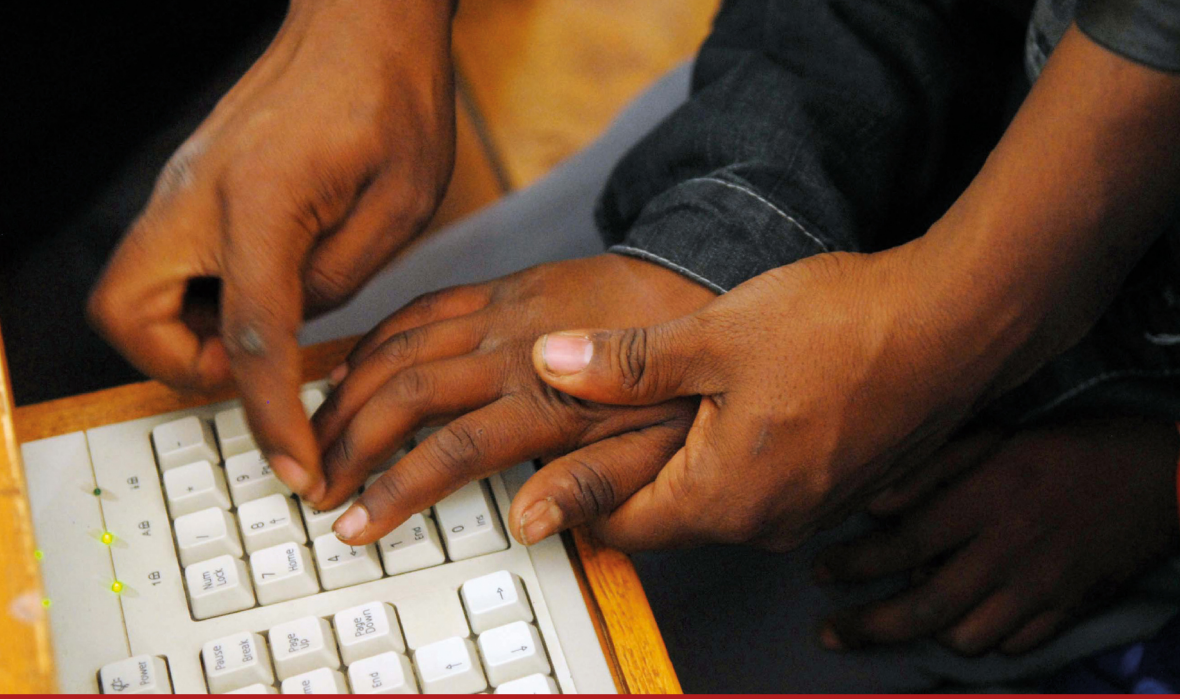

CRITICAL ICT4D

(INFORMATION AND COMMUNICATION TECHNOLOGIES FOR DEVELOPMENT)

EDITED BY AZADEH AKBARI AND SILVIA MASIERO

ROUTLEDGE STUDIES IN SCIENCE, TECHNOLOGY AND SOCIETY

ROUTLEDGE

CRITICAL ICT4D (INFORMATION AND COMMUNICATION TECHNOLOGIES FOR DEVELOPMENT)

The edited volume *Critical ICT4D* highlights the need for a paradigm change in theorising, designing, and researching Information and Communication Technologies for Development (ICT4D). Engaging authors from the Majority World and entering a process of restoring epistemic justice in knowledge production and ownership, the text:

- Reflects on the histories and narratives around development programmes, their deep-rooted socio-political background, and the power relations integrated into or induced by such measures
- Problematises the current scholarship and practices through decolonial and pluralistic approaches built with an explicit perspective of resisting epistemic violence
- Constructs justice-enacting engagements of technologies with society.

Offering thematic discussions in many development sectors with up-to-date case studies informed by recent research in the field, it sheds light on constructive contributions of critical ICT4D research. Written in accessible language, the book will appeal to postgraduate students, fellow researchers, and policymakers in the fields of sociology, development studies, STS, critical data studies, surveillance studies, international relations, public administration, and information systems.

Azadeh Akbari is Assistant Professor of Public Administration and Digital Transformation at the University of Twente, the Netherlands. She is a European Union's Marie Skłodowska-Curie Actions Global fellow for her project on Authoritarian Smart Cities. She is a member of the board of directors at the International Surveillance Studies Network and the founder and director of Surveillance in the Majority World Research Network. Her research focuses on digital authoritarianism, the use of surveillance technologies in urban spaces, especially against women, and data justice.

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CRITICAL ICT4D (INFORMATION AND COMMUNICATION TECHNOLOGIES FOR DEVELOPMENT)

Edited by Azadeh Akbari and Silvia Masiero

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This book aims to start an interdisciplinary conversation about ICT4D scholarship, research, and policymaking. All the shortcomings are the responsibility of the editors. We hope that the next editions of this book will engage with more disciplines and facilitate participation of more practitioners and scholars from the Majority World. The editors, respectively, as director of the Surveillance in the Majority World research network and chair of the International Federation of Information Processing Working Group 9.4 on the Implications of Information and Digital Technologies for Development, endeavour to facilitate epistemic justice and collaborations within the Majority World. We see this book as another step in this journey.

1

INTRODUCTION*

Azadeh Akbari and Silvia Masiero

This book is the materialisation of an ongoing conversation in the field of Information and Communication Technologies for Development (ICT4D) for a paradigm change, a shift, or a transformation. Its idea was conceived when the editors started to repeatedly meet up at different conferences and share the same concerns about the state of digital development on their social media. In an academic world, where interdisciplinary and transdisciplinary collaborations are constantly used as buzzwords, this encounter proved to be a genuine intellectual endeavour. Coming from different disciplinary backgrounds of digital geography and information systems, our observations of digital repression, exclusionary digital governance, and widespread digital harm in many development programmes forced us to reach out to other disciplines. We came to believe that there is no other way than interdisciplinary thinking that can equip us to address these concerns. In this sense, this volume bears the title *critical*, in its effort to transcend rigid disciplinary limitations. We did not intend to achieve geographical representativeness but are fully aware that we have not succeeded in including every related discipline, positionality, and historical debate in this book. Despite these shortcomings, we deeply hope this volume encourages more rigorous discussions about the future directions of ICT4D field of studies and practice.

