



Delft University of Technology

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DOI

[10.4324/9781003395966-12](https://doi.org/10.4324/9781003395966-12)

Publication date

2025

Document Version

Final published version

Published in

Critical ICT4D (Information and Communication Technologies for Development)

Citation (APA)

Calzati, S. (2025). From Data Governance to Data Ethics: Invoking Epistemological Plurality for Enabling a Critical Turn in ICT4D. In A. Akbari, & S. Masiero (Eds.), *Critical ICT4D (Information and Communication Technologies for Development)* (pp. 139-156). (Routledge Studies in Science, Technology and Society; No. 60). Routledge - Taylor & Francis Group. <https://doi.org/10.4324/9781003395966-12>

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9

FROM DATA GOVERNANCE TO DATA ETHICS

Invoking Epistemological Plurality for Enabling a Critical Turn in ICT4D

Stefano Calzati

9.1 Introduction

Thanks to a decade or so of research in critical data studies, it has become (almost) a truism by now that datafication – the turning of human life into digital data and the processing of such data to deliver services as much as to establish forms of monitoring – reinforces and/or creates power asymmetries at various social, economic, and environmental levels (Hilty et al., 2004; Kitchin, 2014; Metcalf & Crawford, 2016; Dencik et al., 2016; Brannon, 2017; Eubanks, 2018). Interestingly, this is the case even when data-driven initiatives are pursued “for good”, such as through international aid, development, and humanitarian practices (Taylor & Broeders, 2015; Masiero, 2016). Oftentimes, these initiatives go under the label “ICT for Development (ICT4D)” (Unwin, 2009; Heeks, 2010) and involve Low- and Middle-Income Countries (LMICs) with the goal to increasingly include them into the Fourth Industrial (informational) Revolution (Jasperneite, 2012).

As a matter of fact, while data bear a preconditional role in establishing forms of inclusion and evidence for people who have been marginalised and silenced throughout history and across the globe (Johnson, 2014; Heeks & Renken, 2016), a growing number of scholars (Masiero, 2016; Taylor, 2016, 2017; Milan & Treré, 2019; Segura & Waisbord, 2019) have shown the surreptitious nature of “datafication for good”. Notably, ICT4D rests upon epistemologies and practices that tend to be *hetero-topic*, conducted through means and based on values oblivious of local specificities (Makulilo, 2016; Mutsvairo & Ragnedda, 2019) and *hetero-directed*, mostly top-down, by either international organisations or private foreign actors (Taylor & Broeders, 2015; Gagliardone, 2019; Calzati, 2022). In other words, more often than

not, through these initiatives the poor are objectified, that is, made forcefully visible through practices that overlook, among others, fully informed consent, the possibility of disengagement, and/or a cognisant involvement and partake into the kind of data collected, the modalities of their processing, and the benefits coming from such processing.

One proposed response (Mutsvairo & Ragnedda, 2019; Edmundson, 2022) is to “indigenize” technology – that is, to enable the investments and development in loco of data-driven technologies and ICT infrastructures – with the goal to let the data actors of LMICs foster their own datafication. However valuable such indigenisation might be, the risk is to dislocate the power asymmetries that datafication produces from a globalist to a localist frame, without reworking the exploitative rationale of datafication as such. More radically, scholars have questioned the pillars on which ICT4D rests. Notably, to have fallen under scrutiny is the idea of “development” (Escobar, 2011), which hides Western-centric and econometric assumptions of wealth; the duplicity of the preposition “for” in ICT4D (Brown & Grant, 2010; Taylor, 2016), suggesting both an enabling-empowering function and a potential co-optation of ICTs “for the sake of” development; as well as the very notions of LMICs (Qureshi, 2015) and ICTs (Calzati, 2020), which to this day remain colonially tainted. From here, Masiero (2022) arrives to provocatively ask the extent to which it is still worth speaking of ICT4D, a standpoint which led subsequently Akbari and Masiero (2023) to call for a paradigmatic shift in the field, able to recalibrate ICT4D *with/through* critical data studies.

It is along this line that this chapter follows. Concretely, the questioning of ICT4D demands work from *within*. On the one hand, this work points to the epistemological and ethical cores of the field, urging to unpack given spatial coordinates, actor-network links, and the kind of “goodness” at stake. On the other hand, this work requires ex-post assessment, that is, the in-loco, over-time qualitative analysis of data-driven initiatives’ perception and impact, with the goal to unveil if/how they (re)produce power asymmetries and/or enact a fair(er) digitalisation not only by and of LMICs but *for* LMIC people. This chapter will expand on both these directions.

