish login page of the app, so the users are able to login*
- *As a developer, I want to finish sign up page of the app, so the users are able to create an account*
- *As a user, I want to have a home page*
- *As a user, I want to be able to edit my profile picture and bio*
- *As a user, I want to be able to change my settings*

The team members indicated their willingness to work on the following user stories.

- *All team members*
 - *Rebeca Gonzalez: As a developer, I want to finish sign up page of the app, so the users are able to create an account*
 - *Arquimides Cala: As a user, I want to be able to edit my profile picture and bio*
 - *Rogelio Lopez: As a user, I want to have a home page*
 - *Sebastian Aviles: As a user, I want to be able to change my settings*
 - *Justin Venegas: As a developer, I want to finish login page of the app, so the users are able to login*

Sprint 5

Sprint Planning Meeting Minutes:

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After discussion, the velocity of the team was estimated to be 4

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- *As a developer, I want to fix login page loading bugs of the app, so the users are able to login smoothly.*
- *As a developer, I want to fix sign up page loading bugs of the app, so the users are able to create an account*
- *As a user, I want to have a loading screen between transitions.*
- *As a user, I want to have a home page ui*

- *As a user, I want to be able to edit my profile picture and bio*
- *As a user, I want to be able to change my settings*

The team members indicated their willingness to work on the following user stories.

- *All team members*
 - *Rebeca Gonzalez: As a developer, I want to work on the homepage UI and backend to the database so the data is accurate.*
 - *Arquimides Cala: As a user, I want to be able to edit my profile picture and bio*
 - *Rogelio Lopez: As a user, I want to have a home page*
 - *Sebastian Aviles: As a user, I want to be able to change my settings*
 - *Justin Venegas: As a developer, I want to finish login page of the app, so the users are able to login*
 - *As a developer I would like to get the messaging feature to be complete with database functionality*

Sprint 6

Sprint Planning Meeting Minutes: 4/3/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After discussion, the velocity of the team was estimated to be 4

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- *As a user, I want to have a loading screen between transitions.*
- *As a user, I want to have a home page ui that has the selection UI to accept people or not similar to Tinder yes/no.*
- *As a user, I want to be able to edit my profile picture and bio*
- *As a user, I want to be able to change my settings*
- *As a developer I want to get information from the users such as age, name, sex and school in the sign up screen*
- *As a developer I want to redesign the UI for the login and sign up page*
- *As a developer I would like to get the messaging feature to be complete with database functionality*

The team members indicated their willingness to work on the following user stories.

- *All team members*
 - *Rebeca Gonzalez: I want to get information from the users such as age, name, sex and school in the sign up screen*

- *Rebeca Gonzalez: I want to redesign the UI for the login and sign up page*
- *Arquimides Cala: As a user, I want to be able to edit my profile picture and bio*
- *Rogelio Lopez: As a developer, I want to work on the homepage UI and backend to the database so the data is accurate.*
- *Rogelio Lopez: As a user, I want to have a home page*
- *Sebastian Aviles: As a user, I want to be able to change my settings*
- *Arquimides Cala: As a developer, I want to finish login page of the app, so the users are able to login*
- *Justin Venegas: As a developer I would like to get the messaging feature to be complete with database functionality*
- *Sebastian Aviles: As a user, I want to be able to change my settings*

Sprint 7

Sprint Planning Meeting Minutes: 4/17/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After discussion, the velocity of the team was estimated to be 4

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- *As a user, I want to have a loading screen between transitions.*
- *As a user, I want to have a home page ui that has the selection UI to accept people or not similar to Tinder yes/no.*
- *As a user, I want to be able to edit my profile picture and bio*
- *As a user, I want to be able to change my settings*
- *As a developer I want to get information from the users such as age, name, sex and school in the sign up screen*
- *As a developer I want to redesign the UI for the login and sign up page*
- *As a developer I would like to get the messaging feature to be complete with database functionality*
- *As a developer I would like to get all functionalities working in unison together*
- *As a Capstone student I would like to be able to present out project in a professional manner that impresses recruiters and fellow students*

The team members indicated their willingness to work on the following user stories.

