

Connecting with Users through Multiple Design Research Methods

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1. INTRODUCTION

This paper explores a designer's expedition to better understand the aging population through multiple design research methods and the valuable insights he found through using those methods collectively. The initial stage involved the designer conducting a literature search which provided the designer better contextual insights which will be discussed in the introduction. The secondary stage of the expedition involved 'need' finding, which was facilitated through the use of photographic ethnography and can be found in chapter two. In this study the designer wanted to empathize with cane users. In order to do this the designer taped his midsection to simulate tight or arthritic joints. This experiment will be discussed in chapter three. Chapter four describes a list of qualities sought by cane users which was attained through personal interviews.

1.1. Independence

In 2003, 35.9 million people were aged 65 and older in the United States, which accounted for twelve percent of the total population in the US. This number is projected to reach 86.7 million by the year 2050, which will make up twenty percent of the total population (He et al., 2005). As the size of this group increases exponentially it becomes critical for them to maintain their independence because of the potential increases in the economic, physical, and emotional requirements involved. One of the biggest contributors to a decrease in independence is a lack of activity and exercise (Dunlop, 2005). As their ability to walk decreases through conditions such as arthritis or injuries, the need for assistive devices increases. Mobility aids, such as canes and walkers, are often used by older adults so that they can move about independently and maintain their balance (Bateni, 2005). Unfortunately, not everyone uses these devices. According to Phillips et al., 29.3% of all devices are completely abandoned because of a lack of consideration of user opinion in selection, easy device procurement, poor device performance, and change in user needs or priorities (Phillips, 1993).

It is important to maintain perceived independence. "Dependency in ambulating... [is] significantly associated with urinary incontinence in nursing home populations in most countries" (Sgadari, 1997). There is a huge economic and social impact of dependence.

"Older adults are at higher risk for many types of injuries that can lead to death, disability, dependence, lost mobility, isolation and pain. In 2000, the injuries incurred by adults age 65 and older will also have financial consequences including total lifetime economic costs of more than \$31 billion in medical expenses and lost productivity" (CDC.gov).

Self image is also important to consider. According to Hedrick, the Director of the Division of Disability Resources and Education Services at the University of Illinois at Urbana-Champaign, it is important to address how assistive device users perceive themselves relative to the prescribed device because their self image will usually win. They prefer not to be perceived as being less able and will usually limit their mobility by choosing the wrong device, or not using the device at all until they experience a fall.

1.2. Implications for Designers

With a growing elderly population in the United States and the world, it is important for designers to better understand who they are and what their needs might be. As individuals get older their bodily functions and abilities have a tendency to fail and those medical conditions become a part of their lives. It is imperative to design with the elderly user in mind and de-stigmatize the devices that they use in order to curtail further increases in assistive device abandonment. Designers need to afford the marketplace with products that encourage the maintenance of independence for the elderly.

2. Photographic Ethnography

The designer's first step toward a better understanding of the elderly involved observational research. This research was performed in residential areas through photographic ethnography. Photographic ethnography involves the immersion of oneself into the daily life of a small group, documenting what is learned and thought through photographs (Laurel, 2003).

The first observation was of a married couple. They are both seventy-nine years of age and are both limited by their abilities. Observation of this couple afforded the designer with great insights into their daily lives and potential product opportunities (Abrams, 2000). Those opportunities will be discussed in the product opportunities section.

2.1. Product Opportunities



Figure 1. Opening packages.

2.1.1 Packaging

Most 65- to 85-year-olds have dreams and aspirations and they enjoy life, but they are not as strong physically as they once were and sometimes tend to operate on diminished faculties. Many suffer from diminished grip dexterity and strength, which makes opening any variety of packaging quite difficult. Cereal boxes, candy wrappers, and shrink wrapped items are opened with knives and scissors because they cannot grasp the ends of the plastic to open the items. Jars and milk jugs are especially difficult because of the strength required to open them. Hot water, jar openers, towels, and knives are used in an attempt to open them, but sometimes those do not work. The designer was asked on several occasions to open a variety of different packages during his observations of the elderly.

Product Opportunity

Develop an entire line of universal packaging designed to facilitate the opening and closing of products.



