Micro UX Unit | Critical Essay

Speculating the Digital Future:
Responding to the dematerialized world by design

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Introduction

The infrastructures on which our lives rest are increasingly invisible (Nutanix Team, 2015; Tierney, 2017), leading not only to the dematerialization of our transactions and our interactions with the surroundings, but also problems like lacking direct interactions with the world and lacking privacy and security (Greenfield, 2017). Working on materializing the blockchain keeps me thinking about our life in the digital future and the contradictions between human rights and needs and the use of digital technology. This essay will examine the dematerialization of everyday infrastructures inrelation to the recent Micro UX project. It will also explore how UX designers can respond to the digital future and its relevant ethical issues to build a more sustainable future.

Physical Response and *Information Procession and Storage*

This term, we collaborated with the design company This Ain't Rock'n'Roll on the brief about materializing the blockchain, a distributed ledger technology (DLT) that can support decentralized, peer-to-peer transactions and verify data events. This collaboration raised questions about what materialization is and why we need to materialize the blockchain. Gibson's *Theory of Affordances* (1979), studies by Ishii et al. (2012) envisioning the future human-material interaction, and Krishna's *The Best Interface is No Interface* (2015) have provided essential insights into materialization.

Living in a society that is transforming to a digital future, there is a tension between human's need for direct physical interactions and digital technology's powerful abilities to quickly mediate huge amounts of information. Human beings have evolved to have an enhanced ability to "sense and manipulate the physical world" (Ishii et al., 2012, p.38). On the one hand, we are used to direct physical manipulation which creates an instant response that can be directly and immediately perceived. On the other, human beings cannot process the sheer volume of information because we do not possess the same data processing capability as digital technology is able to. According to Ishii et al. (2012), users need an understanding of the dynamic capacities of the digital world, i.e. its "affordances" (Gibson, 1979). We have to know the affordances of the infrastructures we are interacting with so that we can perform our daily activities appropriately (Gibson, 1979).

Even though blockchain has the capacity to verify and store data in a decentralized way (Nakamoto, 2008; Tang et al., 2020), it cannot intuitively inform people about its affordances. Our haptic and peripheral senses make us easier to interact directly with physical infrastructures than to control the digital information through a screen-based medium (Krishna, 2015), which "takes little advantage of our capacity for hand-eye coordination" (Ishii et al., 2012, pp. 38-40). Thus, there is a need for our design team to devise a way to materialize the blockchain, so that people can experience and manipulate it in a more physical way in order to understand blockchain's features and mechanism, and even potential risks.

Considering design for balancing the tension between physical needs and digital advantages, Krishna (2015) provides an example of the Mercedes' car key. Mercedes disposed of the need for an application to unlock the car, but added a distance sensing system that unlocks the door automatically in proximity of the key (Krishna, 2015). Although Krishna's (2015) definition of interface is limited to screen-based graphic user interface (GUI), his notion - "the best interface is no interface" - is still a reminder for design practice to move beyond the screen. Moreover, Ishii et al. have proposed a future material they call "Radical Atoms", which would enable users to interact with the digital information by directly manipulating the fully physical materials, while the materials would "conform to constraints, and inform the users of their affordances" (2012, p.50). Both examples suggest reframing the design context from interactions with a digital screen to our "natural course of actions" (Ishii, 2012; Krishna, 2015). Starting from the people's natural behaviors and considering how to incorporate digital technology into tangible artifacts would enable us as UX designers to create an experience that takes into account people's physical needs.

Individual Rights and *Surveillance*

Proposing to consider people's physical needs, but constrained by our limited technical skills, our team thought of a compromise - to design a mixed experience incorporating physical interaction and digital interaction. At the later stage of our project, we proposed the idea of recording the collaborations and original creations in the physical world through videos or audios as "ledgers" that evidence the "transactions" (the exchange and sharing of talents) between two peers, and uploading the files to the immutable digital platform for storage (Fig. 1). However, within the blockchain mechanism, all peers are required to share necessary data indefinitely, and all historical records are stored and can be accessed by everyone in the network permanently (Nakamoto, 2008; Tang et al., 2020). Although our design idea appeared achievable and would have

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protected the copyright of people's original creations, it is pointed out in the speed dating that its essence is the infringement of the participants' personal privacy and the "right to be forgotten" (Rosen, 2012; Zuboff, 2019), or "the right to not be re-found" (Lin et al., 2020, p.143) (Fig. 2-4). So, our team abandoned that idea.

