

Campus Chat

PM5 Final Report

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ABSTRACT

Every year there are hundreds and thousands of new students as well as transfer students that come to Virginia Tech. A lot of them struggle with finding a place within the campus community which can impact their academic performance, social life, and their overall well-being. To mitigate this risk, we introduce Campus Chat - a mobile application that is designed to connect VT students with a unique combination of social media features that are tailored for college experience. Campus Chat allows students to create profiles that show their hobbies, interests, dorm locations, hometowns, and current or planned courses. With search and filtering capabilities, students can easily find and connect with peers who share similar attributes. The app offers direct messaging, group chats, and anonymous posting where it allows personal connections and a broader community of engagement. What sets Campus Chat apart is that it focuses on the college environment and special group features that allows users or students to create and join different types of communities with algorithm that perform suggestions to relevant groups based on individual interests. By using extracurricular activities and student organizations on campus, this app enhances the students' ability to make meaningful connections.

INTRODUCTION

Going through and figuring out college life at a large University like Virginia Tech can be stressful for new and transitioning students, especially when they have a lot on their plate. With thousands of students entering campus each year they face challenges in making connections, identifying study partners, and even getting involved with extracurricular activities that this school has to offer. The challenge of building a supportive social network early can lead to being isolated eventually, along with lack of being active in academic and campus events which leads to a negative overall college experience. This problem points out the importance of tools that help students incorporate campus life effectively that can make their overall college experience a whole lot better. The main motivation behind Campus Chat is to help students find their niche by allowing users to create profiles, which show descriptions of each student's hometowns and hobbies, so that students can easily discover peers with shared interests and goals. In addition, this tool helps with building connections effectively and

efficiently by having advanced search and filtering features to allow students to connect based on specific interests or attributes like common interests, shared courses, etc. To put it at a broader perspective, Campus Chat directly addresses the problem of student isolation and the need for efficient social connection within the college environment by creating a platform that supports academic collaboration, social engagement, and personal growth where we aim to enhance the Virginia Tech experience and lay the foundation for scalable adoption across campuses worldwide.

REAL-WORLD APPLICATION AND RELEVANCE TO SOFTWARE ENGINEERING

Campus Chat serves as a real-world solution to significant problems faced by students at large universities. The challenge of building meaningful social and academic connections is real for all college students. The app addresses the challenge faced by Computer Science students who are too busy with their coding projects, assignments, and research which leaves them no time for social interactions. It serves as a convenient platform for them to connect with their peers who share similar interests, hobbies, or courses. In this way they will be able to form study groups, collaborate on projects and become more involved with campus life. This will have a positive impact on their academic performance and they could maintain a healthy balance between work and social life. Additionally, this creates opportunities for CS students to connect with like minded individuals to work on projects that could turn into a startup or an innovative application. It allows students to collaborate and share ideas which could become something big. Students can gain real world experience and build a strong network within the software engineering community.

BACKGROUND AND KEY CONCEPTS

To understand the functionality of the Campus Chat, it is important to understand concepts related to the project:

- **Social Networking Platform:** It is a digital platform that allows users to connect, interact, and share information.
- **User Profiles:** In Campus chat user profiles are personalized pages that allow users to share hobbies, interests, hometown and courses. This allows users to connect with people who have similar interests.
- **Advanced Search and Filtering:** This functionality allows users to search for other users and groups.
- **Group Recommendation Algorithm:** The app uses recommendation algorithms to suggest relevant groups based on the user's interests.
- **Collaboration and Innovation:** Campus Chat fosters an environment where CS students can connect, collaborate and form teams to work on projects.
- **Privacy and security:** This ensures that user data is protected through secure authentication methods.