Notably, Akbari and Masiero (2023) understand Critical ICT4D as based upon three pillars: “reflection”, “problematization”, and “construction”. The structure of this chapter mirrors these three pillars, moving from an overview of existing findings relatable to ICT4D towards the examination of the deeper ethical and epistemological implications of such findings, to eventually advance a constructive proposition which operationalises the reached conclusion.

Hence, in the second section, the chapter provides a critical overview of the diverse lessons learnt from research I have conducted and/or have been involved in over the last few years, in particular on the digital (un)sustainability of Estonia’s e-residency program; the presence of the Chinese tech

giant Huawei in smart city projects in Italy and South Africa; the perceived sociotechnical tensions embedded in the Ubenwa health app developed in Canada and used in Nigeria to detect cases of asphyxia in newborns; and the perceived impact of automated policing governance on marginalised groups (e.g., Syrian refugees in Estonia and Turkey). The synthesis of the lessons learnt from these case studies points in the direction of the need to reconceptualise and enact data governance as an ongoing situated practice, meaning that, rather than a normative toolbox of policies and guidelines, data governance shall be designed as an iterative process keeping data subjects in the decision-making loop. The third section further problematises the critical implications of such conclusion. At stake is not solely the reworking of dichotomies such as indigenous-foreign, global-local, individual-collective, and public-private, but the necessity to legitimise and summon different epistemologies beyond the positivist one foregrounded by datafication. This, in turn, leads to deconstructing normative concepts of evidence, knowledge, and agency, starting from the awareness that *what* data “tell” is valuable only if combined with the answer to two other questions: *how* and *why*. The fourth section is reserved for the task to operationalize these insights by acknowledging that datafication fosters a sociotechnical ecology that eludes any axiomatic tackling (in terms of bad/good) as well as any privileged standpoint of assessment – to *care*, more than to know, is always an immanent open-ended endeavour. Hence, what is devised is a *problem-opening* approach (against a problem-solving one) which seeks to explore digital transformation’s unintended consequences (both positive and negative), cutting through contexts, scales, and timeframes. As an example, the chapter discusses the course “Ethics for the Data-driven City” designed and delivered by the author at the Delft University of Technology.

9.2 Data Governance Revisited: Lessons from Case Studies

As part of the Data Lab at Tallinn University of Technology, between 2019 and 2021, I had the chance to explore processes of datafication and its related governance, untangling their sociotechnical imbrications through various lenses: sustainability, perceived effectiveness and subjectification, and sovereignty. Here I provide an overview and draw some conclusions.

9.2.1 *The Digital (Un) Sustainability of Estonia’s e-Residency Program: Insights from African Users*

In a 2021 article (Abaku et al., 2021), we looked at Estonia’s e-residency program in terms of digital sustainability. First, based on the literature, we conceptualised digital sustainability as a prism that includes social, institutional, economic, technical, and environmental dimensions. Second, we analysed the

extent to which Estonia's e-residency program complies with and enacts such dimensions, especially from the perspective of African users of the program.

Launched in 2014, the e-residency program provides citizens outside of Estonia with the chance to become Estonian e-residents (owning a digital ID). This means that, although originally the program was motivated by national motives of growth, it represents a key opportunity, especially for LMIC citizens, to virtually enter the EU market from anywhere in the world and do business within it, according to Estonia's legislation, and capitalising on the country's digital infrastructures and services. Still today, however, a large proportion of Estonia's e-residents belong to countries with very high or high levels of economic and digital development (Tamppuu & Masso, 2019). As far as Africans are concerned, despite the fact that the African continent is currently one of the fastest-growing digital markets worldwide (World Bank, 2024), little is known about the actual involvement of its citizens in the program.

