

Addressing ethical gaps in ‘Technology for Good’: Foregrounding care and capabilities

Alison B Powell¹ , Funda Ustek-Spilda², Sebastián Lehuedé³ 
and Irina Shklovski⁴

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Abstract

This paper identifies and addresses persistent gaps in the consideration of ethical practice in ‘technology for good’ development contexts. Its main contribution is to model an integrative approach using multiple ethical frameworks to analyse and understand the everyday nature of ethical practice, including in professional practice among ‘technology for good’ start-ups. The paper identifies inherent paradoxes in the ‘technology for good’ sector as well as ethical gaps related to (1) the sometimes-misplaced assignment of virtuousness to an individual; (2) difficulties in understanding social constraints on ethical action; and (3) the often unaccounted for mismatch between ethical intentions and outcomes in everyday practice, including in professional work associated with an ‘ethical turn’ in technology. These gaps persist even in contexts where ethics are foregrounded as matters of concern. To address the gaps, the paper suggests systemic, rather than individualized, considerations of care and capability applied to innovation settings, in combination with considerations of virtue and consequence. This paper advocates for addressing these challenges holistically in order to generate renewed capacity for change at a systemic level.

Keywords

Ethics, technology for good, start-ups, justice, practices, capability

Introduction

Technologies heralded as tools to make the world a better place are now described as insidious tools of surveillance, disenfranchisement and control. These technologies contribute to increasingly unsustainable consumption of the world’s resources, and continue to threaten the potential for democracy. As connected devices and services proliferate, data collection and algorithmic processing become less visible, less accountable and more difficult to dispute and resist. Yet, data-driven technologies are still assumed to hold solutions to social crises and to generate the potential for people to become the best versions of themselves: connected, data-driven or otherwise optimized. This commonly repeated narrative suggests an ethical crisis in the design and adoption of data-driven technologies. Calls for ethical, responsible, fair, transparent and accountable technologies have proliferated; as have initiatives that seek to certify technology production as ‘ethical’, leading to a burgeoning field examining data and AI ethics, where AI (referring to ‘Artificial Intelligence’) is used as a broad catch-all term for a range of data-based automated systems (Floridi, 2009, 2013; Floridi and Cows, 2019; Jobin et al., 2019; Whittlestone et al., 2019). This field

seeks to retain the benefits of data-driven technology innovation while limiting, mitigating or responding to ethical problems.

As this field of data and AI ethics expands, scholars and practitioners have begun to move beyond an ‘ethical principles approach’ to consider ‘ethics in practice’. The shift towards focusing on ethics in practice addresses some of the weaknesses of the principles approach – including misuse by industry actors who interpret principles as ‘softer version[s] of the law’ (Jobin et al., 2019), and may hold the potential to build on a wider range of ethical principles as they fit their interests. This could mean leveraging

¹Media and Communication, The London School of Economics and Political Science, London, UK

²Oxford Internet Institute, Oxford University, Oxford, UK

³Centre for Human Rights and Governance, University of Cambridge, Cambridge, UK

⁴Computing/Humanities, University of Copenhagen, Kobenhavn, DK

Corresponding author:

Alison B Powell, Media and Communication, The London School of Economics and Political Science, London, WC2 2AE, UK
Email: a.powell@lse.ac.uk



not only the consequentialist ethics often used to make ethical principles realizable and attainable, but also other ethical approaches. With increasing attention to the practices and behaviours that underpin technology development, the hope is that this aim of flourishing can be achieved through, once again, ‘better’ development of data and AI technologies. Now this betterment can include the development of ethical practices and sensibilities contributing to the development of ‘technology for good.’ ‘Technology for good’ has become a popular phrase in research, industry and policy circles operating at various scales and with competing spheres. Previous work in this area has focused on information technology for good, technology for good governance, tech for good and technology for social impact (Magno and Serafica, 2001; Michael et al., 2019; Tomlinson et al., 2021). “Technology for Good” thus loosely refers to technology developed or employed to advance human flourishing or for social purpose. In this article, we use the phrase as it was used by developers and business leaders in the start-up companies we studied: to refer to technologies that have a social purpose or that intend to alter, change or improve existing technologies seen as having unethical implications for human well-being.

This article makes a unique contribution to the study of ethics in practice within the technology development field, more specifically ‘technology for good.’ This area makes a claim to a particular ethical orientation to technology, while also establishing a social setting oriented towards potential business success. There are paradoxes at the heart of ‘technology for good’: it suggests that changes to technology design or technology business processes are either necessary or sufficient to align technologies with ‘good’ ends. Furthermore, like all social settings, ‘technology for good’ development processes are shaped through practices that, whether described as doing so or not, constitute ethical engagement of the individuals involved in those relationships. Our contribution is to demonstrate and analyse how and why these principles and values might compete with each other and why there is a need to combine diverse ethical frameworks in order to address the levels of the individual, the collective and the relational to engage with the paradoxical dynamics of moral claims and practices related to technology.

We address the paradoxes of ‘technology for good’ by focusing on ethics in practice; that is, ethical thinking and ethical acting in contexts as performed by individuals immersed in a technology development field. Our observations reveal a need to examine different aspects of ethical practice (individual, collective and relational) to understand how technology developers make decisions and why some ethical approaches are valorized over others. Our assessment of ethical practices identifies gaps associated with the ways that ethical approaches – particularly virtue ethics and consequentialism – have been applied within these social settings. We consider these gaps as analytical

lenses and suggest more effective modes of observation and intervention.