The birth of the ICT4D field can be traced to the early introduction of computers in what were originally called "developing countries" (Heeks, 2014), a term that, as this book will illustrate, has come under much problematisation over time. Initially lean and unproblematic, the core assumptions of the ICT4D field pertained both to the nature of "development" and to the role that ICTs could play within it. "Development" was associated with ideas of progress, prosperity and modernisation, soon shifting from the economistic logic of

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growth to a more encompassing, human-centred perspective (Akpan, 2003). Along similar lines, ICTs were seen as intrinsically able to spur the so-called "development" processes and to participate in the betterment of conditions for people in situations of vulnerability (Akpan, 2003; Heeks, 2014).

All of this was, however, to be questioned with the field's evolution. Over the last two decades, the core assumptions on which the ICT4D field was built were problematised: ideas of "development", originally associated with progress and prosperity, became linked to notions of coloniality and illicit appropriation (Escobar, 2011; Qureshi, 2015). The association of ICTs with "development" became confronted with adverse digital incorporation, encompassing the multiple forms of harm that people incur by being included in, and not excluded from, digital systems (Heeks, 2022). And the term "developing countries", initially adopted as a staple for contexts of socio-economic vulnerability, has been exposed in its colonial undertakings (Qureshi, 2015), leading to question its very usage from the early days of the discipline.

Against this backdrop, we highlight the need for a paradigm change in the way we theorise, design, and execute ICT4D research. In this book, we introduce Critical ICT4D – *a vision that constructively problematises the core assumptions of ICT4D research* – as a route to generate research that positions the field within historical relations of power, reflects on the socio-political context of ICT4D measures, and transcends technological solutionism to account for ICT-induced harm. By problematising assumptions of "development" as a destined "better" way for all countries and communities and of ICTs as an intrinsic catalyst for achieving it, *Critical ICT4D* offers a way of thinking that openly deals with structural harm and injustice, in the pursuit of the construction of fairer engagements between humans and ICTs (cf. Heeks, 2022; Masiero, 2022, 2023).

In this introduction, we offer the foundational bases for a theorisation of Critical ICT4D. First, we review the key building blocks of ICT4D history, which provide the rationale for the concept's elaboration. Second, we define critical ICT4D and illuminate the key conceptual elements at the heart of this notion. Third, we suggest themes of interest for Critical ICT4D, arising at the intersection of critical data studies and cognate disciplines illuminating the perverse effects of technology adoption. We conclude by illustrating the ten chapters contained in this book, highlighting the unique relevance of each in contributing to theorising and enacting Critical ICT4D.

1.1 Building Blocks of ICT4D History

In this section, we summarise the two building blocks of ICT4D history. These coincide with the rise and fall of two assumptions that built the rationale for the initial establishment of ICT4D as a field of research: the first

assumption is that "development" is an inherently positive process that brings good impacts on beneficiaries and at large on the system of stakeholders around development interventions; the second one is that ICTs contribute positively to development, generating opportunities that the same system of stakeholders can leverage. The questioning of these assumptions illuminates the colonial roots of superimposed "development" processes and unpacks the harmful effects these can have on people.

The term "development" has few definitions in published ICT4D research. Akpan (2003) defines it as "the fulfilment of the necessary conditions for the realisation of the potential of human personality, which translates into reductions in poverty, inequality, and unemployment. (It is also) the increasing satisfaction of basic needs such as food". Basic needs definitions were common in the early days, signalling a shift from an economistic view to a Senian capabilities approach (Sen, 2001; Robeyns, 2009). What was overarching, in early-day definitions, was the focus on "development" as an overwhelming force of modernisation, a top-down solution for how to catch up with the "developed". A connected discourse held for the role of ICTs in development. As argued by Brown and Grant (2010), *for* in "ICT4D" is not only a preposition but also an expression of intent to use ICT4D to generate positive outcomes in what was originally referred to as the developing world. This is what made early-day ICT4D research centred on combating the digital divide, conceived as "is the gap between those who have access to and use ICTs including internet connectivity, internet-enabled devices and digital literacy skills and those who do not" (UN-Habitat, 2021, p. 15). Defined in terms of different technologies over time, early-day ICT4D research was informed by the fight to the digital divide, linking ICT access with the opportunity for economic prosperity.

Strong in their tenets, both assumptions have, however, experienced a crumbling turn in the last two decades. Initially hailed as a beacon of progress and prosperity, "development" has been exposed as a colonial paradigm, resulting in disempowerment and exploitation of development subjects, dispersal of communities and their ways of life and being, and perpetuation of oppression on them (Escobar, 2011). Bringing such a paradigm to "developing" countries is a hegemonic process that, rather than challenging existing hegemonies of power, reinforces them, leaving beneficiary narratives systemically silenced in the light of magnification of governments and humanitarian agencies. The hegemonic discourse of development, development aid, and development goals is nowadays so deeply established in international organisations, ministerial levels of Western countries, and an army of well-funded NGOs and foundations that questioning its discursive legitimacy seems like an existential threat to international politics.

Such terminological problematisation leads this book to engage, rather than with "developing countries" or similarly constructed entities, with the

Majority World as its centre of attention. As we use it, the term "Majority World" has both a demographic and a conceptual relevance. Demographically, the term points out to the majority of the planet's inhabitants, who experience the conditions of structural imbalance that the chapters of this book engage with. Conceptually, it conveys the assertiveness that homogenising terms, such as "Global South", do not present, hence concurring with an operation of restoration of epistemic justice (Galvan-Alvarez, 2010). In producing such an operation, we are inspired by the theorisation by Milan and Treré (2019) of a plurality of South(s), each of which is characterised by geopolitical specificities and acting as a site of resistance rather than submission (Milan & Treré, 2019, pp. 319–320).

The assumption that saw ICTs as a route to achieving "development" went down a parallel route. Technology was seen as a neutral force that, through the generous offering of Western countries, would have "fixed" the development gap. However, Heeks (2022, p. 688) highlighted how "adverse digital incorporation" enables "a more-advantaged group to extract disproportionate value from the work or resources of another, less-advantaged group". If inclusion in a digital system can be harmful and result in the perpetuation of extractive and surveillant dynamics (Taylor & Broeders, 2015; Akbari, 2022), ICTs have little scope for remaining upheld as a "magical" route to "development" and are instead to be studied in the light of the harm they can, and do, cause to recipients. Fusions of ICT4D research with fields related to critical data studies have illuminated this point and led to the questioning of previously established logics of ICTs for development (Masiero, 2022; Schoemaker et al., 2023).

It is in this landscape that a call for the construction of new research paradigms arises. Born as a byproduct of information systems-led technology enthusiasm, ICT4D is traversing a historical phase where it is called, morally and epistemically, to come to terms with the harm that the uptake and diffusion of digital technologies can and does cause to people. Our suggestion of a turn to Critical ICT4D is a direct acknowledgement of the need for such a paradigm shift.