Hence, we conducted a series of interviews with current and prospective African e-residents, questioning the program from a user perspective, in line with the conceptualised digital sustainability prism. From the interviews, widespread discontent emerged concerning the effectiveness of the e-residency program, as interviewees pointed out various limitations cutting across all dimensions of digital sustainability. Most of these limitations can be ascribed to the African context as a still emerging digital market with consolidating infrastructures. Nonetheless, some issues concern directly how Estonia designed the program. For instance, the limited flexibility of the program to accommodate the institutional diversity among and within African countries was mentioned, alongside the lack of linguistic representativeness on the e-residency platform. Apart from hindering the smooth functioning and adoption of the program by African actors, these aspects project onto the conceptualisation of digital sustainability a still-missing cultural dimension. In other words, for the e-residency program (and similar initiatives) to be digitally sustainable, cultural diversity – from language and traditions to institutions and organisational culture – must be recognised and operationalised. A fit-for-all platform is not enough, if not accompanied by a cognisant understanding of the plurality of targeted groups, especially beyond Europe. Hence e-services that aim to have a global outreach (as well as a conceptualisation of digital sustainability that aims to properly assess them) require to consider the multifacetedness of the milieu in which digital services are deployed, as well as how such multifacetedness can inform sustainability itself.

9.2.2 *Relocating Data-Driven Technologies: Perceived Effects by Diverse Actors*

Along a similar line, in 2022 (Masso et al., 2022), we explored the concept of relocated algorithmic governance through a qualitative study of the Ubenwa

health app. By relocated algorithmic governance we mean the displacement of data-driven technologies across contexts and scales, thus triggering implementations and uses well beyond the locus of technology's initial conception and development. In this respect, the Ubenwa app was a fitting case study because of its composite life cycle. The app records and analyses a child's cry to provide instant feedback on possible signs of asphyxia. The app's algorithm was developed, trained, and tested in Canada using an initial dataset of 1389 asphyxiated and non-asphyxiated samples of infant crying from the "Baby Chillanto" database in Mexico, which has been extensively used by research institutions worldwide. Ubenwa is now in clinical trials in Canada and Nigeria and is tested on real-life patients, continuing to collect and annotate infant cries.

To explore the possible tensions that such a relocated tech solution might originate, we conducted in-depth interviews with parents, medical practitioners, and data experts in Nigeria, thus bringing to light how these people perceive the dislocation and relocation of the Ubenwa app and how they negotiate – individually and collectively – its sociocultural embeddedness from the perspective of digital self-determination. The study showed that this relocated algorithmic solution was neither opposed nor endorsed a priori but underwent scrutiny depending on the diverse concerns, expertise, and motivations of the affected interviewees. Hence, the app was perceived according to a kind of "cosmopolitan data localism" discourse that reworks and multiplies spatial scales (and cultural uses) beyond the normative spectrum of data globalisation and/or the indigenisation of globally available technologies. More precisely, the successful cross-bordering of solutions like the Ubenwa app depends on multi-layered sociotechnical assemblages – i.e., data by, of, and for people – of which it is necessary to recognise not only the diversity but also the right to self-determination.

Hence, to speak, as we do in the title of the article, of (non) negotiable spaces of algorithmic governance points, above all, to the need to investigate algorithmic governance as an emergent affair dictated by the dynamic interplay of structural, cultural, and social practices. It is through such interplay, which is irreducible to one practice or the other, that data-driven technologies as complex assemblages come to be accepted (or not) and used (or not).

9.2.3 *Policing and Relocation Algorithms as Technologies of the Self: Voicing Refugees' Discontent*

In a third study (Kasapoglu et al., 2021), we explored automated governance for migrants' settlement through the lens of Foucault's work on governmentality. Our focus was on Syrian refugees in two national contexts – Estonia and Turkey – intersected with four types of algorithms to which these refugees can be subjected: relocation algorithms, police risk scoring, recommendation

algorithms, and online advertisements. While relocation and police risk scoring algorithms are institutional and territorial technologies, i.e., they depend on an institutionalised characterisation of the subject (refugee/non-refugee) within a given community/country; recommendation algorithms and online ads are informational commercial technologies, i.e., they create global subjects as consumers. As research highlights (Pelizza, 2020), the automated decisions to which migrants are subjected may impact not only their status but also the real possibility for them to be granted access to a given host country and to a number of in loco opportunities. From here, we aimed to investigate the “algorithmic imaginaries” of Syrian refugees in Estonia and Turkey – to whom we added the perspective of data experts – built around the four identified types of algorithms. We did so, again, through a series of interviews, which helped us realise how, on the one hand, informational algorithms have been so much interiorised by refugees that these algorithms come to be perceived as technologies of the self, i.e., strategies by which the self manages to determine itself rather than being determined by it. On the other hand, territorial algorithms are perceived as technologies of objectivisation of the subject, being perceived as more prone to originate forms of discrimination and arbitrary decisions. Put differently, automated governance of migrants’ redistribution is perceived by the affected people as imposing, technocratic, and rigid.

