

In pursuit of socially-minded data-intensive innovation in banking

Aitken, Mhairi; Ng, Magdalene; Horsfall, Dave; Coopamootoo, Kovila P.L.; van Moorsel, Aad; Elliott, Karen

DOI:

[10.1016/j.techsoc.2021.101666](https://doi.org/10.1016/j.techsoc.2021.101666)

License:

Creative Commons: Attribution (CC BY)

Document Version

Publisher's PDF, also known as Version of record

Citation for published version (Harvard):

Aitken, M, Ng, M, Horsfall, D, Coopamootoo, KPL, van Moorsel, A & Elliott, K 2021, 'In pursuit of socially-minded data-intensive innovation in banking: a focus group study of public expectations of digital innovation in banking', *Technology in Society*, vol. 66, 101666. <https://doi.org/10.1016/j.techsoc.2021.101666>

[Link to publication on Research at Birmingham portal](#)

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.



In pursuit of socially-minded data-intensive innovation in banking: A focus group study of public expectations of digital innovation in banking

Mhairi Aitken^{a,*}, Magdalene Ng^b, Dave Horsfall^b, Kovila P.L. Coopamootoo^b, Aad van Moorsel^b, Karen Elliott^c

^a The Alan Turing Institute, British Library, 96 Euston Road, London, NW1 2DB, UK

^b School of Computing Science, Newcastle University, 1 Science Square, Newcastle upon Tyne, NE4 5TG, UK

^c Newcastle University Business School, Newcastle University, 1 Science Square, Newcastle upon Tyne, NE4 5TG, UK

ARTICLE INFO

Keywords:

Data ethics
Corporate digital responsibility
Ethical AI
Innovation
Public engagement

ABSTRACT

While the field of data ethics is increasingly engaging with the complex socio-technical nature of data practices and their impacts, in the private sector, data ethics continues to be pursued largely through limited instrumental measures. This paper addresses the following research question: How can socially-minded data-intensive innovation be pursued in the private sector? It reports the findings of a series of five focus groups to explore the role of public deliberation in informing ethical data practices in banking. The findings indicate that deliberative forms of public engagement present valuable opportunities to incorporate diverse views and perspectives and to enable critical reflection on organisational practices and the trajectory of innovation. We conclude that public engagement is vital to ensure that private sector organisations move beyond “ethics-washing” or tokenistic efforts at Corporate Digital Responsibility (CDR) to meaningfully address public concerns and reflect public values in all innovation processes.

1. Introduction

2020 was a year which, among other things, focussed attention at a variety of struggles relating to social justice: ranging from international protests around Black Lives Matter and Climate Change to English A-Level students protesting the use of an algorithm to determine their exam grades. This heightened awareness of social and political tensions and the power of public movements was felt in the field of data ethics and responsible Artificial Intelligence (AI) where increasing interest in social justice and socio-technical dimensions of AI and data are said to be underpinning a third wave of ethical AI [1].

However, to date social justice-oriented discussions of data and AI have predominantly related to public sector data practices. Conversely, in the private sector, while data ethics and responsible AI are major topics of interest, the focus remains largely on approaches which emphasise improving existing and planned data practices rather than fundamentally questioning the trajectory and momentum of innovation [2–4]. Recognising that new technologies can have transformative effects both on individuals and wider society [5], in this paper, we explore

how a more socially-minded approach to data-intensive innovation might be pursued in the private sector. Our central research question is: How can socially-minded data-intensive innovation be pursued in the private sector? To address this, we focus on one particular sector: Banking.

Banking is chosen as it represents an area in which digital innovation and data-intensive technologies are leading to both significant industry-wide change and societal impacts. These new technologies underpin digital services such as internet banking, mobile payments, crowd-funding, peer-to-peer lending, Robo-Advisory and online identification [6]. AI is used to drive automated chatbots for customer services, to create efficient processes for detecting fraud and money laundering and improving automated processes that utilise large volumes of data (e.g. client risk profiling or credit scoring) [6,7]. The impacts of these new data-intensive technologies in banking will be experienced not just by direct customers but also by wider society. Such impacts may be positive (e.g. opening up financial services to unbanked or underbanked populations [8]) or negative, (e.g. creating new opaque systems through which access to finance is determined or reducing people’s capacity to

* Corresponding author.

E-mail addresses: maitken@turing.ac.uk (M. Aitken), Magdalene.Ng@newcastle.ac.uk (M. Ng), Dave.Horsfall@newcastle.ac.uk (D. Horsfall), Kovila.Coopamootoo@newcastle.ac.uk (K.P.L. Coopamootoo), aad.vanmoorsel@newcastle.ac.uk (A. van Moorsel), Karen.Elliott@newcastle.ac.uk (K. Elliott).

<https://doi.org/10.1016/j.techsoc.2021.101666>

Received 16 October 2020; Received in revised form 1 July 2021; Accepted 2 July 2021

Available online 14 July 2021

0160-791X/© 2021 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

opt out of data sharing or data collection [6]). Therefore, this represents an important area in which to consider the ways in which private sector organisations might engage with social justice considerations around data-intensive innovation. This paper does not aim to identify particular ethical concerns to address or actions that organisations should take, rather it explores the value of engaging with the public as an approach to pursue socially-minded data-intensive innovation in banking.

Section two of the paper provides an overview of current literature around data ethics and responsible AI setting out the three waves identified by Kind [1]. Section three discusses emerging interest in the concept of Corporate Digital Responsibility (CDR) and the ways in which this relates to the more established concept of Corporate Social Responsibility (CSR). Drawing on critiques of CSR and critical studies of existing private sector approaches to data ethics, it highlights the risks of CDR leading to ethics-washing or ethics-shopping [9,10].

Sections four and five present our focus group study examining public responses to data-intensive innovation in banking to explore the conditions which may need to be met to establish a social licence [6] for future practices and to underpin meaningful approaches to CDR.

We argue that in order to go beyond rhetorical commitments to ethical practice and to take a more social justice-oriented approach, it will be essential for private sector organisations to engage with diverse perspectives to understand public interests and concerns and to align with public values. Therefore, in this paper we aim to set out what it would mean to take this approach in the context of private sector organisations (notably in the banking sector). The focus group discussions demonstrate the value of public deliberation and the considerable potential for similar deliberative methods to shape future practices. We conclude with reflections on what our findings mean for future approaches to data ethics and responsible AI in the private sector.

2. Trends in data ethics

Kind [1] has outlined three waves of AI ethics. While her discussion focusses particularly on the ways that ethics is pursued in relation to AI, here we extend the argument to broader debates around data ethics.

Kind [1] sets out that the first wave of AI ethics was focussed on identifying harms caused through uses of big data and AI and led to a proliferation of sets of principles to underpin best practice (as evidenced by Ref. [11]). The first wave was dominated by philosophers, ethicists and social scientists, in some instances working in collaboration with public sector or private sector organisations to develop codes of practice and ethical guidance. However, such approaches have been criticised for leading to co-option of ethicists [2] and largely rhetorical commitments to ethical practice. The proliferation of principles enabled what Floridi [9] has termed “ethics-shopping” whereby organisations are able to shop around for the set of principles which most closely aligns with their own practices, thereby legitimising “business-as-usual” rather than leading to meaningful change and action.

The second wave was dominated by more technical approaches, led by computer scientists, programmers and data scientists [1]. These approaches tended to focus on quantifying and measuring harms (e.g. bias and unfairness) and developing technical fixes to address them. Such approaches have appeal to tech companies and organisations committed to using innovative data-intensive technologies. However, they have been criticised for focussing on narrow aspects of AI and data practices [4,12]. In doing so, they have offered technical solutions to symptoms of deeper socio-technical problems. These technical approaches have generated substantial interest and investment from across the public and private sector, which may not be surprising given that they do not challenge or oppose the central drive for increasing collection, storage, use and reuse of data or the momentum for investment in AI and data-intensive technologies. In suggesting that the ethical challenges associated with AI and data can be resolved through technical fixes, the second wave largely overlooked broader considerations relating to the role and impacts of AI and data in society [13,14] and did not question

the trajectory of innovation [1].