Figure 2. An elderly woman using the Internet.

2.1.2. Internet Independence

The seventy-nine-year-old woman in Figure 2 enjoys her time on the internet and spends around two hours a day checking her email messages and opening the interesting attachments that come with them. It gives her a sense of connection with her friends and family. It also gives her a sense of independence

from her husband. Her computer is configured to be almost fool proof and all she has to do is make a few clicks with her mouse and she can check her email. Her niece made it so that the process was intuitive for her.

Product Opportunity

Design a user interface to be intuitive to navigate in order to facilitate internet independence.



Figure 3. A rehabilitation center visit.

2.1.3. Adult Incontinence Product Experience

The designer spent an afternoon at a rehabilitation center and spoke with several employees and residents there. When nurses were asked what they would improve about their jobs, the responses were unanimous... improve the adult diapers. "Make a brief that works... they all leak all over the place," said one nurse. "I can't think of anything else that needs more improvement..."

Product Opportunity

Reduce the negative experience of incontinence.



Figure 4. Stroke-recovery victim observation.

2.1.4. Stroke Recovery Assistance

The designer also observed a stroke victim for half a day. She had a stroke about a year before and had taught herself to read, write, and speak again. Her left side was paralyzed after the stroke and she has trained her muscles how to function again.

Product Opportunities

Design the exercise experience to avoid strokes.

Develop products to assist stroke victims along their journey back to independence.



Figure 5. Cane-use observation.

2.1.5. Mobility

The man in Figure 5 enjoys life and the simple pleasures of working around the house, but he has spells of vertigo that have led him to take a few falls in the past few years. Some of these falls have resulted in further injury. Currently, he uses a cane or walker to stay mobile. It is challenging for him to use a walker because it affects his pride and he prefers to use his cane, even though the walker is safer and more stable.

Product Opportunity

Redesign the experience and visual appearance of cane walking to encourage the product's use.

2.2. Cane User Observations

The designer decided to pursue the design and development of the cane user experience and delved deeper into understanding that experience through cane user observations. The findings will be briefly discussed here. Some use their canes occasionally when they feel they are losing their balance; others need to use them chronically. Some use them in a contralateral manner and others use them in an ipsilateral manner, even though therapists and doctors suggest that they use them in a contralateral manner. While walking with the assistance of a cane the user's arms and shoulders are used extensively and could potentially be injured.

3. Empathic Modeling

It is important for designers to better understand product user's needs in order to develop better products. Empathic modeling is a research method that allows the designer to potentially empathize with the user and ultimately come to a better understanding of a user's needs. Empathic modeling involves the use of a restrictive or inhibitive device that limits a designer's abilities. This allows designers an informal way to test their ideas or prototypes for usability challenges (Poulson, 1996).

In this exploration the designer wanted to empathize with cane users. In order to do this the designer taped his midsection and joints to simulate tight or arthritic joints. The designer also used glasses to impair his vision and sense of balance. The designer then went about his daily activities and found various challenges and benefits to using a cane.



Figure 6. Empathic cane walking, bending, and door handling.

Findings

The designer reflected the following after he used the cane:

“The cane felt clunky and I almost tripped over it several times. I tried a few different models, but the one that felt the best was the lightest and least expensive one. The cane did come in handy when I lost my balance, or when I was going down stairs. I had to think to use it properly and different terrains like grass, or gravel were difficult to address. Simple tasks like picking something up or opening a door become much more difficult.”

4. Cane-User Interviews



Figure 7. Cane-user interviews.

In an effort to better understand why cane users do not like to use their canes the designer conducted interviews. Cane users were also questioned in regard to the qualities that they would like a cane to have. The participants ranged in age from 50 to 89 and had been using a cane for at least a year. The interviews were very rich with insights and were used in the decision making process of the final design (McCracken, 1988). In one of his interviews with a cane user, the interviewee inspired the designer. The interviewee, in response to the question ‘how do you feel about the canes on the market today?’, said, “They’re hospital-looking . . . why not get a beautiful cane that is decorated just for you?” (Osborn, 2007). The majority of cane users (and non users) the designer had spoken to had different desires and wishes for their canes and he felt that each person would want a different design. What speaks to one user may not do so to another. Cane users need to feel ownership in the cane design so why not involve them in the process? The designer, through interviews, felt that encouragement of use could potentially be facilitated through users getting involved with the design of their own cane. The process should be so stimulating that it gets them excited about their cane design and anxious to receive it in the mail.