We argue that the current approaches to ethics and technology development maintain gaps between theory and practice, between principles and action and between rhetoric and dialectic. In this paper, we focus on three of these gaps: (1) a misplaced individualization of virtue; (2) the constraints on ethical action created through social context; and (3) the often unaccounted for mismatch between ethical intentions and outcomes in time and space. We ask, ‘how can we understand and address contextual gaps and build more complex capacity for work in data and AI ethics, especially given the increasing focus and hype in the “technology for good” space?’ Our approach in this paper is to outline these gaps as they emerged in our research studying the professional and business practices of technology companies concerned with developing ‘technology for good’, specifically start-ups employing data-intensive, connected or Internet of Things (IoT) technologies.

We present two potential ways of addressing these gaps, first focusing on the social and cultural dimensions of technology development and second arguing that ethical considerations need to be positioned across individual and collective experiences. We then reflect on how adding different ethical perspectives such as the capability approach and care ethics can also enrich current thinking on data and AI ethics – using these approaches to address issues at a systemic level, such as the capability for organizations to participate in public debate, or the interpretation of care as a set of systematic actions. Therefore, we advocate for approaches to ethics in practice that consider virtue ethics, the capability approach and care ethics in combination. These theories provide different possibilities to engage with ethical action in ways that are inclusive, grounded and constitutive of different practices.

Principles, practices and actions

Our research fits into a broader shift in the data and AI ethics field towards considerations of ethics as part of social practice. This mirrors a shift from discussions of ideal ethical principles that should be addressed in technology design towards discussions of specific contexts and practices in technology design processes (Møller et al., 2020). Specific contexts can also bring their own specific social expectations and understandings of ethics. This is what is discussed as part of the ‘social milieu’ or the context in which ethical action unfolds: the social milieu as a territory for the exploration of individual virtue and its collective constraints. In our case, the milieu of start-up and small business in the ‘technology for good’ sector has intensified attention on some aspects of ethical or value-based decision making and displaced others. We

observed that this overall dynamic has created gaps that persist despite the continued focus on ethics as practice.

After a period of enthusiasm produced by the rise of digital technologies, a new set of studies on the ethics of technologies have gained prominence as dystopian visions for data and AI technologies permeate media and popular culture. The role of transnational tech companies in scandals such as the genocides in Myanmar (Miles, 2018) or other manipulations of public attention has contributed to what Bowers and Zittrain (2020) call a ‘public health era’ marked by discussions assessing technologies in terms of risks and benefits. This has focused attention on the potential harms produced by the widespread use of data (Boyd and Crawford, 2012), algorithms (Mittelstadt et al., 2016) and connected technologies (Wachter, 2018). This strand of scholarship describes few reasons for optimism: these emerging technologies seemed to be reinforcing already existing imbalances, making it difficult to hold these systems accountable and enabling unfair outcomes.

To address this, other approaches have employed moral philosophy as a means to ground responses to these challenges within clear normative and moral positions. Advocates suggest that a move from the descriptive to the normative (from ‘is’ to ‘ought’) might provide a clearer orientation towards ethics for people involved in the technology industry who might otherwise not be familiar with ethical discussions, or might not be immediately concerned with them. These studies often draw on *deontological ethics* and focus on duties, the rightness of actions and moral truths (Copp, 2006). Kantian ethics and consequentialism are two examples of this approach, which represents one of the most widespread ways of understanding ethics. In practical terms, applications of this ethical position can be found in ‘policies and regulations, attempts to codify the ethical development and use of technologies, creating standards for punishing errors, teaching best practices and preventing future failures’ (Ananny, 2016, 96).

Against this backdrop, large technology companies have also embraced the ethical turn, though largely in relation to principles. Google’s launch of an Advanced Technology External Advisory Council (ATEAC) – popularly known as the ‘ethics board’ – in 2019 (Walker, 2019) is an example. However, this board existed for only 2 weeks before the company announced its suspension (Piper, 2019). Microsoft, Amazon, and other big tech companies also made declarations about their ethical principles, while the interest in ethics began to permeate entrepreneurship and start-up culture in the ‘technology for good’ space. Informal meet-up groups such as Tech for Good/Technology with purpose have emerged, seeking to contribute by providing ‘digital solutions to social challenges’ (‘Tech for Good on Meetup’ n.d.). Incubators for start-ups have also increased their attention to ethical practices within technology design and business development, and investment has followed with hedge funds, venture capitals and

angel investors focusing on projects intending to ‘do good’ with technology.

This turn comes in the wake of the technology industry grudgingly capitulating to observations that technologies are not neutral (Friedman and Hendry, 2019). Investigations of how designers and technology developers address values and political beliefs in the design process (Braman, 2013; Verbeek, 2011) highlight how intentions, goals and political beliefs can shape technology development, with long-standing and far-reaching ethical consequences. Several different approaches have been developed to attempt to promulgate ethical values in design, from the value-sensitive design approach to values in design discourses emerging from the field of science and technology studies (Shilton, 2018). Many of these efforts focus on what kinds of values ought to be instilled into technology design and how to identify these in practice. However, as Greene et al. (2019) show, values statements produced by companies who create data and AI technologies continue to embed deterministic views of ethics. They also fail to attend to the influence of business contexts themselves and therefore fail to engage the normative or justice-oriented grounding of these critiques, showing the significant work yet to be done.

