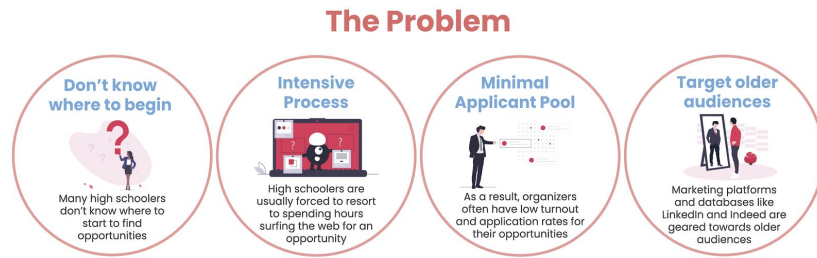


## Background Research Summary

### 1. Problem

High school students are eager to volunteer in their communities, learn through summer programs, or develop skills at internships – but most of them do not know where to begin. Students often have to scour the internet for hours and visit numerous websites to search and apply for opportunities at hospitals, senior centers, universities, or companies. Specialized websites like VolunteerMatch, TeenLife, and Chegg provide many volunteer opportunities, summer programs, and internships, but do not provide effective filtering mechanisms and relevant or up to date offerings for high school students, making them cumbersome to use. More importantly, these websites do not provide a mobile application that could make these opportunities easily accessible to high school students. Despite these obstacles, some students still land such opportunities due to connections through family or friends. Furthermore, organizations looking to market their opportunities to high school students often have a difficult time reaching a broad student audience due to the unavailability of a mobile platform that could bring organizations and students together. Therefore, there is a strong need to create a mobile application platform to help high school students search, find, and apply to relevant volunteer opportunities, summer programs, or internships and help organizations market their opportunities to a broad high school audience. HelpOut is a mobile application platform that we envision will satisfy this critical need. With over 17 million students in 27,000 high schools across the United States, we believe there is a large demand for such a mobile platform (Digest of Education Statistics, 2019). Throughout this document, the term *extracurricular opportunities* collectively refer to high school volunteer opportunities, summer programs, and internships.



*Figure 1: The main problems high schoolers face when searching for relevant opportunities.*

The impact of extracurricular activities on a high school student's career cannot be overemphasized. Students often find and nurture their passion through community service, summer programs, or internships, and through them can gain a head start in their college and professional careers. Community service in high school allows students to set themselves apart in their job or college application and explore various career paths (Goldy-Brown, 2017). For example, if a student wants to become a doctor, they can volunteer in clinical settings to determine whether a pre-medicine track is a correct path for them in college. Furthermore, summer programs are a great avenue to spark a student's interest in a particular subject, build confidence in their ability to succeed in a college atmosphere, and connect them with other similarly-motivated students and life-long mentors in specialized areas (amandaja, 2019). Finally, internships can help high-school students prepare for a future internship or direct employment after high school. According to a 2014 survey conducted from over 300 employers, 89% agreed that high school students that partake in internships would have a competitive advantage when applying for college internships or full-time jobs ("Employers, Students Benefit from High School Internships", 2014). The aforementioned benefits of extracurricular opportunities justify why it is essential to provide an efficient mobile application platform for

high school students so they can find their passion and be successful in their college and professional careers.

Unfortunately, finding a relevant opportunity is not easy for most high school students. During our background research, we sent a survey to 200 high school students in Massachusetts to better understand how high school students are finding opportunities and whether any issues exist with the current process. Of the 78 responses received, we found that two-thirds of students found their opportunities through their friends or school counselors and less than half used the internet. Most students found the process of finding opportunities difficult, while students who found the process easy often wrote that they were able to get them with the help of their family, friends, or school. The questionnaire highlighted the critical need for a mobile application platform that all high school students could use to find relevant and up-to-date opportunities.