The third wave is said to have developed through recognition of the limitations of the first two waves along with a heightened interest in social justice borne out of the social and political turmoil of recent years. The third wave recognises that the ethical and social challenges associated with data and AI are inextricably interwoven with broader, long-standing social, political and cultural factors [1]. The processes through which data-intensive technologies are developed, deployed and evaluated are social processes, inevitably reflecting the contexts in which they are undertaken. As such it is not possible to resolve complex ethical challenges by focussing on technologies alone [4]. Rather we need a set of approaches which take account of the social, cultural, political and economic dimensions of data and AI. This requires much more than abstract principles or technical fixes to improve technologies, but rather broader consideration of the role these technologies play in society and the conditions under which they may be appropriate and acceptable.

This third wave presents an imperative to build social justice into future approaches to data-intensive innovation and technology [1]. Kind’s tripartite classification of approaches to AI ethics is useful in illustrating the various ways ethical challenges have been addressed and highlighting the limitations of dominant approaches (wave 1 and 2) which largely do not challenge the trajectory or momentum driving innovation. However, the waves may not in fact be truly successive but rather they have always co-existed. While the first and second waves have in recent years surged and crashed on the shores of tech policy, practice and public discourse, bringing with them a tsunami of ethical principles and codes of conduct, there has always been a steady undercurrent of third wave thinking.

Indeed, there is a long-standing and well-established body of literature in the field of Science and Technology Studies (STS) which has consistently focussed on social, cultural, political and economic dimensions of science, technology and innovation (e.g. Refs. [15–18]). STS studies have examined social processes and impacts relating to *inter alia* energy technologies [19], nanotechnology [20], nuclear weapons [21] genetically modified crops [22] and genomics [23] and have long argued for the recognition of science and technology as human and social endeavours requiring wider societal engagement and scrutiny to underpin ethical and responsible practice [24–26]. While the technologies under examination may vary, the social processes through which those technologies develop and the ways in which they both rely on and challenge society’s relationships with science and technology remain consistent. Third wave approaches can therefore learn a lot from building on the substantial existing body of work in this field.

However, while such third wave thinking is gaining traction in relation to public sector contexts (perhaps due to their ostensible focus on societal outcomes and public good) to date private sector organisations working in this field appear to be largely wedded to first and second wave approaches. These approaches enable more instrumental – and less challenging – means to demonstrate (rhetorical?) commitments to ethical and responsible data practices.

An important question remains: what does the third wave mean for private sector organisations and how might it be pursued in profit-driven commercial settings? To begin to address this question we now turn to consider how data ethics and responsible AI are being pursued in the private sector. Specifically, we discuss growing interest in the concept of Corporate Digital Responsibility (CDR).

3. Data ethics in the private sector

As noted above, growing criticism is directed at current private sector approaches to pursuing ethical data practices. While in recent years ethical advisory boards, commitments to ethical principles and the creation of senior roles focussing on data/AI ethics have become regular features of companies across the private sector [2,27,28], the extent to which such activities have led to real change or impact is questionable. Current private sector approaches have been criticised in a number of

ways. Ethics is often pursued instrumentally, primarily as PR exercises, serving to enhance the branding of an organisation and market it as an “ethical” company [2]. This leads to “ethics-washing” where an organisation makes unsubstantiated claims to ethical practice or subscribes to ethical principles without making meaningful changes or actions [9].

A second major criticism levied at private sector approaches to data ethics is that commitments to ethical practice are often made in order to lobby against increased regulation of data-intensive technologies [9]. In setting up internal ethics boards and advisory bodies the private sector has often pushed for self-regulation and argued that strict, or formal, regulation would stifle innovation and harm economic growth. However, existing internal bodies and processes for self-regulating ethical practice typically “lack teeth”. They have been criticised for their limited authority and accountability and ethical principles that are largely not enforced [2]. Moreover, self-regulation through internal bodies typically leads to a focus on narrow aspects of innovation and favours minor tweaks or technical fixes which enable planned technology projects to go ahead, rather than fundamentally questioning the value, rationale or impacts of innovation [2].

However, despite growing criticism of the approaches being taken, private sector interest in (at least the rhetoric if not necessarily the action) of data ethics continues to grow. Recent years have brought interest in the emerging concept of Corporate Digital Responsibility (CDR) [29–31]. CDR is advocated as a means of centring digital responsibility within private sector practice. It has developed through growing recognition of the central importance of digital innovation to all areas of business as well as the potential for both positive and negative societal impacts [32].

CDR builds conceptually on the established field of Corporate Social Responsibility (CSR): While CSR sets out a company’s duty to reflect society’s economic, legal, and ethical expectations of how it should operate in relation to social and ecological goals, CDR extends this to include societal expectations in relation to digital innovation and data practices [29]. Yet CDR is distinct from CSR in its approaches and aims [33]. CDR is intended to provide a set of norms and values to guide organisations’ approaches to both creating and using digital technologies [29], as such it is not solely intended for organisations with a technological or innovation focus. Furthermore, CDR is conceptualised broadly and engages with social, economic, technological, and environmental dimensions of digital innovation [34].

However, as CDR is gaining traction the ways in which it is discussed and enacted are varying. While conceptual discussions of CDR set out its broad scope and the value of engaging with diverse stakeholders to identify and pursue responsible approaches [29,33,34], industry discourse around CDR often reflects more instrumental and managerial approaches, emphasising the opportunities it presents to build consumer trust through establishing a responsible or ethical brand.

CSR has long been criticised as leading to tokenistic or cosmetic commitments to address social and environmental aspects of companies’ work [35–37] and there are risks that as CDR becomes more mainstream, it may also exacerbate current levels of “ethics-washing” around data-intensive innovation.

Key to avoiding the criticisms which have previously been made of both CSR and of current private sector approaches to data ethics is taking more socially-minded approaches reflecting “third wave” thinking. This necessitates opening-up discussions of ethics to include broader discussions of the contexts in which data-intensive technologies can add value and the conditions which need to be met to ensure they are used in ways which are appropriate, legitimate and socially acceptable. This in turn requires greater openness and engagement with diverse interests and perspectives [6].

While private sector organisations have often sought to control and restrict debates around ethical practice by keeping them “in house” and limiting involvement to carefully selected groups of experts [2,28], more socially-minded approaches recognise that in addressing complex socio-technical challenges we need to understand these challenges from

the perspectives of those who are impacted (both directly and indirectly) [12]. Moreover, to take approaches that reflect societal expectations and public values, we need to engage with members of the public to identify and reflect what these expectations and values may be [6].

This resonates with the arguments of many STS scholars who have pointed to the importance of public engagement as a valuable mechanism to inform the development and deployment of new technologies and as being crucial to ensure accountability and good governance of science and technology [25,26,38,39]. Public engagement serves important roles in ‘test[ing] and contest[ing] the framing of issues that experts are asked to resolve’ [40]: 397), facilitating scrutiny and accountability and ensuring professional “expertise” is not used to perpetuate unjust points of view or to bestow too much power on the organisations within which expertise is located (*ibid.*). Additionally, public engagement can ensure that science and technology conform to cultural standards and align with public values (*ibid.*).

This may present challenges in the private sector where profit-driven organisations are ill-accustomed to meaningfully engaging with diverse publics (beyond direct customers or service-users) [6]. To explore how this challenge may be addressed and what public expectations may be relating to data-intensive innovation in the private sector, the remainder of this paper presents a focus group study examining public attitudes and expectations around data-intensive innovation in banking.

