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INFO 608: HCI

Week 3 DOET Digest: Designs Influence on Human Behavior

Over the past few weeks, I have reflected on Don Norman's writings regarding discoverability and understanding in design. To further understand good design, we must understand the fallibility of humans, when it comes to human-computer interaction, and the importance of solving the right problem in design. In Chapter 6 of *The Design of Everyday Things*, Norman discusses the Design Thinking process and how the ideal design process includes iteration. One of the reasons designs iterate is to improve the user experience. Likely, devices need to improve because humans err. While errors are never able to fully be avoided, designers can implement practices and certain considerations in their designs to prevent them from occurring.

Before we can understand how to design to prevent errors, we need to understand the nature of human error. There are two types of human errors that are discussed, slips and mistakes (Norman, 2013, Chapter 5). In design, the idea is to design in a way that reduces error and, when slips and mistakes occur, prevents devastating outcomes. Slips tend to be errors where the wrong action was attempted. Mistakes, on the other hand, occur when the wrong plan or goal is executed. (Norman, 2013, Two Types of Errors: Slips and Mistakes) As mentioned in Chapter 5, slips are more common in skilled people and mistakes are more common in unskilled people; relating to the goals/activities they are attempting in the interaction (Norman, 2013). Because both skilled and unskilled people will use designs, it is important to consider and observe all types of demographics, a concept we later learned to be universal or inclusive design.

Audiobooks are a good example of an inclusive design. In the past, individuals with visual impairments may not have been able to read books. Large-print books are an alternative reading method for the visually impaired, but present two issues: they don't support all people with vision loss and people may not want to buy the large-print books as it admits their impairment (what is referred to as the Stigma Problem in Norman's book). Not only do Audiobooks aid the visually impaired, but they are usable across all groups of people. Audiobooks are for everyone - they are for people who want some entertainment on a long car ride, those who may not like reading but like stories, those with reading challenges, and so on. This makes the design successful. It also reduces human error because it is easy to listen to an Audiobook. If you have access to a device with audio-capabilities, it is easy to download and play the Audiobooks.

There are many other ways to prevent errors when people are interacting with devices. The best way to reduce costly accidents, that result from human error, is to layer on multiple prevention methods in the design. With multiple prevention mechanisms, when people make errors, they are less likely to cause a mishap. This is known as the Swiss Cheese Model (Norman,

2013, Chapter 5). Norman describes many prevention methods throughout the book, and they include:

- Add constraints to block errors
- Allow for people to undo or reverse operations
- Provide confirmation and error messages to inform the user (allow them to correct)
- Provide sensibility checks
- Enable people to pick up where they left off when they get distracted
- Keep in mind that people and computers are collaborative systems
- Provide checklists
- Reward safety
- Support an environment that enables the detection and acknowledgement of errors without punishment.

(Norman, 2013, Chapter 5)

The last one stands out to me as the most important but also the most challenging. The reason it is the most important is that it is the best way to understand human needs, behaviors, and capabilities. The reason it is the most challenging is because societal, cultural, and competitive pressures prevent people from reporting these errors until there are devastating results. While we are quick to blame humans for errors, we often do not report or admit to seemingly minor errors out of fear of retribution. This systemic issue prevents designers from being able to incorporate the necessary measures, such as constraints, into the devices. I theorize that if one person made an error that they are likely not the only one. People have similar conceptual models and experiences as other people in their demographic. Therefore, they err in similar situations.

For instance, my team uses an internally built whiteboard tool. It is not easy to use. During our training events, we received a lot of survey feedback about the trainees' dislike for the tool. There was no help or "how-to" article. The biggest issue faced was in lack of knowledge on how to scroll left/right and up/down. Zooming out seemed to be the only option, but then the charts and text became unreadable. Luckily, one day, one of our trainers discovered how to achieve the desired functionality. Now, we rarely see any negative comments about the tool. Unfortunately, this knowledge is not in the design and thus, became knowledge in the head. We did write it down for our user-group, but this does not help others in the company use the tool. While this may seem like a minor nuisance, it deters employees from using the internal tool and drives them towards tools that may not be approved for company usage. This is risky because it could lead to a data breach.

While this may not ever be resolved in the design of the tool, I would like to discuss how this tool could benefit from activity-centered and iterative design. The whiteboard tool is not a new, radical concept. Thus, if this tool is to be successful, it needs to enable the actions intended by its users. If this internal tool was developed externally, it would likely have failed. This is because there are many competitors out there such as Lucidspark, Mural, etc. However, given that it has limited competitors within the corporate ecosystem, it could benefit from some enhancements. Primarily, either adding some information on how to use the design to achieve certain actions, like scrolling around, or by making those actions more intuitive and flexible. The designers could iterate on this base model by observing people as they use the

tool. Norman describes iterative design as a powerful tool (Norman, 2013, Two Forms of Innovation: Incremental and Radical, para. 1).

The reason that human-centered, activity-centered, iterative, radical design processes are effective is because the Design Thinking process is powerful. It is aimed at solving the right problem and not the initial problem the designers were presented with. Earlier in his book Norman mentioned that people often don't know what their true needs are (2013, Human Centered Design, para. 4). Fortunately, designers are trained to observe and identify these needs by following the four stages: observe, ideate, prototype and test (Norman, 2013, Chapter 6). The challenge is time and money.

Most recently, I was tasked with re-designing our train-the-trainer program. As I only had one month and no budget, I conducted a rapid design thinking session with our trainers. I followed the double-diamond approach by diverging on a list of problems and selecting a few core issues, and then again diverging on ideas for those problems before converging on a few solutions. I did this by asking the trainers to describe their experience with program, from which I identified a list of problems. I found this approach to be beneficial as I discovered new problems and found creative solutions. Regardless of not having time or budget to test, I found utilizing this design approach beneficial.

Despite the seemingly numerous challenges to design and the nature of human error, Norman emphasizes the importance of the field. The rapid advancement in technology helps humans and keeps pushing society forward. Design is a multidisciplinary field and applies to much of everyday life. I believe that it is often in people's nature to solve problems, with which design is at the core of. The key to a successful design is one in which solves a true problem and addresses human needs, as well as can be easily integrated into everyday life.

References

Norman. (2013). *The Design of Everyday Things: Revised and Expanded Edition* (Rev. and expanded ed.). Basic Books.