Still, there is little critical work analysing the ethical paradoxes that accompany efforts to harness or apply technologies for moral or ethical purpose. Technologies designed to offer solutions to social problems are not always built with social justice in mind, nor are they developed within settings where practitioners are able to attend to the ethics of their practice. These paradoxical relations can mean that claims about employing technology ‘for good’ can mask the ways that they displace risks on to vulnerable populations in the name of harnessing technology for ‘social good’ (see Madianou (2020 who discusses this in terms of AI within humanitarian operations). For Magalhães and Couldry (2021), the very notion of ‘social good’ can be conveniently adapted by powerful companies to make this humanitarian ideal fit their corporate interests. As these two studies show, ‘technology for good’ can be contextualized as part of the colonial patterns underlying the Big Tech sector. Put simply, the ‘good’ in ‘technology for good’ continues to mask the structural issues inherent in our societies that cause the problems that need to be fixed through technology.

Our paper thus enters a space of tension in studies of technology development practices and their ethical aspects, marked by attempts to depart from a ‘default consequentialism’ of ethical approaches. Universal laws and principles might not necessarily respond to the flexible and iterative ethos of technology design and development. *Context-sensitive* approaches such as virtue (Vallor, 2016) pragmatic (Bulleit, 2017) and care ethics (Van Wynsberghe, 2016) have been positioned as more useful in providing a long-term and situated comprehension of the difficulties that arise in the processes of conception, building and maintenance of

social media networks, nanotechnologies, care robots and other technologies. Researchers also have begun to move beyond discussions about abstract principles by focusing their inquiries on the *practices* of technology practitioners, examining their everyday actions and interactions in the workplace (Barocas and Boyd, 2017; Møller et al., 2020; Neff et al., 2017). Our work joins this nascent tradition, focusing on how paradoxes remain when these context-sensitive approaches are used, and examining temporality and public conversation as sites to address these paradoxes.

Methods

Our project examined how participants in self-identified ‘technology for good’ start-up companies using data-driven technologies (connected sensors and the IoT) defined and enacted ethics in their product design and development as well as their business strategies. Between 2017 and 2020, we conducted fieldwork with IoT start-up communities across Europe, including networks such as IoT London, Better IoT, Women of Wearables, ThingsCon, Next Generation Internet (NGI4), Bethnal Green Ventures, Central Research Laboratory and DesCon Belgrade. We interviewed and participated in events in London, Amsterdam, Rotterdam, Copenhagen and Belgrade, logging over 100 fieldwork instances. We also conducted several design and ideation workshops to discuss, speculate and imagine more ethical IoT futures. We identified our research sites through desk research and through speaking with key industry leaders and prominent entrepreneurs who pointed us towards the connected technologies start-up scene in Europe.

Our project focused on start-ups because their small size and nascent development suggested that they might have different capacities to position ethical ideas or practices than bigger, more established companies. In our fieldwork, we were interested in how individuals actively participating in this start-up space in Europe understood and acted on ethical considerations in their work creating data- and sensor-based products and services. We recruited broadly and without regard for whether participants stated a specific interest in ethics, in order to understand the various ways that ethical practices unfolded within this social milieu. For some, ethical concerns arose during the development stage of their products, for others, they arose when they were formulating their business plans. Only a few focused on developing ethical products, or incorporating ethics-by-design approaches to their products and businesses.

Analytically, our long-term fieldwork revealed limitations in the individualist approaches we employed to understand the ethical stances, and suggested that what was needed to address the gaps was an integrative approach combining aspects of virtue, capability and care. Here we outline the gaps in consideration of ethical action, as they emerged in

relation to our initial application of virtue ethics. This approach also enabled us to explore how and why the good intentions associated with ‘technology for good’ practices were often not sufficient to create changes in behaviours or broader contexts, as individual perspectives and capabilities were influenced by structural constraints.

Ethical gaps in ‘Technology for Good’

Misplaced individualization of virtue

The first gap concerns the subject that is considered to be the central agent of ethical practice. In the turn towards practice, researchers of technology ethics have examined the processes through which ethical actors can act in ways that support a broad flourishing. Virtue ethics is concerned with questions such as ‘What is a good life?’ or, more specifically, ‘What does it mean to be a good person?’ (White, 2008). Virtue ethics posits that there is a kind of ‘final good’ which represents the desirable aims of someone’s life, and against which these aims can be evaluated. All questions attached to the right action are assessed against this final good known as eudaimonia (Annas, 2011). Technology ethicist Shannon Vallor examines how different ideas of virtue appear and reappear across Christian, Buddhist and Confucian traditions, focusing on what might be necessary to develop a concept of ‘technomoral wisdom’ adapted to technologically driven contexts (Vallor, 2016).

While ‘practical wisdom’ is an expansive concept, many aspects of the interpretation of virtuous action in relation to technology focus relatively narrowly on an individual’s behaviour or on a potential future outcome or consequence that might unfold in response to it. In our project, for example, our research participants, involved in technical innovation and in the creation of technology start-ups, described a desire to act well and in support of others in their professional work. However, the institutional arrangements of start-up companies, being dependent on crafting a narrative of financial viability and potential attractiveness for investors, constrained exercises of ethical responsibility outside of well-meaning individual action. Individual, here, means personal not only to a single person, but the behaviour of an individual entity (including a business or institution) as opposed to an interrelated system. We also noticed that this perspective often involved continued attention to a consequence or outcome connected with that individual behaviour. Thus, ‘doing good’ is understood as a collective goal to be achieved with individual efforts, whether that individual be a person, a start-up, a company or a venture capital investment.