4. Methods

A series of five focus groups were held between September and November 2019. These engaged with members of the public from diverse backgrounds and perspectives to examine current experiences with banking and attitudes towards current and future data-intensive innovation in this area. Focus groups were chosen as a method due to their value in exploring new areas within social contexts [41] and enabling an exploration of how attitudes and responses develop and are articulated through dialogue and deliberation [42].

Five focus groups were conducted. This number of focus groups was chosen to allow sufficient diversity of perspectives to be considered within time and resource constraints of the project. Five focus groups is considered an appropriate number to gain meaningful insights in order to address the research question. Previous research has found that more than 80% of themes discovered through focus group research can be identified from within two to three focus groups, with 90% being discoverable within three to six focus groups [43].

A semi-structured approach was taken. A topic guide was developed to ensure a level of consistency between the focus groups (see Appendix). This was very flexible and allowed participants to raise issues and/or concerns which they considered to be relevant. The semi-structured design also meant that topics of discussion did not always arise in a pre-determined order, and that the focus groups were able to explore unanticipated areas of interest. As is recognised to be an advantage of focus group research, this approach allowed for a responsive, conversational style resulting in open and frank discussions and enabled individuals to engage with aspects of the topic which were previously unfamiliar to them [42,44].

The focus groups typically lasted around 1 h. They were audio-recorded with written consent from participants. The recordings were professionally transcribed. The transcripts were then reviewed and corrected by the lead researcher, removing any potentially identifying information (e.g. names and/or details about workplaces) before the transcripts were analysed.

The transcripts were coded in NVivo (Version 12) software. The coding process followed an inductive, grounded theory approach [45] drawing out key themes from each of the focus group discussions and highlighting emerging areas of interest and/or concern. The coding focussed on bringing out high level themes, structuring a narrative account of the discussions. The themes were mapped to illustrate their interconnections and the ways in which different topics discussed

related to one another (see Fig. 1). This formed the basis of a narrative account of the main discussion points across the focus groups. This analysis enabled an exploration of the ways in which participants' responses were articulated and developed through the discussions.

4.1. Sample

The focus groups all took place in Newcastle (U.K.), except for one which was held in a rural town, 20-miles outside of Newcastle. It was considered important to hold a focus group in a more rural location as it was anticipated that rural residents may have different experiences relating to accessibility of banking services, and digital connectivity.

Participants were recruited through pre-established groups including students, meetup groups for senior citizens and young professionals, and via community centres. Engaging participants via pre-existing groups is a common and effective approach in focus group research [42]. This approach can increase efficiency of recruitment of participants since interested individuals are able to bring a friend, colleague or another member of the group along with them - this both increases numbers and can make participants feel more at ease. Additionally, the existing group dynamic, while new to the researcher and important to consider, enables participants to engage in more natural conversations and to relate the discussion topics to common experiences or areas of interest (ibid).

Focus group participants were sampled through purposive sampling focused on maximising diversity across the focus groups in order to access a broad range of viewpoints and perspectives. The aim was to have a diverse, rather than statistically representative, sample [44]. It was important that individuals within each of the groups shared common traits or interests as this meant that they felt comfortable and able to discuss the issues freely (ibid.). Participants did not need to have any prior knowledge or experience of data-intensive innovation or of digital banking services. Within the focus group discussions participants demonstrated varied levels of interest and understanding in relation to data-intensive innovation as well as varied levels of experience of digitally enabled banking services. These varied perspectives enabled a

great deal of engagement among participants who shared experiences and ideas with each other.

A total of 23 participants took part in the focus groups. The focus groups engaged a diverse range of age groups (the youngest participants being in their early 20s and the oldest over 75). Participants came from a range of professional backgrounds, the largest group were students (39%), 13% of participants were employed full-time and 13% were employed part-time, 13% were jobseekers, 9% of participants were self-employed and equally 9% were retired.

One limitation of the sample was that it included a disproportionately large number of women (17) compared to men (6). This is a limitation of the study which will be addressed in future research. However, it is important to emphasise that this research did not aim for a representative sample nor to perfectly reflect the proportions of different demographic characteristics across the wider population. Rather the sample includes sufficient diversity to allow a consideration of the range of views and perspectives that may be expressed. The research does not aim to make any generalisations about viewpoints in relation to particular demographic characteristics but rather aims to explore the value of deliberative processes in relation to the subject of this research. Nonetheless, it is important to be mindful in interpreting the findings that men's views are underrepresented in the overall sample.

In the following discussion, the five focus groups are referred to by a term which denotes the common characteristics of the participants in each group:

1. Seniors (members of a meetup group for senior citizens)
2. Rural (a focus group held in a rural town 20-miles outside Newcastle)
3. Young Professionals (recruited via a meetup group for young professionals)
4. International Students (recruited via student forums at Newcastle University)
5. Postgraduate Students (recruited via student forums at Newcastle University)

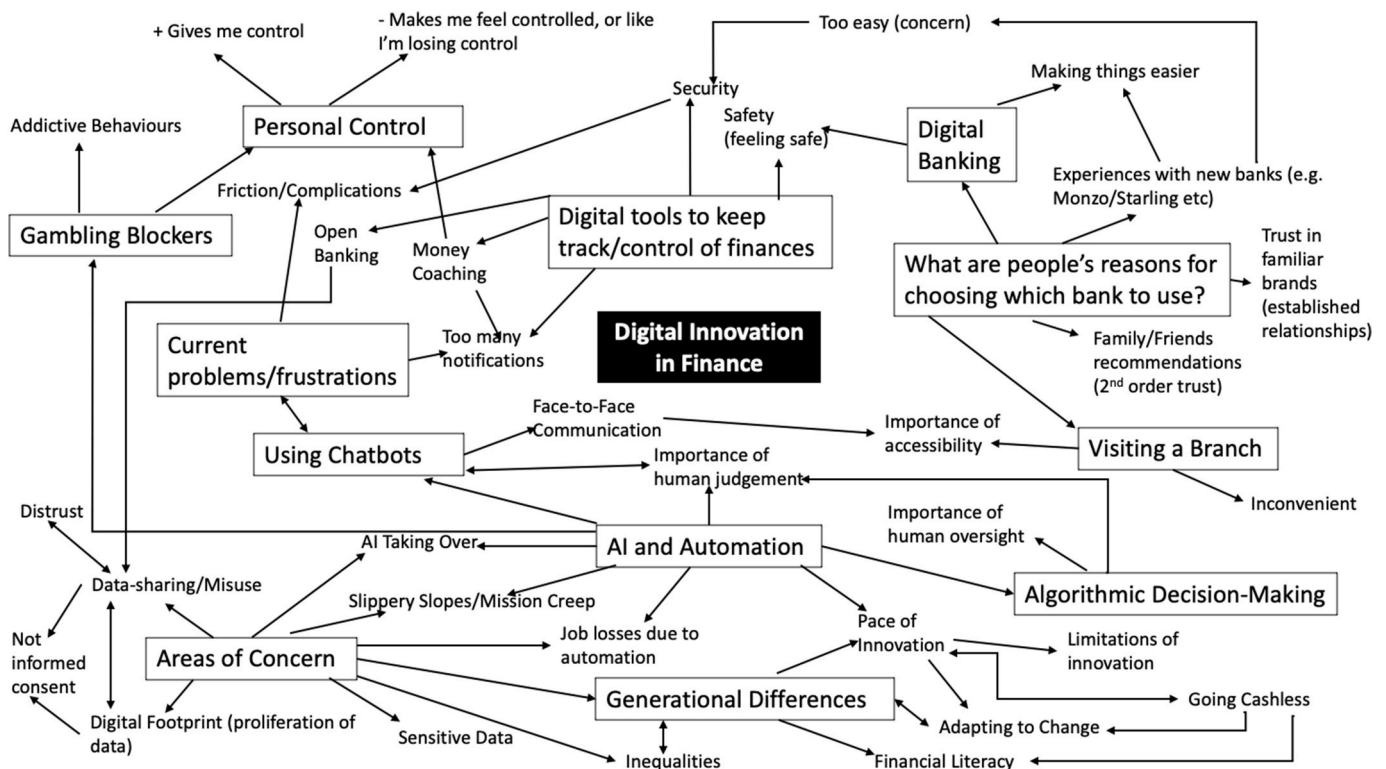


Fig. 1. Map illustrating key themes across the focus groups.

