

Envisioning a human-centric data economy through speculative practice and co-design

Samuel Barnett
School of Interactive Arts and Technology, Simon Fraser University, Surrey, Canada
sam_barnett@sfu.ca

ABSTRACT

Through participating in our contemporary digitally-mediated society individuals are surveilled, generating data about them that is analyzed and aggregated to create computational models of their everyday habits, behaviors, desires, and anxieties. The concept of data intermediaries has recently been proposed and gained purchase as digital services that could enable people to have more control over what data is collected about them and how it is used. Yet, data intermediaries currently exist as a high-level aspirational concept. Little is known about how they could or should be designed; and, my doctoral research is oriented towards making contributions precisely at this gap. Stage 1 of my PhD research proposes a diverse range of concepts and scenarios that, taken together, offer a range of possibilities and consequences that personal data, shaped by data intermediaries, might hold for mediating data exchanges in people's everyday lives. Stage 2 mobilizes lessons learned from Stage 1 to create and conduct participatory workshops with teenagers focused on envisioning how their individual and collective desires could better be supported within the data economy. Stage 3 focuses on the creation and deployment of design artifacts that give form to and speculate on potential tensions, anxieties, benefits, and desires revealed through participatory workshops with teenagers in stage 2.

CCS CONCEPTS

• **Human-centered computing**; • **Interaction design; Interaction design theory, concepts and paradigms.**;

KEYWORDS

Data Intermediary, Data Economy, Personal Data, Speculative Design

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1 INTRODUCTION & BACKGROUND

The scale at which the *data economy* will impact society is considered by the European Union (EU) to be "a transformation as fundamental as that caused by the industrial revolution" [16:2]. The industrial revolution held both opportunities for the advancement of society and social harm, and so too does the emergence of the data economy. The data economy is fueled by the *datafication* of society, where the activities of human life become seemingly never-ending streams of data generation [9, 20, 28]. Through participating in our contemporary digitally-mediated society, individuals are often surveilled where data is generated about them that is analyzed and aggregated to create computational models of their everyday habits, desires, anxieties, and wellbeing [10]. This algorithmically mediated big data is increasingly exploited by corporations and governments and can lead to reduced capacity for personal agency [35, 49, 53]. Consequences resulting from these socio-technical shifts also include the proliferation of social injustices [4, 12, 21, 53], such as predictive policing [39, 44] and predatory marketing [33].

For individuals, providing data is typically the cost of using digital services, yet the processes of datafication are opaque. Not only is it difficult to keep track of what data is being extracted from one's digitally mediated interactions, but the ways in which such data will be used in the present and future are challenging to anticipate or imagine [35, 36, 41, 42]. Once data about an individual has been generated, they have little meaningful control over how it is used [53, 54]. Surveillance capitalism scholar Shoshana Zuboff describes this deal as 'Faustian' as it comes with a "psychic numbing that inures people to the realities of being tracked, parsed, mined, and modified — or disposes them to rationalize the situation in resigned cynicism" [53:84].

While it is unlikely that we will turn off the taps of datafication, whether surveillance capitalism establishes itself as the dominant form of capitalism of the 21st century remains to be seen. This asymmetrical system, where the minutia of a person's interactions with the world are extracted and exploited as data without meaningful mechanisms of consent or compensation for the unfettered growth of corporations, is being actively challenged at all levels of society. Many initiatives within the sphere of *government* have focused on transparency and individual agency over the collection of personal data (e.g. [55, 56]). However, these regulations leave the burden of maintaining privacy with the individual through "opting out" or requesting that data be deleted [14], rather than enacting a paradigm shift. In the sphere of *civil society*, organizations are reporting on injustices emerging from the data economy (e.g. [27]), undertaking advocacy work, and proposing alternative socio-technical infrastructures. While limited in scope and agency, *individuals* are actively protesting the collection and use of their data through actions such as enabling ad blockers, using software that reduces

the ability for corporations to track individuals between webpages, or choosing not to use "smart" devices.

The tensions reviewed here make clear that **there is a critical need for more diverse approaches to conceptualize the roles, agencies, and potentialities that should be afforded to people within the data economy**. In light of emerging social consequences and in recognition of possible beneficial opportunities generated by datafication, the proposition of a *human-centric data economy* has recently surfaced [3, 38]. Numerous governance models, technological tools, and ideological realignments, have been proposed as the potential socio-technical infrastructure for this new data economy, with varying degrees of reasoning, authority, and adoption [25, 26].