1.2 The Anatomy of Critical ICT4D

Over the last decade, decolonial approaches – which delink the production of knowledge from Western science and values – have become prominent in ICT4D outlets, challenging the pre-established hegemony of Western theories as a means to make sense of technology in vulnerable contexts (Khene & Masiero, 2022). Among many approaches, decolonial research is central to combating epistemic violence, a term that refers to violence exerted on knowledge through knowledge (Galvan-Alvarez, 2010). With Western theories elevated as paradigms to understand technology-induced dynamics across

space and time, decoloniality invites a turn to approaches generated from local contexts, using Indigenous concepts and terminology to make sense of dynamics at the local level (Tsibolane & Brown, 2016; Masiero, 2022).

It is against the backdrop of decoloniality and its implications for research in our field that we propose Critical ICT4D as a novel paradigm for research ICTs for development. By paradigm we mean, in alignment with Guba and Lincoln (1994), a set of assumptions that inform the researchers' mindset, hence shaping the way research is conceived, designed, and executed. Defined as *a vision that constructively problematises the core assumptions of ICT4D research*, Critical ICT4D is introduced as an approach that questions the very tenets on which our field was built, with a view of understanding technology-induced harm in order to challenge its production. Built upon the three key conceptual components – reflection, problematisation, and construction – along which this book is structured, the notion of Critical ICT4D proposes a way to look directly into digital development dilemmas and their histories and politics for the purpose of imagining fairer, justice-enacting engagement of ICTs with people and society.

The conceptual components of Critical ICT4D can be articulated as follows: a first component is centred on *reflection*, conceived with Monteiro et al. (2022) as a conscious examination of the assumptions on which research and practice are based. With a focus on reflection, we invite all researchers, policymakers, aid workers, and stakeholders of ICT4D to reflect on the histories and narratives around "development" programmes, the deep-rooted socio-political background of the programmes themselves, and the power relations integrated into or induced by such measures. It is on such a reflection that ideas pertaining to Critical ICT4D are built, and the same reflection makes it possible to operate the subsequent components of problematisation and constructiveness.

By *problematisation* we mean, in alignment with Chatterjee and Davison (2021), a process in which the researcher questions assumptions, not taking previously established findings for granted. Crucial to the conception of Critical ICT4D is the stock-taking of the crisis of the core assumptions on which the field was built. As noted above, Critical ICT4D stems from questioning their validity, mirrored by harms that "development" and the technologies built for it have induced (Taylor & Broeders, 2015; Masiero, 2022; Taylor et al., 2023). Viewed in this light, critical problematisation is crucial to imagining different ways of researching and enacting ICT4D: ways that are openly decolonial, intersectional, and built with an explicit perspective of restoring epistemic violence.

At the same time, it is a constructive problematisation that is proposed here. *Constructiveness*, as a conceptual building block of Critical ICT4D, is indivisible from reflection and problematisation: indeed, the purpose of questioning "tech for good" assumptions in vulnerable contexts is that of

understanding the harm generated by technology engagement, with a view of overcoming its causes and production. In other words, Critical ICT4D problematises ideas of technology as a force of good by engaging in the study of harm and dissecting the causes of its generation to challenge it. The constructive component, in which justice-enacting engagement of technologies with society and people is imagined, is a substantial element of Critical ICT4D and the one that translates it from research to action.

1.3 This Book's Agenda and Chapters

This book consists of ten chapters, each illuminated by a different aspect of the overall conception of Critical ICT4D. In what follows, we introduce each chapter, illustrating its theoretical perspective and the empirics it brings to the attention of a multidisciplinary readership.

Following the fundamental components in our definition of Critical ICT4D, the first five chapters *reflect* on the histories of development and technology from different perspectives. In Chapter 2, "Digital Development Dilemma", Azadeh Akbari notes how "digital development" stands as a top priority for national, regional, and international development endeavours. Despite the strong advocacy of such digital development, reports of digitally induced discrimination, injustice, and violence are associated with development programmes abound, characterising harm as a direct product of alleged technologies of development. In this light, the chapter introduces the digital development dilemma as a concept describing the inherent dilemma carried in the core of digital development programmes: increasing efficiency, inclusion, and participation on the one hand and paving the way for digital repression, consolidation of exclusion, establishment of new forms of technological dependency, and complicating digital self-determination, on the other. It argues that, without situating ICT4D programmes in their colonial, political, sociocultural, and economic contexts, a wholesome and fair analysis of the same schemes cannot be conducted. The chapter opens the book by showing the impossibility of a "neutral" ICT4D and illuminating the conceptual basis of critical ICT4D research.

In Chapter 3, the two editors of this book interview Shirin Madon, Professor of Information Communication Technologies and Socioeconomic Development at the London School of Economics and Political Science (LSE). A key figure of global ICT4D research, Madon details the journey of ICT4D as a research field, noting the distinctive features of its early days and observing how these have become increasingly problematised over time. In doing so, she outlines important themes of transformation of the development discourse over the years, its enactments, and the role of international funding institutions in shaping the course of ICT4D, including some of the harmful effects detailed in the Introduction. The interview concludes with a focus on

the future and on the importance of non-ICT interventions as active participants in the landscape of digital development that current ICT4D researchers need to engage with.

In Chapter 4, "Bringing Critical ICT4D from the Margin to the Centre", Tony Roberts builds on hooks (2000) in bringing "to the centre" existing critical, but currently marginalised, theory and practice of ICT4D. To do so, he conducts an auto-ethnography of his 35-year involvement in ICT4D research and practice, using autoethnography as an epistemic device to reflect on inbuilt assumptions of the ICT4D world and their questioning. Auto-ethnography allows the author to reflect on his own starting points of white saviourism, techno-solutionism, and sell-out to funders, using this as a reflexive analysis to connect to wider failings and opportunities for ICT4D. His journey travels from a techno-optimistic stance to his current position as an academic with a strong, conscious focus on digital rights and social justice, which shape his research direction and act as powerful instantiations of Critical ICT4D.

In Chapter 5, "The Interface Position of ICT4D Research", Silvia Masiero takes stock of a central lesson from the first section of the book: ICT4D research finds itself in a peculiar position, characterised by the crisis of its original assumptions and needing to come to terms with adverse digital incorporation (Heeks, 2022). She characterises this as a novel position, described as the interface of past and present, research and practice, and cross-disciplinarity, especially with domains of data justice, surveillance, and critical data studies. The interface serves as an epistemic device to investigate contemporary ICT4D and to introduce the ideas of problematisation and constructiveness that characterise the next sections of the book.