What if cane users could design their own canes? They could pick the style, sizes, materials, finishes, and colors and have their own cane to be proud of. At the cost of \$30 more why not have your own conversation piece of a cane? What if the design was modular and allowed the user to customize his/her own design? What are the qualities that elderly cane users are searching for?

4.1. Desired Potential Cane Qualities

Comfort

In interviews cane users made comments like these: “The handle should distribute the weight well” (Hedrick, 2007). “The grip should be comfortable” (Brown, 2007). The handle should be comfortable and distribute the weight well.

Adjustable

Keeping in mind that everyone tends to be anthropometrically different, the designer felt that it was important to offer different sizes of handles to potentially accommodate most users (Tilly, 2002). The majority of cane users that were interviewed rated adjustability high on a list of potential cane qualities. Each user is a different height and should be accommodated. The handle should also be adjustable in order to potentially accommodate the different angle preferences of each user. This also accommodates left and right handed users. If the users wish to change hands they simply loosen the screw and click the handle to the desired angle and tighten the screw again.

Strap

The designer initially questioned the need for a strap, but in his interviews it was mentioned that it is important to be able to hang the cane somewhere when it is not in use. "If I am in line at the cafeteria I need to be able to hang my cane on my wrist or something....so it needs a strap or a hook or something so it does not fall when I set it down" (Evans, 2007). Although the designer did not feel it necessary to provide a strap, he did feel that a hole or clip should be incorporated into the design to afford the possibility of applying a strap to the device.

Aesthetics

"I want a cane that looks good" (Evans, 2007). One particular interviewee when asked to tell how he felt about different shapes the designer developed said "I've never seen one like that one on the right, but I like it." In order to persuade users to use their canes they should be proud of them. There is no better vehicle for this than aesthetics. "Things satisfy all sorts of physical and emotional needs in us.....Our dependence upon things is not merely life-saving and life-enhancing it confers upon us the dignity of our human status as well (Akhta, 2005) ." The aesthetic goal should be to develop a cane that will embrace this dignity and be an instrumental object that its users could be proud of.

Colors

The designer wanted the user to have a variety of colors to choose from on each piece of the cane. If they want everything to be a different color or similar colors the modular design allows for this to take place.

7. Conclusion

By using multiple methods the designer found that it is extremely important to not only get involved with users, but to actually perform the tasks that they are doing, and ask them about those specific tasks and the objects involved. In this competitive global economy it would potentially be detrimental to simply rely on one research method and it is recommended that multiple methods be used in a judicious manor. Each user, environment, and task might be better understood using a different method and thus triangulating the research findings. There is no one method that can address every challenge and designers should consider using multiple methods to potentially add to the breadth of their understanding. Multiple design research methods enabled the designer to gain valuable insights into the cane user experience. Photographic ethnography made it possible to document various interesting interactions and potential needs within the cane user's context. Interviews made it possible to elicit more needs and better define the qualities of the cane that users are looking for. Empathetic modeling afforded the designer with better understanding of the cane user experience and broadened his empathetic horizon.

This process was motivated by the designer's initial observation of a cane user and how using a cane affected the users' pride. He felt that through design, cane users could be encouraged to use canes by reducing psychological barriers. The multiple methods used broadened his understanding of this challenge and afforded him a substantiated list of cane qualities which could potentially encourage the elderly to use them when needed.

7.1. Future Considerations

The designer will take these qualities and develop a design proposal and have it prototyped and evaluated among the elderly population. This would involve developing five to ten prototypes to be tested for a period of a week at cane user's homes. The cane users would be asked to use the prototypes for that period and then give feedback to the designer. The feedback from those interviews would be selectively incorporated into new designs.

It is also proposed that the designer continue to collaborate with persons from a variety of different backgrounds in order to further develop the cane design. The designer enjoyed connecting with users and would like to continue to gain a better understanding of the elderly population through qualitative research methods.

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