In our research, this individualist interpretation of virtue was often expressed as a deep personal desire that came up against other competing forces. For example, in our fieldwork at a trade show, one of our participants, a user

interface (UI) designer, identified that ‘as much as UI designers want to design interfaces that have ethical considerations in mind, they get “interrupted” by brand managers or marketing managers in their companies, who often want to collect more data on their customers, and also direct them to buy more or spend more time on their apps or websites’ (Field notes, 24 April 2018). In this way, the ethics of the technology for good sector is largely conceived of as a field where individuals compete to advance their own interpretation of the ethical purpose or potential of technology.

This idea of the individually virtuous UI designer, programmer or start-up business developer does not come from nowhere. There are echoes of the romanticism threaded through the cultural history of technology development (Streeter, 2003; Turner, 2006). These historical insights identify how a Romantic vision of the individual is often celebrated in narratives around technology development, directing attention away from the broader social or economic conditions surrounding these individuals. For example, one of the most common narratives we identified in our fieldwork linked particular ‘tech for good’ initiatives with the specific concerns, sensibilities or obsessions of the lead entrepreneurs. This romanticism of the individual conceals how the workplace and cultural environments surrounding technology developers may preclude or directly impede the exercise of one’s virtues. They may also frame ethics to suggest that through particular behaviours (including declarations of values or the evocation of statements of accountability) ethical issues can be solved (Greene et al., 2019). They minimize the extent to which persistent inequities or injustices are not unfortunate consequences of an individual action that could or should be corrected, but rather systemic features of the environment in which technologies are developed, including the environment specific to small start-up companies, which is heavily influenced by the competitive dynamics of the business environment.

More clarity on the nature of this gap comes from working with virtue ethicist Alexander MacIntyre and his notion of the social milieu (MacIntyre, 2016). Our research examined the macro-social context and social structures connecting individual participants in technology start-up projects. We identified that one of the characteristics of this social milieu is a persistent belief that creating technology can, in itself, create positive outcomes. MacIntyre identifies that social milieu is related to the social context in which people negotiate their capacity to act ethically and develop their capacity for virtuous considerations and actions (Ibid). Among other advantages, this concept makes it possible to take into consideration the role of communities and other collective entities that ‘have the responsibility of creating the implicit and afforded codes of interpretation and conduct’ (Sicart, 2011, 125).

Some cases we found in our fieldwork clearly illustrate how even our efforts at addressing the social milieu as a

space for virtuous action continued to perpetuate the tendency to reduce ethics to ‘actions’, that is, decisions or behaviours carried out by individuals. As an example, our project’s long-term research within a ‘technology for good’ start-up accelerator observed that the entire effort was predicated on an assumption that if a business proposal was identified as working on ‘technology for good,’ the endeavour was assumed to be ethical. As articulated in a presentation captured in field notes at the accelerator:

We need tech for good. We are in the midst of a technological digital revolution. Our principles [include] ‘be part of something bigger, be responsible, champion diversity, be early, understand the problem, don’t ponder – do, be generous, take the long view’. If your company doesn’t have principles, you can fake the ones here (Field notes, 2018).

As this brief excerpt illustrates, principles of individual responsibility and action without reflection are positioned as key values, along with other unspecified virtues such as generosity and support for diversity. These value statements were followed by a description of how technology for good also generates ‘significant returns to investors.’ We identified in our fieldwork that while individual developers and entrepreneurs were supported in developing their capacity to pitch to investors and navigate business transactions, little substantive work took place to help them navigate ethical concerns or ethical risks associated with their ventures. Similarly, the social and economic implications of the technologies these start-ups were developing were given little consideration, and neither were the difficult working conditions at start-ups, which included low pay and persistent overwork, including for founders. For example, some founders did not receive any money at all 2016 from their ventures for 2 years, which was celebrated as evidence of their dedication. This situation has normalized poor working conditions in this sector, along with structural inequality: the ability to forego pay for extended periods of time substantially limits the range of people able to found technology start-ups.

The role that systemic constraints play in sustaining ethical gaps and paradoxes has been overlooked by both practitioners and ethicists. Our own experience as researchers is an example of this. We previously examined how a limited range of action positions became possible within the social milieu of technology design (Ustek-Spilda et al., 2019). However, we did not explore how this limitation occurred – demonstrating that even in our research we were sometimes unable to perceive the influence of systemic contexts beyond the individual action of a person or organization. This also impacted the extent to which we could identify ethics as connected with action.

Capacity to act virtuously within a social context

The second gap concerns the notion of freedom from constraint. Technology for good appears to be constructed based on the idea that an individual actor can make ethical choices based on good intentions and efforts at improving outcomes, in a philosophical environment where they have full freedom to act. The gap here concerns the nature of accountability, which is the foundation of many practical ethics guidelines and which structures how redress ought to be made for the consequences of ethically problematic action. Unfortunately, this mechanism for accountability assumes that a single, stable entity can be held accountable. It also presumes freedom from constraint. This individualization separates an institution (like a company or organization) from the broader context in which it is embedded, including the collective public conversations that address aspects of responsibility that might be other than straightforward accountability. The gap here is the assumption that the ‘virtuous individual’ is free from constraint.

