

An Approach to Design with People Who Have Special Needs

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Abstract. The main challenges when designing for people with disabilities are that 1) designers have difficulties empathizing with them; 2) designers tend to focus too much on the disability rather than the individual; and 3) people with disabilities have difficulties articulating their desires outside of their disabilities. A new approach is proposed to help designers overcome these problems. This involves getting insights from people without disabilities to understand the underlying desires of people with disabilities. Disabled people are then engaged as experts of their situations and invited to collaborate closely with the designers. This helps designers to focus on what people with disabilities want, instead of what they cannot do, and create solutions that have the greatest relevance and positive impact while maintaining minimal disruption to their everyday lives. The new approach is presented through the design process of “Blindspot”, a white cane that uses smart technology to improve the lives of blind people.

Keywords: people with disabilities, blind people, white cane, Blindspot.

1 Introduction

Imagine a blind person walking along a busy street with a white cane. Along the same street, a friend is texting on the phone. Without the friend taking the initiative to spot the blind person, they miss each other along the same street. A little further down the street, a long stick is carelessly protruding from a trashcan. Unable to detect the stick with the white cane, the blind person walks right into the stick, leaving a bruise on his face.

Now imagine the blind person walking along the busy street with a smart white cane. The friend has checked-in his location through a social network on his phone. A notification informs the blind person of the check-in through a Bluetooth earpiece. Among the choices of calling, finding or ignoring, he chooses to give his friend a surprise by finding him. The blind person is guided to the location of his friend with the help of the smart white cane. On the way, the long stick protruding from the trashcan is avoided with the help of a sensor on the white cane. The blind person finds his friend and said “hi”.

“Blindspot” is the smart white cane. It empowers blind people to locate friends who are nearby and can direct visually disabled people to their friends and/or any destinations. It can also detect overhanging objects not contactable by the cane. A new approach was used in designing “Blindspot” that expanded design opportunities and developed a solution that has impact. This paper aims to explain the new approach through the design process of “Blindspot”.

2 Challenges When Designing for People with Special Needs

“Blindspot” began with the traditional design approach of literature research, brainstorming and ideation, and user interviews. However, there were several difficulties in this process. Blind people have articulating their desires outside of their disabilities. The designer, on the other hand, finds it challenging to look beyond the disabilities of blind people and identify their real desires. Several assumptions about blind people were made because the designer couldn’t empathize with them.

Through research on existing products or conceptual design for blind people, some product problems were identified. Some of the products either made blind people look more handicapped than they already look, or try to hide all of the handicapped signs of the blind person. The products also do not consider what will happen if the technology breaks down.

3 New Approach

A new approach was developed to overcome these barriers and is described below.

3.1 Expanded Literature Research

There are a number of books and articles about the physical conditions of blind people and how to cope with blindness [1], [2]. However, most methods and approaches to designing for visually disabled people discuss technologies, interface design, etc. This research was sufficient for a start on the technicalities surrounding blindness; however it was limiting in helping the designer to empathize with the blind people.

Fictional novels or non-fictional bibliographies of blind people are better sources of literature to understand and empathize with them. These books [3]–[5] have more descriptive narrative about the emotional and mental state of the people, which are not typically articulated by the participant or observable through their actions. The books also give a better understanding of their capabilities and issues of daily living.

3.2 Comparison to People without Disabilities

The fictional and non-fictional literature research revealed a pattern that blind people want the same things as everyone else; such as social connections, convenience,

information access, etc. Based on this assumption, people without disabilities can be a reference to understand the underlying desires of disabled people. In designing “Blindspot”, the emotional needs of sighted people were used as a source of insight to identify deeper emotional needs of blind people that are hard to articulate.



Fig. 1. People with and without disabilities share the same desires

Insights were derived by asking the following questions:

- What would people without disabilities do in this situation?
- What would people without disabilities want in the same situation?
- What about disabled people in the same situation?
- How would disabled people achieve what they want in that situation now?
- If it's not possible now, how can they achieve it through design?

By concurrently comparing what sighted people want and what blind people can do now, several insights about the opportunities surrounding the unmet desires of blind people were identified. When comparing people with and without disabilities, it is important to compare between culturally and demographically similar people. That is, a European 60 year old blind person is very unlikely to have the same desires as an Asian teenager.

3.3 Interviews with Experts

Ideas and assumptions about blind people were verified through a professional expert on the “Blindspot” project. There are several benefits of approaching experts prior to the meeting with the blind participants. First, learning about how to communicate with blind people is important to avoid unnecessary misunderstandings. Second, experts have vast knowledge about the legal and administrative constraints with regards to blindness in the country. Third, experts can arrange suitable participants based on the project scope.

3.4 Validating Desires and Ideas with Participants through Interviews

The expert may not have an accurate account for issues regarding the emotional needs and desires of blind people. For instance, during an interview with a therapist for blindness, he mentioned that knowing the identity of people is not important for blind people. This contradicted what the blind participants said later in an interview.

Desires and ideas were generated through the literature research, and comparisons with sighted people. In order to validate the desires and ideas, interviews were conducted with blind participants. The following questions were asked:

- What would you do in these situations (related to desire)?
- Why would you do that? (validating desire)
- What if you could do this (new idea)?
- Why would you want to do this (new idea)?

Through repeated validation and refinement of the desires and ideas with blind people, the insight that was identified for “Blindspot” was that blind users want to initiate everyday social interactions but are unable to due to their inability to identify people around them.

3.5 Co-creating with the Disabled Participants Using Interactive Models

Blind people are then involved as experts of their situation in the creation of the design concept. When trying to present a concept to blind people, they often have difficulties imagining an idea. In addition, their suggestions are often limited to their knowledge of technology. Therefore physical and interactive models helped blind people imagine concepts better, and break through their limitation of technology knowledge. In a co-creating session, blind people were able to propose better features for the designs with responsive and interactive models rather than stagnant models.

3.6 Continued Collaboration with Disabled Participants and Experts

As experts of their own situation, people with disabilities can collaborate closely with designers to develop an effective solution. Blind people provided inputs from the

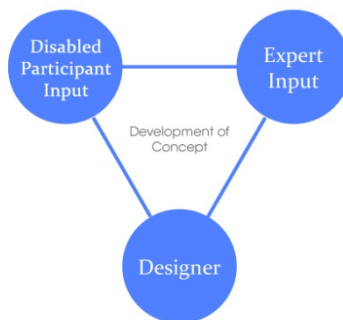


Fig. 2. Input from Experts, Disabled Participants and the Designer to develop the concept

user's desire standpoint, while the professional experts informed about legal and administrative constraints. This triangulated collaboration ensured that the problem to solve or the solution to propose was of significant impact to blind people's lives.

4 Conclusion

"Blindspot" broke through conventional norms of targeting solely on disabilities when designing for people with disabilities. Instead, it focused on designing with people who have disabilities in order to provide for their desires. It won James Dyson's Finalist Award 2011 and was the Netexplo 2011 Grand Winner. The approach helped identify deeper desires of blind people and created a holistic solution that can change lives.

In the future, the approach is likely to be applied not only to designing with blind people, but also people with other disabilities.

5 Limitations

This approach is developed based on one case study, "Blindspot". The case is also only focused on designing with blind people. The approach has yet to be applied to other projects, nor other cases of disabilities.

"Blindspot" is also a conceptual product that is not yet available for sale in the market.

"If you manage to design something that has a positive impact for one blind person, your design is likely to also have positive impact for most blind people."

– Quote from an interview with a blind participant.

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