This led us to suggest that, in order to foster a politics of care able to regard Syrians as subjects and not merely as data entries to be scaffolded and kept monitored, it is necessary to reconsider algorithmic governance of relocation as an iterative collaborative loop including supervisors/authorities, algorithms/data experts, and users/targets. Such an iterative collaborative loop represents the precondition for granting a voice, especially to the latter pairing, and enacting a fairer decision-making process of relocation, allowing for decisions to be redressed if contextual situations change.

9.2.4 *Huawei in South Africa and Italy: Evidence of Transnational Forms of Digital Sovereignty*

As part of a broader research examining the role of Chinese ICT actors in Sub-Saharan African countries through the lenses of digital sovereignty and digital colonialism, in 2021, I focused on the presence and workings of the tech giant Huawei in South Africa (Calzati, 2024). The case study was the Open Lab launched in 2017 by Huawei in Johannesburg, which was compared to a similar project – the Joint Innovation Center (JIC) launched in Cagliari, Italy, in 2020 – of which Huawei is also one of the main stakeholders. While the objective of both these initiatives is to develop tech solutions for the smartening of the cities, the research aimed at exploring the extent to

which bilateral cooperation between Huawei and African actors, on the one hand, and Huawei and Italian actors, on the other hand, can be said to foster indigenous empowerment rather than (re)producing (colonially tainted) power asymmetries.

First, the research offered deeper insights into the discursive framing of these initiatives; second, by relying on the grey literature (the request for interviews with Huawei's representatives went unanswered), the study shed light on the governance models of these initiatives, with particular attention to Huawei's partnerships, as well as to the management of data lifecycle. Findings show that both initiatives are discursively framed in/through forms of techno-optimism, which highlight the smooth smartening of the city through data and technology, overlooking by and large the socio-economic sustainability of the solutions developed, especially in terms of the inclusion/exclusion of certain neighbourhoods and communities over others. Furthermore, Huawei's Open Lab de facto excludes African actors, either public or private, making room, instead, for other foreign (private) partners. The JIC, by contrast, sees the collaboration between Huawei and Italian public and private actors, but it remains unclear how power across partners is distributed concerning the management of data. Overall, Huawei shows high contextual flexibility when establishing its investments and partnerships abroad, being able to articulate forms of digital sovereignty based on opportunities that are contingent and contextual, meaning that they tend to overcome national Chinese interests, for instance, involving other foreign firms, as well as to rework local ties with public and/or private actors, based on Huawei's needs for strategic market and geopolitical positioning. This leaves the door open to further on-field research to unpack potential geopolitical/multistakeholder tensions affecting such a transnational approach.

9.2.5 *Lessons Learned*

Overall, the fil rouge connecting all these case studies can be summarised as follows: the realisation of tech-based initiatives "for good" rarely depends on the technology per se; rather, it is the socio-cultural-political conditions to count. The digital unsustainability of Estonia's e-residency program highlighted the key role of cultural factors in shaping global digital services that are really inclusive; the case of the Ubenwa app showed that its relocation responds to a complex intertwinement of perceptions and expectations that, in view of a successful adoption of technology, cannot be read solely in terms of technological glocalisation, but demands a cognisant ethnographic study of all actors' stances and their mutual negotiations; the automated relocation of Syrian refugees brought to light the need to enable a more nuanced governance of such process by keeping refugees in sight before, during, and after the decisional process; last, Huawei's intervention and operation in different

countries is guided by an agenda that, in view of the company's strategic positioning against competitors and local actors, is guided by negotiation and adaption to contextual and contingent circumstances.

Overall, lessons from all these cases suggest that, far from being reducible to a normative affair informed by guidelines to be ticked off, fit-for-all platforms, and policies driven by a universal ethos, the governance of data-driven technologies shall be better regarded as an iterative, context-sensitive, and human-centric process. Such process represents the condition *sine qua non* for managing these technologies in a fair way, i.e., able to mitigate possible discriminatory outcomes and finetune to contingent factors and needs, especially those of countries and people who have remained at the margins of the informational revolution until recently. Moving beyond calls for the indigenisation of technology, more radically we need to reconsider the positivist rationale on which data rest, to make room for alternative epistemologies.

