StringShare: Final Report

Prepared by:

Group 7

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Introduction:

As we navigated through the COVID-19 pandemic recently, we learned that it is easy to stay in touch with your friends and family through various social media platforms. Our application StringShare, serves as a modern platform designed to redefine social experiences. The main goal of our app with innovation in mind, is that StringShare serves as the bridge for connecting individuals, allowing them to effortlessly forge new relationships and rekindle old ones. Our final project report encapsulates the comprehensive components and features that make StringShare a distinctive and smooth social media application for all users.

Details of the Project:

This final project report guides you through the intricacies of StringShare, presenting not just a social media platform but an application that connects the digital and physical worlds. With a primary emphasis on content creation and sharing, StringShare revolutionizes personalized social interactions through a unique blend of innovative posts, combining images and texts to enrich user experiences.

## Project Components and Description: A Glimpse into StringShare's Essence

StringShare is more than just a mobile app; it's a powerhouse of features designed with the user in mind. Its sleek and intuitive design boasts an array of essential tools, perfect for everything from catching up with old friends to capturing life's most memorable moments. With key components like an expertly crafted user interface, integrated mapping, audio and visual capabilities, advanced mobile sensor technology, a robust database, and industry-leading authentication protocols, StringShare stands out as a cutting-edge platform.

User Interface: Navigating Social Connectivity with Ease

StringShare's user interface goes beyond a mere blank canvas; it serves as an intuitive gateway to a seamless social media experience. Leveraging the availability of the GlueStack UI Library, the app uses a user-friendly environment for tasks ranging from signing in, registering, and creating new posts. With five primary tabs - Home, Search, Post, Activity, and Account Info - users can effortlessly navigate the available features, offering a personalized and engaging interface. Users are also able to comment and like the posts of those that they follow. This allows users to interact with other accounts and the content that they're posting. The search tab allows one user to search for another user. The activity tab shows the user who has interacted with their posts. This could include any new followers, new likes, or new comments on their posts.
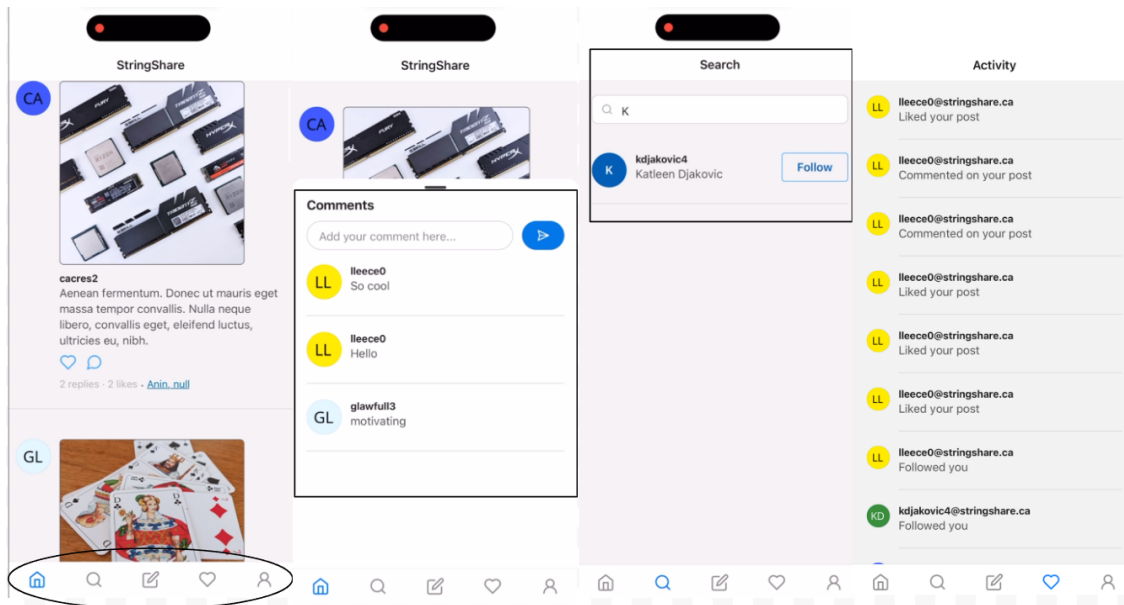
The above figure shows the homepage with the posts, the ability to add a comment on a post, the search functionality, and the activity page.
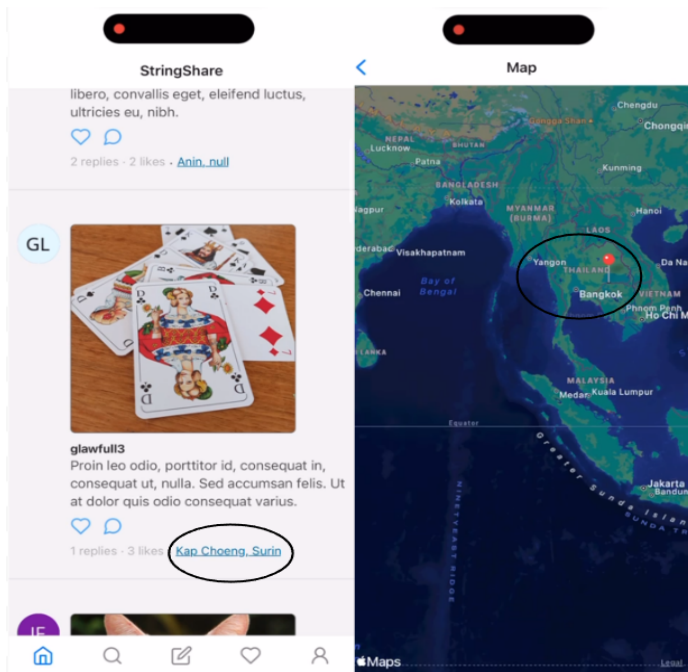