Individual participants in each group are referred to by reference to their gender (F or M) followed by a number which remains constant for each individual throughout.

5. Findings

The focus groups discussed a broad range of topics relating to data-intensive innovation in banking (as illustrated in Fig. 1). Within the scope of this paper, it is not possible to cover all these in adequate detail. Findings from this same study relating specifically to applications of AI in banking have previously been discussed in [46]. This paper focusses on public expectations for the role of data-intensive innovation in banking and preferences and concerns relating to future directions in this area. The findings below begin by discussing responses to recent examples of data-intensive innovation in banking before considering areas of concern that emerged through the focus groups.

5.1. Experiences and perceptions of data-intensive innovation

Most participants in the focus groups regularly used digital banking services. There was only one participant who reported never having used online banking. This was a member of the seniors' focus group who expressed unease about using online services. Many participants described a general sense of satisfaction with existing digital banking services. Typically, it was suggested that they did not want to have to think about banking in their day-to-day life and that their satisfaction came from banking services being easily accessible and frictionless. For most participants, the transition to digital banking had been fairly intuitive.

However, while there was near-consensus on the convenience and utility of digital banking services, other forms of data-intensive innovation led to more varied opinions. Digital innovation was generally viewed positively where it was perceived to increase convenience and/or increase individuals' control over their own finances, conversely it was viewed negatively if it was perceived to be inconvenient or to reduce individuals' control. These different perspectives were clearly illustrated through discussions relating to two of the examples introduced: Gambling Blockers and Open Banking.

5.1.1. Gambling blockers

Participants were told that a number of banks now offer the option of blocking gambling transactions, and that this is intended to help people with gambling addictions. It was stated that customers voluntarily set up the block on their account or credit card, and that this denies transactions to be made at betting shops, or gambling websites. Participants were told that Artificial Intelligence (AI) may be used to track transactions and identify which ones to block.

Of all the examples introduced, this vignette received the most positive responses in the focus groups. Most participants agreed that this was a worthwhile and potentially valuable innovation. In articulating their reasons for being positive about gambling blockers participants typically emphasised the importance of it being voluntary, and that customers remain in control:

F2: It's a good step I think because even the one that you can take off really quickly, if I was a gambling addict, I would have to take this step to take that off which would make me think rather than being impulsive. So yes, anything that helps.

F1: I think it's a good idea too with the same feelings about if it's a joint account and one partner is dominant over the other. Financially then what happens? But I think in theory it's a great idea.

F3: I like that too. I wasn't aware of that but I think it's a good idea. Like you say, it just gives that pause to the behaviour, maybe just gain back some control. As long as it's not enforced and it's their

choice to do it, to have that backup, safety net, yes, I think that's a nice idea.

(RURAL)

Focus group participants typically discussed the potential value of gambling blockers for *other people* (i.e. those with gambling addictions). Given that this relates to a stigmatising addiction, it is perhaps unsurprising that people typically did not describe gambling blockers as needed in their own lives, however, many participants described other forms of addictive behaviour (which carry less stigma) that they would themselves benefit from being more controlled, for example:

"Like McDonald's, I need that! And Starbucks. I'd save a fortune!" (POSTGRADUATE STUDENTS: F6)

"I think for me personally, a block on buying cigarettes. That would do me. I don't have the willpower to give up but because the only reason I want to give up is because they're expensive. But if I couldn't buy them then I couldn't buy them so I'd have to ..." (POSTGRADUATE STUDENTS: F4)

In most focus groups, participants discussed potential areas in which similar blocks could be developed, where there might be benefits for customers:

M1: I think it's a good – like you said they've got to admit they've got a problem, but I think it is a good way to tackle addiction, you have to use multiple methods and this could be a good one. And not just gambling. For example, [XXXX] is 64 and she is a widow and she likes to hoard, she buys thing off the internet

F1: that's an addiction isn't it

M1: people say it's a mental illness, hoarding. So I'd like to see things that tackle other conditions

(SENIORS)

F1: I'd like to just say shopping, as stupid as it sounds, but then again it's how do you categorise it? Is it just retail, but then what about Asda for your food shopping!

F2: If it was like your phone bill where you can put a block on if your phone bill gets to a certain point so you can't spend more, if you were going to a shop but you had like a £100 limit, if you were going to spend more than that it would stop you. [...] I think it's a really good idea.

(YOUNG PROFESSIONALS)

This was an example of where participants enthusiastically and creatively discussed ideas about potential future applications of technologies and ways of maximising public benefits from innovation.

However, while responses were largely positive there were some concerns about potential indirect consequences of using gambling blockers, particularly relating to the collection of data about their use:

"The thing is, I mean me and my friends like to bet on sports at the weekend. I've got friends who are looking to buy a house and won't use an online gambling website because that will negatively affect your credit score and might affect them getting a mortgage or things like that. [...] So I think it's a really good idea as long as when you're applying for a mortgage, there is nothing on your score that says this person engages with gambling blockers which makes them more of a risky investment because they recognise themselves that they have gambling addictions. I think it's a good idea as long as it's not tracked and affecting your score." (POSTGRADUATE STUDENTS: M2)

There were also some concerns about the role of AI in detecting gambling transactions, and the importance of customer control to be

able to correct inaccuracies:

“I think it sounds really good in theory but then there are so many caveats and loopholes. Just because somebody ... the AI could potentially misinterpret what counts as gambling or something like that. [...] So the technology would have to be sophisticated enough to judge situations properly but people need to have some kind of control over it to say, “This is not what I need.” (POSTGRADUATE STUDENTS: F1)

Finally, some participants expressed scepticism that gambling blockers would actually work for people with serious addictions. In part because customers have to themselves identify as having an addiction and want to take action to tackle this, and secondly because addictive impulses might lead individuals to find alternative ways to gamble:

F2: Well some people will not admit they've got an addiction

F1: yeah, that's true

F2: like alcoholics “oh I'm not an alcoholic, I only drink in moderation” you might say the same about gambling

MA: so it only works if the customer themselves ...

F2: admit it. They've got to admit they've got a problem

(SENIORS)

“But I think for some people who have genuine addictive personalities and genuine issues, surely say somebody was addicted to gambling and they went to use the online betting system and then it was being blocked, could that not spiral their behaviour into something else? Could it make them do something worse or more drastic measures to be able to fulfil that behaviour or fulfil that action? [...] somebody who is so addicted to gambling, like you say, they could just go and withdraw some cash and then end up spending more than they would have on the app or something. So it can make behaviour snowball potentially for a few people.” (POSTGRADUATE STUDENTS: F1)

The discussions relating to gambling blockers led to reflections on the potential benefits of the technology and opportunities to extend this, consideration of the limitations of what the technology could do and also concern about the extent to which a technological solution could help people with addictive behaviours. As such the focus group participants acknowledged and discussed complex socio-technical considerations relating to the technology. In doing so they demonstrated “third wave” [1] thinking in considering not just technical aspects but also the social contexts and challenges to which the technology relates.

5.1.2. Open Banking

Open Banking was also introduced as a vignette in the focus groups. Before being read a description of what Open Banking is, participants were asked if they had ever heard of this. Across all the focus groups no participants said they had heard of Open Banking.