9.3 Legitimate Epistemologies Beyond the “Datum”

To begin with, a governance of data-driven technologies that is meant to work iteratively, finetune to the context, and keep data subjects in the loop requires the establishment of a proper, fully fledged (digital) polity on/through which such governance can legitimately operate (Calzati, 2023). The starting point is the evidence that by now we live in a transnational multi-polarised scenario which, through ICTs, reworks scales, agents, and values (Winseck, 2017; Wasserman, 2018; Wen, 2021). As Wen (2021) writes, “the development of the global economy has been characterised by the transition towards transnationalised capitalism, within which information and communications technologies have increasingly played a pivotal role in restructuring the global capitalist system”. An accurate understanding of such a scenario requires undoing conceptual dichotomies such as global-local, individual-collective, and public-private. In this respect, Wasserman (2018) observes that at stake is the remaking of global power relations that “have prompted different ways of thinking about categories such as the ‘South’, the ‘global’, the ‘local’”. More broadly, to emerge are federated forms of ICT-based geopolitical globalisation in which the imbrication between people and data depends very much on contingent multifactorial trends, including competing and/or collaborative agendas, authorities, powers, and territories. In fact, it is the fundamental “cut and paste” (Floridi, 2017) logic of the digital, which remixes actors, scales, and values across contexts, to be at the basis of such a scenario. This means that today's cyber-geopolitics (and its governance) cannot be reduced to a linear mapping of the subjects involved and/or their relations. It is a whole entangled macro dimension to emerge – and if one wants to

govern it fairly, it is fundamental to acknowledge and operationalise epistemologies other than the positivist one hypostatized by the “datum”.

Indeed, to know (to track, to monitor) is not enough for achieving human-centric governance. A politics of care needs to problematise knowing as a practice that links the observer and the observed, emphasising “the ability to understand exactly what has to be measured and tracked” (Taylor, 2020) as well as how and why. While research has unveiled the socio-cultural fabric of data, insofar as they embed precise values (data as agencies), data also have a performative side. This means that they are agents and, as such, they (re)enact a precise worldview, notably one based on accountability. To “ac-count”, indeed, draws upon the idea of describing by counting, which inevitably means to enact a basic thought and process of quantification. Data, then, configure a quantification of information; but as quantifiers, data provide only a *certain* configuration of the phenomena they represent. After all, as Drechsler (2019) noted, “the fundamental problem is that one can always construct a set of indicators that proves any answer one wants to the question posed”. This idea highlights the ever-partial configuration of the physical reality created and (re)produced by/through datafication, pointing in the direction of the need to reconsider data beyond a “thing” or commodity in favour of data as contested (sociotechnical) processes (cf. also Akbari, 2020).

A case in point is the misalignment emerging whenever the effects of data as agents need to be regulated by law. Data manifest a Janus-faced nature: if one stresses their informational constituency, then data are a virtual entity and are potentially distributable globally; if one stresses their mechanical constituency (from collection to storage and use), then data are material entities whose allocation and circulation can be favoured or hindered in many ways, intentionally or not. In turn, this Janus-faced nature of data is responsible for tensions at the legal level. Someone can claim ownership over data even without control (and vice versa), stressing either the informational (e.g., European legal doctrine) or mechanical (e.g., US legal doctrine) constituency of data. When, for instance, the EU’s General Data Protection Regulation is interpreted as the “law of everything” (Purtova, 2018), this attests to the friction between data as a mechanical construct and the application of the law to an informational realm that can hardly be parcelled.

Moving beyond the “datum” means recognizing and legitimizing other qualitative formalisations that can foster other-than-quantitative epistemologies. This is the case, for instance (but not solely), with linguistic and body-dependent epistemologies, which foster ways of doing that can complement and/or contest datafication by inscribing the latter into an open-ended ecosystemic understanding of knowledge (Landauer, 1996). It is in this vein that Khene and Masiero’s (2022) call for a decolonisation of ICT4D can also

be read – a call for which an epistemologically plural understanding of knowing as a practice provides the basis.