In reality, many forms of constraint exist, some of which actively frustrate ethical consideration and ethical practice. Individually, constraints may relate to how a person is situated within an organization in terms of their professional responsibilities, or even their other connections and relations with their families, neighbourhoods or religious and cultural practice (MacIntyre, 2016). Our previous research has understood these relational connections as including the negotiations of ‘ecologies of values’ (Powell and Nash, 2013) where professional policymakers negotiate their individually held moral beliefs against and between those of others, in order to achieve collective aims.

In our research with technology start-ups, we heard participants apologize for or dismiss some of the social constraints they experienced. This was particularly the case for women founders of technology start-ups. Women at an event for start-up founders debated whether it was better to work on a company during every waking moment when they might also be caring for children, or to minimize their caring responsibilities or outward evidence of difference, for example, by employing PR and management strategies to ensure that they would appear as serious contenders for venture capital funding even if they were (for example) visibly pregnant. Founders whose technology products were targeted at female consumers or that addressed women’s experiences (e.g. period trackers) also struggled to have the clear benefit of their products perceived by funders or investors, even when they identified ‘significant gaps in the market’ and hence ‘huge potential for growth’. Women’s health was thus not taken to be a ‘technology for good’ context, nor a mainstream investment context, leading to difficulties in bringing so-called ‘femtech’ to market. For example, a female venture capital investor explained that she started her investment company after realizing that there had been no innovation in electric breast pumps since the early 1980s

because of lack of investment. When she saw that a woman-founded start-up was crowdfunding investment for developing a new design, she decided that women’s health tech was ‘tech for good’ on its own, and started an investment company that solely invests in women-founded start-ups.

We did hear entrepreneurs and developers discuss social and economic constraints that they might have experienced in the past. However, these were suggested as ways to connect to their client base or as ways to foreground the social purpose of their companies. In a group activity we witnessed, the developers were asked to engage in the ‘Privilege Walk’, a game where a narrator reads a set of statements and participants walk when statements do not apply to them. The organizer from the accelerator programme explained at the end of the game that each time the participants think they are losing focus or who their target audience is for their product, they should do a privilege walk in their minds. Yet even this exercise, seemingly designed to provide reflexivity to founders about their privileged status, was intended to help the founders better understand their customers to be better able to market to their ‘soft spots’; not to generate their own capacity to be more gentle, kinder, giving or inclusive.

In philosophical terms, a focus on ‘freedom from’ constraint suggests liberated actors empowered to contribute to processes of technological innovation, which in themselves generate ethical goods, measured by increased sales, broader market share or more connection to a ‘client base’. As with the gap concealing the relationship between individual and collective endeavours, this gap conceals the constraints experienced by people whose contributions to data- and sensing-driven technology businesses may reflect experiences not represented in the romantic narratives of individual technology entrepreneurs. In public discourse, this is reflected in the efforts of influential technology companies to hire members of under-represented groups, or forming ‘diversity’ departments, while failing to address the systemic constraints that undermine any ability for these people to effectively critique the organizations. This dynamic underpinned the public narrative concerning the dismissal of Google AI Ethics leads Timnit Gebru. Along with co-authors, Gebru had recently completed a paper identifying the extremely high environmental cost of training large language models, as well as the risks that the data collected to train these models might include racist, sexist or abusive language. The paper was deemed not to meet the company’s standards for publication, although the public discussion turned primarily on how Gebru was treated leading up to what the company described as her resignation and what she described as an unfair dismissal.

In this case, Gebru and her co-authors were attempting to act in ways that aligned with their ethical values – as well as their scientific acumen. Despite their professional efforts, they laboured under significant constraints generated by their visible position as women and Black people – both within the company and in broader society. Google’s complex

corporate entity was faced with a deep conflict between research revealing systematic gaps in the ethical capacity of the company to address potential, yet unknown future responsibilities for harm produced by training large language models, and the perpetuation of business as usual. The result silenced the voices of Gebru and colleagues, as well as the organization as a whole.

While this example unfolded not in a start-up or small company, the resulting chilling of discussions of constraints or differential impacts of technology limits the capacity for people occupying marginal or vulnerable social positions to bring forward ethical issues from those positions. In our fieldwork, we observed that while there is an explicit push for more inclusive team structures, and addressing diversity as a ‘societal problem to be solved with technology’, there is at the same time an implicit and tacit understanding that companies led by women and minorities struggle to raise start-up sustainable funds, and are encouraged to minimize their own experiences in order to prove their worthiness as professionals.

Relationships between virtuous intentions and outcomes

The next gap concerns a tricky issue of virtue and consequence – whether a virtuous action or intention can be expected to produce a virtuous outcome. In our research, we noticed that participants struggled with the separation between their intention or action and the kind of outcome produced by the data-based system they were involved in creating. For example, one participant identified how ethics (as they understood them) created the opportunity for a software business to fill the gap they perceived between the drive to create a minimum viable product (MVP) and the long-term lock-in of a software product that might run without much intervention. Their solution was to create a company where ethics could be ‘black-boxed’ into an early stage of development. They suggested that if, for example, a software company was concerned about energy consumption and CO₂ creation, the company could automatically embed tree planting calculations to trigger an automatic tree planting arrangement if certain code levels were triggered.