A description of Open Banking was then given, this set out that regulation which came into force in January 2018 means that all UK-regulated banks are required to let customers share their financial data with other organisations if they choose. Participants were told that this financial data includes information about spending habits, regular payments and companies customers use (e.g. bank, credit card or savings statements). They were told that customers can choose to share this information with other banks or budgeting apps to help them manage their finances and that the data can only be shared with their permission.

There were mixed responses to Open Banking. Some participants considered this to be potentially very useful. In particular, some considered Open Banking to potentially give people greater control over their finances:

“I think I would quite like that because I have a few different accounts and it would be nice to be able to see them all, you know, without having to go through each separate statement, to have it in one place” (SENIORS: F1)

“I guess it's good that it gives you, I don't know about your financial situations but people who are not, we get similar tools to the people who are really into money and wealth to have control over our money and, as you say, using a budgeting app and that could step up to some investments and so having more tools as an ordinary earner.” (RURAL: F2)

Once Open Banking had been described some participants said they had seen services advertised which sounded like they were facilitated by Open Banking and some were interested in potentially using these. However, across the focus groups there were a number of concerns expressed about Open Banking. In particular participants had concerns about data security and data sharing arrangements:

F1: oh yes, that would be handy

F2: oh I don't know about that

MA: Is there something that concerns you about it?

F2: Just having all your personal data shared by

F1: no, but that is with your permission

F2: hmm, but is it safe?

M1: yeah, I mean I share some of the same concerns. There are things these days like with Facebook people taking other people's data

(SENIORS)

“I can see the benefit of changing and having all of your information there and using it as a reference kind of thing and that's great but again, I would have questions about how long they store this information for, what it's going to be used for after it's been used for that purpose if you like. Is it going to be destroyed? Is it going to be sat on record for ten years? Is it going to be referred back to? I don't know. So it's not necessarily something that I would be interested in using but I can see benefits to it, but questions as well.” (RURAL: F3)

“the main concern will be opening another security door, who would really be able to see that data and who would be able to track it? For example, I'm not sure if let's say just the government, would they have all of my data or would the organisation? [...] I think opening that door may make it easier for other organisations or governments to just turn around and say, “Okay new law now all of those apps have to share the data with us,” or something along those lines. So although it's quite useful probably the main issue with it is security, even from governments.” (INTERNATIONAL STUDENTS: M1)

The concerns around data-sharing related to potential uses or abuses of the data. This included concerns that financial data could be used for surveillance, including potentially by future governments (as described in the quote above) as well as for marketing purposes.

Participants' responses to Open Banking were typically shaped by two key considerations, firstly; the extent to which they considered Open Banking to increase their control over their finances, and secondly; whether they trusted the organisations handling their data. Trust was central in shaping participants' responses. This trust related not just to perceptions of the technology but more so to perceptions of the organisations that were handling or sharing customer data. It was clear that participants were aware of risks relating to data sharing and/or data misuse. The extent to which participants were interested in using new services underpinned by Open Banking depended on how confident they felt that they would remain in control of who had access to their data.

5.2. Emergent themes

The vignettes introduced in the focus groups worked well to spark discussions around data-intensive innovation in banking. Through these discussions a number of broader themes emerged.

5.2.1. Slippery slopes

A number of participants were concerned about the ways in which data used in financial apps or shared through open banking might potentially be reused in the future. There was concern that while current regulations might limit data sharing or data reuse to purposes which were perceived to be acceptable and legitimate, in the future such regulation might change to allow further possibilities which are less acceptable (including potential government access of personal data).

Moreover, there was concern that data might be used, or reused inappropriately or shared with third parties:

“I can’t see me wanting to do this and trusting it at all because you give your permission for something, you have no clue what’s going to happen with your permissions unless they expressly tell you this in detail. I’d have to be very persuaded to give them permission to look at all my financial information I think and not know how long that lasted or what they could do with that information and if it’s going to turn up on Facebook or something like that.” (RURAL: M1)

“That would be okay if it was free market, increased competition, give you more options and to some extent that information might be used to target more affluent people to buy luxury products and things like that. But then if it went the other way and people who were in bad financial circumstances, if they start being targeted by things like Wonga and loan sharks, poor financial opportunities” (POSTGRADUATE STUDENTS: M2)

Beyond particular data uses, there was also concern about potential slippery slopes around the role of AI and impacts on society. In particular, participants expressed concern that increasing reliance on AI in automating decision-making processes could erode human capacities and expertise:

F1: I think it’s kind of worrying if now we have this one and then we depend on AI to give us advice. Say AI is getting better and then everyone can, let’s say AI can really does the job and then everyone just talks to AI and then no more human interactions and then we are all relying on this AI to give us whatever advice. It’s going to take over our thinking. We cannot think as a human but it’s like we let them think and then they tell us. I’m just worried.

M2: Yes, that’s what I meant especially with teenagers and people who grew up then in that time because they don’t know anything else.

F1: They will always think, “Okay, there is an app, AI, that can always give me that.”

M2: They depend on it.

(INTERNATIONAL STUDENTS)

This related to concern that AI could “take over”:

“If this did come about, how long would it before artificial intelligence takes over the whole thing?” (SENIORS: F2)

The risks of AI and automation increasingly replacing human judgement and oversight was a major theme which emerged consistently across all the focus groups (this is discussed further in Ref. [46]).

5.2.2. Generational differences

While the focus groups engaged with participants from a wide range of ages (from early 20s–80s), there was limited evidence to suggest that

age substantially affected attitudes towards digital innovation in banking or expressed willingness to use new services or technologies. Previous reports (e.g. Refs. [47,48]) have suggested that younger age groups may be more positive about digital innovation and older age groups more concerned, however the focus groups did not find evidence to support this. While the focus group with senior citizens included one participant who did not use digital banking services and described herself as “computer illiterate” the discussions within that focus group were largely ambivalent and acknowledged both potential benefits and risks of digital innovation in banking. Equally, the focus groups with younger participants (in their 20’s) included many individuals who were very concerned about current and future data practices. Indeed, the two focus groups held with students contained the greatest discussion of risks and potential negative impacts of digital innovation. Therefore, the link between age and support for data-intensive innovation does not appear to be as strong or clear as previous reports have suggested.

Nevertheless, the assumption that age correlates with attitudes towards digital innovation was evident within the focus groups. It is noteworthy that across the focus groups participants frequently made statements about how they expected other age groups to respond (either those older or younger than themselves) and speculated about the relevance or irrelevance of new technologies for other age groups.

In particular there was concern about impacts on older generations:

“I deal with an older generation sometimes and they certainly struggle with how banks are now. I have a feeling that even though I think an older generation did very well out of the world financially, I’m not sure they’re enjoying their retirement as much with the way things are going in terms of banking and the internet and all these things they have to deal with constantly and giving their identity. Those changes have been very quick for that whole generation. It’s a bit of a worry too.” (RURAL: M1)

“I think there are some people who would really detest the idea of the computer deciding whether you can get a house or get a student loan or something. I mean to older people potentially, no matter how good the algorithm is and how comprehensive and effective it is, the idea that there’s not a person on the other end of it deciding that thing, I think for some people that would really, really annoy them” (POSTGRADUATE STUDENTS: F3)

Equally, across the focus groups there was considerable discussion about impacts on younger generations, and the extent to which young people are developing skills to be financially responsible:

F2: Even if the kids are tech savvy, they still need to know about safety and what money is, that difference between game coins and coins that you’re going to live off.

M1: All those games encourage gambling, which we briefly talked about. If the gambling is there for people who have no clue what that means and they’re doing that, encouraged to [...] It’s a tricky thing. That point is when they need some financial education.