To unpack the notion of practice, it is worth referring to the work of the German philosopher Walter Benjamin. Benjamin (2002) speaks of two different forms of human experience in connection with technological development: *Erfahrung* and *Erlebnis*. The former is a collective qualitative experience that entails forms of shared reflection, knowledge, and understanding; the latter is a kind of atomised immediate experience focused on the moment and lived through momentarily by the single subject. According to Benjamin, the technologisation of human experience – whose genealogy goes from oral storytelling to written texts, down to mass media – has produced a gradual decay of *Erfahrung* in favour of a blossoming of individually lived experiences as *Erlebnis*. And it is not hazardous to see in the process of datafication the last step of this never-ending decay of collective experience as *Erfahrung*. This vision, however, overlooks the fact that technology supplies only one possible way to make sense of the world. While concretising a techno-based experience of the world as *Erlebnis*, data do originate from socially shared practices as *Erfahrung*: data are always created under certain (sociotechnical) conditions, used for certain purposes, in certain contexts, by certain actors, and with certain results. This is where Benjamin's standpoint betrays a certain longing for origins, which tends to overlook the *embodiment* of any knowledge – including that coming from experience shared orally.

Hence, instead of thinking about knowledge as a thing – or as evidence of a (supposed) ground truth – to know shall be better regarded as a collective process informed, at all times, by a plurality of means and expressive forms, whose epistemic values escape easy-made fixation. After all, truth and factuality are not ontological properties, but sociohistorical and collectively defined values. An example to clarify this point comes, once again, from the law: “a patent applicant” Frischmann et al. (2014, p. 23) wrote concerning intellectual property rights, “must demonstrate that the invention claimed in the application possesses an ‘inventive step’, such that the invention represents a sufficiently great technical advance over the existing art”. This epitomises how law, by means of language, dissects experience (as *Erfahrung*) and turns it into *Erlebnis* (ready to be economized). Law artificially creates rights (value) by parcelling human activity in the same way as data-driven technologies turn human life into datafied experiences to be harnessed.

Hence, data, language, and the human body, as different forms of expression (among others), all produce epistemologically laden configurations of physical phenomena and human behaviours, which can be repeatedly translated into each other, depending on the task at stake: “it is the architecture of interplay and entanglement that is the real innovation”, Easterling (2021) writes, “value begins with physical arrangement, location, community, diversity”. This entails not only investigating this or that arrangement

but also exploring how the reflection on the whole process of interplay comes into being and is conveyed – i.e., how people create their own shared epistemological horizon(s) *at all times* based on *certain* data-language-body configurations.

9.4 Teaching Data Ethics: From Problem-Solving to Problem-Opening

So, how to proceed? How can an epistemologically diverse understanding of knowledge be operationalized as a practice? One avenue I explored with a colleague from the Department of Urbanism at the Delft University of Technology takes the form of an elective course, “Ethics for the Data-driven City”, which we expressly created as part of the Geomatics Master program. The course aims to unpack the tensions embedded in today’s normative understanding of data through the lens of ethics. More specifically, following up on a sociotechnical (iterative, contextual, subject-in-the-loop) approach to data-driven technologies, our starting point was a non-axiological (beyond good vs bad) non-normative (beyond do vs don’t) understanding of ethics. As Wilk (2019) acknowledges, “ethics does not always provide a right answer to moral problems. For many ethical issues, there is not a ‘right’ answer”. This entails contesting the possibility of finding, once and for all, ethically robust answers and solutions when it comes to developing, implementing, and using data-driven technologies in context. In other words, ethics (like governance) is not a toolbox “for good”, but a dimension requiring ongoing (collective) negotiation.

For the sake of the course, we defined ethics as a systematic reflection on what, how, and why people collectively justify as good (or bad). This definition bridges relational ethics and utilitarian positions with two advantages: (1) it regards ethics as a practice that can neither be framed once and for all nor be abstracted from the context; (2) it regards ethics as bearing a collective connotation by default, meaning that it is not possible to reduce ethics either to an individual affair only (cf. “virtue ethics”) or to a sum of individual positions. Ethics is a fundamentally uncertain (i.e., open-ended) practice, insofar as it provides a temporary synthesis, among different stances, of what a given collective considers as good. This resonates with the idea of “care” introduced above, whereby the value of ethics resides in the “relational, contextualised, embodied and realised through practices rather than residing in stand-alone principles” (Atenas et al., 2023). From here, when coupled with data-driven technologies, a non-axiomatic ethics leads to exploring the value-laden non-zero-sum entanglements embedded in the development and implementation of data-driven technologies, as well as the unintended consequences (both positive and negative) of their use in context.¹

To enable a teaching experience based on these premises, we adopted a transdisciplinary approach that could help students not only to grasp the complexity of the ethical dilemmas that data-driven technologies in/for the city bring with themselves but also to critically operationalize such understanding towards the realisation of their final assignments. As Nicolescu (2005) wrote, transdisciplinarity “concerns the dynamics engendered by the action of several levels of reality at once”. In a data environment where all answers are accessible and assembled on demand, students shall be especially encouraged to cultivate doubt, intended as an adaptive stance stemming from the awareness of the intrinsic uncertainty of our own being and acting in the world.