- *All team members*
 - *Rebeca Gonzalez: I want to get information from the users such as age, name, sex and school in the sign up screen*

- *Rebeca Gonzalez: I want to redesign the UI for the login and sign up page*
- *Arquimides Cala: As a user, I want to be able to edit my profile picture and bio*
- *Rogelio Lopez: As a developer, I want to work on the homepage UI and backend to the database so the data is accurate.*
- *Rogelio Lopez: As a user, I want to have a home page*
- *Sebastian Aviles: As a user, I want to be able to change my settings*
- *Arquimides Cala: As a developer, I want to finish login page of the app, so the users are able to login*
- *Justin Venegas: As a developer I would like to get the messaging feature to be complete with database functionality*
- *Sebastian Aviles: As a user, I want to be able to change my settings*

System Design

System and Subsystem Decomposition

Subsystem: (As can be seen in Appendix A1)

The app is written in Dart language. Which the flutter framework takes and compiles for the 3 different operating systems: apple, android, and google. The client side executable operates and goes the methods. When the client side needs to interact with the database it calls on the User class to change or read the database. The utils/user class calls the back4app database using our private keys to instantiate the connection, and using the ParseObject and ParseUser class to do handle the JSON callbacks. Based on research conducted from Granados and *Write your first flutter app* by Flutter.

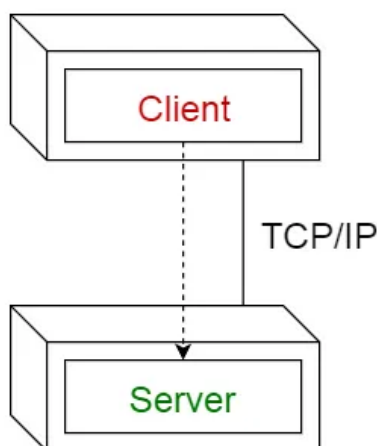
The database is Parse

based and built on Back-4-App. There are 3 classes/ParseObject separations: User, Friend, Message. The user represents a student/admin/faculty/human and has their own attributes and primary keys: objectId, username, email. The friend represents a friendship when two users have both added each other, a friendship is created. The last is Message. A Message object is created when a user sends a Message to an established Friendship: the primary key of Message is objected. However, Messages record the receiver and author so in the message chat the left and right messages denote the correct sender/receiver.

There is a 1-2 Friendship User relation, 2 friends in a relationship. A user can have many friends, 1-N User Friendships. (As can be seen in Appendix A2.)

