

Using the Mobile Application ClickHealth to Provide Accessible Healthcare to the Homeless

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ABSTRACT

Our Android application, ClickHealth, helps the homeless locate the nearest health care facilities to help treat their health needs. There were two stages to developing the app: researching/planning and developing. Our app has numerous features including a Google Maps view, markers which show the closest hospitals and drugstores, info pages about hospitals, and a favorites tab. ClickHealth provides all important information about each hospital in a convenient fashion, and without using too much data. ClickHealth will help reduce the number of homeless who are in need of health care because of the way it guides users to facilities that accept walk-in patients and allow appointments to be made over the phone.

Keywords

Homeless; mobile application; health; clinic; Android

1. INTRODUCTION

A 2010 nationwide survey found that 1 in 4 homeless people have experienced medical needs without appropriate care in the previous year [1]. A primary cause of the large percentage of unmet medical conditions lies in a lack of clear knowledge of the locations of medical centers in the area. Thus, homeless people are unable to find clinics or facilities that offer free or affordable health care.

ClickHealth is an application created to resolve the difficulty that the homeless population of Santa Clara Valley face by locating medical centers to treat their health needs. The application, made on Android Studio, features an interactive GoogleMap that provides the locations of nearby health care facilities. Patients can make appointments by phone for medical checkups by utilizing the application's contact feature. ClickHealth provides a convenient means of accessing information regarding a clinic's address, contact information, offered services, accepted insurance plans, and languages spoken.

The current capabilities of the application allow users to access the locations and details of health clinics while using a minimal amount of data, as the efficiency of data usage stands as a priority for the homeless when installing mobile applications. However, the developers aspire to add more features to ClickHealth so that it will serve as a central

means of locating services for the homeless in a data efficient manner. The application is in the process of creating additional features that will meet the needs of the homeless. Current updates of the application branch from ClickHealth's original medical intent, providing the locations of nearby drugstores that offer over-the-counter and prescription medication, as well as other supplies necessary to survival, including food, blankets, and clothing. Future versions of the application aim to provide a means for the homeless to find employment opportunities, housing shelters, and food banks.

2. BACKGROUND

2.1 Emergence of Mobile Phones in Homeless Community

Contrary to common belief, the developing integration of technology in society has allowed the majority of the homeless population to gain access to mobile devices, primarily mobile phones. Cell phone access has become so prevalent that a study conducted by Post et al of 5788 emergency department patients found that 70.7% of homeless patients possessed cell phones, compared to the 85.90% of patients with stable housing who possessed cell phones [2]. The emergence of mobile device use among the homeless introduces the capability of assisting the homeless population with their physical necessities, including finding shelter, food, and healthcare.

2.2 Difficulty the Homeless Face in Finding Health Care

The lack of accessibility of affordable healthcare in particular has become a rising concern for those who wish to assist the homeless. Homeless patients display interest in receiving information regarding alcohol/substance abuse, mental health, domestic violence, pregnancy, and smoking cessation, making non-emergency health care a necessary yet rarely accessible service for the homeless population [2].

Technology companies have deemed cell phones a powerful tool to provide emergency department services to the homeless. Mobile applications such as YTH Health offer access to vital health services to the homeless and

unstably housed youth demographic in the San Francisco Bay Area [3]. A 6 month trial of the application in Oakland, CA, produced successful results for YTH Health. The homeless and unstably housed youth who used the application reported that the simple user interface of the application and the application's ZIP code-enabled location services gave users convenient access to health services in a feasible manner.

A major concern for homeless patients who possess mobile phones is the need to save phone battery due to limited opportunity to charge. Homeless people surveyed by *The Independent* have reported frequently setting their mobile devices to Airplane mode, which cuts off use to Wi-Fi, due to limited opportunity to charge their devices, charging periods often lasting an hour every two to three days [4].

The success of existing mobile applications catering to the needs of the homeless and the feedback provided for such applications are promising to the future of providing health care, transportation information, and social interaction for the homeless. The features of our application allow the homeless to have more access to this health care.

3. METHODS

3.1 Application Purpose Planning Process

The planning process for developing ClickHealth involved a primary research phase that searched for the most common challenges that the homeless population of the Santa Clara Valley face. The developers of ClickHealth met with Gregory Kepferle, the Chief Executive Officer of the Catholic Charities of Santa Clara County Leadership, in order to discuss the main struggles that the homeless face in the area. Kepferle informed the developers that one of the main challenges faced by the homeless people that Catholic Charities serve involves finding adequate health care and locating medical supplies to treat their health conditions [5].

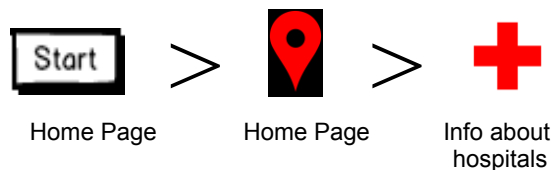


Figure 1. Application process

3.2 Technologies Used

Because a majority of the mobile phones that the homeless populations uses consists of Android devices [2], the developers used Android Studio in the process of creating and designing the application. The application design software Balsamiq was used in the initial design process of the development of the user interface (UI) of ClickHealth. The application utilized a GoogleMaps API to locate nearby clinics and health care facilities. The additional

features of the GoogleMaps API also allows users to directly receive directions from their current location to their desired destination.

