ConnectBU: A Platform for Advising and Connecting Students

Hussain Albayat, Yousuf Khalid Yousuf Baker, Benjamin Chan, Nadim El Helou, Damani Phillip

Project Summary—The platform to be developed will allow BU students to search for and connect with people based on things such as major, class history, lab affiliation, career path, club involvement, personal interests, and so on. This is positioned as a more casual counterpart to linkedin, while also having more granular search capability than general use social media platforms (facebook, instagram, etc). The vision is to allow students to connect in a setting that is not fully professional, but also still distinct from their personal lives and social media. The project to be delivered is the MVP of a webapp which provides the above service. The log in process would be handled by Google SSO, along with storing the personal information in a cloud database. Instant messaging would be powered by services such as Sendbird, Twilio, or Google Hangouts APIs with video chatting handled by Google Hangouts or Zoom.

- *Hussain Albayat is with the Department of Electrical and Computer Engineering, Boston University, Boston, MA 02215. Email: hussainb@bu.edu*
- *Yousuf Khalid Yousuf Baker is with the Department of Electrical and Computer Engineering, Boston University, Boston, MA 02215. Email: ybaker@bu.edu*
- *Benjamin Chan is with the Department of Electrical and Computer Engineering, Boston University, Boston, MA 02215. Email: chanben@bu.edu*
- *Nadim El Helou is with the Department of Electrical and Computer Engineering, Boston University, Boston, MA 02215. Email: nadimh@bu.edu*
- *Damani Phillip is with the Department of Electrical and Computer Engineering, Boston University, Boston, MA 02215. Email: dphilip@bu.edu*

1 Need for this Project

One of the key factors determining a students success and performance is their "College Readiness", which is defined as the "academic and practical knowledge needed to be successful in higher education" [1]. This "academic and practical knowledge" includes everything from the students technical preparedness, to their soft skills such as ability to network and comfort with asking questions or knowing how to ask questions. These skills are dependent on the prior socioeconomic background of the student, which directly relates to the quality of education and mentorship they have access to. These skills are also dependent on the closeness of the students' upbringing and culture to that of the country of study, since soft skills and social etiquette are to a certain extent culturally determined. It can be especially difficult to navigate the subtleties of a language in developing soft skills and social literacy when you are speaking it regularly for the first time.

Thus, first-generation students, and international students, often come into these US institutions with a clear gap in preparedness in one, or many, of the "college preparedness" metrics. Though they are not by any means the only groups or students facing difficulty navigating the university landscape.

At Boston University, though these support resources exist, they are oftentimes distributed and difficult to find and navigate, such as in the case of looking through the 300+ groups at BU, developing a network of upper-classmen, or even gaining the knowledge of what resources and opportunities exist. There are also certain trade-secrets to finding opportunities that are only learned by talking to other students, such as reaching out to the PhD students, as opposed to the P.I. of a lab you would like to work with.

Thus, there is a pertinent need to centralize this information while also providing easy access to support resources that provide personalized mentorship and advising for the different aspects and needs students may have. This is not to mention the importance of finding mentors and an educational/social support system that you can identify with. Though first-generation and international students will especially benefit, all students will benefit from this sort of platform. To further demonstrate this need, we can look to the story of the founder of Piazza:

"Throughout her college days, she [Ms. Pooja Sankar] felt a sense of loneliness. Being one of only three girl students in her engineering class, she felt extremely shy to discuss computer problems with her male classmates. "I would sit in a corner of the computer lab and work on the problems all alone. They would all talk to one another, ask each other questions, and learn a lot by working together. I missed out on this learning. What was worse was I wouldn't even get to the core of the learning that the professors intended for us since I was stuck on a nuance and couldn't complete the assignment." [2]

It is clear that the need for our platform stems from a similar root as the need for Piazza—both are intending to solve a problem for a specific group, but are to the benefit of all students, and both are driven by the desire to democratize and universalize the college educational experience. Though where piazza is focused on democratizing access to questions and class support, the platform we are developing is more holistic in scope.