(RURAL)

“For me it’s that financial literacy that should be taught in schools. I think you can’t overemphasise that. I don’t just mean how to use computers online but budgeting, what happens when you get into debt, all of that stuff. I think it should be a course that children take” (RURAL: F1)

M2: If you have this virtual money coach for instance, teenagers or whatever, they will never really learn to deal with their own money in their own way. They will always have this helping hand everywhere, which I don’t think is that good [...]

F1: They will always think, “Okay, there is an app, AI, that can always give me that.”

M2: They depend on it.

(INTERNATIONAL STUDENTS)

The discussions of financial literacy and support needed for both older and younger generations highlighted a concern expressed throughout the focus groups that technological solutions or innovations could have negative impacts if they are not accompanied by education or social interventions. Participants consistently discussed technologies and data-intensive innovation in relation to the contexts in which they would be applied and by reference to “real world” examples of the problems they either seek to address or might potentially create. This was a consistent theme which emerged in each of the focus groups, participants emphasised the importance of human involvement and social interaction to realise the benefits of digital innovation.

6. Discussion

As set out above, taking a socially minded approach to pursuing data ethics in the private sector requires engaging with diverse views and perspectives to identify and address public concerns and expectations and to ensure that future practices align with public values. The focus groups clearly demonstrated that members of the public are able to engage in thoughtful and insightful discussions of the complexities, challenges and opportunities presented by data-intensive innovation. This is consistent with previous studies which have used deliberative methods to engage members of the public in complex discussions relating to data or AI (e.g. Refs. [39,49–51]).

The focus groups also gave insights into some of the considerations which need to be addressed in centring social justice in data-intensive innovation in banking. Participants’ responses typically reflected “third wave” thinking in discussing technologies in relation to the social, cultural and economic contexts in which they may operate. Participants rarely responded to examples by discussing the technologies or financial services without also discussing the social problems or needs which they were intended to address or wider social factors which would shape how they operate. This indicates that while current private sector ethics boards and advisory groups have been criticised for their narrow composition or their restricted remit [2], public engagement presents valuable opportunities to incorporate diverse views and perspectives and to enable critical reflection on organisational practices and/or the direction of innovation. Moreover, while first and second wave data/AI ethics have been dominated by particular disciplines and professional expertise [1] wider public engagement can play a valuable role in contesting framings and opening up discourses around data ethics and responsible AI to a wider range of perspectives and considerations.

This is very much aligned with STS perspectives on the importance of public engagement with science, technology and innovation as a means of informing practices and ensuring accountability and good governance [25,26]. Public engagement is also a core component of Responsible Research and Innovation (RRI) which emphasises the need for inclusivity to inform research and innovation processes [52–54]. However, to date, RRI has largely been developed and pursued in public sector contexts and led by academic or public bodies [53]. This is said, in part, to relate to uncertainty around the benefits of RRI for businesses and a ‘lack of business-oriented tools and methods to aid implementation’ (ibid.). As such, there is a clear need to build awareness and resources within the private sector to improve understandings of the value of public engagement in pursuit of ethical data practices.

A particular set of challenges has been noted in relation to RRI and AI in that opacity of algorithmic processes can hinder public scrutiny and accountability [55]. Considerable, and growing, attention has been directed at the importance of explainable and interpretable AI which allows stakeholders to scrutinise decision-making and understand how outcomes have been reached [56]. Yet this focus on understanding technical innerworkings of AI systems and technologies can obscure the

very many other facets of AI and data-intensive innovation which can – and must – be opened up to public scrutiny and interrogation. There is an ethical imperative to involve stakeholders (broadly defined) in informing decision-making about the role and impact of AI and other technologies in their lives and societies. Such deliberations do not require detailed technical understandings of AI technologies, and indeed requiring this would be a substantial barrier to democratic engagement. Understandings of the contexts in which technologies will be applied and lived experience of communities that may be impacted are valuable forms of expertise and knowledge within these deliberative processes. In our focus groups participants provided thoughtful and relevant perspectives on data-intensive innovation in banking through reflecting on their own various knowledges and experiences with banking and digital services as well as the many personal and social considerations that these related to. Participants were clearly confident and enthusiastic to engage in these discussions despite having very limited technical understandings of the technologies being discussed. While explainable AI (XAI) is an important goal it is not a necessity for meaningful and valuable public engagement to inform future ethical data practices.

The focus group discussions generally reflected neither technological utopianism nor technological dystopianism [57]. Rather the focus groups led to nuanced discussions through which participants articulated sophisticated, thoughtful and often balanced views. As has been found in previous qualitative research around public attitudes towards data practices (e.g. Ref. [39]), members of the public rarely express outright opposition or unconditional support for data uses or new technologies, rather qualitative methods, such as focus groups, provide rich insights into the conditions which underpin support or concerns. These insights are valuable for organisations to identify key features to address in order to ensure long-term social acceptability of new technologies and their applications.

Crucially, this is not about market research to identify ways of appealing to new customers or understanding why current customers choose to use products or services, but instead the aim is to explore wider social and ethical considerations relating to innovation. While market research might consider growing customer uptake of new products and services to indicate public acceptance, this does not necessarily indicate that those new products and services – or the technologies that underpin them – are socially acceptable. The distinction between public acceptance and social acceptability is important and points to the responsibility of private sector organisations to consider more than direct customer preferences but also indirect societal impacts and areas of concern. Considering only the preferences and experiences of existing or potential customers blinkers organisations to wider ethical and social responsibilities. Therefore, engaging with the public (rather than simply customers or service users) is a valuable exercise to inform ethical practice.

Focus groups are one method for doing this, however there are many other deliberative methods which can be used to engage diverse populations. For example, citizens’ juries, consensus conferences, deliberative workshops and other forms of “mini publics” [58] are excellent mechanisms through which to examine the conditions that underpin public support or concern. These methods aim to develop collective reasoning and socially-minded approaches to address complex issues. Deliberative methods are not intended to provide snapshots of public opinion or build support for particular projects but rather to identify the conditions that need to be met to ensure data practices and technologies align with public values and to identify ways of improving ethical conduct within organisations. There is also growing interest in innovative digital methods for public engagement and deliberation, including virtual, online platforms [59,60].

Of course, one reason existing ethical infrastructure is limited in private sector organisations is that this is shaped by instrumental rationales which may view ethical commitments as good PR while ethical practice and/or criticism are considered inconvenient or distracting. In this context one might be sceptical about the extent to which an

organisation would be open to engaging with critical voices or creating meaningful opportunities for wider debate and dialogue. Good quality public engagement requires more than instrumental rationales, but rather a commitment to genuine exchange of ideas and an intention to address concerns and reflect preferences in meaningful ways [6,61]. Yet, Buhmann and Fieseler [55] argue that facilitating meaningful engagement which opens up genuine spaces for deliberation may also have strategic reputational advantages for companies and better equip them to anticipate and respond to critical challenges.

The focus groups presented in this study included discussions of the opportunities to maximise the benefits and value of data-intensive innovation (e.g. through creatively thinking about potential future applications of “blockers”). They also discussed the extent to which new technologies would benefit individual customers and what conditions would need to be met for these benefits to be realised. Much of the discussions raised wider concerns about long-term, indirect impacts of innovation, including impacts on future generations. As has been found in previous research [39] public concerns around data practices typically do not relate primarily to individual or private interests, but rather to broader societal impacts. Importantly, and aligned with “third wave” approaches to data ethics, focus group participants stressed the importance of combining social and technical approaches and consistently emphasised that social interaction and human contact were vital to maximising the value of new technologies and mitigating their risks.

The nuanced and thoughtful discussions within the focus groups highlight the capacity of public engagement to engender constructive dialogues around innovation. This can add real value to innovation processes in both the private and public sector. Embracing this capacity represents an opportunity for private sector organisations to move beyond rhetorical commitments to ethical practice as PR exercises to more meaningfully engage with public interests in order to establish a social licence for current and future practices [6].