Concretely, we developed a pedagogical approach to data ethics that is not problem-solving, but *problem-seeking*, that is, an approach that recognises and constantly problematises the ethical multifacetedness and inherent open-endedness of all ethical stances and tech “solutions”. Just to give some examples, we compelled students to critically engage with principles (often connected with data technologies) such as “transparency”, “openness”, “inclusivity”, “trust”, or “privacy”; the critical point is that these notions cannot be taken as one-dimensional or in isolation; any one of them always presupposes its own opposite. Thus, there cannot be openness (e.g., of data) and transparency, without defining, acknowledging, and accounting for closure and opacity. Also, a data-driven service designed to promote inclusiveness might achieve this for certain people and not for others, or it might be inclusive for certain people under certain conditions but then result exclusive for these same people under other conditions. Similarly, Duenas-Cid and Calzati (2023) showed that trust shall be best approached as an entangled concept – “dis/trust” – which accounts for the duplicitous co-presence of the two opposites when discussing the adoption of data-driven technologies. The same goes for personal data: Purtova (2017) rightly claims that “just as light sometimes acts as a particle and sometimes as a wave, data sometimes act as personal data and at other times as non-personal data”. At stake is the fundamental awareness that there is no clear-cut way to discern once and for all whether a certain set of data contains personal data or not; these are two complementary features. Last, speaking of Open Government Data, Bates (2014) notes that “the ends to which openness is being driven by different social actors have become more complex and contested. For some advocates this emerging complexity has been framed in terms of the ‘unintended consequences’ of OGD”. From a pedagogical point of view, it is precisely the unintended consequences emerging from such complementarity that require attention: they are not happening “by chance”, but they are systemic. This is why there is no fixed solution for “good” of data-driven initiatives; only ongoing adaptation.

In order to critically reflect on and move beyond the limits of data epistemology, we asked students two things as part of their final evaluation. On the one hand, we asked them to realise an artefact – e.g., a model, a boardgame, or a video installation – that exposed and/or redressed the ethical tensions – in the form of principles’ double-sidedness and possible unintended consequences – embedded in a case study of their own choice, which intersected a data-driven service within an urban setting. On the other hand, from the end of class 1, we required them to keep track, by means of a project journal, of their own reflections, jotting down ideas and advancements towards the identification of their case study, as well as the realisation of their artefact. The journal had to be in writing, but we let students free to add other media formats (drawings, photos, images, etc.).

Then, during the oral exam, students were asked to expand on the role and content of the journal and on how and why the artefact explored the identified ethical tensions in the chosen case study (i.e., design choices). Figure 9.1 provides one example of both an artefact and the accompanying journal. In this case, the student took the Outdoor Mobility Digital Twin (OMDt) project of the TU Delft campus as a case study, which is meant to monitor, visualise, and predict all traffic on campus, including pedestrians and cyclists. The main function of the artefact, which is designed as a black box containing a traffic scene inside, is to allow the observer to look at the scene from

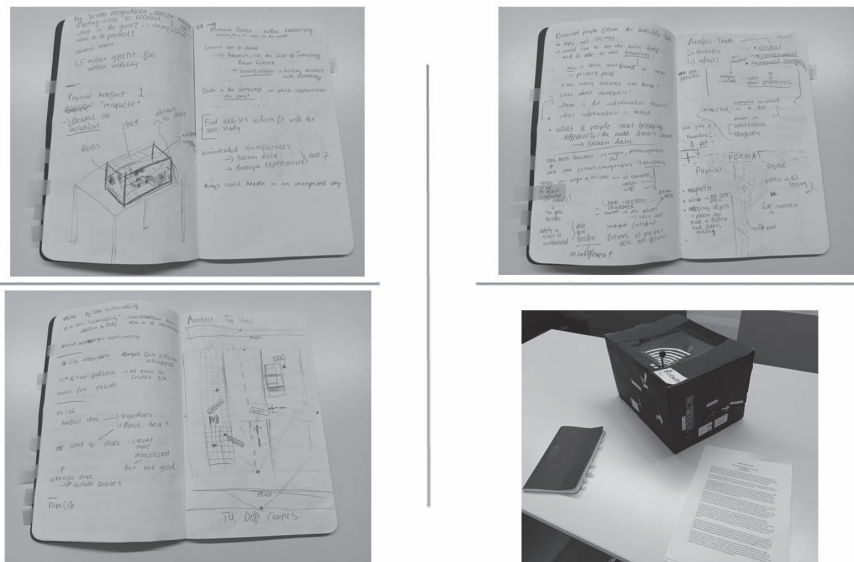


FIGURE 9.1 Some pages from the student’s journal and the final artefact for the course “Ethics for the Data-Driven City”.