NOVELTY

Although social media applications exist in several spheres of our life, our proposed software Campus Chat specifically targets social media among college students, and further is geographically focused on campuses. We feel that this unique aspect of our application makes it both an appealing and useful tool for the nearly 20 million students across the United States. Further, our design process in the creation of

Campus Chat was modular, leaving lots of room for our application to be expanded, but also divided, in the future. While many of the features in our applications such as group chats, profiles, friends, and anonymous chatting are widely used in the software world, it is the unique combination and integration of these elements that sets our application apart from other platforms. That said, our application does offer one new feature that does not exist in the current social media climate. Our 'group' feature allows users to create and place themselves in different communities.

RELATED WORK

As mentioned previously, the current domination of social media in our society means there is no shortage of these applications. To name specifics, we drew inspiration from Facebook, Discord, Yik Yak, and even Tinder. Facebook was a major source of inspiration due it being the first large-scale social media application. The profile creation and community aspects of the app were helpful in shaping our view for Campus Chat. Discord is widely used among college students, so we looked at and discussed specific features like group chats that made the application so popular. Yik Yak contains anonymous chatting features, which broadcast popular messages in a certain geographical area. This application is already massively popular in college areas, so we felt that the anonymous aspect of the application would be appealing in Campus Chat. Finally, we inspected Tinder primarily for its pairing algorithm and interface. This provided some inspiration for our group-finding and recommendation algorithm discussions.

RELEVANT TOOLS

Throughout the course, we learned about several different software tools that are crucial to healthy

and efficient software development practices. Additionally, it is important to separate the design process clearly, recognizing specific tools that work in each area. While our team planned Campus Chat, we ran into several of these applications and even discovered a handful of new ones. Because we did not actually create the application, some tools were not used, however they still warrant mention.

- Git, GitHub
 - Git provided an invaluable version control system for the technical portion of our project, and we relied on Git heavily during the planning process for keeping track of starter files. If further execution of the project follows, Git will be even more important, helping keep group members synchronized, and with a clear understanding of the project technical details. GitHub was the online cloud service that we used to store our files that utilized Git.
- XCode/Swift
 - XCode, which we used with the language Swift, was the main coding platform and environment in which we planned our application in. Because our app is primarily a mobile interface, XCode was the perfect platform to build it in. The provided code in our GitHub repository reflects some of the starting files that XCode would utilize.
- Canva
 - Canva was used primarily as a visual tool to help design prototypes for the UI that we wanted the users to experience.

Canva's many tools allowed us to create any physical representation of what we could imagine. The final wireframe UI designs in our presentation originated from Canva designs.

- Jira
 - We utilized Jira as our project management tool to organize tasks, track progress, and ensure efficient collaboration throughout the planning process. It's important that we manage our workflow and have a concrete way to follow the Agile development process that we pursued.
- Tools that were not used, but would be used if actual implementation of Campus Chat was pursued
 - Postman—used for API requests
 - React/Svelte—used for better organizational structure to UI
 - MongoDB—used for large-scale reliable database management

IMPLEMENTATION PROCESS

In the initial discussion of our project, we planned out our software stack, which we have mostly followed throughout the semester. As detailed in previous sections, our application Campus Chat is a mobile-focused application, so XCode became our main environment for coding, which was done in the Swift language. Node.js was also a crucial component of the entire stack, as it served as the server-side coordinator throughout the project.

One of the main focuses of our design and implementation was keeping the entire

application modular. Since Campus Chat was really a combination of several different features, from group chats to profiles, we tackled each of these problems individually, often leaving separate group members to take control of much of the design discussion for specific sections. This modularity of our application allowed for better error handling, as errors tend to be divided between separate sections, instead of them being a tangled mess that affects the whole system.

Front and back-end designs were also strictly separated, allowing for both processes to evolve simultaneously. This was an advantage of our software engineering process, and something that has helped efficiency and communication throughout the project.

Additionally, we used iMessages and Discord to communicate with each other through organized chats and servers. Clear communication was crucial in making sure deadlines were met, and disagreements and discussions were brought when necessary.

