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Jonathan Follett's *Designing for Emerging Technologies*

In this day and age the impact of advancing technology is apparent nearly everywhere. With now possible biotech robotics, 3D printing, wearables and connective technologies, it is imperative to consider the elements of design necessary to best navigate such a heavily saturated technological market. Jonathan Follett speaks of some of the now possible technologies, how they can shape and govern society and science and what he believes are the eight tenets for emerging technology.

Follett discusses the internet of things, explaining that within the digital realm it is possible to collaborate and create in means more affordable and quicker than ever before. Follet speaks of networks, wireless communication and interconnectivity declaring that the result of such developments leads to disruptive technologies and data driven user to device invention. Such connected environments accelerate communication and commerce thus progressing future technologies. 3D printing allows for additive fabrication, the possibility to assemble parts using an array of materials and a speedy means to prototype, even construct buildings. The debatable ethics stem from the capabilities of 3D printing weapons or other malintented objects, although for the moment, it remains cheaper to manufacture or buy firearms secondhand.

A large part of the reading was devoted to Follett's self-proclaimed passage to design. Follett believes the general public as less concerned with the development behind technology and science behind emerging solutions than they are concerned by the potential outcomes. With that, Follett highlights successfully identifying problems, continuous learning, systemic thought

process, working in a variety of scales, connecting people and technology, provoking and facilitating change, working effectively on cross-disciplinary teams and taking risks as well as responsibility, as the pillars of design. While I agree that these are all elements necessary to consider when designing for emerging technologies I don't believe he covered every aspect of the design process nor considered more frivolous undertakings of designed products as objects that would incorporate all eight factors. I also feel his list was rather a general way to go about life and not something specific to solely design. Follett values designers as the people who are to shape the future of technology and base decision making off both negative and positive propositions and outcomes.

Reading reflection of Michael Levin's *Fashion with Function: Designing for Wearables*

To Michael Levin, the market for wearables vastly appreciates as technology progresses and processors grow smaller and smaller with further and further capabilities. Levin argues that wearables have only reached infancy and speaks of popular categories of wearables in today's day and age. Levin reminds us not to forget about the relation between humankind and their non-wearable devices and talks about the codependency that these new wearables share with their predeceasing processors (computers, phones, televisions.) VR headsets, smartwatches, health trackers and smart glasses, all involve interaction with other devices.

A wearable does not constitute as something within the body, it is solely an object made to be worn and not necessarily worn forever. Many wearables are contextual and may only be worn in specific scenarios, others act as a constant monitor and some utilize data variables with respect to the senses. No matter the wearable and what or how it's reading data, Levin claims the ecosystem of connections between man and computer are affected and people will use (or not use) their wearables accordingly. Levin also goes into great detail in discussing some of the many UX design choices for wearables today. Some wearables are intended to be disguised and in other cases the wearable exists to facilitate communication rather than enhance it. Levin implies that simplicity in wearables is desirable as it not only less to troubleshoot, but creates a better nuanced means of representational communication (for example rather than on display, functions are implicated by lights.)

Levis speaks of wearables as micro interactions, these micro interactions can be manual, semi-automatic or fully automatic. In addition to there being a specification to the micro interaction there is also a classification of information flow; input or output. Manual interaction

is instantiated by the wearer, semi-automatic is the system warning the wearer to carry out an action and fully automatic is fully performed by the system. Input could be visual, audible, tactile or physical buttons. Output serves as feedback; this feedback depends on the wearable and its purpose and intent to disturb. Levis says that the trick to designing wearables is to design without the intent to replicate what is already accomplishable via smartphone or pre existing technology, to understand the system and the role the wearable will play in the connective ecosystem rather than on its own.

Martin Charlier's *New Responsibilities of the Design Discipline: A Critical Counterweight to the Coming Technologies.*

Martin Charlier uses this chapter to emphasize design, its necessary involvement in social contexts, and the role designers must play to make for successful design decisions. Charlier argues that successful design benefits people and that designers have more than aesthetic responsibilities, designers must consider ethics and potential social impacts. Businesses today use designers trans-disciplinary way of thinking to develop better products and benefit the success of the company as well as its clients.

Charilier compares what was previously necessary to carry out specific tasks, to what is now possible with the technologies of today (for example sending letters vs sending a text or video calling, physical maps to navigate vs gps mapping and navigation.) Of course the advanced technology of today has its negative effects and potential threats, GPS systems can be used for guided missiles or hidden surveillance, online fraud plagues the net, self replication could lead to a new kind of social divide, yet designers can play a critical role in prevention of such malintented or ethically compromisable developments. Designers in digital technology retain the same focus of aesthetics and user friendliness as designers so long ago concentrated on.