This software business concept provides an example of the difficulty in positioning virtuous action in time. Our participant understood that software products might have long-term or unpredictable outcomes that their creators might wish to avoid or mitigate. Yet, the approaches that seemed most amenable to the technical and business development settings they wanted to influence also made flexible intervention impossible: ‘black-boxing’ ethics suggests that virtuous action can only be taken once and needs to be ‘locked down’ like other software development processes. This is also an example of treating ethical decision making as a singular moment in technology design processes.

The second example came from our own research practice. In writing this paper, we reflected on how in fieldwork we often began discussions by identifying that we were interested in ethics, or asking questions about whether participants had encountered any ethical issues in their professional practice. Our questions fixed ethical action as something that participants urgently needed to encounter: we produced a kind of temporal and personal urgency to address ethical questions. Later in our research process, the team developed research and reflection strategies building on the other ethical positions we elaborate below. Yet throughout our research, we grappled, together and individually, with how, where and when to position ethics, and how broadly to interpret the idea of ‘ethics as practice.’ In some ways, our early research approaches reproduced an ethical gap that focused on the connection between virtuous intentions and capacities for ethical outcomes. The gap became clearer as we observed our participants retrospectively framing their actions as ethical decisions or finding ethical justifications for their actions.

Our engagement with virtue ethics attempted to address this gap between individual intention and unknown future outcomes. In philosophy, this problem is referred to as the ‘fallacy of composition’, that is, an error created by inferring that all members of a group will share the same values, ideals, norms (Feldman, 1978, 45) and therefore assuming that society’s shared values can be deduced from the views of a single individual. In our research, we observed this in examples like the one above, which foregrounds and reiterates an ethical position taken at a particular moment by a particular person. This paradox is familiar to the debates around the idea of human-centred technology development (Coles and Norman, 2005) where ‘end-users’ of technology are ascribed virtuous intentions, even as the technology is designed to scale into a wide variety of contexts where use practices would undoubtedly be widely diverse.

Having identified not only that these gaps appeared within the social milieu we were examining as well within our own research process we shifted our efforts towards modelling ways to create what Katie Shilton (2013) terms ‘values levers’: the collaborative and organizational processes that can make ethical values a more explicit part of technology development processes. Shilton documents how effective value levers can change the topics of discussion and promote attention towards social values alongside market and innovation concerns. In our project we sought to introduce opportunities for ethics-related topics of conversation and to offer structure and scaffolding for discussions of the kinds of dilemmas and trade-offs technical decisions in a start-up might entail (Ustek-Spilda and Powell, 2019).

Addressing ethical gaps in data-driven business contexts

In the previous sections, we identified a set of persistent gaps in intention and practice surrounding efforts to

develop ‘technology for good,’ analysing how these gaps emerged as a result of narrow interpretations of ethics and difficulties in responding to the paradoxes raised by the promise of ‘technology for good.’ In this section, we suggest repositioning ethical temporalities and contexts by examining *practices of care* that unfold over time and social space. In the next section we consider how to address issues of social context through a focus on *capability*.

Repositioning ethical considerations: The role of care

One possible means to address gaps and paradoxes involves attending to how ethics operates as a process unfolding across individual, collective and contextual aspects. In essence, this would involve embedding a turn towards notions of care, as in, ‘taking care,’ within the context of start-ups. It would also mean addressing the continued injustices related to who takes care, and how that care is received.

Care ethics, and especially the feminist approach, positions care as ‘a species activity that includes everything that we do to maintain, continue and repair our ‘world’ so that we can live in it as well as possible’ (Tronto, 1993, 103). In this formulation, care ethics enables lines of action that do not follow the consequentialist and individualist mindset dominating in some technical cultures (Puig de la Bellacasa, 2017). Whereas many ethical approaches assume an autonomous self-made man as the agent of moral action, this way of thinking foregrounds the fact that humans and non-humans are embedded in networks of interdependency that make possible our very existence and survival in the first place.

Caring for and providing care are often placed in the background in considerations of technology design since care doesn’t align well with efforts at scalability or marketability. Care is difficult, situated, and is usually carried out by the less privileged in society, including women and people of colour. In the business contexts that make up the space of our research and the space where much data and AI ethics work is positioned, care and attention towards anything other than the already articulated business goals is often not considered legitimate work. More profoundly, care ethics’ focus on networks of interdependency challenges the vision of the virtuous individual we discussed earlier, revealing that in order to become ‘virtuous’ individuals necessarily rely on material and affective labour carried out by actors who tend to become invisible in ethical reflections. For example, this brings to the surface an awareness of the different layers of invisible work that are required to make technology systems operate, from cleaning staff working in the offices of Silicon Valley to the workers in India training the algorithms to be used by automated vehicles in Europe. Furthermore, it invites consideration of the affective investments and repair practices that

make technology work as well as the importance of tools that make possible the survival of our species, other living beings and the planet.

The logic of care pushes back against the individualizing of ethical responsibility, resisting guilt, blame and displacement of responsibility. The difficulties of caring work include the devalorization of nurturing associated with feminized or precariat labour as well as the quality of attention required to *care about* something. This is the ethnopolitical aspect of care – the relations negotiated between people and institutions (Puig de la Bellacasa, 2017). For ‘technology for good’ endeavours, where statements about the goodness of intentions are intended to hold the ethical space for competitive capitalist projects, caring about issues or processes that call the pursuit of the project (and therefore its assumed ‘good’) into question can be disruptive.