7. Conclusions

While the field of data ethics is increasingly engaging with the complex socio-technical nature of data-intensive innovation, the private sector typically pursues limited, instrumental approaches to data ethics. Private sector approaches to data ethics or responsible AI have often been criticised as representing “ethics-washing” or “ethics-shopping” [9]. With growing interest in the concept of Corporate Digital Responsibility (CDR) it is important to establish new approaches which go beyond tokenism or PR.

Just as CSR has been criticised for becoming defined by narrow business interests and limiting the extent to which broader public interests are addressed [62] there is a risk that if CDR prioritises the views of professional and “expert” groups it may lead to a narrow focus on pre-defined areas. CDR might then become yet another mechanism for validating existing data practices and leading to increasing “ethics-washing”.

This paper has set out some of the ways in which private sector organisations can pursue ethical data-intensive innovation. We argue that doing so requires meaningful engagement with diverse interests and perspectives in order to reflect public values within all innovation processes.

The five focus groups conducted in this study have illustrated the value of public engagement to inform ethical data practices. The rich and varied discussions point to many areas which the banking sector should address in pursuing ethical and socially-minded approaches to data-intensive innovation. Doing so may be crucial for establishing and maintaining a social licence for future approaches [6] and ensuring the social acceptability of new technologies and their applications. This points to an important role of public engagement to develop “third wave” data ethics in the private sector and to underpin meaningful approaches to CDR.

While the focus groups are not intended to be representative of wider

public views they provide rich insights into diverse perspectives and experiences and demonstrate the value of deliberative methods in informing ethical practice. The focus groups were conducted in one region in the North-East of England, conducting these in other regions or other countries may lead to different issues being discussed or different concerns arising. It will therefore be important for similar research to be conducted in varied settings and contexts. The findings of this research point to the importance of using deliberative methods to develop socially minded approaches to data-intensive innovation to reflect social values. Given the international importance of data ethics and responsible AI, deliberative methods such as focus groups, represent an important set of tools to be used in varied settings. As such while our focus groups were conducted in the North-East of England we expect the findings to be of relevance to private sector practices worldwide.

This paper has not aimed to identify particular ethical concerns to be addressed or actions to take within the banking sector, rather it illustrates the value and importance of public engagement and deliberation to inform future practices. It has shown that public engagement is vital to ensure that private sector organisations move beyond “ethics-washing” or tokenistic efforts at CDR to meaningfully address public concerns and reflect public interests and values in all innovation processes.

Credit roles

Mhairi Aitken: Conceptualisation; Methodology; Formal Analysis; Investigation; Data curation; Writing – Original Draft. Magdalene Ng: Writing – Review & Editing. Dave Horsfall: Writing – Review & Editing. Kovila P.L. Coopamootoo: Writing – Review & Editing, Funding Acquisition. Aad van Moorsel: Writing – Review & Editing; Funding Acquisition. Karen Elliott: Conceptualisation; Methodology; Writing – Review & Editing; Funding Acquisition.

Acknowledgements

This research was funded by the EPSRC, grant reference: EP/R033595/1.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.techsoc.2021.101666>.

References

- [1] C. Kind, ‘The Term ‘ethical AI’ Is Finally Starting to Mean Something’, 2020. <https://venturebeat.com/2020/08/23/the-term-ethical-ai-is-finally-starting-to-mean-something/>.
- [2] E. Bietti, January. From ethics washing to ethics bashing: a view on tech ethics from within moral philosophy, in: *Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency*, 2020, pp. 210–219.
- [3] K. Yeung, A. Howes, G. Pogrebna, AI governance by human rights-centred design, deliberation and oversight: an end to ethics washing, in: *The Oxford Handbook of AI Ethics*, vol. 2019, Oxford University Press, 2019.
- [4] S.P. Gangadharan, J. Niklas, Decentering technology in discourse on discrimination, *Inf. Commun. Soc.* 22 (7) (2019) 882–899.
- [5] C. Voinea, Designing for conviviality, *Technol. Soc.* 52 (2018) 70–78.
- [6] M. Aitken, E. Toreini, P. Carmichael, K. Coopamootoo, K. Elliott, A. van Moorsel, Establishing a social licence for Financial Technology: reflections on the role of the private sector in pursuing ethical data practices, *Big Data Soc.* 7 (1) (2020), 2053951720908892.
- [7] S. Maskey, How artificial intelligence is helping financial institutions, Available at: <https://www.forbes.com/sites/forbestechcouncil/2018/12/05/how-artificial-intelligence-is-helping-financial-institutions/#7cdd45b4460a>, 2018.
- [8] World Bank, *The Global Findex Database 2017*, 2017. Available at: <https://globafindex.worldbank.org/>.
- [9] L. Floridi, Translating principles into practices of digital ethics: five risks of being unethical, *Philos. Technol.* 32 (2) (2019) 185–193.
- [10] L. Floridi, J. Cowls, A unified framework of five principles for AI in society, *Harvard Data Sci. Rev.* 1 (1) (2019).

