Project Proposal

Digital Solution for Blind and Visually Challenged Individuals

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### Requirement

Blind and visually challenged individuals could greatly benefit from support in their daily activities that often gets them through new and unknown environments and situations. Their quality of life can be significantly improved through tools that increase their independence in travelling around the city, shopping, interacting with other people, or having fun. Design a digital solution that can provide such support in specific, relevant areas that you identify.

### Application Description

The application we are designing aims to increase the independence of blind and visually impaired individuals. Due to the lack of support on a day-to-day basis in public places, getting around without the help of another person is highly challenging for people with visual disabilities, even in the case of tasks that are fundamental for their basic needs. One solution in order to make their lives easier is to create smartphone applications, especially designed for their needs. In order to tackle part of the problem, we have decided to focus on designing a mobile application that offers our users guidance when shopping. Our proposal takes into account all the stages that are involved in buying groceries, for example. Therefore, the application provides help all the way from creating a shopping list and getting to the store to finding their way around the shop and proceeding to payment.

### User Description

In order to come up with an effective application, we need to firstly analyse the group of people it is designed for. Our solution is specifically tailored to the needs of blind and visually challenged individuals. Vision impairment means that a person's eyesight cannot be corrected to a normal level. It can be caused by a loss of visual acuity, where the eye does not see objects as clearly as usual. Therefore, the application should provide enough guidance for both people that have completely lost their vision and for people that have difficulties such as distinguishing exact shapes or reading.

Based on the fact that shopping for groceries, for instance, is a task that must be manageable by everyone, we aim not to restrict the targeted users. Therefore, the application should be intuitive and straightforward for both young and old people, with or without any previous contact with this sort of technology. The only specification is that users should have access to a mobile phone, which has trackable location and is equipped with a camera that is able to scan objects.

### Understanding the context

Blind and visually impaired individuals face several challenges when shopping due to their limited or lack of vision. These challenges can make the shopping experience significantly more complex and sometimes even inaccessible. Instead of simply assuming what difficulties visually challenged people have when shopping, we took a closer look at the context in which they are in and read some more about this problem. Here are some of the conclusions that we have drawn and some of the key problems that need to be tackled:

1. Inaccessible store layouts: Many stores are designed with visual aesthetics in mind rather than accessibility. Complex layouts, cluttered aisles, and inadequate signage can make it difficult for visually impaired individuals to navigate independently. They may struggle to find specific products or even locate essential store amenities like restrooms or customer service desks.
2. Product identification: Visual information plays a crucial role in product identification. Blind and visually impaired individuals often rely on braille labels, tactile markers, or assistance from store personnel to identify products on shelves. Without these accommodations, it can be challenging to distinguish between different items, especially those with similar packaging.
3. Inaccessible technology: Many retailers have adopted technology solutions like self-checkout kiosks or mobile apps for shopping. However, these technologies are not always designed with accessibility in mind. Blind and visually impaired individuals may encounter difficulties when trying to use these systems independently.
4. Visual cues and displays: Many promotional displays, sales signs, or marketing materials rely heavily on visual cues. These are often inaccessible to individuals with visual impairments, making it difficult for them to take advantage of sales or promotions.
5. Transportation barriers: Travelling to and from stores can be challenging for blind and visually impaired individuals. They may rely on public transportation, ride-sharing services, or assistance from others.
6. Payment and financial transactions: Paying for products and handling financial transactions can be problematic. ATMs, point-of-sale terminals, and payment apps may not be designed for accessibility, making it difficult for visually impaired individuals to enter PINs, sign receipts, or verify payment amounts.

Another factor that must be taken into account is the shopping store environment. Even though initial steps, such as creating a shopping list, are most likely done in quiet, calm places, the main task - shopping for groceries or other similar items - is performed in a store. This is an important factor to be considered as being outside is already stressful for visually challenged people, but even more so when they are in a crowded, noisy place. For this reason, it is vital that we provide enough information - either by sound or vibration - for them to feel safe and not overwhelmed.

### Already existing solutions

Here is a list of already existing applications that could be useful in completing certain tasks that we also aim to fulfil:

* Be My Eyes: this is a mobile application and service designed to connect blind and visually impaired individuals with sighted volunteers through video calls. Its primary purpose is to provide assistance in various daily tasks that may require visual information or guidance.
* Aira: it operates similarly to Be My Eyes by facilitating connections between individuals with visual impairments and sighted volunteers to assist with tasks, including locating airport gates. What distinguishes this app is its team of trained sighted users, who are specifically equipped to support blind or visually impaired users.
* Seeing AI and Lookout: these are 2 different apps, but their functioning is similar. One of them is available for iOS and the other for Android. They mainly read and describe documents, but can also be used for recognizing images, colours, faces and objects and providing a description.
* Evelity: this app is the first indoor wayfinding solution for people with a visual impairment to navigate in complex venues such as museums or universities.

The solutions described above are great ones and fulfil their purpose, but they either rely too much on outside help - even if that is met through the means of the internet, or they fulfil a very specific task. Therefore, in order to complete a more complex one, an individual would need the help of various applications.

### References

* Using smartphones applications as a solution to day-to-day problems:

<https://www.inclusivecitymaker.com/the-smartphone-a-revolution-for-the-blind-and-visually-impaired/>

* Apps that have proved to be useful for blind or visually impaired people: <https://www.inclusivecitymaker.com/apps-blind-visually-impaired-people/>
* Statistics regarding the number of blind and visually impaired people: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5820628/#:~:text=The%20prevalence%20of%20people%20that,estimated%20to%20have%20functional%20presbyopia>.
* Studies about shopping for blind and visually impaired people:
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