The second section of the book engages with the component of *problematisation* of current ICT4D scholarship, research, and policy. In Chapter 6, "The Violence of Algorithmic Systems in Social Policy in Colombia: (Re) Localising the Digital Welfare State in the Postcolonial Context", Joan Lopez-Solano studies the case of the System of Identification of Social Program Beneficiaries (Sisben) and the Household Social Registry, used by the Colombian government to determine eligibility for social protection schemes. Drawing on extensive primary research on both programmes, he shows how both systems produce instances of structural violence, which depoliticise the requests of marginalised communities and misrepresent social rights as a product of benevolence or good luck. The chapter offers a historical analysis of both schemes, noting the involvement of datafication in an involution that reflects the historical tendencies towards structural violence in Colombia. The chapter illuminates, at the same time, how localised actions of resistance are paramount in exposing and countering the same structures.

In Chapter 7, "Digital Humanitarianism: Orthodoxy and Lived Realities", Silvia Masiero engages the concept of *digital humanitarianism*, which

she defines as the assemblage of processes, means and technologies through which the practice of humanitarian work is digitised. The chapter starts by detailing the theoretical building blocks of digital humanitarianism, to be found in the notions of *mapping*, *providing*, and *empowering* applied to systems of humanitarian action. The narration proceeds, however, by illustrating how empirical work leads to questioning all three building blocks: harm and injustice emerge as being produced at all three levels, with involvements in digital technology that the chapter maps. The philosophy of digital humanitarianism is then presented in light of such hurdles, conceiving design injustice as a central tool in the making of humanitarian schemes through digital technologies.

In Chapter 8, "Reimaging Smart City Transplants for the Global South: A Post-Colonial Lens on Human Rights and Digital Sovereignty", Alina Wernick, Gabriel Udoh, and Emeline Banzuzi reflect on how smart city technologies often fail to take into account the contextual specificities emerging across the Majority World. Such failures lead to the reinforcement of digital colonialism, in ways that put human rights at risk and ultimately endanger the same demographies that "smart" architectures are supposed to protect. Focusing on Lagos, Nigeria, the chapter notes the non-replicability of Eurocentric approaches in the Majority World, illustrating how city-centred, human rights-based approaches to governing technology offer a significantly more solid alternative to addressing issues of governance. The chapter also offers a markedly decolonial approach to smart city research, positioning digital sovereignty as a central device to enact such an approach.

The third section of the book *constructs* a new approach to ICT4D based on the reflection and problematisation of some of the existing issues in the last two sections of the book. In Chapter 9, "From Data Governance to Data Ethics: Invoking Epistemological Plurality for Enabling a Critical Turn in ICT4D", Stefano Calzati positions epistemological plurality as a central contextual device in the making of critical ICT4D research. Reflecting on the findings from the four studies conducted at the Data Lab at Tallinn University of Technology, he illuminates the need to reimagine data governance as a pluralistic practice, involving continuous negotiation among data experts, data subjects, and their context. The chapter then problematises the very meaning of pluralism, highlighting the need for the coexistence of multiple qualitative epistemologies to produce meaningful exchanges in the data governance field. To operationalise such a perspective, he describes a university course on data ethics for the city, premised on a sociotechnical understanding of data-driven technologies and translating such an understanding in the course teaching and assessment.

In Chapter 10, "Design for Water Justice: Co-Developing Tools for Equitable Cities", Fenna Imara Hoefsloot, Andrea Jimenez, and Liliana Miranda Sara present water datafication as a central route to supporting water

management and service delivery, especially in the light of water scarcity. They describe several datafied technologies for water management: they note, however, how these tend to be premised on a neoliberal approach to water, deprioritising issues such as justice, equity, and sustainability. The chapter presents an alternative, the *Observatorio Metropolitano de Agua*, where a water management platform was premised on principles of data justice and on their enactment for the system of stakeholders revolving around the platform. In this light, the chapter offers a data justice perspective on water management, illustrating important connections between this perspective and practical tools for platform co-development.

In Chapter 11, "Social media and Sisterhood in Latin America: Discourses and Practices", Juan Bossio and Illari Diez address how *sororidad* (the Spanish word for "sisterhood") is developed and shaped across feminist groups on social media. Presenting social media as practical applications of sisterhood, they present Latin American diversity from the perspectives of a sociotechnical view, collective action, and social networks. Premised on extensive fieldwork from the two authors on the topic, the chapter offers a powerful illustration of sisterhood practices on social media, presented through the lenses of intersectionality and power. These two lenses, applied to feminist social movements in Latin America, actively concur with the conceptual armoury of Critical ICT4D.

1.4 Conclusion

In this introduction, we have set the premises for a paradigm shift in ICT4D, resulting in a vision, Critical ICT4D, which problematises the field's main assumptions to imagine fairer human-technology engagements. While we set out a view of Critical ICT4D as an inseparable connection of reflection, problematisation, and constructiveness, we wish to apply this way of thinking to phenomena of interest to critical data studies and cognate academic fields, including surveillance studies and data justice. Despite our efforts, many vital chapters on the intersection of ICT4D and decoloniality, queer theory, Indigenous data movements, political economy, and many more are missing. Our failure highlights the difficult but necessary task of building bridges between disciplines and scholarships. On the one hand, we believe that the recent history of ICT4D, with the crisis of the field's main assumptions, calls for a critical approach towards the "tech-for-good" ideology. On the other hand, we find that criticality needs a constructive orientation to leverage interdisciplinary studies of injustice and oppression in order to overcome their effects. We see Critical ICT4D and its role in informing and executing research as a route to restoring epistemic justice, where the voices of oppressed recipients are accounted for in imagining just, technology-informed systems. It is in light of the restoration of epistemic justice that we invite you to engage in the chapters to come.