Our team also conducted a design study on the availability of relevant and up-to-date opportunities for high schoolers using preset search queries on 4 different platforms: Google, VolunteerMatch, TeenLife, and Chegg Internships. The results of the queries were recorded and each opportunity in the results was checked whether it was outdated or irrelevant. Relevancy was determined by whether the opportunity matched the high school audience, and if the subject matter matched the search query. When using Google, we found that of the 13 unique opportunities recommended when searching for hospital-related community service in Worcester, MA, only 5 of them were relevant and up-to-date. Similarly, when computer science internships were searched for using Google, only 4 of the 11 unique results were relevant and up-to-date. Considering that each student is looking for different things in each opportunity, having such a low percentage of their search results be potential opportunities for them is

frustrating, unnecessary, and changeable. The results of the queries for the other three websites are summarized in Section 2.1.

## **2. Competitor Technologies & Patents**

This section will discuss the competitor technologies and intellectual property related to the invention.

### **2.1. Competitor Technologies**

We identified four existing websites or platforms on the market that have similar goals to our proposed platform: VolunteerMatch, Chegg Internships, TeenLife, and LinkedIn. This section will explain each of the services and detail their advantages and disadvantages.

#### **2.1.1. VolunteerMatch**

VolunteerMatch is a volunteer engagement network based in the US where people of all ages can find volunteer opportunities through keyword and location searches. A student account allows high schoolers to view recommendations for opportunities based on their specified location, causes, and skills in the profile page. Although the website features volunteer opportunities in places such as animal shelters and senior centers, it lacks relevance and diversity of opportunities— oftentimes the search results are far from what the keywords and location parameters indicate. Currently, this tool is only hosted on a website and not on a mobile application which makes applying for and tracking volunteer opportunities inefficient.

We conducted a design study on VolunteerMatch where we investigated the top five results of a search query with the keyword and location, “Hospital” and “MA” respectively, into an incognito tab. We repeated the process for four trials (4 different users). We found that although none of the top volunteer opportunities were outdated, all of them were irrelevant to the

search query. Instead of listing opportunities about volunteering at a hospital or a medical care center, the website lists unrelated volunteer opportunities which seem to be a result of a limited, homogenous pool of opportunities. However, searching for “Animal Shelters” does result in relevant opportunities. The design study results indicate that VolunteerMatch has a limited dataset of volunteer opportunities and a poor filtering system.

### **2.1.2. Chegg Internships**

Chegg Internships is a website where college students can search for internships and jobs through keyword and location searches. There are a variety of filters for searching, including position type, compensation, commitment, and eligibility. Students on the website can create a professional profile and add skills, education, work experience, and awards, and export it to a PDF. The website is targeted towards undergraduate to graduate-level students seeking an internship or job position, and not for high school students.

When the team conducted the design study on Chegg, we found that it had a limited number of internships for high schoolers. We investigated the top five results of typing a search query with the keyword and location, “Computer Science” and “MA” respectively, into an incognito tab. We repeated the process for four trials. We found that 14.3% of opportunities on the platform were outdated and 71.4% of the volunteer opportunities were irrelevant. Although most of the opportunities were related to computer science, the reason why the opportunities were irrelevant was that they required an undergraduate or masters student instead of a high school student. Companies such as Draper, BAE Systems, Raytheon, and Affectiva do offer internships for high schoolers but these opportunities are nowhere to be found on Chegg. Therefore, the platform is not suitable to search for high school internships.

### **2.1.3. TeenLife**

TeenLife is another website for teenage students to find summer programs. Students can search through keyword and location searches. When students click on an opportunity, they can view the overview and contact information for that particular opportunity. When students apply, they are redirected to the source website that shows more information. TeenLife lists over 650 diverse high school summer programs from universities across MA and over 600 programs in CA. However, other states such as New York and Texas have limited listings on the website.

When we conducted the design study on TeenLife, we found that it had relevant programs but these opportunities did not always meet the search criteria. We investigated the top five results of typing a search query with the keyword and location, “STEM” and “MA” respectively, into an incognito tab. We repeated the process for four trials. We found that 50% of opportunities on the platform were outdated and 25% of the volunteer opportunities were irrelevant. One reason why many opportunities were outdated was that the search was conducted during the summer when most programs were in progress or canceled due to the COVID-19 pandemic. There are many extra details about the opportunity including cost, start month, session length, and academic grade, but there is no way to filter for these details on the website. The website lacks advanced filtering features and a mobile application would make the process of finding opportunities more convenient. Nevertheless, we do plan to leverage the rich set of public information about summer programs available on TeenLife in HelpOut.