In the **first** of the three stages of my research program (see [2]), I interrogated the potential impact of one such proposal, *human centric data intermediaries*, on everyday life — which have emerged from the advocacy and policy work of MyData [24] and the recent EU's Data Governance Act (DGA) [57]. Currently, in the **second** stage of my research, I am developing a participatory design workshop for teenagers that aims to move beyond the focus on the almost paralyzing outcomes of surveillance capitalism and toward envisioning alternatives — what would teenagers like to be able to do with their data, if they lived in a more equitable human centric data economy? The **third** stage of my research will extend insights from the workshops through returning to a design-led process of designing artefacts that further interrogate the design space.

My research is grounded in Research through Design (RtD) methodology [18, 51, 52], and draws from HCI's rich history of employing Design Fiction as a method to both encapsulate and catalyze critical reflection on the present and on possible socio-technological futures [1, 45]. I see storytelling as a key skill for situating design fiction in the everyday, and teasing out the nuances and tensions that they embody. I am developing my practice to utilize participatory design and co-design methods [40], as my research moves to engage with teenagers, co-speculating on their visions of a human-centric data economy.

This ongoing research has been funded through a federally awarded *Social Sciences and Humanities Research Council of Canada* (*SSHRC)* graduate fellowship. It is being conducted in the School of Interactive Arts & Technology at Simon Fraser University, under the supervision of Dr. William Odom, an HCI scholar who specializes in design research initiatives to critically enrich people's everyday lives, in his *Homeware Lab.* I have been developing my research practice through continuing collaborations with my peers over the last three years, which beyond publishing my own research at NordiCHI in 2022 [2], has led to four publications (see [7, 8, 31, 50]), and a further two that are currently under review at DIS 2024. Through this work I have developed my RtD practice within HCI, engaging in the research methods of design fiction, co-speculation, co-design, and participatory design, as well as interaction design and filmmaking practice.

This DIS Doctorial Consortium falls at an ideal time in my PhD to receive feedback. I am nearing the halfway point of my research program, and am currently iterating and piloting my workshop, before deploying it in the early summer. I will be running final workshops and beginning to analyze the outcome during the doctorial consortium, and there is the opportunity for it to significantly shape this stage of my research, and then how it leads into the creation stage. I am also working on expanding my background knowledge beyond the field of HCI, on how the data economy and visions of a human-centric data economy are discussed and critiqued within the field of Science and Technology Studies. Being exposed to diverse opinions and backgrounds at this time would be beneficial in framing my understanding of the area.

2 RESEARCH PROGRAM & PROGRESS TO DATE

The overarching goal of my doctoral research is to inquire into the question of: if people are given more understanding, agency, and control over their personal data, what kind of future could, or should, this collectively lead us toward?

My research investigates the following questions: *(i)* In what ways can data intermediaries increase personal agency for individuals and social groups in everyday life? *(ii)* What services might be enabled through data intermediaries and how could they encourage participation in a more human-centric data economy? *(iii)* How might individuals be able benefit from their personal data within a human-centric data economy? *(iv)* Within a human-centric data economy, what do teenagers desire to be able to do with their personal data? *(v)* What potential benefits, tensions, and consequences exist in this emerging design space?

2.1 Stage 1: Exploration & Opening a Design Space

The goal of the first stage of my research was to take a step toward understanding what data intermediaries are, how they could be conceptualized, and how they might become entangled in people's everyday lives. Data intermediaries mediate data exchanges between an individual, a source of data, and a data user to ensure more equitable and transparent uses of personal data [23] (for a more thorough description, see [2]). Data intermediaries have been embedded in the EU's recent DGA, which considers them as infrastructure which will support individuals in "[exercising] their rights under the General Data Protection Regulation" [57]. Thus, there is the potential for the presence of data intermediaries to rapidly expand, and for individual and corporate trust in them to increase. Yet, data intermediaries currently exist as a high-level aspirational concept.

In Stage 1 of my PhD research, I employed design fiction as the means to explore and reflect on the potential impact on everyday life of data intermediaries emerging as the infrastructure for a human-centric data economy. This process involved an ongoing review of literature on data intermediaries and a human-centric data economy; an exploration of the related areas of privacy, data policy, data activism, and surveillance capitalism; a hands-on exploration of current data intermediary services; and the development of design fiction proposals that shaped a design space for data intermediaries in a human-centric data economy. The design research into data intermediaries is specifically informed by prior work that has explored the creation of fictional products to formulate design proposals [7, 11, 17, 30, 34, 37] and, more generally, works that situate the design of fictional interactions and concepts at the core of design research practice [1, 5, 45, 47].

