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Can Data Visualization Enhance User Experience in the Age of Exploding Big Data?

Nowadays, as the world is unprecedentedly connected, emerging Big Data provides possibilities that allow designers, engineers and entrepreneurs to create user-oriented products and services by analyzing each individual's needs. Wearable devices and smart phone apps are gathering people's health data and other life pattern data from their daily lives. According to futurists, by the year 2020, over 26 billion things – cars, machines, food and even domestic animals – will be connected to the internet. In this way, personalized data is explosively growing in our current society as the use of smartphones and other wearable devices is increasing. Many scholars predict that the IOT environment and wearable tech will totally change our lifestyle. I think big data can be more widely used through Data Visualization combined with interaction design and it enables a designer to make services and platforms be personalized by gathering each individual's data and information. By analyzing data, User Experience can be focused on each user by considering their specific needs. In a flood of data, visualization and curation of data can help users organize information. As a user, I want my social network services and platform services to show me more visually organized data by collecting it according to my tastes and needs by enhancing the user experience of data visualization. By gathering people's data, platform services and social networks can give us selective information that we exactly need and can recommend us appropriate services up to individual's needs. As a designer, I've been interested in how to apply new data visualization methods to produce creative displays of information up to each individual's interest and tendency. Also, I would like to research how technology is expanding both our access to data and our ability to use and display it effectively.

However, I still doubt that our data can be used in proper ways while the myth of Internet of Things is spreading. Chris Murphy, an editor of Information Week said "one of the myths about the Internet of Things is that companies have all the data they need, but their real challenge is making sense of it. In reality, the cost of collecting some kinds of data remains too high, the quality of the data isn't always good enough, and it remains difficult to integrate multiple data sources." Also, there are also some side effects like privacy matters about the misuse of data when large companies collect our daily data. According to The New Yorker's article "Planning Machine,"¹ big social platform services like "Uber" want to grab as much customer's data as possible for their business. The rise of the sharing economy is recently booming and the increase the openness of markets. Also, large media companies like Google and Facebook are analyzing users' data in every second. Sometimes these media conglomerates are often compared to the Big Brother in our 21st knowledge based information society because all users on the internet are already connected to the large media platforms. They have been gathered our information and can control the information and data that are displayed to us.

Besides, Internet connectivity is increasing more and more with the development in sensor technologies and provides a basis the future hyper-connected society of the Internet of things. The media conglomerates are creating some apps that can monitor our daily lives. Korea's futuristic planned city "Song-

¹ Evgeny Morozov, "The Planning Machine: Project Cybersyn and the origin of the Big Data nation" A Critic at Large, *The New Yorker*, (2014) <http://www.newyorker.com/magazine/2014/10/13/planning-machine>

do” can be one of the examples of the hyper-connected society. The city has been built systematically by considering aerodynamic and ergonomic, maximizing the flow of people, energy, and information and the Songdo international city often referred to as a smart city based on bio-technology.² Within Songdo, planners designed hyper responsive environments, considering design elements for inducing “happiness.” Smart poles with sensors and surveillance cameras in the smart city monitor traffic violations and crime and other entertainment services like music based on individual needs can soothe the public space via apps. Likewise, a lot of things are connected to each other in the urban space and many tech companies have designated the city as the outpost for their future IoT business. I believe that IoT environment can enhance people’s quality of lives. However, it is true that it is apprehended that there will be problems about privacy matters and misuse of data for business as well.

Data and Commercial Design: “Information design should not be used for misleading public.”

Also, in our daily lives, we may be deceived by displays of information that are not based on objective data and proof before we are not aware of. In commercial design, advertisement and brand design sometimes show us wrong data and information to attract consumers, so they manipulate consumers’ mind and mislead behavior. Take package design, for example; there is the issue of fake organic marks on package designs in Korea. Nowadays, consumers in Korea prefer to buy organically grown food and products which contain natural ingredients. So, there are lots of organic food and commodities in the market. Even though the organic certification marks and the other health related certifications should only be allowed if there are clear standards for measuring the performance of the products, many companies exaggerate the facts through the packaging and advertisements to sell more of their products even when their products are not organically grown and contain harmful ingredients. I think that this is a deception because this kind of package design leads consumers to make wrong choices. If information design which is based on facts is widely adapted to commercial design, consumers can more clearly understand ingredients and nutrition and identify the side effects or advantages when choosing products. I believe that this makes the brands more credible to consumers. Ultimately, this would be helpful to sell the products. We, designers, are not only concerned with the aesthetic form of products, but also their context. I think designers should provide people with objective data and let them realize the objective reality of their personal life and our current situation of the world. I think the objective perception of the reality can allow people to know what they are really doing and totally involve in the present with holistic sensation and being aware of the reality can urge people to take right actions toward to critical issues in the global world.

² Orit Halpern and Gökçe Günel, *Apocalyptichope Deming unto Death: Smart Cities, Environment, and “Apocalyptic Hope”*

Data and Humanity: “technologies based on data should not degrade our humanity.”