2 Problem Statement and Deliverables

BU students lack personalized academic/ professional/ extra-curricular advising resources. It's difficult to meet other students to ask for advice; support

is often decentralized and up to the student to parse from distributed resources (clubs, faculty, events, etc). Hence, we are proposing a unified platform to allow for easier communication between upper and lower classmen. From reading about and observing student experiences at BU and elsewhere, having access to this network of upperclassmen can make the university experience holistically smoother and more efficient, especially for first generation students. Thus, students who are not able to access that same network for one reason or another are at a clear disadvantage. Our platform intends to circumvent this issue by democratizing access to this network.

Product to be delivered:

ConnectBU is a webapp that will provide a centralized and personalized advising experience for BU students. It's important that students are able to easily find like-minded peers and mentors, so the web app will allow students to search for other users based on their skills, clubs, classes, majors, and several other criteria. This information will be provided by the users; upon logging in, each user will be able to fill out a profile and display their experiences. In the case that a student doesn't know how to effectively use the search criteria to connect with their peers, even though they have a question in mind, ConnectBU ensures that they get their question answered by recommending a list of users to contact for advice. When a student connects with another user, whether it be by searching or asking a question, they will be able to communicate through ConnectBU's instant messaging service. All chats will be kept private between the two users and they will be able to view up to a year of their past chat history.

3 Visualization

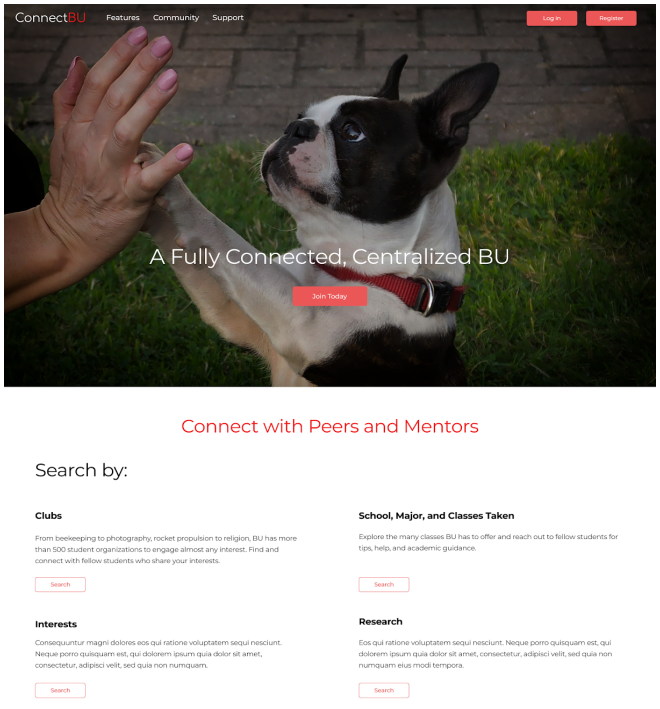

Fig 1. This image shows the front page of the web application.

The wireframe shows the landing page of the web application. It includes an image of a Boston terrier, which is symbolic of the BU student-base and community, and also shows the numerous search options that the site offers.

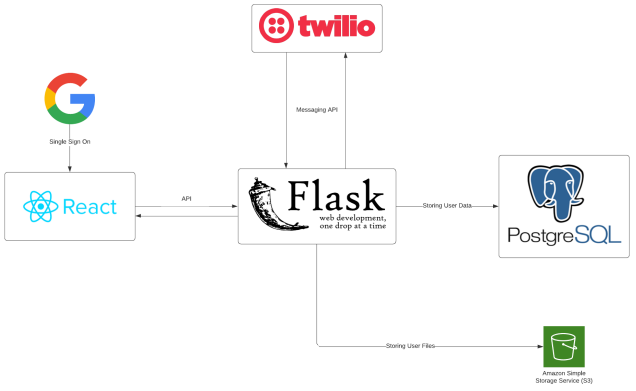

Fig 2. This image shows the overall architecture of the application.