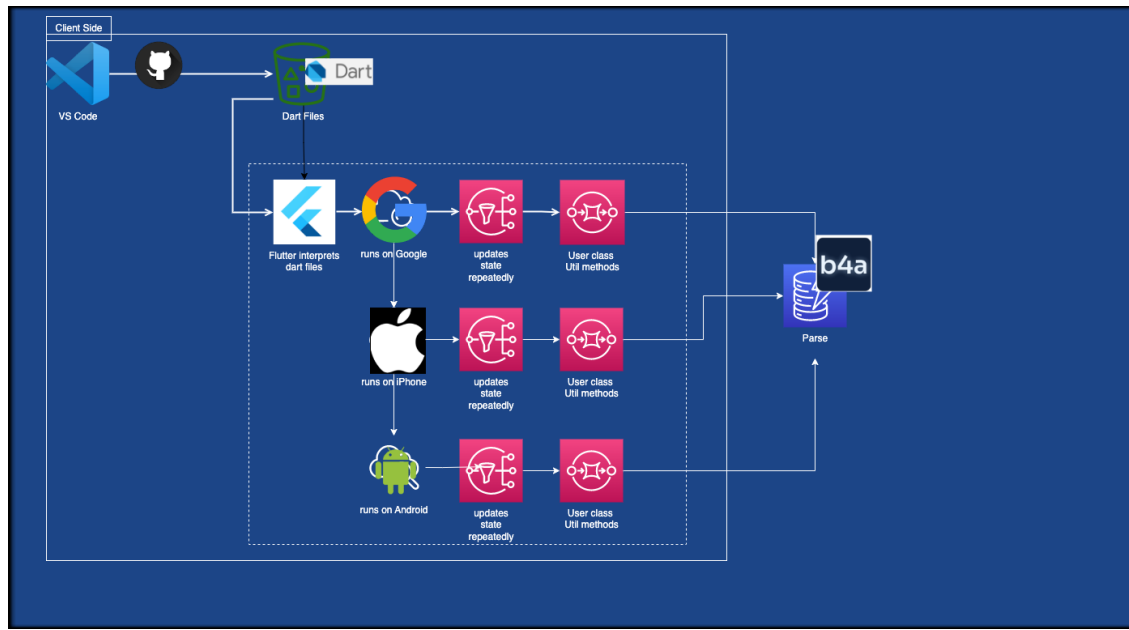
Architectural Patterns

The architectural pattern we employed for this app was Client-server pattern. In which, all client side applications (mobile phones, laptops, etc.) students logged in and communicated with our server side database that stores everything. Any interactions between users passed through the database and back.



- Account creation (sign up) goes through the server before it can be created to check email and username does not exist.
- Account authentication (log in) goes through the server to confirm it exists.
- Editing the profile (name, username, picture)
- Sending a message to a user means creating a message in the database.
- Becoming friends with another user.

Deployment Diagram



Design Patterns

- ☐ Facade: The app uses the facade design pattern to hide the system's logic from the user while still presenting the UI in a user-friendly way.
- ☐ Singleton: The app uses the Singleton design pattern to keep a single instance of back4app database with a single global access point in order to prevent repeatedly instantiating the database API. Accessed in the utils/User class.
- ☐ Iterator: In the app, the messages are displayed using the Iterator design pattern using the listviewbuilder from Flutter.
- ☐ The chain of responsibility design pattern is used by a number of the app's components to grant access to functionalities to other components.

System Validation

Using GitHub as our version control system, every user story had a branch that pertained to changes relating to it. Our changes came about with the help of IDE debugging whether the developer decided to use Visual Studio Code and the frameworks we used throughout development. Only once the code was verified would we merge it into the main development branch. Verification of our work was a collaborative effort, where each one of our pull requests required reviews from two other team members to be considered ready. When reviewing, we would run the app locally using Expo on our own devices and ensure the issue was completed correctly and caused no new issues along the way. Issues were reported if necessary, and we always made sure to check on both Android and iOS devices to ensure consistency. At the end of the semester, the development branch was merged into the release branch and the culmination of our work was released into the world.

Glossary

Framework: *A basic structure underlying a system, concept, or text.*

Authentication: *The process of confirming if the user is who the user says it is*

Feature: *A capability that the software offers*

UI: *Short for User Interface. Is the display on which the user interacts.*

Cloud functions: *Cloud Functions is a server-less execution environment for building and connecting cloud services.*

API: *Short for Application Programming Interface. a set of functions and procedures allowing the creation of applications that access the features or data of an operating system, application, or other service.*

Expo: *Expo is a platform that allows you to develop and quickly iterate on applications that are based in React Native and JavaScript.*

Dependencies: *is a broad software engineering term used to refer when a piece of software relies on another one*

TestFlight: *is an online service for over-the-air installation and testing of mobile applications, currently owned by Apple Inc. and only offered to developers within the iOS Developer Program*

UML diagram: *Is a diagram based on the UML (Unified Modeling Language) with the purpose of visually representing a system along with its main actors, roles, actions, artifacts or classes, to better understand, alter, maintain, or document information about the system.*

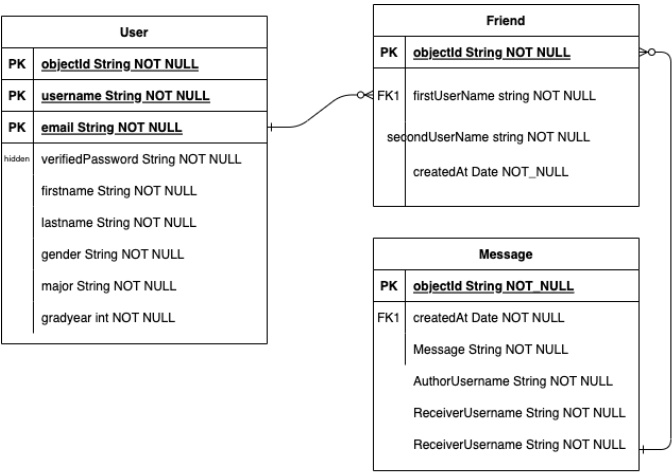
PO: *Short for Product Owner. Is the person responsible for guiding changes and talking to developers about things that need to be modified on a software.*