Note

* The main structure of this chapter is inspired by our conference paper on the same subject:

> Akbari, A., & Masiero, S. (2023). Critical ICT4D: The need for a paradigm change. In M. R. Jones, A. S. Mukherjee, D. Thapa, & Y. Zheng (Eds.), *After Latour: Globalisation, inequity and climate change*. IFIPJWC 2023. IFIP Advances in Information and Communication Technology (vol. 696, pp. 350–355). Springer. https://doi.org/10.1007/978-3-031-50154-8_25

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2

DIGITAL DEVELOPMENT DILEMMA

From Progress to Control

Azadeh Akbari

2.1 Introduction

Digital development remains a top national, regional, and international priority in all development programmes. The United Nations and International Telecommunication Union (ITU) regularly measure and report on different digital development indices, such as the ICT development index, e-government development index, e-participation index, online service index, and telecommunication infrastructure index. Institutions of the global economy closely follow each country's share of digital markets, e-commerce, and platform-based labour. While the move towards digital futures seems to be inevitable, there are concerning reports about discrimination, exclusion, injustice, repression, and bias backed up by the newest technologies. Many of these problems are portrayed as unintended outcomes, digital harm, political repression, or planning and design mistakes. This chapter takes a brief historical look at the conceptualisation of technology in the decades of development work and the faith in technological fixes for socio-political problems. It argues that without situating ICT4D programmes in their colonial, political, socio-cultural, and economic contexts, their complexities and their "outcomes" cannot be analysed. This chapter introduces the digital development dilemma as a concept describing the inherent dilemma carried in the core of digital development programmes: increasing efficiency, inclusion, and participation on the one hand and paving the way for digital repression, consolidation of exclusion, establishment of new forms of technological dependency, and complicating digital self-determination, on the other. The chapter also includes recent examples of state control and surveillance, the increasing engagement of Big Tech companies in digital development, and new colonial

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models of platform-based work. In doing so, it aims to scrutinise the neutrality and idealism of ICT4D programmes by highlighting the dilemma between efficiency, control, and dependency at the heart of such initiatives.

2.2 Development and Technologies: A Short Overview

The literature on development in the 1990s saw a surge of critique against the fundamental concepts of development. This was not the first time that development as a concept was questioned. The waves of modernisation theory and practice after the Second World War were based on liberal political theory and focused on economic growth. For the advocates of modernisation, development was a universal linear progress promising a kind of prosperity that can only be realised through capitalism, liberal democracy, and Western values. Although modernisation theory was under attack even in its own time, its emphasis on economic growth (Rostow, 1960) and linear progress is still formative to many international development organisations' agendas and philosophies. Since the 1960s, influential counternarratives have depicted alternative accounts of how development discourse has taken shape and continues to deepen global structural inequalities. In reaction to modernisation discourse, dependency theory (Frank, 1970) emphasised that access to technology, investment, or integration in global markets does not change the structural power imbalances in world trade; poor countries are poor as a result of historical relations of colonisation and oppression. As these two camps continued to fight over free markets or structural change and revolutionising the world system, the 1980s seemed like a dead-end of grand narratives. As neoliberalism was becoming dominant and the Cold War nearing its end, the modernisation framework of development was losing its foothold.

During this time, the reality of development work on the ground was so different from the theoretical debates that scholars wrote about the "irrelevance of development studies" (Edwards, 1989). While the political victory of the West convinced some of the "end of history" (Fukuyama, 1989), it seemed that the *evolutionary* character of development had lost all conceptual diversity; Western liberal democracy was the final answer to any socio-political agenda for progress. In this environment, the intrusive Structural Adjustment Policies of the World Bank and IMF weakened the state, cut back on public expenditure, and exacerbated the debt system of dependency (Graeber, 2011). In the midst of scholarly criticism, other international organisations also strongly opposed the adversity of such programmes and called the 1980s the "lost decade of development" (Khan, 1997). A UNICEF study in 1987 titled "Adjustment with a Human Face" (Cornia et al., 1987) showed how the World Bank and IMF, with their army of economists focusing on macroeconomics, failed to recognise the effects of their policies and programming on poverty increase and decline of health and education indices.

These challenges had some direct effects: In 1990, UNDP published its first Human Development Report and introduced human development as a concept that focuses on people, opportunities, and choices rather than just economic growth (UNDP, 1990). The report was significantly influenced by Amartya Sen's (1981) capabilities approach, which expanded the idea of fulfilling basic needs, gave centrality to choice, and highlighted people's ability to *be* and *do* things based on their idea of a good life. This combination of human and economic factors paved the way for the ratification of the Millennium Development Goals – an international agenda for putting back humans at the centre of development agenda. Concurrently, a new wave of post-development ideas attacked the managerialism of development plans and projects and their reluctance to power structures, locally and globally. Post-development scrutinised how the discourse of development has helped to sustain unequal relations of power and invented concepts such as third world, poverty, population control, and technological transfer as the drives behind "catching up" with the developed (Escobar, 1995).

Attention to such characteristics of mainstream development discourse was not limited to advocates of post-development. All through these decades, alternative approaches to development such as empowerment, grassroots mobilisation, participation, or rights-based approaches tried to build upon bottom-up systems that used the grand narratives as perspectives rather than as an operationalisation manual. Many groups from the Majority World used participation as a vehicle to reflect the socio-cultural complexities of their communities and give *voice* to the people who suffered the most as a result of development programmes. Empowerment was originally a critical feminist approach advocated by women's rights groups from the Global South. However, many of these radical and revolutionary ideas were co-opted and defused by mainstream development organisations. Participation was turned into a managerial process, depleted from its aspirations for changing decision-making structures. The "tyranny of participation" (Cooke & Kothari, 2001) was criticised for making participatory approaches a project management tool insensitive to socio-cultural nuances. After the Beijing Conference on Women in 1995, empowerment was separated from its radical meanings and integrated into the gender mainstreaming of international organisations as a quantifiable index of development (Calvès, 2009). Development and its powerful institutions turned radical politics into "development buzzword[s]"; "feel-good" phrases that provided development agencies with the "goodness and rightness" that they needed "to assert the legitimacy to intervene in the lives of others"(Cornwall & Brock, 2005, p. 1045).

In addition to this wave of criticism and former development managers admitting mismanagement and defeat (Easterly, 2006), the Brundtland Report, published in 1987, brought attention to environmental issues and

argued for a notion of development that was intertwined with sustainability. Although many scholars were also concerned that the progressive idea of sustainability would be overshadowed by development's political and economic nature (see, for example, Lowe et al., 1999), the shifting focus deeply influenced the international development discourse and agenda. Most importantly, the United Nations Development Programme took a human-centric approach to development and introduced human development instead of a sheer focus on economic growth. After years of debating, declarations, and development programmes, in September 2000, the United Nations Headquarters in New York hosted world leaders to ratify the United Nations Millennium Declaration. The resulting Millennium Development Goals initiated a new global collaboration to eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria, and other diseases, ensure environmental sustainability, and develop a global partnership for development – all until 2015. The fulfilment of MDGs was uneven across the developing countries, and by 2015, hardly any country had achieved all goals. The Sustainable Development Goals set the stage for another global effort with a deadline of 2030, this time integrating sustainability as a central theme. Although quantifying development might simplify complex socio-cultural, political, and economic aspects, the human-centric approach meant a more diverse and holistic approach to what development means to individuals, communities, and societies.

