
HAM: Homeless Aid Machine

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Abstract

This project dealt with the problem of the lack of communication of information between homeless people and service providers in Toronto. The goal of this project was to provide homeless people with a tool that enables them to find thorough information about the resources available to them, at all times. We researched how homeless people currently find information about resources and if technology is involved. This research allowed us to design an interface that was appropriately accessible, considering the users' relationship with technology. We designed a prototype using this interface in the form of an ATM style touchscreen on outside walls. This solution contains thorough, location specific information about all different types of resources and service providers for homeless people in Toronto. The goal of this prototype is to direct homeless people to the appropriate resources in order help them with both their short-term and long-term needs.

Author Keywords

Homelessness; Toronto; Technology; Accessibility; Communication; Information; Resources

Introduction

Homelessness is an issue affecting large groups of people in urban areas, especially in downtown Toronto. Homeless people face extreme difficulties in order to attain the basic human rights of shelter, food, health, and safety. While there are many organizations providing various resources that homeless people need for survival, far too many homeless people are unaware that these resources even exist. Our problem space focused on the lack of communication between homeless people and the organizations and resources designed to help them.

Toronto has many charities, governmental organizations, and non-governmental organizations that offer shelter, food drives, medical treatment, governmental and legal support, education, and specific support groups for the homeless. However, homeless people are not always aware of or capable of seeking information about these available resources. Our initial research presented various problems that prevent homeless people from seeking help, including problems with mental health, accessibility, and communication. While technology can be extremely useful in finding information, it also adds a whole new level of difficulty with accessibility and communication. Our problem space encompasses these many different types of difficulties that homeless people in Toronto face when accessing information about resources.

Research

The goal of our research was to answer a set of questions, related to both the relationship between homeless people and the resources available to them, and their relationship with technology: What are the

resources provided to homeless people, and are homeless people aware of them? How do they learn about these resources? Do homeless people use technology? For what purpose? How can we improve communication between homeless people and the resources available to them?

In order to answer these questions, we used three unique research instruments. The first was interviewing homeless people panhandling in the street to discover their personal experience with the city's resources and with how they use technology. The second research instrument was administering questionnaires to people who volunteer or work at resources and service providers. The final research instrument was using indirect observation to record specific statistics about homelessness within Toronto and other cities.

Our research concluded that homeless people learn about the resources available to them from other homeless people, the internet, advice of professionals, and word of mouth. Nowadays, the homeless have more access technology such as phones and computers, but access to the internet is inconsistent. Professional advice is usually only found at resources, which is not available to those who are struggling to find resources in the first place. Learning about resources by word of mouth is not a quality source of information.

We wanted to create a system in which homeless people could rely on to find information about the resources available to them based on their current location. This system would be a free tool which prioritizes the needs of homeless people we discovered

through our research. It would be easy to use for people of all levels of technological skill and understanding, and be available throughout the city to reach as many homeless people as possible.

Prototype

When designing our prototype, our main goal was to listen to and adapt to our users' needs and abilities. From the research we did, we drew the following conclusions: the tool we're making needs to contain all the information that our users are looking for. This information needs to be exhaustive and accurate. What's more, we have to make an easy-to-use and intuitive tool, since a great part of our users might not be used to digital interfaces.

Our application should accommodate everyone in need. This is the reason why we decided to make it available in several languages spoken by the homeless community in Toronto. There is also a "speaker" option, designed for the people who have difficulties reading.

We decided to split the information in different categories, and to make those categories obvious, colourful, and illustrated on the home page. The simple design and use of icons to represent the titles of categories helps make the home page easy to understand. Our primary goal is that a user in need does not waste time seeking out the information they want.

Our prototype is mainly designed to direct homeless people to locations where they can find the help they need. From the categories displayed on the home page, the user is able to see a list of resources within the selected category. Useful information such as distance and open/closed are clearly displayed for each location, and is easily seen by the user. Once the user has selected the location they want to go to, they can find information as to how to get there, the schedule, and are able to print this information as many times as needed.