Maps: Redefining Location-Based Posts

When individuals on the app share valuable information about nearby places, like a coffee shop, they can include the exact location in their posts. Thanks to this feature, other users can easily see the mentioned place on an interactive map within the app. A dialogue box will appear by simply clicking on the designated location on the map, offering users the option to click on the "directions" button. This thoughtfully designed integration allows users to directly open their Maps application from StringShare, effortlessly guiding them to the location shared in the post. This cohesive blend between StringShare's map functionality and external mapping services enhances the overall user experience, offering a practical and user-friendly way to explore shared locations. The figure on the left shows how the location feature works when a location is added to a post. The location opens up on Apple Maps.
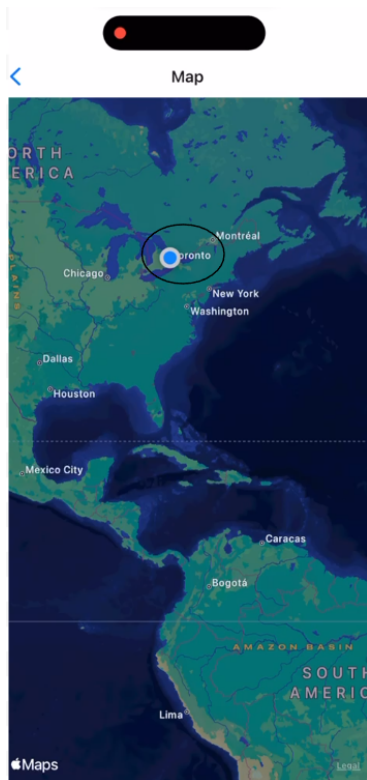
Mobile Sensor (GPS): Dynamic Location Visualization

StringShare leverages the mobile's GPS sensor to enhance the visualization of user locations to the selected points of interest. Building on the previous example, if a user posts about a coffee shop and provides its location, another user can interactively view their position relative to the coffee shop. Upon selecting the linked location, a dynamic blue circle will signify the user's location on the map, offering a real-time representation. This dynamic mapping approach not only adds a layer of engagement but also enhances the practicality of StringShare, allowing users to connect with shared locations while connecting with others on the platform. The figure on the left showcases the mobile sensor working as expected as our current location while viewing the post is Toronto and the blue dot is displayed in Toronto.

Authentication and Database:
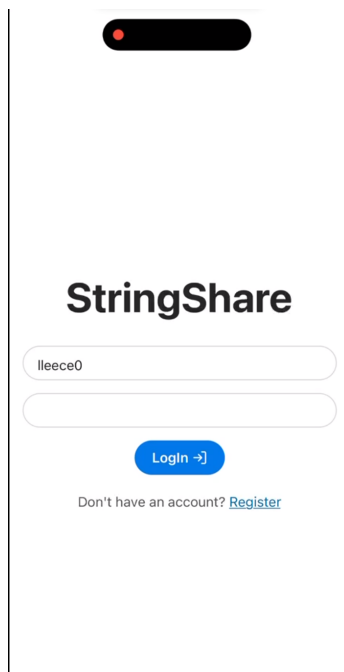
At StringShare, the security of our users' data is our top priority. To achieve this, we implement industry-standard authentication technologies. Our frontend and backend servers work together, utilizing OAuth2 for secure user authentication. To further strengthen our authentication mechanism, we also utilized password hashing and salting. When users set passwords, they undergo a one-way hashing process that makes passwords impossible to read. Additionally, we add a unique layer of complexity to each user's password through the inclusion of salt. This prevents common cryptographic attacks and adds an extra level of security to our authentication process. In addition to authentication, StringShare is supported by a robust PostgreSQL database that functions as the central repository for most user-generated content within the application. This database securely stores the user profiles, including personal information, relationships among other accounts as well as between images with posts and multimedia content such as posts. The figure on the left shows the login page for authentication with the database.