This new approach was accompanied by a *global ICT revolution*. Digital technologies were rapidly changing our way of life, governance models, and the world's economy. According to the ITU's World Telecommunication/ICT Indicators, only 7% of the world population was using the Internet in 2000; but this figure reached 63% in 2021 (ITU, n.d.). Although the percentage of Internet access remains relatively low in developing countries- 35% of the population (World Bank, n.d.)- digital transformation injected new hope into development discourse and programmes. The World Bank founded its infoDev group as an "ICT-for-development research leader" in 1995 (infoDev, n.d.). The group pivoted towards innovation, digital entrepreneurship, and climate technology in the 2010s and mainstreamed its ICT4D work into all World Bank programmes. Two important World Summits on the Information Society in Geneva 2003 and Tunisia in 2005 rolled out action lines for ICT4D. Information and communication technologies also play an integral role in the SDGs. Target 9.c aims to "significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020". Target 4.b supports higher education scholarships in the area of ICTs. ICTs are also mentioned as "enabling technologies" for promoting the empowerment of women (target 5.b), and for technology and innovation

capacity-building (target 17.8). However, the human-centric ICT-powered development approach was inevitably exposed to global political events.

The terrorist attacks on 11 September 2001 changed the balance of world politics for the coming decades. The *securitisation of international relations* and the ongoing war against terrorism were heavily dependent on surveillance technologies and cyber wars. Snowden revelations in 2013 showed the NSA's closed surveillance of not only American citizens but also international politicians and friendly heads of state. While the political scene and global public opinion were shaken by the extent and power of such surveillance measures, the burgeoning war in the Middle East, and the increasing disbalance in global geopolitics, social media platforms were rapidly expanding to become an inseparable part of our digital lives. For the first time after decades, digital technology companies, such as Alphabet, Apple, Microsoft, Meta, and Amazon, replaced the oil and gas industry's hold on top profitable businesses. Although the opening of public virtual space supported socio-political movements and helped topple many longstanding dictatorships, disinformation and misinformation campaigns raised concerns about the future of democracy.

In this environment, the old patterns of development discourse started to resurge despite the harsh critique of the 1990s. As shown by Michael Adas in the "Machines as the Measure of Men", modernisation ideas were already promoted by American educators and missionaries in the 1920s and 1930s (1989, p. 402). After the Second World War, American progress and prosperity were treated as an ideal model of development. In this sense, science and technology were not only an integral part of American economic success but "technological innovation was [seen as] essential to progressive social development" (Adas, 1989, p. 410) and acted as "standards for judging human worth" (Adas, 1989, p. 406). Although the modernisation theory, especially its civilising colonial connotations, has been heavily criticised, the faith in technology and science as the best tools of growth and development is still prevailing. Arturo Escobar (1995) highlights the historical trajectory of such thinking, specifically in development discourse. He points out how the American Development Aid programme, Point Four, was based on two fundamental pillars of modern technology and capital. However, as he argues, "it relied much more heavily on technical assistance than on capital, in the belief that the former would provide progress at a lower price" (p. 36). Technology was seen as a neutral moral force (Escobar, 1995) that helped underdeveloped nations fulfil the modernisation dream.

The undisputed faith in technology for solving complex socio-political problems and overcoming unequal economic structures, which was generally called technosolutionism or technological fix, also cast its shadow over development programmes. This time, ICTs and digital technologies were the top priority of the World Bank and other development and aid organisations. As

early as 2002, there were scholars warning about the ICTs being "oversold as the key both to higher efficiency of corporate and public organisations and to stronger responsiveness of government to citizen-customers" (Wade, 2002, p. 443). Strategies and projects, such as World Bank's policy paper on the "networking revolution" and other ICT4D programmes, were criticised for assuming ICTs' inherent quality to "leapfrog institutional obstacles and skill and resource deficiencies on the ground" and neglecting the problems of scaling to national and regional levels (Wade, 2002, p. 445). The same problem was prevalent in the ideal world of Silicon Valley inventors and entrepreneurs, if not originating from there. One Laptop per Child (OLPC; laptop.org) is a good example of such an altruistic initiative to provide children in disadvantaged parts of the world with a cheap laptop, focusing on learning coding and self-teaching, without targeting any underlying infrastructural problems, human resource challenges, and barriers to education. In an explanatory marketing video of the OLPC foundation, the narrator asks, "Why give a laptop to a child who may have no electricity or even running water?"; the answer does not address the question but rather suggests substituting "laptop" for "education" (OLPC Foundation, 2008). The video argues that we cannot stop education until other problems have been solved; but does not consider why this technology-based method of education is the best solution. After substantial sales to many developing countries, reports from Peru, Uruguay, Nepal, and many other countries showed no significant improvement in children's skills or learning (Heeks, 2018, p. 232). The technosolutionist approach to many areas of development, such as health, education, gender equality, and economic inclusion, highlighted a deep-rooted belief that technologies can inherently elevate long-standing challenges. Things became even more complicated using such an "add-ICTs-and-wait approach" (Samarakoon et al., 2017, p. 649) in a world where digital technologies are rapidly evolving. The sheer technological necessities of such programmes, including infrastructural development, investment in gadgets, and training of human resources, worked as incredible shocks to already vulnerable economies.

Despite all these critiques, ICTs play a vital role in development programmes, and many developing countries have national strategies for digital development. This book contains thorough discussions about gendered aspects of technologies, smart cities, water management, and digital IDs – fields that have been revolutionised through digital programmes. There are also important debates about privacy, digital rights, data protection, and data justice in regard to ICT4D and digital development programmes. This book also contains historical discussions about how ICT4D as a field has developed and how its thematic areas and research foci have evolved. This chapter frames many of these debates within a framework of "digital development dilemma". The dilemma transcends the competing discourses of digital harms, exclusion, and discrimination on the one hand and efficient

digital public services, effective e-health, and inclusive digital identification on the other. The chapter rather focuses on the inherent contradictory features of digital development and argues that such aspects are directly related to socio-political, historical, and colonial backgrounds. There is no good, bad, or neutral technology (Kranzberg, 1986); all technologies are situated and therefore digital development cannot be planned, implemented, or evaluated without considering this situatedness.