A cultural theorist, Paul Virilio discusses about perception in connection with speed and offers precise look at impending future in his book “Vision Machine.”³ He reorganized the relation between the development various media and our perception, considering the meaning of such a reorganization of perception. Virilio argues that images are fragmented due to speed and suggest a new concept of “Picnolepsy,” a kind of amnesia – the absence of attitude and temporary cessation as a result of fragmented imageries. Virilio worries and criticizes that people with power abuses their authority by monitoring other people through completed surveillance systems in the network. Actually, it is a matter of grave concern because surveillance systems have already settled down throughout our daily lives. There are many kinds of remote monitoring systems that gather our daily data like traffic surveillance cameras. Also, our private data such as details of usage of credit cards and access to internet are recorded with great fullness. Large conglomerates and governmental system can monitor and control our daily lives in case of need. People are not usually aware of the inspection in this “Panopticon.”

In Virilio’s view, internet of things cannot be a utopian new world, it is just a world of dislocation within screens that are monitored by large systems. In our current world, innovation of speed in the screen is maximized, so I think the third revolution will be achieved from a different way of innovation. It will be the transplant innovation. Nowadays, there are new attempts to implant prothese to human body in the robotic technology field. Scholars predicts mind control microchip will implant in human brain and other parts of our body. “Internet of Things” is not just limited to interactions among things, human body itself will be interacted with the outside world in the future IoT environment. As the futurists and Dadaists imagined the metallization of human body, it may be odd features when microchips are embedded in human bodies. Throughout our history, mankind has been continued to make an effort to separate the human nature from other animals in Aristotle’s view.⁴ But microchip will make blurry lines between human nature and super-natural animals because human bodies with artificial microchips are not natural anymore. There should be a new ontological norm for our humanity. Also, we have to prepare to accept the gaps between the everyday and the exceptional, the ordinary and the extraordinary. Although Herbert Simon pointed out, “those things we call artifacts are not apart from nature. They had no dispensation to ignore or violate nature law.” in his journal *The Science of the Artificial*⁵, If biochips would be implanted into human brain, the moral issue of Big Data will be more magnified as a new controversy. Many pending problems of humankind that have been unsolved because of the limitation of intellectual ability If It can be possible to input tons of information into our brain automatically. Also, daily routine jobs will not be the matter of lack of will if we can control our thinking systems and behaviors. In other words, data itself is a power in the age of biochips. If human nature can implant knowledge and information at will and utilize them freely, what the power structure of our future society will be and what advance of our humanity of the new age should be? It should be pursued in the way not to degrade our humanity.

³ Virilio Paul, “Vision Machine” London: Indiana University Press, British Film Institute, 1994.

⁴ Eugene Thacker, “Cryptobiologies.” *Artnodes*, Issue 6 (2006) <http://www.uoc.edu/artnodes>

⁵ Dilnot Clive, “Why the Artificial May Yet Save Us.” In *Design as Future Making*, 191. New York: Bloomsbury Academic, 2014.

Summary

(i) Design for Experience

“Everyone designs who devises a course of action aimed at changing existing situations into preferred ones.” This quote by Herbert Simon is well-suited to my vision of the “design for experience.” As a young and enterprising designer, I would like to research user experience and interaction design to create positive experiences for living. That’s why I’m eager to pursue further study in the field of design for experience based on data visualization for wearable tech and IoT environment. In my view, the designer is a person who finds solutions for a better quality of life. In this sense, I have always wanted to be a designer who improves the present situation and creates ‘optimal experiences’ for people. In our current society, the designer’s role is extending, keeping pace with rapidly developing technology and a new media environment. We, designers, are not only concerned with the aesthetic form of products, but also their context.

(ii) Data Visualization which gives people objective information

I want to provide people objective data and let them realize the objective reality of their personal life and our current situation of the world. I think the objective perception of the reality based on statistics can allow people to know what they are really doing and lead them to involve in the present with holistic sensation. I was inspired by Hans Rosling’s Gap Minder program which shows amazing interactive data visualization, dealing with various world issues of economic and political matters such as wealth inequality. I think the understanding of the world can urge people to take right actions toward to critical issues in the world.

(iii) Data and Commercial Design: “Avoid Data Misuse.”

We, designers have to build and promote a culture of sincerity where the norm is to handle data with responsibility. Data Visualization using actual data sources is a motivating act that has a power of journalism. With my work, I have the power to effect relationships between people and technology, as well as among people in the society. I will not use this influence to only make profits or create business platforms. instead, it is our designer’s responsibility to utilize design thinking and process to help people, communities, and societies thrive.

(iv) Data and Humanity: “Prevent to degrade humanity.”

Big Data in the age of Internet of Things should be used in the direction of respecting human rights, not degrading our humanity. People with power and authority in public data should carefully plan the usage of data and should not invade individual’s privacy. We should make sure the boundary line between “Artificial” and “Nature” if the biochips would be grafted into human body. As a designer, we should make some guidelines to enhance our humanity like “empathy with nature, love, creativity” in the design process for the future IOT environment.