Challenges of Responsible Innovation for Technology and Internet Use

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ACM Reference Format:
Kelly Widdicks. 2019. Challenges of Responsible Innovation for Technology and Internet Use. In *Proceedings of ACM Conference (Conference'17).* ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/nnnnnnn.nnnnnnn

INTRODUCTION

I am a third year Computer Science PhD student at Lancaster University. My research concerns investigating the demand for Internet data in everyday life, and looking for ways in which we might reduce its prominence and growth for achieving a more sustainable underlying Internet infrastructure (i.e. data centres, communication networks). In particular, I am interested in how the *design* of technology affects use and demand of the Internet (e.g. through the Cornucopian paradigm [8]), and how SHCI (Sustainable Human-Computer Interaction) design can be utilised to counteract its exponential growth. This is especially relevant at a time where it is expected that, by 2030, ICT will reach 21% of our global electricity use [1].

With this sustainability lens, I have been carrying out mixed-method studies in the home (building on prior work on data demand in SHCI [7, 12]) capturing quantitative network usage logs and qualitative interviews with participants. Through in-depth discussions, it has become apparent that some users dislike the way they use their technology and have even pointed out that HCI designs are affecting them negatively. For example, video auto-play was seen to be a time-hog for

Conference'17, July 2017, Washington, DC, USA

my participants–a design which has been seen to also have implications for binge-watching [3], parent-child relationships [6], and network operators dealing with peak load [10]. A small design change, like the auto-playing of video, can have a significant impact on users' well-being, productivity, relationships, and the environment we live in. As a result, there is a lot to think about when innovating technology *responsibly*.

Designing technology and Internet use in a way which is socially-beneficial and environmentally-friendly is a core part of my work, and therefore links well to the aims of this workshop. This position paper outlines my experience of challenges in this research area for RI (Responsible Innovation), and what I personally would like to discuss with the community at this workshop.

CHALLENGES IN RESPONSIBLE INNOVATION

Through my PhD, a number of obvious challenges to RI have become apparent. I discuss these briefly below, linking to relevant questions that the RI workshop hopes to address.

RI can Contravene Business Models

Creating designs which aim to reduce the use of the Internet and digital technology ultimately go against the business model patterns we have in our society today. Why would Facebook ever want us to log out, if our activity on the site provides them money through advertising? Why would Amazon want us to avoid purchasing Alexa-enabled products for every room in our house, if this data demanding smart home technology provides them with profit and opportunities for further Amazon advertising? And why would Three ever advertise for using less data each month, when their current stance pushes unlimited plans to entice customers[1]? This is an extremely hard challenge to overcome for HCI researchers in facilitating RI in the real-world. There's certainly a need to engage policy makers for this challenge, a commonality with other SHCI papers [2, 4, 5, 11]. Yet, I also believe the role of responsible innovators in HCI is to find ways in which users would be motivated to use responsibly innovated products and services–examples of which I discuss in the next challenge.

[1]Three's 'Go Binge': http://www.three.co.uk/go-binge

Finding Motivations for RI User Engagement

Everyone is different and unique; and whilst we can create an Internet service which provides utility for everyone, motivations for responsible use of technology may vary. For example, for using technology less: some people may be motivated by reasons of sustainability, others may be prompted by the need to spend less time online and more time with their family. Even the same underlying reason (i.e. spending more time with a family) may then be achieved in different ways, e.g. a user may find it easy to put their devices away whilst others may require prompts designed into technology. Such brief examples show the variation of motivations for responsible use and the complexity of implementing them effectively in RI. As the workshop organisers have partly expressed, simple box-ticking exercises

for HCI designers or practitioners will not be enough for RI; rather, an in-depth understanding of motivations, implementations and ways in which these can be uniquely tailored to users is required. Perhaps it is interesting to also consider the limitations of RI and what it may not be able to achieve, given these complexities. At the workshop, I am hoping to discuss with other researchers how we may consider the varying user engagement motivations for RI, as well as 'everything responsible'–for which I discuss next.

Considering 'Everything Responsible'

I have found in my work that aspects of RI can, and do, interlink. As I mentioned in the introduction, designs of technology and Internet services can affect society (e.g. users' wellbeing, productivity, relationships, and even privacy) as well as the environment (e.g. by the energy associated with the Internet infrastructure that my PhD focuses on, and additional sustainability issues such as device obsolescence [9]). These links mean that designing responsibility for one 'thing' (e.g. well-being), could cause a form of 'domino' effect on every other interlinked 'thing'–meaning that we are potentially designing for 'everything responsible' in RI. But how can we feasibly design for 'everything responsible', and how could we evaluate this? Would integration of RI in HCI require many collaborations between academics and practitioners across different HCI research areas? This is an interesting and challenging aspect to consider within RI, and one in which I would like to discuss with other attendees at the workshop.

WORKSHOP OUTCOMES

In this position paper, I have outlined just some of the challenges (from my experience) that we may face as HCI researchers in RI. I am excited to get more involved in this work, I hope that I can add to the thought-provoking discussions that will take place at this workshop. I am also looking forward to meeting more researchers within this field, and helping drive a research agenda that will lead to a more responsible (and better) future with technology.

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