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Reading 1:

Prototyping for Physical and Digital Products

Kathryn McElroy writes an excellent piece on the value of prototyping and the different stages it comes with. McElroy explains the different ways one can prototype depending on the discipline. For architecture, prototyping included various sketches, form studies, and aesthetic models. Whereas prototyping for personal electronics includes sketches, component testing, and material testing. Every discipline holds a number of different prototyping approaches. Each prototyping technique is used to resolve specific problems, derived from tests. Tests are a great way to discover alternatives and decide the final direction. According to McElroy, it is important to have a basic understanding of a target market and an experience goal before doing any sort of prototyping. The goal is to continuously generate prototypes as it gives you the ability to test specific areas and question your design process. McElroy states a number of different reason why we must prototype. The main reason is to test and improve. Since prototypes are disposable and easy to generate, one can dig into specific problems as they have the freedom to think of diverse ways to solve and refine ideas. Another reason as to why we prototype is so there is ongoing communication between your team and potential users. Showing your team prototypes rather than verbally presenting ideas limits the circulation of miscommunication and misinterpretation. Everyone accurately understands the idea and the direction of the project. Furthermore, they can give immediate and direct feedback. Constructing various prototypes ensures that the end user is always at the centre of the process. As one builds, they get a sense of what the user will endure. It's an easy and inexpensive way to validate the product. Moreover, it is much cheaper to make changes during the early prototyping stages than nearing the final product. McElroy continues to explain the differences between physical product and digital product prototypes. The physical products have a high importance of materials and environment while the digital focus more on figuring out what components are needed, how they will work together, and acknowledging possible inputs and outputs. However, both instances practice three levels of fidelity to prototype. The first level is low fidelity which has no similarities to the final product. It uses cheaper mediums and inaccurate sizes. The main goal of the low fidelity stage is to test basic notions like architecture, navigation layout and organization. The second level, mid-fidelity, is where the prototype begins to look like the final product, including cost and value. This level makes it easy to navigate throughout the whole product and is great for testing. Finally, the final stage is high fidelity. This stage includes the final medium, final code, and high-quality industrial design models. At this point, there are only tests on small details. As McElroy explains, it is very important to make people test these prototypes since you will be able to note their micro-expressions, examine the emotional response to the experience, ask important establishing questions (which allows you to understand the users background and biases) and feedback questions (which allows you to understand what they were expecting and any possible issues they were having). All in all, prototyping is the best way to improve a product and is a core will all designers should hold.

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Reading 2:
Designing for Emerging Technologies

This reading explains how the sudden emergence of disruptive technologies has positively affected human interaction while negatively affecting the economic order. The Internet of things, robotics, 3d printing and genomic and synthetic biology, specifically show potential to generate change in our society. the Internet of things represents the communication between machines. It has generated a large pool of endless amounts of data. As more digital devices are invented, more-and-more data will be stored. Especially now with the new wave of wearables, more data will be housed in these pools. Robotics represents the construction of robots. These robots will be used for labor-intensive work while being monitored. 3D printing gives the ability to create objects rather quickly and cost-efficiently for various domains like medicine, for example. It is now possible to 3D print prosthetic attachments and even organs. Genomic and synthetic biology tackles the idea of building the human using DNA, as well as generating drugs that target specific illnesses which in turn can affect human biology. With the emergence of these new technologies also emerges new demands from designers. It is very important that designers are willing to learn new materials and techniques regularly. Every day new techniques and programs are being invented therefore it is the designer's job to stay up to date and understand them all. Designers are also expected to be able to identify problems, be system thinkers, consider and project future occurrences, be able to work at a number of different scales, be able to successfully connect people with technology, be able to influence change, be apart of a cross-disciplinary team, and not be afraid to take risks. These key qualities are part of the eight design tenets which one needs in order to properly work with emerging technologies. It is necessary to follow these eight elements as they ensure that the experience people have with technology remains clear and enjoyable. These new innovative technologies generate drastic change, positive and negative, that not everyone will be ready for. It is the designer's job to ensure man and machine connect well together.

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Reading 3:
Fashion with Function

In this chapter, Michal Levin discusses the next big wave in technology which is wearables. Wearables are electronic and sensor devices that are designed to be worn and attached to the body. Up to date, the dominating themes in wearables are sports and fitness trackers, health and medical sensors, smart watches and smart glasses. Unlike smartphones which are seen as an attachment to the human body, wearables are complimenting the human body and enhance our everyday life. For example, health and medical sensors monitor heart rate, respiration rate, temperature, emotional stress, and dehydration. Having these instances recorded allows us to follow our health and if something is wrong, we will know immediately. As wearables emerge, the more we recognize how they impact human interaction. A new way of connecting people, devices, and content surfaces alongside these new devices. There are four factors to consider when designing a wearable. The first factor is visibility which relates to the attractiveness of the object. It is important to focus on the user interface design and the industrial design as they are both equally important since they depend on each other. the second factor is role which relates to the different roles a wearable can play. A wearable can either be a tracker (wearable monitors user's state and collects data), a messenger (wearable displays alerts or messages making it quick for the user to receive information), a facilitator (wearable saves the user time as it facilitates certain elements which are already found on the smartphone), and finally, a enhancer (the wearable enhances a real-world experience for the user by digitally manipulating it. One can choose more than one role for their wearable however it is important to consider the size and space limitations. The third factor is display-on-device which is associated to understanding which is the right display treatment for your wearable. A wearable with no display means there is nothing inputted or outputted from the device, therefore, there is less to no user interaction. Since there is no display, the design is important. A wearable with minimal output display returns more visual feedback, usually using LEDs. Lastly, full interactive display contains a full display, input, and output. Since there is a small display, there must be multiple, clear input methods for the wearable to rely on. The forth factor is the interaction model which is based on micro-interactions. Overall, when designing a wearable, the focus should be on the core of the device and being able to deliver it through a simple UI. In terms of design, less is always more; wearables are supposed to be light and sleek.

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Reading 4:
Design for the Networked World

Technology is advancing every single day and is increasingly changing our understanding of reality. Networked technologies have affected our lives immensely to the point that it has given us up to a ninth sense. Smartphones, for example, are addictive and have become one of the most essential items for everyday use throughout the world, according to studies. Smartphones keep us connected no matter where we are in the world, they are like safety blankets that people carry around so they never have to feel alone. While smartphones get smarter and emerging technologies get more complex, it is important for designers to understand all aspects of these new environments. Machine to machine communication is the key to successful interactions therefore, designers have to take into account all the various objects that run in our environments rather than just the human. We can compare this to the 1960's when artists began illustrating interactive art; these artists thought about how the objects interact with the audience and the environment in order to create a conversation. This illustrates how it is the designers who pave the path for the future. Traditional design is no longer as powerful which is why the foundations of design needed to be reassessed and improved. Texture now reflects how well different components work with one another. If the elements flow together, the texture is seen a smooth, else, the texture is rough. Agency accounts for the amount of power a user can apply to the different parts of a network. Opacity reflects how clear it is to understand the workings of a network. For example, a computer is seen as opaque since the componentry is hidden inside whereas breadboard circuits are transparent since we can follow the flow of power. Finally, reflectivity accounts for how a network or system provides feedback given the actions. In order to successfully work with all these new technologies, a designer must be ready to experiment by testing new programs and make prototypes, to learn new skills using tutorials, and to be critical by considering how a product fits into the connected world. This new era of design brings in new opportunities and challenges which everyone should be eager to encounter.