Puig de la Bellacasa’s assessment of the *doings* of care identifies how caring generates labours and creates frictions with others (2017). These labours and frictions are part of what establishes the space for the logic of care: the entanglements and agreements shape the choices that build a space of possibility. In a technology development context, taking this perspective on care might mean that instead of thinking about whether an individual is deemed to act virtuously in ensuring their business adheres to data protection laws, it would mean thinking about how the entrepreneur is able to act in relation to others – what their capabilities are, in other words – and how the expectations created within the broader business context provide them with a particular space of potential. This space is different than, but connected with, the space of potential of the person who uses the finished design.

Positioning relationships of care and attention as legitimate areas for ethical consideration might address the gaps we identify by refocusing practice away from ‘mere behaviour’ and towards efforts that contribute to defining and negotiating power. These could include reframing concepts, identifying previously under-appreciated perspectives or foregrounding different needs. This approach considers ethics as being broader than ‘the good’ – also comprising ‘the difficult,’ ‘the tense’ or the ‘distressing.’ These relations are one part of what may be necessary to shift ethics away from a mechanism to foreclose, delay or avoid accountability and towards an enhancement to it.

Limits and potentials for action: Capability approaches

The second potential means to address the gaps involves further pursuit of a systems-oriented approach foregrounding the differential *capabilities* of individuals and institutions to become involved in considerations of ethical issues or practices. Capability ethics brings to the fore the structural limitations and difficulties faced by individuals as they attempt to reflect and act in ethical ways. While

deontological approaches emphasize the ‘should’ and ‘ought’, capabilities draw attention to the real-world constraints that might impinge upon the capacity of actors to define what ‘virtue’ is and how to pursue it.

Of particular interest is the capacity of individuals and organizations to participate in the kind of public conversations that engage with difficult perspectives as well as with risks and harms that are separated in time and space from actions taken. In the start-up company context, this might mean addressing the varying capabilities that different actors have to engage with deep questions about the motivations for their projects. As Boltanski and Chiapello (2005) point out, the spirit of capitalism frames the pursuit of projects as an end in itself, sustaining the connection between the creation of technology for good projects, the good efforts of entrepreneurs and (presumed) good outcomes. This formulation leaves out consideration of the extent to which it is possible for the different actors within this space to attend to or relate to other kinds of issues of ethics that are outside of their project’s scope.

This capacity to attend to things can be viewed from the perspective of the capabilities approach. Sen (1999) explains that a person’s ‘capability’ refers to the different ways that people could act in their lives, given the constraints they might encounter. In Martha Nussbaum’s (2011) discussion of capability, she identifies how structural constraints influence the potential for people to change the situations in which they live. The creation and maintenance of institutions are fundamental for enabling capabilities, opening up or foreclosing the capacity of actors to pursue their own goals. This suggests that filling the ethical gap might involve shifting away from individual agency and placing more emphasis on the role of factors such as the regulatory landscape, the distribution of resources and the professional ethos with which technology is designed and developed. Attending to this dimension facilitates a more holistic account of the implications of ‘tech for good’ projects, while also raising questions about our practices as well as those of our participants.

We were interested in a few capabilities, including the capacity of individuals and organizations to participate in public discussions connected with technology and ethics at different scales and time periods. Even if good decisions are made at one point in a technology development process, being able to address the criticism circulating across society makes it possible to introduce a broader range of questions unfolding across space and time – including in the times and spaces beyond the expected ‘end use’ of a start-up’s product. Crawford and Joier’s (2018) ‘Anatomy of an AI System’ provides an excellent visual resource to start thinking about this aspect, which includes, in the case of the Amazon Echo, the extraction of ore in mines, the manufacture and assembling and components, farms of data centres and processes of artificial intelligence training such as machine learning. No ‘unicorn’ technology start-up would

be possible without this chain, which can be approached as either an invisible infrastructure or as a map of the many relationships that influence the capacity for an ethical decision, action or practice to be undertaken at any moment. Without a profound engagement with conversations pointing to the conditions that make data-intensive technologies possible, ethical attention remains directed to individual or temporally constrained contexts.

In our fieldwork, participants often approached ethics as related to regulatory compliance or as a potential competitive advantage for their products and services. At an IoT showcase in London, we approached a representative of a logistics geolocation services company (Field notes, 24 April 2018). When we introduced ourselves and mentioned that we were doing research on ethics, the participant’s response was to explain to us that he didn’t think he had much to discuss in terms of ethics, since the company was GDPR compliant. After some discussion, it became clear that the company was addressing several ethical issues in its data management processes, including having decided to encrypt client data and allow clients ‘full power’ over it. However, our participant’s explanation of the value of these innovations centred around how they created an ‘advantage’ over services like Google’s, which don’t provide such protection or access. The language and framing our interviewee used repositioned ethical issues in terms of competitive advantage and regulatory compliance. This illustrates the ongoing gaps in public conversations that complicate the recognition of innovative practices or ethical engagements.

Public conversations regarding the ethics of data and AI systems extend beyond individualistic perceptions of good intention, behaviour or outcome. For example, regulatory frameworks like the GDPR in Europe, privacy regulations or content regulations establish limits on what are sometimes described as ‘innovative’ actions. These frameworks create the space in which action is permitted, in line with the values underpinning the regulations. However, leveraging ethics as a space apart from the connection with these external regulatory frames and the social values they embed individualizes ethical reflection and decouples it from accountability, especially accountability sought through regulation. Put another way, separating ethics out from regulation, accountability or responsibility weakens the overall capacity of a society to care for itself.