IDE: *Short for Integrated Development Environment. is a software application that provides comprehensive facilities to computer programmers for software development.*

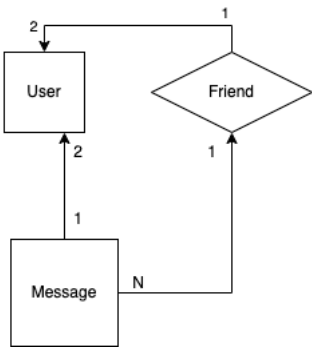
Appendix

Appendix A - UML Diagrams

[1] Database Design

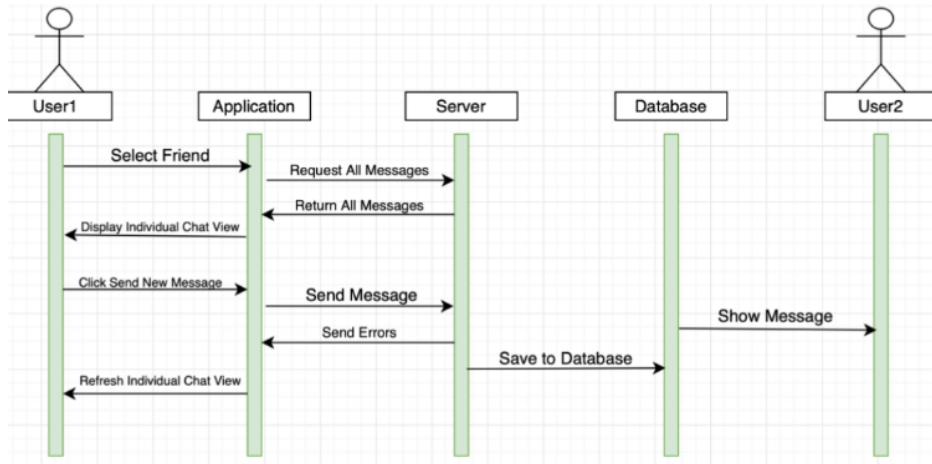


[2] Database Relation



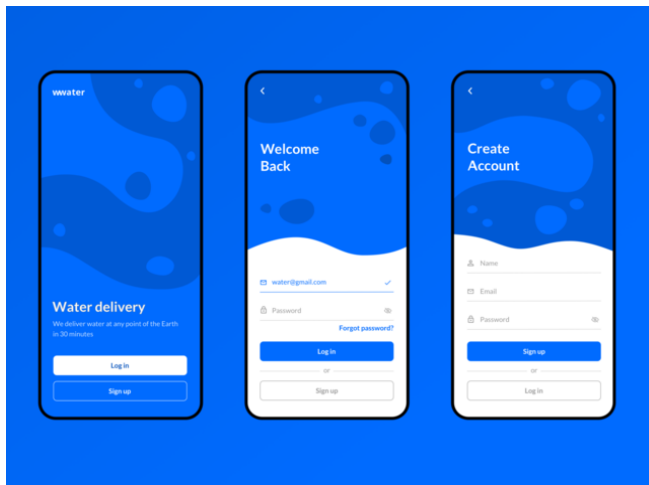
Diagram

[3] Use Case Diagram: All User Interactions

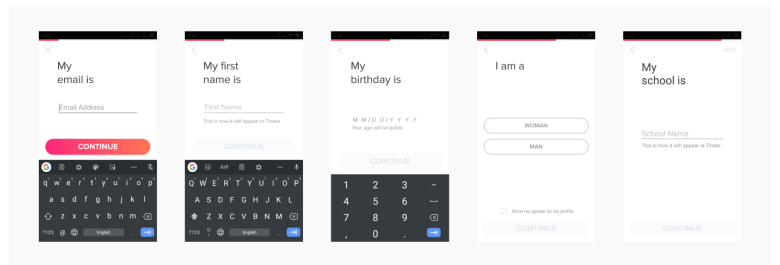


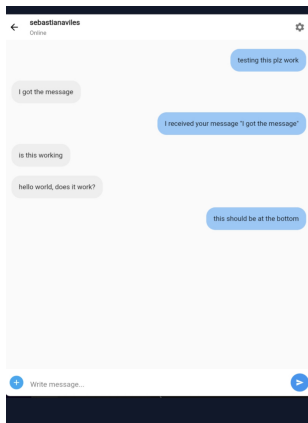
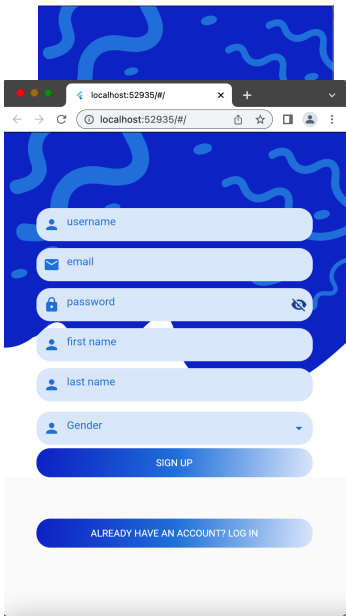
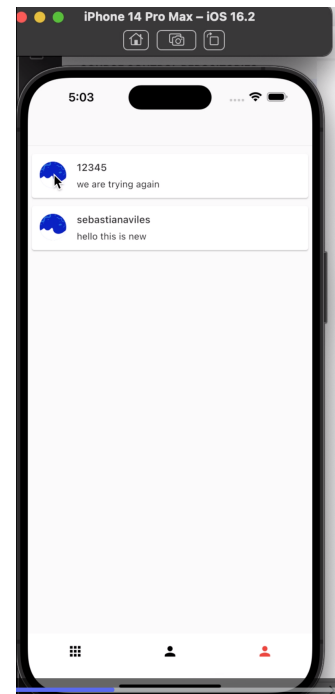
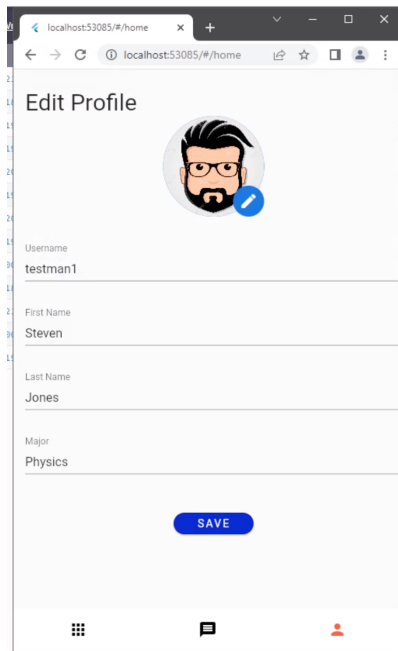
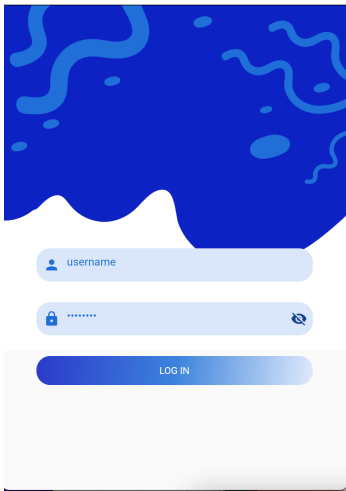
Appendix B - User Interface Design

Planned Template to follow:



Current UI Implemented:





Appendix C - Sprint Review Reports

Sprint 1 Review Meeting Minutes:

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- *Task 1 – Welcome to Spring 2022*
- *Task 2 – Setup and Technical Meeting*

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- *N/A - All user stories were completed and accepted*

Sprint Review 2 Meeting Minutes: 2/12/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- *Task 1 – Welcome to Spring 2022*
- *Task 2 – Setup and Technical Meeting*

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- *N/A - All user stories were completed and accepted*