AGILE PROCESS

Regarding communication, our group decided to pursue an Agile software development process. As learned in class, this meant that our timeline would be separated into sprints, which we typically had every two weeks, though sometimes shorter if necessary. The Agile process appealed to us because this project did not feel rigid enough to warrant some of the stricter processes such as waterfall or v-model. Knowing that this was a more creative and open project, we wanted flexibility to change the direction of our project, which the Agile process allowed, and even encouraged through its collaborative nature.

We employed a scrum master, who would change based on the assignment, and was responsible for keeping the group on track for the current sprint and task. During meetings, we would have

collaborative conversations about the direction of the project. If that needed to be moved or increased in the scope of the main goal, it was usually done.

We did not have stand-up meetings every single day, but they happened frequently enough such that the team was always aware of what was going on, and there always was forward momentum towards our goal.

TESTING

Since the physical execution of the code was never completed, real technical testing did not occur frequently, but they were discussed. Primarily, we would have relied on Postman to test API requests and headers, which would be crucial in an application that relies on communication from endpoints. Additionally, we had planned on implementing a continuous integration environment that GitHub offers, which would have seen the automatic deployment of unit tests on our code. Combined with heavy documentation and intentional bug tests that other team members would sneakily insert, meaningful errors would have likely been discovered.

DEPLOYMENT AND MAINTENANCE PLAN

Furthermore, our application provides an interface that allows users to look at groups that are recommended to them with an algorithm. The college landscape, with the existence of extracurricular activities and student organizations, provides the perfect recipe to ensure the usability of this feature.

FUTURE EXTENSIONS

Campus Chat has the potential to evolve and expand in a variety of ways, providing an even more tailored and engaging experience for users. Some of the opportunities for future extensions include:

- **Integration with school events and calendars:** One way Campus Chat will expand in the future is by having the ability to integrate with a specific school's event calendar and allow users to join forums, chats, or discussions that are attached on the calendar. These discussions could be related to anything including career fairs, club meetings, fraternity rush events, or social gatherings. This would make it easier for students to stay informed about upcoming opportunities and connect with other students who share similar interests or hobbies.
- **Enhanced search and filter features:** The current app allows users to search for other users or forums based on criteria like major, hometown, or dormitory. While this is sufficient for basic functionality, expansion will most definitely be useful in the future. For instance, Campus Chat could allow users to search by specific courses, clubs, extracurricular activities, best study areas, and so forth. Another functionality that could be built into this would be the ability to create a new filter topic that other users can utilize. For instance, if there was a user who wanted to see where the best place to get a haircut in Blacksburg would be, he or she could add a filter for haircut that could help users in the future. Way down the line, a machine learning implementation could also recommend potential groups to users

based on their interests and behaviors on the app.

- **Local business and alumni network integration:** The app could partner with local businesses and the VT alumni network to help users with their job search, offer discounts, or provide partnerships. This could be integrated by either expanding the audience of the app or integrating another section of the app for “Off Campus” interaction. This capability would allow students to connect with local businesses or businesses where a past Hokie works and engage in conversations about topics of mutual interest.

LIMITATIONS

While Campus Chat has great potential for expansion, there were several challenges and limitations that impacted its planning, development, and deployment in a negative manner. These limitations include both technical and operational issues that need to be addressed in the future.

- **Integration Challenges:** One of the most significant challenges faced during development was the difficulty in merging the backend software with the front-end interface, or at least the concept behind it. Efficient integration between the back end and front end is crucial for seamless functionality, especially as new features are added, so a work around was not really an option
- **Manpower Constraints:** The limited number of team members working on the Campus Chat project impacted the speed and efficiency of feature development. With fewer people available to handle the various aspects of design, development, and testing, it became challenging to meet all project milestones within the desired

timelines. This constraint often meant that features had to be prioritized, and some tasks were delayed or scaled back to ensure core functionalities were maintained.

CONCLUSION

Campus Chat represents a promising solution to a longstanding problem, providing an innovative way for students to form connections and engage with campus life. As the app grows and evolves, it has the potential to become an indispensable tool for building community and enhancing college life at Virginia Tech.

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