2.3 Digital Development Dilemma

Digital development dilemma refers to the phenomenon where the positive outcomes of digital development are shadowed, paralleled, or contested by unprecedented controlling possibilities enabled by the same procedures of digital development. In the last section, we discussed how the discourse of development has been saturated with positive beliefs in the power of technology, while decades of scholarly research and activism have shown how technologies cause harm, discrimination, and exclusion. For many years, *access* was the top priority of development programmes, and the digital divide was the catchphrase of all international institutions. However, digital inequality is not only about the divide between the Global South and North in accessing digital technologies but also about the direct inequalities caused by such technologies (Heeks, 2022). Indeed, digital technologies have a potential: they can make services and systems efficient, accessible, and participatory, but they also facilitate surveillance, control, and discrimination in an unprecedently effective way. Next, this chapter sheds light on some aspects of the digital development dilemma to highlight the embeddedness of technologies in socio-political systems and how complex new systems and spaces are produced as a result of interactions between existing established systems and newly developed ones.

2.4 Digital Development and Digital Repression

Concurrent with the enthusiasm for the power of technologies in development circles, politics was also affected by the hope that ICTs would bring about democracy. Many believed that if repressed nations had access to free spaces of discussion and mobilisation, democracy would prevail. The proponents of this approach were mesmerised by the wave of Iranian women's blogging (Shakhsari, 2020) and the political upheaval in the Middle East and the Arab Spring. Westerners were quick to label such uprisings as Twitter revolutions without considering the long-standing resistance movements in those countries – as if all the political events were just a consequence of social media platforms' democracy-bearing affordances (Lowrance, 2016). Leaders of the "free" world were so convinced about the social media's democratising

effect that, for example, in 2009 Obama administration requested Twitter to reschedule a planned upgrade so that Iranian demonstrators could further mobilise through the platform (Pleming, 2009). There was not much inquiry into the real number of Iranians using Twitter as their source of information or the extent of Internet disruptions throughout the uprising that would make access to social media platforms impossible (Akbari, 2020). Many similar cases of negligence regarding the political trajectories of oppressed nations were received with criticism, and the celebratory mode for "liberation technologies" (Diamond, 2010) did not last long.

Authoritarian regimes reacted differently to the changes caused by the Internet and ICTs. Some, such as the Chinese government, detected the fundamental upcoming change early on. Concerned with the growing oppositional political views and the threat of free global Internet, China had realised already in the early 1980s that "if you open the window for fresh air, you have to expect some flies to blow in" (MacKinnon, 2008, p. 32), The Great Firewall of China is a good example of centralised digital governance that facilitates control and surveillance. Starting in 1998, the Great Firewall of China demarcated the Chinese cyber territories by blocking or controlling access to foreign websites and cross-border Internet traffic by prioritising domestic companies and local platforms and applications. Many other developing countries lack the resources or the political stability for visionary planning to come up with such comprehensive long-term strategies. However, they recognised the potential of ICTs for consolidating their power and as "tools of oppression" (Burgers & Robinson, 2016). In addition to their affordances as tools, these technologies changed the characteristics of authoritarianism and opened up new spaces of oppression. "Networked authoritarianism" (MacKinnon, 2011) meant that authoritarianism as a political form has integrated the possibilities offered by digital technologies, such as targeted surveillance, effective censorship of digital space, and invasive misinformation campaigns. This adaptation happened within already intransparent and oppressive governance practices and institutions and gave rise to "authoritarian surveillant assemblages" (Topak, 2019), where many government and private sectors and even regional and international bodies interacted to make the surveillance machinery work.

Far from the naïve idea that the Internet and ICTs will "bring" democracy, we have moved to a situation where there is not a day that a new scholarly project, activist group, or political opposition does not reveal how authoritarian regimes are using ICTs for political repression – or, in other words, "digital repression" (Feldstein, 2021). Internet shutdowns, censorship, and targeting of individual activists have become routine instances of state violence (see, for example, Gohdes, 2023), and complex political situations in regions such as the Middle East have become frighteningly dystopian (see, for example, Jones, 2022). Despite this growing literature and debates

about the "global turn to authoritarianism" (Wood, 2017), the ICT4D literature is depoliticised (if not apolitical) and does not substantially engage with the question of politics. Many ICT4D projects are based on participatory approaches, where "participation" is limitedly defined at the community level and does not entail the larger questions of democratic participation and deliberation for structural change (Akbari, forthcoming). A critical ICT4D should not only engage with the fundamental question of whether participation is meaningful in a closed political system but also put it one step further and scrutinise the ramifications of ICTs and ICT4D programmes in the political realm. It is, therefore, impossible to think about using ICTs for development without studying how, in the same context, ICTs are used for repression, surveillance, and control. The notion of digital development dilemma transcends the dynamics of digital development beyond the (sometimes limited) development objectives and emphasises a critical examination and a situated analysis of such objectives – if we ever want to successfully achieve them.

2.5 Digital Development and Consolidation of Exclusion

Digital development can help increase access to communities, groups, and individuals that were inaccessible through usual development programmes: women have access to e-health and m-health pregnancy consultation and emergency lines; mobile money has helped to overcome the class-based and financial barriers of access to the conventional banking system, and warning systems can assist aid organisations in their battle against drought, famine, and natural disasters. These are some positive examples of how ICTs are revolutionising development work and humanitarian aid. However, these technologies are also capable of meticulously singling out individuals and members of a caste or ethnicity and blocking the ambivalent spaces of negotiation that existed before. Exclusion is not just an unintended outcome of some digital development programmes. In many cases, digital systems are designed in a biased way to consolidate already existing exclusionary practices. Rohingya refugees seeking shelter in Bangladesh after being exposed to ethnic genocide in Myanmar is a telling example of such vicious cycles of exclusion and prosecution.

The UNHCR reported in 2018 that they are planning to roll out biometric identity cards for 720,000 Rohingya refugees collecting "biometric data, including iris scans and fingerprints as well as photographs [. . .] for all refugees over the age of 12" (UN News, 2018). This new development could put an end to the endless frustration of a population without IDs that could not verify to receive aid or register for a mobile phone, each of which was necessary for the realisation of the other. This happened because the Rohingya Muslim population has been systematically denied citizenship and

excluded from public recognition by Myanmar authorities. As stateless people in their own country, they were even forced to carry national verification cards identifying them as foreigners (Albert & Maizland, 2020). Although the news about receiving identification from the UNHCR was welcomed by the aid community, the refugees were rightly concerned about the increasing threat of verification, prosecution, and genocide. Three years after the beginning of the programme, it was reported that the UNHCR had shared Rohingya refugees' information with Bangladesh, which in turn had shared it with Myanmar "to verify people for possible repatriation" (Human Rights Watch, 2021). Human Rights Watch confirmed that this information has been shared without the refugees' consent, and interviewed refugees said that they were told that their data was necessary for aid purposes; nothing was communicated about repatriation (Human Rights Watch, 2021).