The rise of scholarship and corporate practice that takes narrow, consequential perspectives on ethics constrains ethical issues in space and time and limits the ability to explore what enables or constrains action. It may make it easier for transnational technology companies such as Facebook to appropriate ethics (Wagner, 2018). It may also discredit ethics and moral philosophy as a space to envision and put into practice other ways of thinking and doing. Without space to describe and support responses to public criticism of the systemic influences of the

‘technology for good’ sector, there is little opportunity to extend the ethical range of this sector beyond its self-declared goodness and the assumed good intentions and good behaviour of virtuous individuals. This perpetuates, rather than resolves, the inherent paradoxes of the sector.

Repositioning ethics as practice

As we demonstrate here, ethics is not an *alternative* to political intervention (Bietti, 2020) but rather a source of reflection and practice that can challenge well-seated and unhelpful assumptions about individuals and social groups that limit the potential for alternative approaches. In response, we have outlined some features of a relational framework that integrates some tenets of feminist care ethics and capability ethics into the field of technological development.

A combination of virtue, care and capability make it possible to address the individual, the collective and the relational when thinking about the ethics of technology. Care ethics focuses on the conditions that make technology development possible, while capability approaches address how societal factors such as the distribution of skills enable or constrain actors to reflect or to act in accordance with their ethical ideals. As we have demonstrated, taking into consideration these two dimensions represents a necessary step for addressing the structural opportunities and constraints that undergird the ‘technology for good’ area in their full complexity. These approaches are needed to address the gaps and paradoxes that are generated by the ‘technology for good’ sector and by the predominant focus on individual virtue or direct consequence associated with it. This combination might be conceptualized as articulated to not only ‘ethics’ but also ‘justice’ – where ‘justice’ is interpreted as ‘challenging power’ (D’Ignacio and Klein, 2020).

We argue that ethics is not a practice in the sense of being a ‘mere behaviour’ – instead, ethics as practice encompasses the juggling and juxtaposing of different individual positions in relation to unfolding collective concerns. These include a concern for the gaps between intention and action and the constraining structures that they reveal, as well as the opportunity to enhance systemic capabilities for facilitating processes of questioning. In the domain of public debate, for example, these may be addressed in the gaps between the stated goals of ethical comportment and the actions of an organization towards its employees. In the domain of technology production, these may be reflected in the continuing difficulty in identifying whether, or how, people who contribute to creating technological systems can contend with the outcomes that these create.

Collective contexts are not composed of aggregated individuals; they shape and create shared meaning. Therefore, ethics as a practice is not only composed of behaviour or

action but also social processes that reiterate what and whom is worth attending to. Without challenges to these processes, narratives of technology for good perpetuate significant gaps, describing ethics as a problem to be addressed processually through virtuous action, without attention to which frameworks have become predominant within a social milieu. In a start-up setting where competitive, project-based capitalism is a significant feature of the social milieu, attention to care and capability illustrate the difficulty of enacting long-term, systematic or disruptive change, even if it might be ethically desirable.

Finally, combining virtue, care and capability ethics requires taking reflexivity seriously in ethical practice. This is because researchers are also embodied and situated actors with their own care duties and subject to different types of structural constraints. The reflections we have undertaken throughout this article on our biases and limitations echoes this way of understanding and practicing ethics.

Conclusion

In this paper, we identify that ethics and values associated with technology development have remained preoccupied with the possibility for a virtuous individual (a single human or individual organization) to ‘do good’ with technology, leading to paradoxes in the conception of the ‘technology for good’ project as well as persistent ethical gaps. These gaps remain even in a research and practice area focused on understanding and ameliorating ‘ethics in practice’. Based on our investigation of the ‘technology for good’ sector and through reflexivity regarding our own biases, we identify how the recent turn towards care-informed approaches can, along with a renewed attention to capabilities approaches, reorient studies of ethics in technology development away from a consequentially oriented focus on virtue and individual action. We suggest considering how organizations – whether the technology start-ups we investigated in our project or the large technology companies whose actions are scrutinized in the public domain – can address systemic issues of care, notably the fact that people are not equal in their ability to perform as virtuous individuals. The capability of institutions or organizations to accept and address harms that might be produced at various scales and times, and may be subject to legal recourse or regulation, is another perspective that could address the persistent gaps we identified (and sometimes perpetuated) through our research.

We reflect that even the virtue ethics tradition, which focuses on the potential for pursuit of goodness as an effort towards human flourishing, can become captured within an outcome-oriented focus preoccupied with addressing the consequences of technology and geared towards efficiency, productivity and optimization within a market-oriented interpretation of ‘goodness’ – especially

‘technology for good’. This positioning has both practical and philosophical consequences: practically, the tendency towards individualism occludes the influence of broader social features like the competitive and capitalistic influences underpinning the social milieu of ‘technology for good’ business practices. Philosophically, it orients even discussions of individual virtues towards their consequences and pushes out discussions of the other dynamics that may challenge the ability of any person or institution to act well. This risks distracting attention away from the systemic changes required in order for institutions to take appropriate care, including through hearing, responding and transforming in response to pressure. Currently configured, ‘technology for good’ is based around a set of paradoxes. Addressing these requires a deep reflection on what other ‘goods’ might lie beyond a market-driven, individualistic orientation.

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ORCID iDs

Alison B Powell  <https://orcid.org/0000-0001-5780-9132>

Sebastián Lehedé  <https://orcid.org/0000-0003-0432-8727>

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