- [11] J. Fjeld, H. Hilligoss, N. Achten, et al., *Principled Artificial Intelligence: a map of ethical and rights-based approaches*, Available at: <https://ai-hr.cyber.harvard.edu/primp-viz.html>, 2019.
- [12] J. Johnson, The question of information justice, in: *Communications of the ACM*, March 2016, vol. 59, 2016, pp. 27–29, 3.
- [13] P. Kalluri, Don't ask if artificial intelligence is good or fair, ask how it shifts power, *Nature* 583 (7815) (2020), 169–169.
- [14] J. Powles, *The Seductive Diversion of 'Solving' Bias in Artificial Intelligence*, Medium, 2018. <https://medium.com/s/story/the-seductive-diversion-of-solving-bias-in-artificial-intelligence-890df5e5ef53>.
- [15] D. MacKenzie, J. Wajcman, *The Social Shaping of Technology*, Open University Press, 1999.
- [16] B. Latour, *Science in Action: How to Follow Scientists and Engineers through Society*, Harvard University Press, 1987.
- [17] B. Wynne, S. Jasanoff, G.E. Markle, J.C. Petersen, T. Pinch, *Handbook of Science and Technology Studies*, Public understanding of science, 1995, p. 361.
- [18] U. Felt, R. Fouché, C.A. Miller, L. Smith-Doerr (Eds.), *The Handbook of Science and Technology Studies*, MIT Press, 2017.
- [19] D.J. Hess, B.K. Sovacool, Sociotechnical matters: reviewing and integrating science and technology studies with energy social science, *Energy Res. Soc. Sci.* 65 (2020) 101462.
- [20] D. Mackenzie, C.M. Pense, M. Zvalaren, Framing the discussion: nanotechnology and the social construction of technology—what STS scholars are saying, *NanoEthics* 6 (2) (2012) 81–99.
- [21] D. Mackenzie, *Inventing Accuracy: an Historical Sociology of Nuclear Missile Guidance*. Inside Technology, MIT Press, 1990.
- [22] T. Horlick-Jones, J. Walls, G. Rowe, N. Pidgeon, W. Poortinga, G. Murdock, T. O'Riordan, *The GM Debate: Risk, Politics and Public Engagement*, Routledge, 2007.
- [23] A.M. Hedgecoe, P.A. Martin, 32 genomics, STS, and the making of sociotechnical futures, in: *The Handbook of Science and Technology Studies*, 2008, p. 817.
- [24] *Misunderstanding science?* in: A. Irwin, B. Wynne (Eds.), *The Public Reconstruction of Science and Technology* Cambridge University Press, 2003.
- [25] A. Irwin, The politics of talk: coming to terms with the 'new' scientific governance, *Soc. Stud. Sci.* 36 (2) (2006) 299–320.
- [26] S. Jasanoff, *Designs on Nature: Science and Democracy in Europe and the United States*, Princeton University Press, 2011.
- [27] K. Hao, 'Let's Stop AI Ethics-Washing and Actually Do Something', 2020. <https://www.technologyreview.com/2019/12/27/57/ai-ethics-washing-time-to-act/>.
- [28] M. Veale, A critical take on the policy recommendations of the EU high-level expert group on artificial intelligence, *Eur. J. Risk Regul.* (2020) 1–10, <https://doi.org/10.1017/err.2019.65>.
- [29] L. Lobschat, B. Mueller, F. Eggers, L. Brandimarte, S. Diefenbach, M. Kroschke, J. Wirtz, *Corporate digital responsibility*, *J. Bus. Res.* (2019).
- [30] C. Joynson, 'Corporate Digital Responsibility: Principles to Guide Progress, Atos, 2018. <https://atos.net/en/blog/corporate-digital-responsibility-principles-guide-progress>.
- [31] i-cio, *The Rise of Corporate Digital Responsibility*, 2017. <https://www.i-cio.com/management/best-practice/item/the-rise-of-corporate-digital-responsibility>.
- [32] Z. Orbik, V. Zozulaková, Corporate social and digital responsibility, *Manag. Syst. Prod. Eng.* 27 (2) (2019) 79–83.
- [33] K. Elliott, R. Price, P. Shaw, T. Spiliotopoulos, M. Ng, K. Coopamootoo, A. van Moorsel, Towards an equitable digital society: artificial intelligence (AI) and corporate digital responsibility (CDR), *Society* (2021) 1–10.
- [34] M. Wade, 'Corporate Responsibility in the Digital Era' *MIT Sloan: Management Review*, 2020.
- [35] L.S. Mahoney, L. Thorne, L. Cecil, W. LaGore, A research note on standalone corporate social responsibility reports: signaling or greenwashing? *Crit. Perspect. Account.* 24 (4–5) (2013) 350–359.
- [36] P. Aggarwal, A. Kadyan, Greenwashing: the darker side of CSR, *Indian J. Appl. Res.* 4 (3) (2014) 61–66.
- [37] D. Quiroz-Onate, M. Aitken, Business and human rights: a critical assessment of the notion of CSR and measurement, *J. Int. Trade Law Pol.* (2007).
- [38] M. Aitken, S. Cunningham-Burley, C. Pagliari, Moving from trust to trustworthiness: experiences of public engagement in the scottish health informatics programme, *Sci. Publ. Pol.* 43 (5) (2016) 713–723.
- [39] M. Aitken, J.D.S. Jorre, C. Pagliari, R. Jepson, S. Cunningham-Burley, Public responses to the sharing and linkage of health data for research purposes: a systematic review and thematic synthesis of qualitative studies, *BMC Med. Ethics* 17 (1) (2016) 73.
- [40] S. Jasanoff, Breaking the waves in science studies: comment on, in: H.M. Collins, Robert Evans (Eds.), *The Third Wave of Science Studies* Social Studies of Science, vol. 33, 2003, pp. 389–400, 3.
- [41] R.L. Breen, A practical guide to focus-group research, *J. Geogr. High Educ.* 30 (3) (2006) 463–475.
- [42] J. Kitzinger, Focus group research: using group dynamics, in: I. Holloway (Ed.), *Qualitative Research in Health Care*, McGraw-Hill Education, UK, 2005.
- [43] G. Guest, E. Namey, K. McKenna, How many focus groups are enough? Building an evidence base for nonprobability sample sizes, *Field Methods* 29 (1) (2017) 3–22.
- [44] R. Barbour, *Doing Focus Groups*, Sage, 2008.
- [45] A. Strauss, J. Corbin, 'Grounded Theor. Methodol. Handbk. Qualit. Res. 17 (1) (1994) 273–285.
- [46] M. Aitken, M. Ng, E. Toreini, A. van Moorsel, K.P. Coopamootoo, K. Elliott, Keeping it Human: A Focus Group Study of Public Attitudes Towards AI in Banking. European Symposium on Research in Computer Security, Springer, Cham, 2020, pp. 21–38.
- [47] Accenture, 2019 global financial services consumer study. https://www.accenture.com/_acnmedia/pdf-95/accenture-2019-global-financial-services-consumer-study.pdf, 2019.
- [48] I. Gulamhuseinwala, T. Bull, S. Lewis, FinTech is gaining traction and young, high-income users are the early adopters, *J. Financ. Perspect.* 3 (3) (2015) 1–20.
- [49] Ada Lovelace Institute, *No Green Lights, No Red Lines: Public Perspectives on COVID-19 Technologies*, 2020. <https://www.adalovelaceinstitute.org/report/covid-19-no-green-lights-no-red-lines/>.
- [50] Ipsos Mori, *The One-Way Mirror: Public Attitudes to Commercial Access to Health Data*, 2017. https://wellcome.figshare.com/articles/journal_contribution/The_One-Way_Mirror_Public_attitudes_to_commercial_access_to_health_data/5616448/1.
- [51] J. Street, B. Fabrianesi, C. Adams, F. Flack, M. Smith, S. Carter, S. Lybrand, A. Brown, S. Joyner, J. Mullan, L. Lago, *Sharing Administrative Health Data with Private Industry: a Report on Two Citizens' Juries. Health Expectations: an International Journal of Public Participation in Health Care and Health Policy*, 2021.
- [52] R. Owen, The UK Engineering and Physical Sciences Research Council's commitment to a framework for responsible innovation, *J. Respons. Innov.* 1 (1) (2014) 113–117.
- [53] B. Ribeiro, L. Bengtsson, P. Benneworth, S. Bühner, E. Castro-Martínez, M. Hansen, K. Jarmaj, R. Lindner, J. Olmos-Peñuela, C. Ott, P. Shapira, Introducing the dilemma of societal alignment for inclusive and responsible research and innovation, *J. Respons. Innov.* 5 (3) (2018) 316–331.
- [54] A. Kerr, R.L. Hill, C. Till, The limits of responsible innovation: exploring care, vulnerability and precision medicine, *Technol. Soc.* 52 (2018) 24–31.
- [55] A. Buhmann, C. Fieseler, Towards a deliberative framework for responsible innovation in artificial intelligence, *Technol. Soc.* 64 (2021) 101475.
- [56] A. Rai, Explainable AI: from black box to glass box, *J. Acad. Market. Sci.* 48 (1) (2020) 137–141.
- [57] Y.X. Dai, S.T. Hao, Transcending the opposition between techno-utopianism and techno-dystopianism, *Technol. Soc.* 53 (2018) 9–13.
- [58] O. Escobar, S. Elstub, Forms of mini-publics: an introduction to deliberative innovations in democratic practice, in: *New Democracy*, vol. 4, Research and Development Note, 2017.
- [59] C. Selin, R. Hudson, Envisioning nanotechnology: new media and future-oriented stakeholder dialogue, *Technol. Soc.* 32 (3) (2010) 173–182.
- [60] M. Aitken, S. Cunningham-Burley, A. Darlington, S. Elstub, O. Escobar, K.H. Jones, N. Sethi, R. Thompson, Why the public need a say in how patient data are used for Covid-19 Responses, *Int. J. Popul. Data Sci.* 5 (2) (2020).
- [61] M. Aitken, M.P. Tully, C. Porteous, S. Denegri, S. Cunningham-Burley, N. Banner, C. Black, M. Burgess, L. Cross, J. van Delden, E. Ford, et al., Consensus statement on public involvement and engagement with data-intensive health research, *Int. J. Popul. Data Sci.* 4 (1) (2019).
- [62] S.B. Banerjee, Corporate social responsibility: the good, the bad and the ugly, *Crit. Sociol.* 34 (1) (2008) 51–79.