The main architecture of the web application will be cloud native, with most of the components on AWS. Our system architecture consists of a React frontend and a Flask backend that interact with a variety of services. The frontend utilizes Google SSO for user authentication and interacts with the Flask backend for other services. The backend communicates with a messaging API to securely send messages between users, a PostgreSQL database, and an S3 bucket for other user data.

The two ends of the application will be hosted using Amazon EC2 instances and will use services offered by AWS and Google.

4 Competing Technologies

Based on the depictions and analyses given prior in the report, the competing technologies are categorized based on the UX design and targeted demographic of the technology.

The first set of competing technologies fall under the category of technologies with overlapping UX design aspects as our own, but with a different target demographic. The technologies in this group are as follows

- Facebook
  - Positioned as a demographically agnostic general use social media platform—learly not a platform targeting students in specific
  - Includes UX elements we are choosing to implement: messaging UI and ability for individual people to connect
  - The user profiles (and thus the search capabilities) aren't very granular or uniform across profiles—difficult to search for people using anything other than full name and sometimes location
  - Generally more informal, people are not looking to associate their facebook profile with their academic or professional profiles

- Instagram
  - Positioned as a demographically agnostic image sharing platform, for anyone from individual content creators to teenagers to politicians and any combination of the categories in between
  - Includes UX elements we are choosing to implement: messaging UI and "explore" page (page with suggested content and accounts based on the content you interact with)
  - The user profiles are more granular and content specific, but searching for specific content or profiles is difficult because of the size of the user base and the inability to search by anything except profile name and hashtag
- Linkedin (the closest to our platform)
  - Positioned as a business networking platform/virtual resume with a target demographic of career
  - The UX largely includes most of what we are trying to implement, including the granularity of being able to search for users based on a variety of profile elements
  - The key difference here is that this is largely a professional platform for people who are looking to develop their careers and brand. The details students would be looking for aren't listed

The second set of competing technologies include those that offer a parallel service to our target demographic (students looking for personalized advising), they are fundamentally different because of differing UX elements. The technologies in this second group include:

- Reddit
  - Forum based platform with sub-forums for almost anything and everything
  - Not practically possible to search for and connect with other users based on profile elements
  - Provides support services to students through these sub-forums (r/college, r/BU, etc), but access to these forums is not limited to students or members of a said university
  - Messaging system exists, but is an outdated, email style messaging system
  - Similar to facebook, people generally do not want to link their reddit profile (and its associated activity and history) with their academic or professional profiles.
- College confidential
  - A college advising, forum based platform offering support resources to students and parents
  - Focused primarily on helping students with the college application and admissions process, as opposed to navigating the university experience
  - Not possible to search and connect with other users and build your network/ask questions in that way. Must ask questions on the public forums.

From these descriptions and analyses, it is clear that we cannot position ourselves as competitors to these technologies in their respective niches—but that is fundamentally not what we are aspiring to do with this project. Rather, we are looking to synthesize certain key UX elements from these technologies, and target an underserved demographic in the social media space. While we are not likely to build a better or more robust platform than these tech giants due to the sheer imbalance of resources,our platform will be built as robustly as our budget allows. The core goal is to deftly construct our core features to better serve our target demographic and provide a solution to the afore-stated problem.

5 Engineering Requirements

The requirements specified for the implementation of ConnectBU include:

1. The platform will have a cloud based architecture
2. Information along with all of the users' data must be stored in a secure cloud database.
3. Database should be able to store and maintain information for at least 1000 students
4. Website availability should be 24/7, save for server maintenance
5. The webapp should able to handle 75% of total user base of simultaneous usage
6. Users should be able to securely login to the platform with their BU credentials (Google Single Sign On)
7. Users will have a profile page where they can edit their information. 7 main fields: school, major, year, classes, labs, clubs, interests
8. Users can search the platform for content
   a. Filter search results by fields (i.e. filter users by classes/interests/…)
   b. Search time should be less than 2 seconds
9. Users should be able to securely message each other through end-to-end encrypted messaging API

Acknowledgment

The authors wish to thank Professor Osama Alshaykh for his continued support throughout the project.

References

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