Video, Audio & Camera:

During the registration process, users are presented with an instructional video addressing social media safety, which incorporates both video and auditory elements. We implemented the camera functionality by adding the option to upload an image with their post. When creating content in the app, users can add visuals by linking an existing photo from their device's gallery or taking a new photo directly via the app's integrated camera feature. This feature not only adds a dynamic and multimedia element to posts but also compels users to express themselves creatively, with imagery that creates an engaging, and visually compelling community within the app Whether it's to capture a scene, share a memorable moment, or teach a story from 2010, the ability to add images to posts enhances the interactive power of user-generated content on the platform.
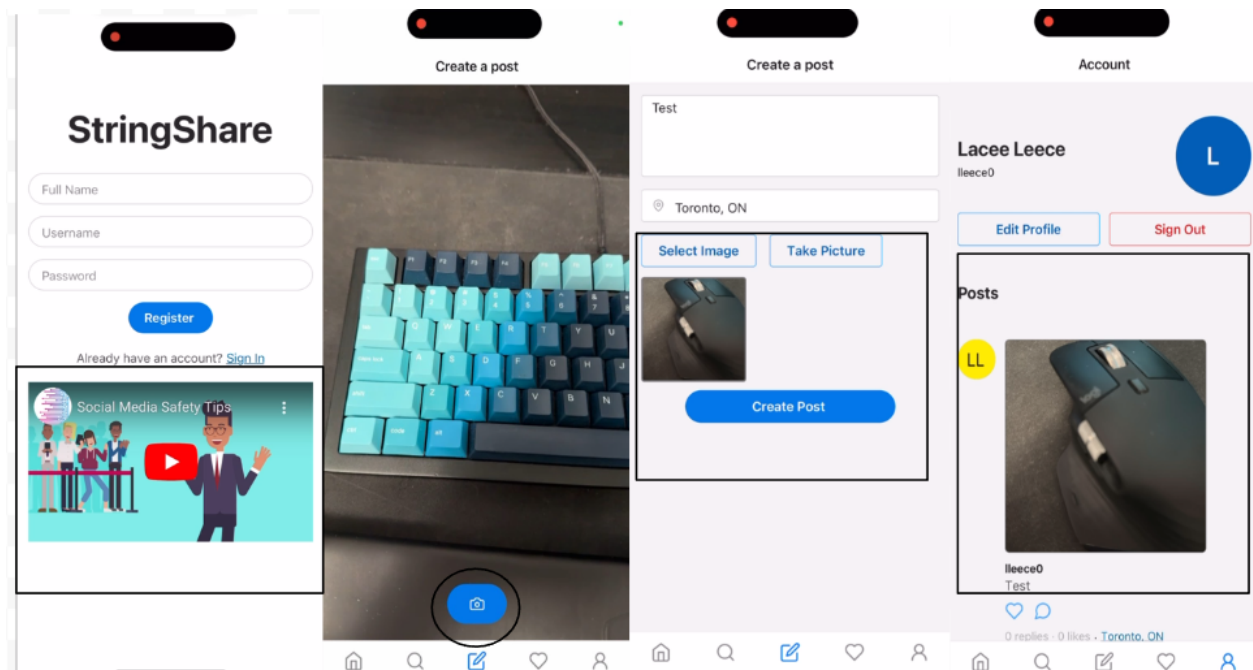
The above figure shows the social media safety video, the ability to take a picture within the app, the ability to attach a picture to the post, and the test post with the picture.

Challenges:

Throughout the development process of StringShare, there were several hurdles the team had to overcome. One significant challenge we came across during development was the integration and setup of the camera functionality within StringShare. To address this challenge, the team engaged in extensive research through different documentation for react native. Through a process of trial and error and using the available resources, we were able to overcome this challenge.

Another challenge that we faced during the development process was setting up authenticated pages. To ensure a secure environment for our users, we needed to strike a careful balance between implementing effective security measures and maintaining easy accessibility to specific pages. To navigate through this challenge, a thorough examination of documentation played a crucial part in formulating a strong authentication system successfully.

When using React Native, we encountered a distinct challenge with making API requests. Our initial approach of relying on localhost posed difficulties, as React Native requires specific IP addresses to call APIs successfully. As a result, the traditional 'localhost' references simply did not work. In response, the team shifted their approach and began utilizing the specific IP address of their local host machine when making API requests. This modification effectively enabled communication between the React Native application and the backend server.

Lessons:

The development of StringShare has taught us more about mobile app development. As the project has faced and overcome challenges, it has instilled a set of foundational principles that will shape the team's approach to future projects. The use of camera features highlighted the significance of adaptability. With technology constantly evolving, it's essential to be willing to experiment and adjust to new tools and techniques. The skill of being able to pivot and embrace change not only leads to more inventive solutions but also ensures that a project stays ahead of the curve. The hurdles of creating authenticated pages highlighted the importance of thorough research. Immersing ourselves in detailed documentation not only led to successful solutions but also enriched our grasp on the underlying technologies. A strong foundation of research is pivotal in effectively tackling challenges. To sum it up, the development of StringShare goes much further than simply writing lines of code. It encompasses a vast pool of knowledge and experience that reaches beyond this specific project. These valuable insights delve into more than just software development; they revolve around fostering a mindset that embraces challenges, places importance on teamwork, and sees every hurdle as a chance to learn and evolve.

Video Demo: StringShare