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## Reading 1 – Prototyping for Physical and Digital Products

This reading focuses on prototyping, what it is, why it is important, and how it works. Prototyping is indeed an essential step in the making of a physical and/or digital product as it lets one test and learn different ways to improve their product. The author explains the definition of a prototype, stating that it is the preliminary model of something from which every other prototype will base itself on and grow from. Prototyping is a step that many industries take into consideration. Architects prototype with floor plans or *maquettes*, while industrial designers prototype with sketches and foam models. With prototyping also comes research. It is very important to understand who your user is and how their user experience will follow through. This goes with the four reasons behind why industries prototype: to understand, to test and improve, to communicate and to advocate. To understand is to create different variations of the product in order to get to know your problems, and thus learn from them. To test and improve is to build various prototypes in order to either validate the assumptions you have or disprove them. To communicate is to give a visual reference to your audience with the help of the prototype rather than just let them picture it in their head. Finally, to advocate means to share your prototyping results to the audience and have their feedback, making it easier for the creator to improve their user experience. Prototyping not only helps you to find problems faster, but it is also a less costly way of creating a first version of the final product. For both physical and digital products, there exists different fidelity levels of prototyping. In this case, fidelity is associated with how close the prototype resembles the finished product. The first type of level is the low fidelity level prototype, which is one of the first or even the first prototype one will do during the duration of the project. It does not resemble your final product at all and it usually does not take design into consideration as much. It focuses more on how it works rather than how it looks. It is usually a very low-cost prototype such as drawings, storyboard or sketches. Additionally, for physical products, low fidelity prototyping can be Arduino code snippets. Mid fidelity prototypes start to be more visually appealing as well as being much more similar to the final product. The cost increases because the creator is going further into the mechanics of the product. Finally, high-fidelity prototypes are what you will be using as the final product or just before the final product. The products are fully coded and designed, ready to be given to a user as a real product. Everything that it contains to create it tends to be of a higher quality as well as costlier. In summary, these fidelity level types of prototyping associate themselves to the design, content and user interface of a physical or digital product, taking these aspects into consideration all along the creation of each and every prototype.

## Reading 2 – Fashion with Function

This reading discusses the topic of wearables, which are known as being electronic devices that are worn on the body or even on the skin. It is a type of device that is getting more and more popular in different fields, whether it be for fitness, health and medicine and fashion. They are giving the user a new way to interact with a device, a simpler and much faster way. Currently, wearable devices that are acquiring great importance in society would be smart glasses, fitness watches and smartwatches, as they provide a quick way of accessing information and notifications. The reading further explores how wearables lead to dynamic changes that connect people by acting as either substitutes or complementary devices. When the wearable promotes simplicity and efficiency, then it is considered to be a substitute. Otherwise, if the wearable is used alongside another device, like the apple watch and the iPhone, then it is considered a complementary device. Additionally, there are four user experience factors to consider when creating these types of devices. The first factor is visibility. Since the wearable is on one's body or clothing, if the wearable is meant to be seen and not hidden from the public, then it has to be aesthetically appealing. People want to wear things that match their personality, and that does not have the same look as every other device. Fashion and wearable designs thus come together in a huge way, as companies are using the help of fashion industries to create a wearable that is very good-looking. This is called the fashion-function relationship. The user interface aspect for the design is as important as the hardware design. The wearable cannot be too overcrowded and has to have a main target audience, while still keeping a general audience in mind. The second factor to take into consideration is its role. A wearable can either be a tracker, which collect data regarding the user's activity, a messenger, which displays alert or notifications to the user, a facilitator, which helps the user with certain activities and saves them time, or an enhancer, which increases the experience of a user in the real world. The third factor is related to the amount of information displayed on the wearable. This can range from no display at all, which is a wearable that does not output any information, to extreme display, which consists of a device that outputs a display screen, notifications, alerts, lights, and takes in input as well. Finally, the last role to consider is a wearable's interaction model. This factor can vary from being a micro-interaction, meaning that the wearables does not need a lot of input from the user, generally just a tap or two. Then there is the multimodal interaction, which takes a bit more as input such as voice, sounds, touch, vibrations. And finally, the multi-device interaction, which connects the wearable's input to another device or vice-versa, a more compel type of input data. Overall, the key with wearables is to keep it simple yet effective, always taking into consideration the four factors as well as the user experience and hardware design.

