Disconnect: A Proposal for Reclaiming Control in HCI*

Awais Hameed Khan
The University of Queensland
awaishameed.khan@uq.edu.au

Scott Heiner
The University of Queensland
s.heiner@uq.edu.au

Ben Matthews
The University of Queensland
matthews@uq.edu.au

ABSTRACT

As the lines between the digital and analog worlds become increasingly blurred, it is nearly impossible to traverse modern life without creating a digital footprint. This integration is so deep-rooted into the fabric of society, that if one attempted to choose to disconnect from today's hyperconnected world, one would have to move away from civilization. Weiser's vision of the omni-present, ubiquitous computer of the 21st century [21] has been realized, but at a cost. With invisible interfaces we forego the ability to recognize when we are being watched, heard or influenced by external actors. This paper takes a bottom-up approach of using design fiction narratives to explore how to design mechanisms of control (MoC) that may help reinstate human control and agency over our data. Preliminary results show emergent themes pertaining to data access, governance and sharing; the forms of MoC; as well as methodological lessons.

INTRODUCTION

Much of our interactions are now mediated by technology, ingrained in ways that are unavoidable

CHI'19 Extended Abstracts, May 4-9, 2019, Glasgow, Scotland, UK.

ACM ISBN 978-1-4503-5971-9/19/05.
DOI: https://doi.org/10.1145/3290607.3313048

KEYWORDS

Speculative Design; Design Fictions; UbiComp; Disconnect; Narratives

and often unidentifiable. Interacting with invisible interfaces creates a self-induced forfeit of control over our agency to reveal the invisible computer if we so choose. Technology is not just a passive collector, aggregator, and repository of data, but also a pervasive actor that can disseminate data, as well as mediate, influence and direct human behaviour [20]. These concerns may be written off as mere caricatures of technology, placed under the - *only as seen on TV* banner; where dystopic sci-fi futures of technology as presented in popular culture media like *Black Mirror* and the *Twilight Zone* drive fear and mistrust of technological advancement into society. However, at the same time we observe that even at this stage of partial transition to a completely technologically embedded world, we can already see it coming apart at the seams. The Australian government recently decided to publish the health records of all of its citizens onto an online cloud portal [2], and give citizens the option to opt out before a cut-off date – consequently, there have been calls to instead use an opt in program, as it is believed marginalized groups at the short end of the digital divide, and those who are not technologically savvy have not been given a fair opportunity to decide either way. Unfortunately, with the widespread use of embedded sensors, and broadcast technology it is becoming impossible for consumers to have the freedom to opt in; so we argue there should at least be technologies that allow users the choice of opting out. Recent examples where exploitation of social media data has influenced major political elections show just how powerful data has become. It is almost as if we have created our very own version of what Adam Smith described as the 'invisible hand' [18], only here the control of balance resides not in the free-market, but in whoever controls the invisible computer and has access to its data. We seek to put forward a call to re-empower humans with the agency of when, and how to choose to be a part of technological machine. As HCI practitioners and researchers it is important for us to take action on this as a community with urgency. The rate at which the speculative visions of dystopic futures are transforming to our reality is increasingly concerning.

BACKGROUND

In their review of science fiction works in relation to ubicomp, Dourish & Bell [5] suggest that even though surveillance, privacy and control over information sharing are widely discussed topics in ubicomp research, the degree of pervasiveness, forms of surveillance and what institutions are able to access data are the actual issues of concern. They further argue that we cannot move back to a world that is not entangled with ubiquitous computing technology, nor replace existing systems in place. This then begs the question of how can we then embed control mechanics into our existing systems? Luger & Rodden argue that the need for consent in pervasive computing systems is of a dynamic nature, without just a "single moment of consent" [13], very similar to how consent would work in the case of physical interactions. They further propose terms of electronic consent mechanisms should not be timebound but afford negotiation; establish user expectations of norms; provide visibility of third-party interactions with data; and move beyond just giving users control, to giving the users autonomy. Cultural countertrends are also emerging calling for "disconnecting,

Figure 1: Design MoC Provocation Cards

unplugging and digital detoxing" in a hyperconnected world [17]. Pierce highlights the criticism this movement receives, as the calls to disconnect are often attributed to the privileged minority, ostracizing views of those marginalized by the digital divide. As technological paradigms like the IoT, cloud computing, and always-on, one-click access technologies evolve, there is a need to establish a middle ground between what Pierce refers to as the 'polarized enthusiasm of techno-utopians and curmudgeon luddites' [17]. We see this as a space for control mechanisms to be established exploring the use of design fictions as a tool to study this further.

