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Reflection

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Building a Digital-Physical System

The process of building a digital-physical system begins first with understanding a problem that needs to be addressed. Understand who your user will be and how you can cater to their needs. It would be important to also understand the abilities of the user-- or their health and age. In order to figure that out, you need to do some research, which can be done in many forms. One such form of research is an ethnography in which you can collect data by making observations, conducting interviews, or having your potential users fill out a questionnaire. From the data you collect, you can then analyze the trends and identify and group the different chunks of information. Then, from there decide on a concept that you feel confident that you can come up with a potential solution for. For our group project we analyzed our collected information and grouped the information into categories in which we believed each of the listed items bore some similarity or relationship to. Individually we decided on the topics that interested us. Each of us then quickly brainstormed some ideas. During the brainstorming stage it is important to get out all ideas without criticizing ones self – get all ideas out no matter how silly they may sound. After that, as a group we reviewed each other's ideas and offered our feedback.

Once you've brainstormed ideas for a concept, you can then begin building interactive versions of it and evaluate implementations of it, going through many iterations to develop the concept. In the end we pick one concept and stick to it. We continued to alter the ideas to get to the final concept. It would help to make a persona, a story of who the user will be and how they will use the product. This also helps you to think about its use and to understand who the user will be, and to think about how the object will be used -- it helps to think about and develop the concept and understand the use of the object.

Once you have your concept, you begin to design the model's actual form and design for its function. In designing the object there are many consideration one needs to make. Probably the most important consideration is that of ethics. Is the concept ethical? Does the object compel some one to perform an action that they would not like? Or enable them to do harm in any way? Obviously, you wouldn't want an object that does any of that. The object should be non-intrusive

and should try to blend into the objects -- as if to become more natural.

As for the aesthetics of the design, you may want to think about how the object will be perceived. First impressions of the object matter, and can bias the users judgment of the object. People seem to equate better design with greater workability and people like objects that are more attractive.

When designing an object you need to think of what its affordance will be. The object should give clues as to how it will be used. Objects should also be designed with error in mind, thus minimizing the chances of the user committing error. Users may make mistakes, therefore good design will allow the user to step backward and correct the mistakes, or make terrible mistakes harder to accomplish. A well designed object should also provide its user with feedback, which can either be in the form of sound or something visual, perhaps a change in color. Feedback is important so that the user will be assured that they have performed an action correctly and can give other cues as well. Sound needs to be considered as that can be very effective in the design and the sound chosen needs to be appropriate to the action being performed. In addition, sound may also make the object more interesting. You would have to consider what functions make what sounds to ensure that the sound makes sense to the action.

While designing the object, you need to consider whether the object will demand attention or be glance able. Ideally for an ambient system, the system should not be intrusive or demand attention. The object shouldn't try to take on too much. It should be a simple object that performs one (or maybe a few) functions and perform it well. In designing the object, it might be nice to think of a metaphor for the idea.

Perhaps the goal of digital physical systems is to move the user away from the computer and make the digital a natural part of life -- so that the digital becomes embedded in everyday life, though in an non-intrusive sort of way. It might be that the best way to bring the digital seamlessly into the physical environment in the most natural way possible is by embedding the digital into already existing physical objects. Some examples of these objects are: the 'show-me' shower meter, and the wearable fashions we looked at in class.

Another consideration is whether or not the user will find pleasure and enjoyment in the design and function of the object. One example is the 'follow-the-lights' experiments -- the 'twinkly" lights. People appreciated the lights on the floor as that was both aesthetically pleasing and fun while encouraging positive behavior all in a way that was natural -- the participants may

not have noticed the behavior change but had fun avoiding the stairs, unaware as they were intrigued by the organic patterns of light.

The object should probably allow the user to reflect upon their behaviors and encourage them to make positive change. The example of the ambient system, Breakaway, does just that in an non-intrusive manner. It senses how long a user is sitting in their chair and slowly curls up, visually demonstrating to the user how 'harmful' long hours of sitting can be for their spine. Thus, encouraging them to take breaks more often. The 'show-me' shower meter also allows the user to become more aware of water consumption while showering and creates a feeling of responsibility upon the user, encouraging the user to change their habits for the better -- it encourages sustainable practice.

Other considerations for the design can be that of the psychology of the user and how a thing is culturally perceived. You would also have to consider how the object will feel and how the things will fit together as a cohesive object. One example comes from wearable objects. When designing something a user will have to wear, you would have to consider whether it is a thing that the user would want to wear. Is it aesthetic and is it comfortable? Does it help the user maintain his or her identity? The wearable object should feel natural and be a part of the outfit or the body itself. You would also want to consider how the object will effect the user cognitively -- will it cause them to become distracted or lose attention, or result in other kinds of cognitive consequences?

Cultural considerations may be how are colors perceived? -- what are the cultural meanings of them? What are the values of a culture? Color is also a psychological consideration. Other psychological considerations include how the working memory functions. You probably wouldn't want your object to demand too much from the user.

The more constrained the design becomes, the more it will enable you to be creative. Once you believe you have reached an end to the design, you cannot really be 'finished' as the design can always be improved. Design takes many iterations.