### Reading 3 – Designing for Emerging Technologies

This reading addresses the topic of the emergence of disruptive technologies. With technology advancing at such a fast speed, the emergence of ground-breaking inventions is something that was bound to happen. This reading focuses on these four specific emerging technologies that have the potential to create a completely new industry: IoT, Robotics, 3D printing and genomic and synthetic biology. Just like the invention of the light bulb, the automobile and the telephone defined modern life in the 20<sup>th</sup> century, these four emerging technologies have the power to transform society's life and economy. IoT is described as anything that involves machine to machine communication, as well as sensors, communication and information delivery, systems and software. Robotics focuses on the robotics industry, where the creation of robots becomes ideal for jobs that are repetitive and physically demanding. 3D printing is the process of constructing a 3-dimensional object with the help of a machine that prints one thin layer of this object at a time, based on an image input one has given the machine through a computer. Finally, genomic and synthetic biology focuses on the entirety of the human, and how to build one based on DNA. With these disruptive technologies also come changes. Some of these technologies would change the lives of workers, by either facilitating their job or making them lose it, creating tensions and negative reactions for some. It is therefore necessary to take into consideration the following 8 design tenets for emerging technologies. The first is to identify the problems correctly. It's better to understand the problem related to these technologies than to try and fix it directly. The second is to learn constantly, meaning that designers always have to be adopting to the latest technologies, constantly learning and reading. Third, designers have to be system thinkers, not only thinking about the product but the ecosystem that surrounds the product as well. Fourth, designers should be able to work at various different scales. Fifth, they have to create the right balance with the help of design in order to connect people with technology. Sixth, it is important for the designers that they provide a smooth transition for the changes coming between people and technology. Seventh, they have to work effectively on cross-disciplinary teams. Different types of workers will have to work together; designer with engineers and scientists. Finally, they have to take risks, as this is what is the key to innovation, and to the creation of an emerging technology.

## Reading 4 – Designing for the Networked World

This reading focuses on what to take into consideration when designing technologies that revolutionize the world. These devices are not only getting smarter, but they are creating a society in which everyone is constantly connected, no matter where they are. It is thus important for designers to have tools and guides in order to create a beautiful and well-functioning network. It is very important to consider the device's environment. Designers will not only have to focus on the user, but also on the objects, networks and algorithms of our environment. Designers also have to experiment and create new tools for the products. They have to prototype and test out their questions through different versions of the device. They also have to have a good understanding of the design foundations, being able to imagine things in 2D and 3D form. The main foundational elements that allow connectivity between the device and the user are texture, opacity, agency and reflexivity. Texture allows the user to feel the interface, letting their touch sense activate. Agency is the role the user has with the system. Opacity is the accessibility and clearness of the system to the user. How easily can the user see how the system works and its connections. Finally, reflexivity is the output of the device to the user. What it informs them and how it informs them. Designers thus have to become comfortable with developing and working with these new technologies and systems. They have to remember to experiment, whether it is by prototyping or creating simple code snippets or even platforms. They have to be willing to learn new skills, whether it is by reading books on a topic or building the first version of a product. They also have to remember to be critical. They have to look at their product and ask themselves questions about its purpose, its design, its user interface and user experience. Designers will thus have the power and the knowledge to design products that start only as an idea, making it come to life no matter how complex it is. Everybody knows has the ability to create, but an issue arises with this. How can one make sure that what they are creating will be pushing society in the direction of a better future? There is still much more to learn and much more to investigate with these new technologies.