Design fictions, situated within speculative design [1,6,7,10] can be used to explore techno-social conflict [19] by presenting provocative speculative scenarios that can generate new ideas and perspectives, spur debate, reflexivity [10,19]. They may be with both utopian or dystopian frames [11], allowing us to critique our current and future practices [1]. As speculative design operates as a form of inquiry, allowing for us to uncover novel perspectives to approach problems of a wicked nature [6], artefacts such as design fictions can be used as thinking tools to understand and explore previously unforeseen implications of our current systems and practices to the future. Auger asserts that such artefacts are invitations for practitioners to consider and reflect on futures individually, without bias or a political stance of what is presupposed as good or bad, right or wrong within the future states imagined [1]. The stories presented in design fictions build worlds [10,12,15], and they should be supplemented with signposting which creates some semblance of familiarity and relevance for the audience, making it easier to understand the fictional world [1]; they should be grounded in detail which can help create believable representations [10]. As a tool they are useful because they not just present possible future worlds that we can speculate on reflexively, but they also allow us to challenge our current social conventions and structures [10]. We adopt design fictions as narratives as they allow us to research, have a focal point for critique and development [3,4]. This study builds on the work of Wong et al., who explore similar themes, and seek inspirations from existing science fiction works to guide their use of design fictions [22].

STUDY DESIGN

We use a mixed-methods approach, investigating how design fictions may be used to explore concepts that attempt to reinstate control of data to people interacting with technology. We started off by initially evaluating the problem space, formulating 17 questions relating to data, control, and how people may interact with their own information. This was used to identify potential concerns (c.f. Worthy [23]) when designing MoC concepts. The questions covered a range of topics including - *Do people want control of their data? What situations would they grant access to their data and to whom? After data is shared and digitized, can you modify, recall or destroy it? Can data be tracked?* In exploring these questions, we were able to speculate instances where control mechanisms could be integrated, and consequently generated a portfolio of 12 different provocations of MoCs that formed our design cards (See Fig 1 & 2). The use of cards has been a widely practiced tool in HCI[8,9,14]. This study builds on the works of Luger et al. [14,16] by designing cards to be used as part of our design process.

Figure 2: Design MoC Provocation Cards (Cont.)

We then drew a card at random, and wrote a pair of design fiction narratives exploring the selected MoC, one utopian (U) and one dystopian (D) for a de-politicised stance and to reduce bias. These narratives types were then selected at random using a coin toss and shared with 9 participants who were asked to read through the narratives and share their reflections, guided by a series of prompts. The card drawn for the scenario was entitled *Social Passport* with the provocation that - all data transactions are stored on a personal data card which can transfer data via tapping another card or be shared remotely with others if they request access and the data owner accepts. The narratives introduce a health data card that is used collect, store and transmit health records from the doctor to the patient, and to their loved ones, with the owner of the card receiving a notification each time someone requests to view the data. The card is specifically designed to help loved ones keep track of each other's health records. Both versions of the fiction narratives are written as short-stories, revolving around the protagonist Thelma who is at the clinic for a check-up. In the scenario narrative U, Thelma is told by the doctor Reiki that she is pregnant and chooses to reject her partner Raza's request to view her check-up data as she wants to surprise him with the good news. In the scenario narrative D, Thelma is diagnosed with a disease that if revealed would reveal her infidelity to her partner, and she again chooses to deny her partner's request to access for the data. Both scenarios deal with allowing control of one's data in a world where sharing health information with one another may be a norm, but present entirely different social contexts.