Indeed, the essence of smartphones and digital technology is surveillance threatening our privacy (Zuboff, 2019). The tangible artifacts and physical infrastructures that used to be integral to our daily life have been transformed and flattened into a small cuboid box - smartphone - which requires a connection to a network for the applications to work, so that we are able to finish our daily tasks (Greenfield, 2017; Zuboff, 2019). Connecting to the network and agreeing to share the behavioral data by clicking on the "agree" button of "terms-of-service agreement" seem to be the default, mandatory response (Zuboff, 2019, p.39).

The invisible process actually starts by this click. Almost all our behavioral data are then uploaded and recorded onto the digital systems and even backed up in the cloud (Rumsey, 2016; Zuboff, 2019). Companies use surveillance advertisement technology to obtain our behavioral data, turn them into metadata, and make them globally accessible to generate tailored advertisements, and finally re-deliver the content to us or people around us (Diehm, 2018; Zuboff, 2019). As a result, individuals

Fig.1 Sketch of the idea about recording and uploading video or audio of collaborations. Svaney Shen & Ines Yin(2021).

Fig. 2 Speed dating with peers - Like the idea of encouraging creations. Ines Yin (2021).

Fig. 3 Speed dating with peers - Point out the potential risks of harming the privacy. Ines Yin (2021).

Fig. 4 Speed dating with peers - Enjoy collaborating to create music. Ines Yin (2021).

receive "personalized" recommendations and be persuaded to spend money on the recommended products or services, and accordingly, companies make profits. Such a socio-economic model is named "Surveillance Capitalism" by Zuboff (2019), under which, our privacy and security have been greatly threatened by commodification.

Besides, in contrast to people's limited memory, the digital world can store information almost permanently in an invisible and dematerialized form (Rumsey, 2016; Zuboff, 2019). With the intangible, forever-young information, we have no rights to control or delete our personal information, and cannot escape from our past (Rosen, 2012).

The next year after Spanish citizens asserted their rights to human future by challenging Google and demanding "the right to be forgotten", the European Commission's proposal to create this new privacy right was announced (Rosen, 2012, p.88; Zuboff, 2019, p.44). However, for now, the attributes of digital technology cannot easily be changed, even blockchain technology that is theoretically secure and anonymous risks information leakage or theft (Robinson, 2020; Tang et al., 2020). Therefore, we are faced with the challenge of protecting people's privacy in a real world situation responding to the conflicts between ease of use and the very essence of digital surveillance and between personal privacy and the permanent memory of the digital world.

Scholars like Greenfield (2017) and Zuboff (2019) highlight the reality of the situations people are facing now and may be facing in the future with digital technology being almost everywhere, but have not provided detailed solutions for solving the problems. So I turned to the Contextual Integrity, a theory of privacy developed by Helen Nissenbaum (2011), and The AOIR Guidelines (Lin et al., 2020) for help. They provide questions that prompts me to think about the possible using contexts to examine the ethics, especially the ones about privacy, of our ideas.

In the subsequent ideation process, each time our team put forward an idea, I would refer to those questions to speculate the potential problems, examine our ideas and remind our team to avoid privacy issues. Since, in blockchain technology, information records will be shared with all parties in the network in real time and cannot be tampered with or deleted (Nakamoto, 2008; Tang et al., 2020), we cannot control "who to share information with" or "how information would be shared in what contexts" in our design (Nissenbaum, 2011). However, questions such as "what information the digital platform can collect" and "whether we have guaranteed the anonymity of data" were our guidelines for examining and optimizing design

ideas (Lin et al., 2020; Nissenbaum, 2011). Although there is still room for improvement in our final design, and we did not escape totally from the having a digital platform to complement the physical experience, the potential risks of privacy infringements were foremost in our plans by not requiring privacy datas and allowing anonymity on the website (Fig. 5-8).