Charlier believes designers of today must be more critical thinkers within the realms of technological advancement and proposes three tactics in which designers might engage in future endeavours more critically. Charlier writes of humanizing emerging technologies, or fashioning technology to fit people and uses the example of the Internet connected pill bottle *Glow Caps* to illustrate his idea of humanizing technology. Charlier believes designers role today may be to make that which is invisible visible and perceivable thus accessible to a larger audience.

Designers use metaphors and analogies to simplify the learning and understanding curve allowing others more agency and control over their technologies.

Another tactic proposed by Charlier is publicizing implications in understandable ways, many companies and advertisers fail to expose the underlying effects and intentions of their campaigns, designers can interfere and bring to light that which is covert or advertised in inaccessible ways. Lastly, Charlier speaks of influencing the scientific community, scientific researchers have a tendency stray from the sociocultural contexts of their work and rather stick within a niche and specialized approach. Charlier urges designers to collaborate with scientists in order to hypothesize for the future and consider how one might go about making these prepositions possible.

Prototyping for Physical and Digital Products

As can be assumed, *Prototyping for Physical and Digital Products* discusses the value of the prototyping process when developing products for now and for the future. Prototyping is imperative to understanding, to development, to communication, potential collaboration and to promote the end product. Additionally this reading discusses the fidelity of prototypes and the differences between fidelities, as well as the importance of feedback and how the research process is necessary when documenting and describing work in a meaningful way. Designers must prototype in order to develop and maintain the title of designer.

Low fidelity falls under the the first stage of prototyping which includes sketching, researching and initial testing. Long before the product is actualized, research, conceptualization and testing of components must be performed in order to minimize error and cost in the future. If initial tests are not performed and research not conducted, it is likely that the further outcome of the product will reflect poorly of the expectation and without research possibly render itself useless if previously developed or impossible to complete. Correcting errors and addressing potential future problems in the low fidelity stage of a prototype is crucial to the future of the end product.

Mid fidelity prototypes hint at what could be the completed product and include a level of interactivity. Mid fidelity prototypes are modifiable and demonstrate a clear proof of concept or implementation. At this stage it is possible for designers to present their product to clients or potential investors along with the previous research and process that came with the development of the low and mid fidelity products. Feedback is possible to consider in this stage and in going

forward with the high fidelity product. The mid fidelity prototype can be modified based on feedback, to better include desirables of the high fidelity product without much trouble.

The last stage of prototype is the high fidelity model, the high fidelity prototype is the closest level of completion. A product in its high fidelity stage functions and aesthetically resembles that which was sought after in the progressing stages of prototyping. High fidelity products need not be fully complete but should be testable and and capable of evaluation and surveying. Following this near complete level of prototyping, the product can easily evolve to its completed and marketable status.

Matt Nish-Lapidus' ***Design for the Networked World: A Practice for the 21st Century***

Devices today have grown increasingly involved in data collection and storage, augmenting self awareness and becoming cognizant at a rate that seems impossible to accurately predict. We as humans must learn how to navigate a world so data driven and address the ways in which we interact with these devices as they interact with us. Computing has become not only commonplace and out of sight, but omnipresent and a part of lifestyle.

Augmented reality has influenced our reality and how we as humans interact with objects today, suddenly there is room for communicative or interactive elements to every object around us. Augmented reality has given us the ability to give sociability to elements never considered capable. Nish-Lapidus uses the cellphone and traffic sensors as examples that illustrate the capabilities of technological influence on the world and its inhabitants, with cell phones becoming a part of identity and traffic sensors impacting population density, pollution, injury rates and more. Designers are given the ask of addressing biases and developing for a future in which social and environmental effects are considered.

Nish-Lapidus believes it is crucial for designers today to understand systems theory, cybernetics, relationships, communication and culture. Feedback is imperative to process, feedback can drive the motive and the prototyping process and the ways in which designers adapt to feedback will influence the outcome of the final product and its developments. Nish-Lapidus argues that designers must incorporate texture, opacity, agency and reflexivity into their prototypes in order to better visualize the potential outcomes. Texture is defined as the interaction between the user and the interface, how the interface makes the user feel. Opacity is how obvious the network and its intentions are, how easy the interface is to use. Agency is the

capability of action in a given system, what effect does the user play in the experience within the interface. Lastly, reflexivity is the feedback and communication loop necessary to troubleshoot any given problem in a system, it is how the system reacts in regards to change.

These core attributes amount to two types of systems; hard or soft. A hard system is constructed to achieve a defined objective and a soft system focuses on understanding the system based on multiple perspectives. Soft systems methodology (SSM) help better explain the fascination of soft systems on relationships rather than classifications. Designers methodology fit well with the SSM focus on perspective and visualization from within the system as well as from the outside. SSM methodology becomes another tool for designers to think more critically of their work and the data that surrounds them.