In addition, when necessary, the application asks the user for more information about themselves (age, gender) in order to direct them to a location that best fits their needs. This design choice follows a discussion we had with a homeless person, who had had difficulties finding a shelter that could accommodate her.

In order to ensure an easy navigation within our application, we decided to add "back" and "home" buttons on all pages.

Our application is a digital interface on a touchscreen. This touchscreen is on an ATM-like kiosk, located in the street, at locations where an important homeless community has been noticed. A speaker and microphone have to be included in the kiosk, for emergency 911 calls, as well as a printer.

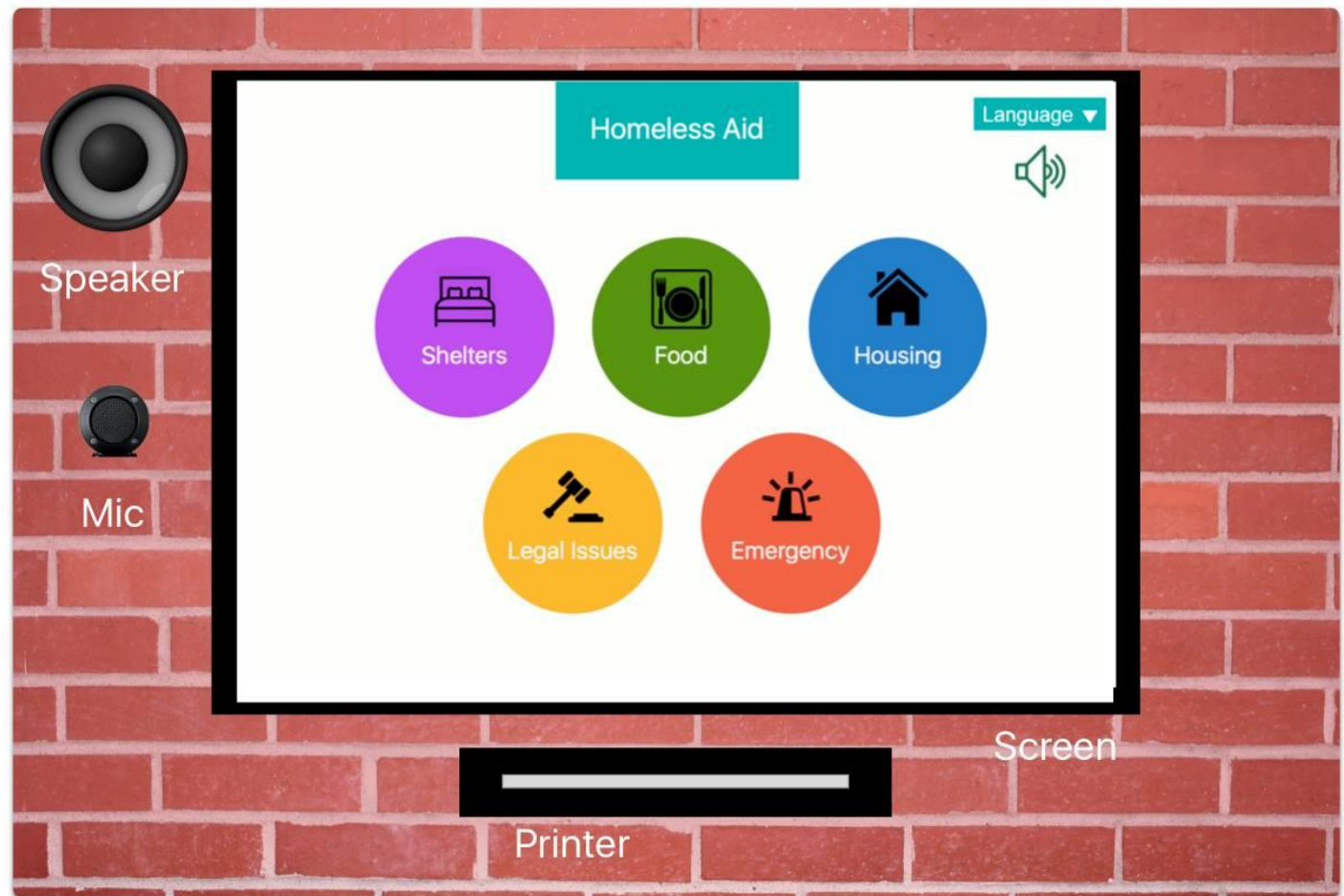


Figure 1 This what the prototype would look like on the outside wall of a building. The screen is a touchscreen. The printer is used to print information. The speaker and microphone are used to call 911 with the "Emergency" option.

Usability Testing

Usability tests were conducted in order to identify problems with our prototype. Before starting the tasks, the participants were asked to give their opinions and thoughts on the interface of the home screen without clicking or scrolling. Our results report that our home screen is intuitive, clear, and simple. They enjoyed the choice of colour and shapes and said that the simplistic design made the interface easy to navigate. Because of the relevant word choice for our categories and the intuitive name of our prototype, most participants were able to infer the purpose of the prototype without previous knowledge of our system. Also, they appreciated the icons for each category because it eliminates the issue where some users who are may have literacy problems. They were interested in knowing how many languages were available to see if the system is usable by speakers of any language. One main confusion that our participants had was the sound icon. One participant thought that with the sound enabled, hovering their computer mouse over the button would make the machine read aloud what is under the cursor, but this does not work in the context of a touchscreen.

Participants were asked to complete three tasks which they needed to accomplish by navigating through our interface. These tasks included:

1. Find a shelter that can accommodate you right now.
2. Print the directions to the closest food bank.
3. You are injured and need to call 911.

The first task required the participant to go to the shelters category, which opens a menu where you must