4. RESULTS

ClickHealth offers patients the opportunity to access nearby health clinics and drugstores in the Santa Clara Valley. The application uses a Google Maps API to access their locations and includes all capabilities of an Android Google Map interface on the ClickHealth application.

The current interface directs the user to a Google Map with markers pinpointing the locations of any health-related facilities that are open to the public and offer services or supplies at an affordable price. Upon clicking on a marker corresponding to a specific location, the user will be directed to a window that displays information regarding the facility.

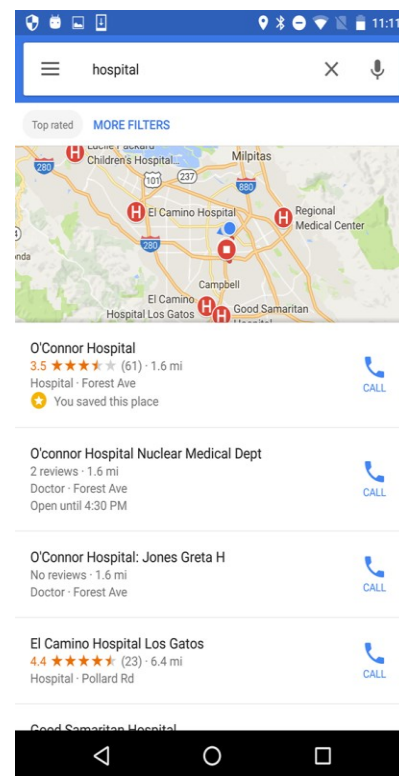


Figure 2. Maps Layout

Information windows for clinics offer details about the clinic's address, contact information, medical specialties, accepted insurance plans, spoken languages, and cost of appointments. The information page for each clinic also features a button that allows users to directly call the receptionist desk for the clinic to schedule an appointment or request to speak to a specific medical professional who works at the clinic. Information windows for drugstores offer information about the drugstore's address, contact

information, and the price of common supplies sold at the drugstore. Future versions of the application intend to inform the user whether the drugstore offers free medical services that homeless and unstably housed patients can utilize.

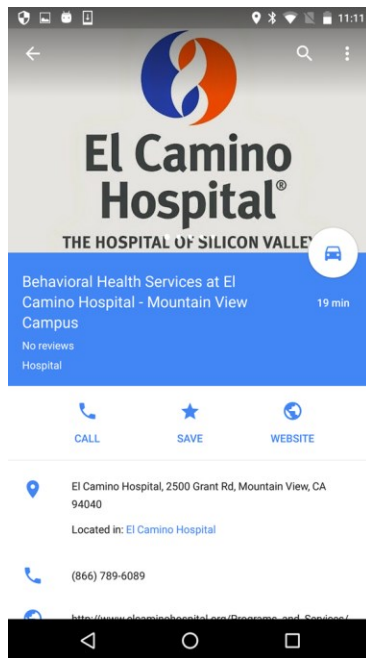


Figure 3. Hospital Detail

In order to allow more convenient access to facilities that the user commonly uses, each information page features a favorites button that allows patients to save the page of a specific clinic or drugstore. The selected information page is then saved into the favorites tab of the application, allowing the user to immediately call or access information regarding the clinic or drugstore.

The application currently focuses on using a minimal amount of data in the GoogleMap API, which meets the target audience's need to save data due to limited access to charging stations.

5. DISCUSSION

Overall, our application is something that can be useful to those who need help locating health facilities to go to when in need. Our features, such as the favorites button, can be helpful to those who stay in the same general area and want to save the names and locations of specific hospitals.

Our app is not only easy to use, but also provides all necessary information about each hospital, clinic, or drugstore. While one can find the nearest health care facilities online, our application reduces the amount of extra research one needs to do about each one. ClickHealth gathers the address, phone number, medical specialties, and allows one to make an appointment all on one page.

Because of how easy our app makes finding these facilities, it is a better choice for users than simply using Google Maps.

Future versions of the application intend to incorporate features that locate other basic necessities for the homeless, such as food, shelter, and employment opportunities. The developers are currently working on a version of the ClickHealth application that offers a more streamlined interface so that they are able to use specific maps that locate a corresponding necessity; for example, the application would include a separate map for available clinics, shelter, and employment opportunities.

6. CONCLUSION

The current prototype of the application allows convenient access to health care to the homeless, providing improved health conditions for the homeless population in the Santa Clara Valley. The application will improve the ability of the homeless to locate the nearest clinic without using an excessive amount of data. The efficiency of the application allows its users to preserve their remaining data so that they are able to utilize their phones for long periods of time.

7. ACKNOWLEDGMENTS

This work was supported by the Summer Institute for Humanitarian Computing (SIHC) held at Santa Clara University (SCU) for ten local high school juniors and seniors in the summer of 2016. Hosted by SCU's Department of Computer Engineering and Frugal Innovation Hub and funded by Google, the Institute's goal was to introduce students to research and publication by working with Catholic Charities of Santa Clara County to develop mobile applications that deliver meaningful information and services to improve the lives of people in underserved communities. The Institute provided instruction by a campus librarian in scholarly research using library resources, instruction by computer engineering faculty on high-level design and implementation of mobile applications, and one-on-one assistance from a technical writing instructor to help prepare this paper.

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