Sprint 4 Review Meeting Minutes: 4/2/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- *Task 1 – Welcome to Spring 2022*
- *Task 2 – Setup and Technical Meeting*
- *Task 3 - Sign Up UI*
- *Task 4 - Create Back4App Database*
- *Task 5 - Activate Back4App API in backend with private keys and setup email verification*
- *Task 6 - Connect database backend to SignUp UI working*

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- *Homepage updated UI design*
- *Breakdown of tasks*

Sprint 5 Review Meeting Minutes:

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- *1- As a developer, I want to fix login page loading bugs of the app, so the users are able to login smoothly.*
- *2- As a developer, I want to fix sign up page loading bugs of the app, so the users are able to create an account*
- *3- As a user, I want to have a loading screen between transitions.*
- *4- As a user, I want to have a home page ui*

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- *5- As a user, I want to be able to edit my profile picture and bio*
- *6- As a user, I want to be able to change my settings*

Sprint 6 Review Meeting Minutes: 4/16/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- *1- As a developer, I want to fix login page loading bugs of the app, so the users are able to login smoothly.*
- *2- As a developer, I want to fix sign up page loading bugs of the app, so the users are able to create an account*
- *3- As a user, I want to have a loading screen between transitions.*
- *4- As a user, I want to have a home page ui*

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- *5- As a user, I want to be able to edit my profile picture and bio*
 - *6- As a user, I want to be able to change my settings*

Sprint 7 Review Meeting Minutes: 4/30/23

Attendees: Rebeca Gonzalez, Sebastian Aviles, Arquimides Cala, Justin Venegas, Rogelio Lopez

Start time: 7:00 pm

End time: 7:30 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- *1- As a developer, I want to fix login page loading bugs of the app, so the users are able to login smoothly.*
- *2- As a developer, I want to fix sign up page loading bugs of the app, so the users are able to create an account*
- *3- As a user, I want to have a loading screen between transitions.*
- *4- As a user, I want to have a home page ui*

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- *5- As a user, I want to be able to edit my profile picture and bio*
 - *6- As a user, I want to be able to change my settings*

Appendix D - User Manuals, Installation/Maintenance Document, Shortcomings/Wishlist Document and other documents

Installation Guide:

For help with your own flutter application follow the following:

- *Setup Flutter*
 - *A few resources to get you started if this is your first Flutter project:*
 - *Lab: Write your first Flutter app*
 - *Cookbook: Useful Flutter samples*
 - *Helpful video to setup flutter in VScode*
https://www.youtube.com/watch?v=0SRvmcsRu2w&ab_channel=CoderWeb
- *For help getting started with Flutter development, view the online documentation, which offers tutorials, samples, guidance on mobile development, and a full API reference:*
<https://docs.flutter.dev/get-started/test-drive>

To install our application:

First, clone the following github repository: <https://github.com/rgonz522/universitysocialapp.git>

Second, create your back4app Parse database: www.back4app.com

Third, use the following link to follow steps to connect Parse SDK to Flutter <https://www.back4app.com/docs/flutter/parse-sdk/parse-flutter-sdk> to update your own private keys for your own database.

Fourth, after opening the app cloned repo in VS Code you should be able to click “run” and the google chrome localhost will open automatically with the app.

Project Installation

https://www.youtube.com/watch?v=wCpxRk-Z_ow

Shortcomings/Wishlist

- Adding security features that prevent malware and the expose of user's information was not something that came into the development process. We now realize the risk this leads towards users and would like to include more security features such as two step verification and some form of protection towards entry of the back end of the app.
- Implementation of a dark mode in the application can further enhance the user experience while also having a better dynamic look with other operating system themes.
- Recover password, for users to change passwords. A settings feature that allows users to manipulate the layout and functions of the app on a basic level. A more in depth messaging system that allows for video and images.
- This is another feature we are in the process of developing, the legality of what users can do and the negative effects that it could have on the developer as well as the user. We hope to implement solid terms and conditions that provide safe use of The University Social App.
- As one of the main functionalities of the app was to be able to match with other users and message one another, it was purely based on who showed up first. Rather than based on major, similar interest, proximity locations all features we would like to include.

References

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- *Write your first flutter app*. Flutter. (n.d.). from <https://docs.flutter.dev/get-started/codelab>
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