### **2.1.4. LinkedIn**

LinkedIn is a platform tailored for professionals and adults to post a professional profile, find jobs based on a variety of filters, and directly network with companies. It allows them to

search for jobs based on many filters such as date posted, company, location, job type, industry, title, and more. To apply for the job, LinkedIn users can click on the “Apply” button which directs them to the company’s application portal. Users may also create a professional public profile where they can display their education, jobs, and experiences. Unfortunately, this application is tailored for adults and professionals and not for high school students.

Given these findings, we have identified a strong need for a new platform for high school students to find relevant and up to date opportunities; our team aims to solve this problem.

## **2.2. Talent Platform Patents**

### **2.2.1. System and method for managing a talent platform (Chuang et al, 2018)**

This invention is an Applicant Tracking System (ATS) that would host and store job opportunities and allow employers to recruit across disparate platforms, thus streamlining the job searching process. Some main features of this platform include a talent “platform exchange” wherein employers and applicants can directly access the talent platform after finding a prospective job and apply in-app. This system is lucrative because it allows for efficient sorting and viewing of a wide database of job opportunities. However, some disadvantages to this approach include a lack of safety protocols for minors and only having data for talent platforms that consent to have their data used. Our team plans to impose stringent safety protocols for minors and allow organizations to market their opportunities separately.

### **2.2.2. Apparatus and method for providing job searching services, recruitment services and/or recruitment-related services (Joao, 2017)**

This invention is targeted for employees and uses an interface to display, send, and receive recruitment-related information over a website. This information would be stored on one

database that contains information on temporary job postings. Once the user has found a job posting they are interested in, they can select the posting to show additional information. The invention allows for an efficient way for users to find job postings they like, and then ask for additional information on them. It involves a one-way process— employees can ask for employer information, however, employers cannot search for potential employees. However, such a design does not include marketing tools for organizers and is not suitable for minors. Our platform would protect student safety by keeping organizer information public and allowing limited communication between organizers and students. Moreover, we would look to build an efficient database with sufficient information for all extracurricular opportunities, over multiple platforms in addition to a website.

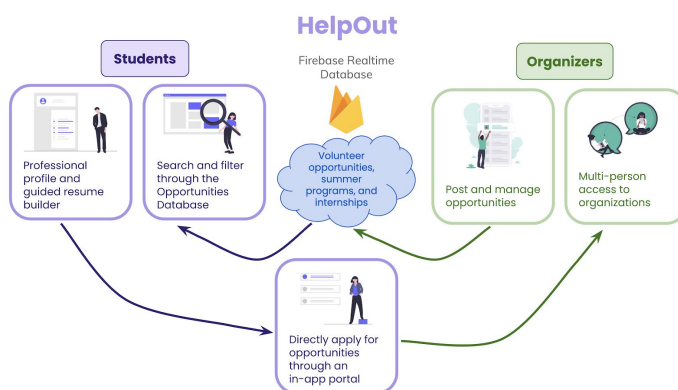
### **3. Invention/Proposed Solution**

To fulfill the aforementioned critical need, we plan to develop an intuitive, efficient, and inclusive mobile application platform for high school students to search, find, and apply to relevant extracurricular opportunities in the US and for organizations to market them to a broad high school student audience. We hope to empower all high school students, regardless of socioeconomic status, and help them discover their passion for community service, enhance hands-on research and skill development, and maximize students' chances of success in their college and professional careers. We plan to target the app for students in Massachusetts and California first and then expand to other states.

This vision will be accomplished through two major parts: a Firebase Realtime Database in the cloud and a front end application. The database will be used to store the opportunities and student and organization information. We plan to develop three front end clients: an Android



application, an iOS application, and a website. *Figure 2* below illustrates the key building blocks of our extracurricular opportunities platform HelpOut.