Discussion and *Conclusion: the Sighted, Ethical Designer*

Irwin et al. (2015, p.1) acknowledge that we are living in a "transitional times" where the future is uncertain and fundamental change in our society is needed to deal with the problems we are and will be facing. "If the digital future is to be our home" (Zuboff, 2019), the online lives we live together will inherently be mediated by the digital technology (Diehm, 2018). However, according to Diehm (2018), how we experience the digital online lives is mediated by design. Just as Floridi proposes, the public spaces like the ones based on the Internet and digital technology should allow people to express themselves, "perform their identities, and reinvent themselves", while providing people with shelter for "empowering opacity of self" and showing "the generosity of deliberate forgetfulness" (2015, p.11).

"A designedly process of making is one whose close-up engagements are guided by foresight" (Ingold, 2013, p.72). When solving the contradictions between people's rights and needs in the physical world and the advantages of the digital world, we
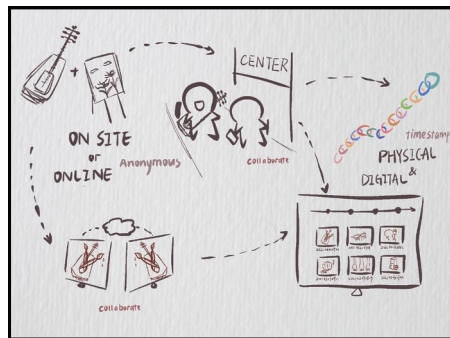

Fig.5 Sketch of the final idea incorporating the physical interactions and the digital ones. Ines Yin(2021).

Fig. 6 On-site collaboration and creation - Typography design mashed up with beats making. Ines Yin (2021).
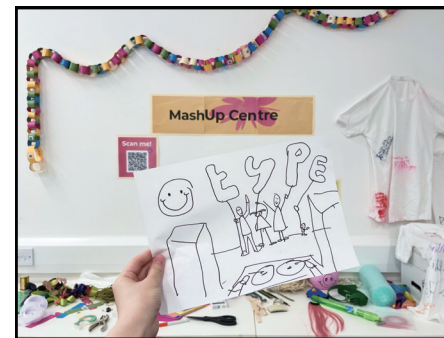
Fig. 7 The physical "blockchain" in "MashUp Centre" and the finished work. Ines Yin (2021).
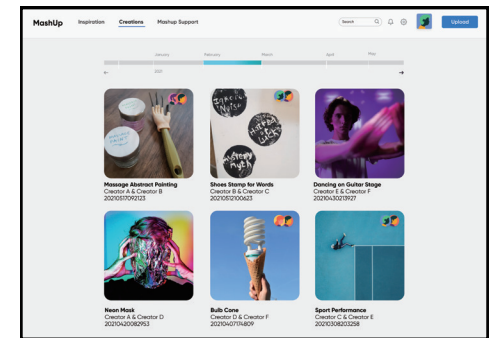
Fig. 8 The website projects would be recorded with specific timestamps. Ines Yin, Manali Panchal, Svaney Shen (2021).

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need to constantly and critically speculate the possibilities of the future, in order to find the future we all yearn for, and to propose the most suitable and sustainable solution for the present.

To conclude, we are in a world that is increasingly dematerialized. The conflict between our need to directly interact with and perceive the physical, materialized contents and digital technology's ability to quickly process and store information prompts us to concern about people's natural actions and abandon the screen-based thinking, so as to incorporate the digital technology into the tangible artifacts in design. Meanwhile, to design for protecting rights and privacy free from the world of surveillance, applying critical questions from guidelines like Nissenbaum's Contextual Integrity (2011) and The AOIR Guidelines (Lin et al., 2020) to examine the ethics of the design ideas are necessary. But the question of how we could embody our concerns about the digital future and balance the those tensions in design still needs to be explored and verified in our design research and practices by foresight and speculative thinking, otherwise all the guidelines will stay embalmed as manifestos. I would argue that, if UX designers do consider the design ethics and apply changes in experience design practices, people would be living in a more sustainable future that the digital and the physical worlds can coexist harmoniously in an interdependent way while not harming the human rights.

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