The first stage of my research took a step toward understanding what data intermediaries are, how they could be thought about, conceptualized, and become entangled in people's everyday lives, and provided concrete examples of how data intermediaries might create spaces for deeper participation in how personal and shared data might be used. In moving to the second stage of my research, I am narrowing my focus from the specific socio-technical infrastructure that might enable a human-centric data economy, to explore more broadly the desires of teenagers within this potential future.

2.2 Stage 2: Envisioning Data Economy Design Alternatives with Teenagers through Participatory Workshops

I am currently in the stage of creating co-design workshops. My research follows a design process informed by Participatory Design and Co-Speculation. Utilizing participatory design strategies [29], a methodology where participants actively guide the research through their needs and desires, I will engage with teenagers from local school in workshops. They will contextualize how data is currently collected and used before co-speculating on how we would like to use our data if we lived in a human-centric data economy. I am guided by Groten's reframing of how to consider the success of a workshop — to measure it not by the artefacts that might emerge from it, but instead to view them as "social prototypes nurturing discussions and disagreement about the implications of the technology they are dealing with" [19:119]. I have piloted this workshop, and am continuing to iterate on it, before running it over the summer.

The workshop begins by having participants collaboratively map the data that they have generated over the last day and imagine where it went and how it was used. We then critique current metaphors that are used to explain various aspects of the data economy, such as "the cloud". Before participants choose a new metaphor to describe what they would like to be able to do with their data in a human-centric data economy. This is then explored further by situating this within a narrative. At each stage in the workshop, participants are actively collaborating with each other.

Teenagers are in the unique position of having known no other reality than the current exploitative model of the data economy. They are deep within the process of constructing their identities, a process which includes the consumption of media and the exploration of technology and digital services, to understand their current sense of self, to express it to themselves and to others, and to imagine their future selves [22, 32, 43]. Teenagers are at the forefront of exploring emergent technologies and through their use of them are influencing their behaviours and social customs [6, 46]. These activities are situated within and mediated by the data economy, and as such, they are uniquely impacted by surveillance capitalism and are largely unable to respond to the system.
Through these workshops, and an analysis of their transcripts and the design artefacts created in them, I seek to gain an in-depth understanding of the current role that data plays in these teenagers everyday lives; what scaffolding is needed to be able to be able to imagine alternatives to the present data economy; and what teenagers would like to be able to do with their data, and what the data economy would need to be like to support this.

2.3 Stage 3: Creation & Deployment

I anticipate that the third stage of my research will involve distilling the outcome of the co-design workshops, into a series of design concepts that can be explored further. This outcome is dependent on the dialogue that emerges from workshops and will be guided by the needs and desires of the participants. In recent research, we employed speculative short films as a method to support co-speculation in interviews that probed on the tensions and benefits of potential socio-technological futures [8], and I see this as being a valuable approach moving forwards to explore how people envision living and operating within a human-centric data economy.

3 EXPECTED CONTRIBUTIONS

The goal of this research is to contribute to HCI research community's understanding of what a human-centric data economy could and should be, its socio-technical infrastructures, and the types of everyday data driven activities that it would support. Designing strategies that enable people to have more choice and control over their personal data opens potential for participation in a more sustainable human-centric data economy that foregrounds agency over exploitation. These concerns intersect with recent calls to "break data free" such that it can be creatively manipulated and given new and unexpected forms by end-users [13, 15, 48].

The first stage of my research advanced the HCI community's understanding of what data intermediaries are through visualizing and framing this largely intangible aspirational concept and alludes to potential future product and service forms entangled with within this space, highlighting where tensions might emerge. This translation work produced an explicit definition of human-centric data intermediaries that operationalizes them for the HCI community.

The second stage of my research is expected to contribute towards an understanding of how teenagers envision everyday life within a human-centric data economy — what would they like to be able to do with their data; what products and services do they image being able to use. Another key consideration of the workshop is its activating potential. By increasing teenagers' awareness of the exploitation and its consequences within the present data economy, and providing opportunities to envision their preferred reality, I see that there is the potential for them to act more agentically — making more informed decisions — and to be able to conceptualize and advocate for alternatives.

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