*Figure 2: The key building blocks of HelpOut.*

There are two user types— *Students* and *Organizers*. *Students* can search, find, and apply to the opportunities listed on the platform. Students will have access to a variety of search filters so they can narrow down to a suitable opportunity. They can also create a professional profile or resume that is exportable to a PDF. When students apply for opportunities, they can directly export their profile information to the associated organization through an in-app portal. On the other hand, *Organizers* can post and manage opportunities under a single organization. They can receive student applications on the platform as well.

The key differentiators of our proposed solution are:

1. A unified mobile platform that includes three types of opportunities: volunteer opportunities, summer programs, and internships for high schoolers – which currently does not exist in the market. Students do not have to visit disparate websites anymore.
2. Intuitive and saveable filters to help students narrow down to a suitable opportunity; these filters include opportunity type, specialized area, cost, location, apply deadline, etc.
3. A guided resume builder tailored for high school students to build a professional profile.

4. An effective interface for organizations to create and market their opportunities directly on the platform to increase the diversity of opportunities on our platform.
5. A user-friendly portal for students to directly apply for opportunities that interest them. Students can export their profile information to the identified opportunity. They would be able to view the status of their application, thus simplifying the process.
6. A safe and secure interface for high school students. Organizer accounts will be verified through verification links. Student profiles will be kept private, and opportunities can be removed by the detection of inappropriate terms or can be reported by students.

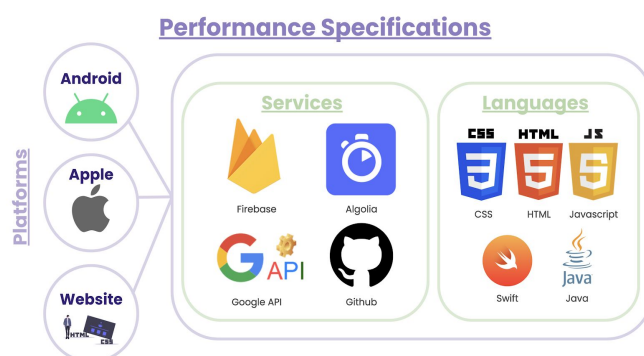
The Minimum Viable Product (MVP) will consist of the above core features. Other features that we hope to integrate are personalized recommendations for opportunities, a portal to exchange signature forms with the organization, a page for blog posts where students write about their personal experiences with opportunities, and notifications about new opportunities.

#### **4. Performance Specifications of the Invention**

We have started to develop some features of the proposed platform during the summer. So far, we have developed basic features for an Android mobile application using Android Studio. We have also started to scrape opportunities from the web to kickstart our small dataset of opportunities for students. We have collected 620 summer programs from TeenLife and over 130 volunteer opportunities from AllForGood, a volunteer search website. We have reached out to our community partners at the Mass Life Science Center, Worcester Tech HS, and Brockton HS among others, and plan to work with them during the development process for feedback.

Our approach leverages existing technology, and we hope to extend our feature set with the InvenTeams grant. We are currently using the cloud database tools from Google's Firebase

suite, which provides our application with efficient data storage, secure user authentication, and low downtimes. We are also using the trial version of the Algolia search API, which allows us to provide search query results instantaneously; it even has advanced features that allow for typing errors and has a 99.999% uptime rating. We also plan on incorporating the Google Maps, Routes, and Places APIs to our app in the future to provide rich location data (*Figure 3*).



*Figure 3: The main services, platforms, and languages our team plans to use.*

Our current Android app has a somewhat large reach given the ubiquitousness of the operating system. Since over 80% of high school-aged students use iPhones (de Looper, 2018), expanding our reach to iOS is crucial to achieving widespread adoption. The website platform would provide the same features as the iOS and Android versions; however, it would be better suited for students to write resumes and application essays and for organizers to manage opportunities and student applications. To develop our iOS application, we plan to use the Xcode IDE with Swift, and for the website, we plan to use the Webstorm IDE with HTML, CSS, and JavaScript. We have extensive experience building websites from scratch with HTML and CSS and developing Android applications with Java. We believe our existing experience with the aforementioned APIs and programming languages will help speed up the development process.

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