choose a filter based on your gender and age. After selecting the correct setting, a list of shelters appears. The user needed to choose one that was open, and then the task was accomplished. Most participants were able to fluidly navigate the interface, but one in particular made a mistake in the first step which led them to the wrong resource. Instead of selecting the shelters category on the home screen, they selected the housing category. When questioned about their selection, they claimed that the house icon on the housing button influenced their decision.

The second task required the participant to go to the food category, which opens a list of food banks and missions. The user needed to select the service with the lowest distance. On the page for that service, they needed to tap on the print button which makes the machine print out the directions to that service. Only a minor issue arose during this task. The closest resource on our prototype that provides food is actually a mission, and the participant chose the second closest option, which was a food bank. This error is primarily an issue of ambiguity of the task. If a homeless user were to use the system in order to find food, they are not likely to restrict their search to missions or food banks. But, they may trust the food bank option more than the alternative because the name of the service promises food.

The third task required the participant to go to the emergency category, click on the "Call 911" button, and wait for their call to start. All participants were able to complete this task with little effort. The word emergency and the red colour of its button were clear indicators that the button should be selected in case of emergency. However, one participant mentioned that it

may be too easy for a user to call 911. For example, if 911 is called and there is no serious emergency, that would be a misuse of the service.

We came up with solutions for the issues the participants had during the usability tests. First, we decided on the functionality of the sound button. When the sound is turned on, the user is able to make the machine read what is being selected by tapping on what they want to hear. If the user taps on the same thing once more, they proceed to the desired menu. When it comes to the difference between the shelter and housing button because we decided to keep them as they are because it is most likely that a homeless person knows the difference between the two. Furthermore, we concluded that the issue in task two was because the task was ambiguous. So, we left the list of food providers as it was before. One participant was concerned that calling 911 was too easy, so we added an extra step which warns the user that they must be in a serious emergency asks the user to confirm the call or go back.

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