The narratives were shared with participants to read and reflect on what was presented. They were provided guiding questions to help guide their reflections. These included aspects such as – *In what contexts might they use this MoC? How did they feel about using such controls? What would they change or add into the system, and what would they keep? Did they feel like the technology discussed would provide them with more control over their data?* These questions were intended to guide the respondents, but they were explicitly told that they did not have to respond to them

PRELIMINARY RESULTS & DISCUSSION

Our preliminary results show that although responses were varied, there were some common threads. Many participants believed they were still being provided with a limited amount of control. **Invasive Access:** The ability for Thelma's partner Raza to request access to the data was believed to be a step too far. A states, *"[I] would remove the fact that it notifies others connected to me [of] the update of information"* while C adds *"[it is] seen as deeply personal and invasive."*, and E highlighting, *"One should not be able to request access to another's information."* **Governance Concerns:** There were some reservations about the level of government control; G drew parallels of the government records to their current records: *"centralized e-health record keeping, similar to what Australia's My Health Record proposes"*. Participant I said they, *"prefer not to have to think about [a mandatory government request for personal data]"*, while H notes *"The presumption of how private data is shared between personal connections and government agencies... also highlights our current acceptance of data sharing with governments and the complexities of sharing with those in our*

Table 1: Participants & Narrative Styles

Participant	*Narrative Type*
A	Utopian
B	Dystopian
C	Utopian
D	Utopian
E	Dystopian
F	Utopian
G	Utopian
H	Utopian
I	Utopian

social circles." **Tangible Passport:** H saw this as a benefit, stating, "*While consent is suggestively enforceable for data sharing with governments- it still requires a physical consent - a tapping of a card - or a version of a digital handshake - which is a long-standing representation of a bond of trust",* other participants were worried about losing their Social Passports. C claims, *"If you lose your data card, what sort of damage can be done in the wrong hands?"*, and Participant E takes it a step further, noting *"The data maybe (sic) stored in a server and it's prone to data leak, hackers and marketing agents."* D also considers the ability for data access credentials to be spoofed, stating *"Alongside this, the potential for scams/phishing - data requests from bad actors, etc. - would be very real"*.

Our study posed several methodological challenges which became more evident as we evaluated the results. The narrative types U & D as presented to the participants were skewed, as the coin toss selection led us to assign more U versions of than D. This was compounded by lack of clarity in how data control mechanisms were understood by participants in the narrative. We see this as both a lesson in how we present the concept to participants in the narrative as well as in the reflection stage. We also see value in revising the methodology to involve more active participant engagement for the review of the narrative as well as discussion and reflection post-reading. This could be supplemented by exploring a workshop format, where facilitated discussion of multiple narrative design futures and combinations of multiple provocation cards and MoCs could be explored. Contextualizing the work with a formal introduction before leading into the introspection, as well as providing space for reflection would address many of the issues relating to participant understanding and framing their perspective. This will allow us to gather a more in-depth, richer understanding of how participants feel about the control mechanisms described and what their views are on refining the ideas or discarding them and why. Another possible avenue is to prepare multiple scenario narratives around the same MoC with different authors' interpretations which will allow for a more communal understanding and representation of the narrative. Further reliance on signposting as described by Auger [1] could also make the abstractions of the story easier to understand. We are considering the use of photo-visual aides to supplement understanding of the MoC. Furthermore, prototypes that can be used to perform roleplaying of the narrative might help participants engage more meaningfully with the concept and provide richer insight. A natural development for this work is to continue to broaden and refine the collection of provocations and MoCs through user analysis and refinement.

CONCLUSION

The aim of this study was to attempt to explore how we may reclaim and reinstate the rights of the user in controlling the terms of engagement with the modern omni-present ubiquitous computing technology. Even though we are still a long way away from making a discernable breakthrough to address this wicked problem, we hope that studies such as this can continue to uncover pragmatic considerations of what manifestations may result in solutions to this.

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