different angles and through different lenses, both showcasing the more or less opaque data acquisition process, and the different ethical positions of the actors involved, including those excluded such as people in a wheelchair not accounted for by the OMDt project. Overall, the artefact not only exposes the ethical tensions identified by the student (transparency vs opacity; inclusion vs exclusion), but it creates an experience for the viewer/user that forces a critical reflection through embodied affection.

While the course was taught in the Netherlands, it was attended (over three years) by a socio-culturally diverse cohort of students. Moreover, in its design, the course maintains a global outlook, looking at case studies that intersect ethics, technology, and the city from around the world. In fact, the course can be easily adopted in and adapted to different socio-cultural and educational settings. Most importantly, by considering ethics as a non-axiomatic non-normative collective practice, as well as advancing a sociotechnical understanding of data-driven technologies, the course aligns well with the ethos of Critical ICT4D. In this sense, the course represents a fitting road test for the paradigmatic shift that Critical ICT4D envisions, promoting new ways of imagining fairer sociotechnical practices and data-driven initiatives, especially in contexts of structural vulnerability.

9.5 Conclusion

In their article, Akbari and Masiero (2023, p. 353) wrote: “Built upon three key conceptual components – reflection, problematisation, and construction – the notion of Critical ICT4D proposes a way to look directly into adverse digital incorporation, its histories and politics, for the purpose of imagining fairer, justice-enacting engagement of ICTs with people and society”. The unfolding of this chapter’s argument mirrored the three conceptual components envisioned by the authors. In the first part, the chapter reflected on and synthesised the findings from different social datafication studies through the lenses of critical data studies. These findings pointed towards the need to rethink data governance as an iterative context-sensitive process that keeps data subjects in the loop over time. In the second part, the chapter problematised such a conclusion by questioning the positivist epistemology of datafication (i.e., one of sheer quantification of human life and social phenomena), invoking the recognition of other qualitative epistemologies – from language-based to body-centred epistemologies – able to cut through traditional dichotomies such as global-local, individual-collective, and foreign-indigenous. This requires a shift in the way to consider the evidence delivered by data-driven technologies, moving from a horizon of knowledge as a fact to one of knowing as a practice of care. This is what Part 3 – “construction” – tried to operationalise, by describing the rationale of a

course in data ethics for the urban environment developed and taught at TU Delft. Notably, the course was based on two pillars: (1) a non-axiological, non-normative understanding of ethics; and (2) a sociotechnical understanding of data-driven technologies. Together, these two pillars led to the design of a transdisciplinary problem-seeking approach aimed at unveiling the non-zero-sum effects arising whenever data-driven technologies are developed, implemented, and used in a given context. This approach can be arguably regarded as the first iteration of the paradigmatic shift envisioned by Critical ICT4D throughout this volume.

Note

- 1 One example comes from the notorious case of Robert McDaniel, an US-American citizen targeted by a policing algorithm, which triggered a chain of dramatic events. One day, the police knocked at McDaniel's house located in a suburb of Chicago notorious for high crime rates. Yet, he had done nothing illegal. The police officers told him that an algorithm in use by the police to predict crimes identified him as a potential subject involved in a future shooting, either as a victim or as the shooter. The visit by the police was just one of many to follow, aimed at trying to keep the situation under control and avoid the shooting. But it was precisely this series of visits that put McDaniel on the spot: indeed, the presence of the police soon raised suspicion in the neighbors, who thought McDaniel could be a potential informant. The situation escalated quickly until McDaniel was indeed made the target of a shooting, which fortunately did not kill him. The algorithm enticed a sort of self-fulfilling prophecy: while working "correctly", its targeting of an innocent and the consequences it triggered were deeply unethical. The news can be read at <https://www.theverge.com/c/22444020/chicago-pd-predictive-policing-heat-list>.

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