In the negligence of Rohingya refugees' data protection and privacy rights, one can detect how a digital development project has gone badly wrong: a digital development dilemma where a system designed for identification and inclusion in aid consolidates exclusion and exacerbates the threats of violence and genocide. Rohingya are by no means a single case. The oscillation "between surveillance and verification" (Weitzberg et al., 2021), especially in aid situations, is well documented by researchers. The biometric ID can effectively push forward the establishment of verification systems in disadvantaged countries, but it can also facilitate a regime of targeted surveillance and prosecution. In 2021, after becoming an internationally recognised power, the Taliban received access to allies' biometric data banks of their Afghanistani colleagues, meaning that the Taliban could easily identify their targets for harassment, torture, or execution (Human Rights Watch, 2022). The situatedness of digital systems in socio-political landscapes is, therefore, not just an academic insistence on complicating development efforts but an issue of life and death for many people targeted through such "efficient" digital systems.

2.6 Big Tech, Development, and Continued Dependency

In the age of platform capitalism (Srnicek, 2017), where Big Tech companies make unprecedented profits through advertisement, profiling, and data extraction, developing countries seem like untouched treasures waiting to be exploited. Data colonialism (Couldry & Mejias, 2019) uses the existing power imbalances between the centre and peripheries of the global economy to increase profit by data grab (Mejias & Couldry, 2024), especially from populations whose data seem to be negligible or hard to grab. Big Tech companies have tried to tap into undiscovered markets of developing countries on the other side of the digital divide. In 2013, Facebook announced its (later named) Free Basics programme, a text-only Facebook that would

provide users with free "access to communication tools, health information, education resources and other low-bandwidth services" (Roth, 2022). The programme received harsh criticism from net neutrality activists, especially in India and was subsequently banned there in 2016 (Roth, 2022). Google started similar projects for main railway stations in India in 2015 but stopped the programme in 2020 because of the widespread affordability and availability of connections through mobile phone data (Roy, 2020). The data wealth remains a lucrative business and Big Tech companies are getting more engaged in the ICT4D and humanitarian programmes. The partnership between the World Food Program and Palantir, a CIA-backed company with a major security agenda "to develop advanced data analytics for the optimization of humanitarian food assistance", has raised concerns and been called "aidwashing of surveillance" (Martin, 2023).

It is not the only data that these companies are interested in. While global debates about digital economies and gig work and its rise and regulation continue, the number of gig workers only in India has increased from 0.54 per cent in 2011 to 1.33 per cent of India's total workforce in 2021 and will triple by 2030 (Vipat, 2022). Many might think about official or semi-official gig labour markets, but there is a growing industry led by Big Tech companies that benefits from unregulated digital markets, vulnerable economies, and unemployment in the developing world. Social media companies, such as Meta, have outsourced their content moderation to developing countries, where employees are underpaid and face mental health challenges without any support (Elliott, 2023). While the world celebrates the AI revolution, machine learning advances are made on the backs of refugees contracted under "educational" programmes for refugees to label and annotate data (Jones, 2021). Big Tech is the emerging actor in digital development, but even in the early stages of global enthusiasm for ICT4D, scholars had warned about a repeating pattern of technological dependency in the context of digital development (Wade, 2002). Technological dependency today goes beyond the production of hardware and software and monopolising the market. It includes data grabbing, exploiting unregulated gig work, and testing surveillance technologies on vulnerable populations. Behind the philanthropic façade of many Big Tech ICT4D initiatives, there is an agenda for market expansion and preserving unequal relations of labour and power.

2.7 Digital Development and the Right to Self-Determination

The dependency patterns or the efforts to keep the existing power imbalance are also evident in the governance and management of global Internet regulatory bodies. While digital development programmes push developing countries to adopt digital technologies and leap through stages of development, there is less space at the decision-making table for such countries. The

lack of voice in organisations such as ICANN made alternative discourses, such as China's concept of digital sovereignty, a convincing choice for many countries with colonial histories – the idea that states should have the same sovereign power they hold over physical territory in cyberspace. Such a governance vision was especially lucrative for regimes whose legitimacy would be damaged through access to the free global Internet and would benefit from Internet control and censorship, many of whom had already had extensive censorship and control programmes under the guise of national security (Yalcintas & Alizadeh, 2020). The geopolitics of digital self-determination within the reminiscent of colonial relations of power and newly established lines of digital colonialism has led to a soft Internet fragmentation, where the governance of cyberspace is divided between antagonistic views of what the fundamental digital rights and values are (O'Hara & Hall, 2021). Additionally, hard fragmentation, for example, by private underwater cables or satellite Internet, or simple Internet shutdowns, is becoming a prevalent method to silence opposition, suffocate mobilisation, or grant Internet access according to the wishes of private companies (see the debate on Elon Musk's Star Link Internet in the context of Ukraine war; Paul, 2024). The right to digital self-determination for many developing countries is heavily affected by geopolitical rivalry, economic constraints, and the effects of access to the free global Internet on social, cultural, political, and ethical aspects of life. China is expanding its influence rapidly in the developing world (Heeks et al., 2024) where many are disillusioned by the objectives of ICT4D programmes dictated by the Global North. Digital development brings about yet another dilemma of dependency and shifts dependency models without enabling a global consensus about fundamental Internet governance and access.

2.8 Conclusion

The different aspects of the digital development dilemma mentioned in this chapter aim to transcend the language of harm to include more critical scrutiny of the politics of ICT4D programmes, highlight the issues of justice and power imbalance, and historicise digital development programmes within the larger landscape of development politics and discourses. The chapter has also briefly discussed Big Tech companies as emerging actors in the development scene and their profit-oriented approach to untapped data and information markets. However, the four above-mentioned categories of digital development dilemma- digital repression, consolidation of exclusion, establishment of new forms of technological dependency, and complicating digital self-determination- are by no means exhaustive. ICTs, artificial intelligence, and machine learning are radically transforming not only our usual interaction with the Internet but also health, education, and other essential aspects of life and governance. They also enable unprecedented surveillance, deadly

wars, and targeted control. Dealing with digital development dilemmas cannot be easily outsourced to legal and regulatory bodies or become a project management or design tick box. This chapter's arguments for the concept of the dilemma are an invitation to think about ICT4D and digital development in a situated intersectional way from planning to evaluation. The attention to the digital development dilemma is not replacing an outcome-based approach with a process-based one but rather to politicise and historicise the use of ICTs in different contexts within a critical framework.

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3

THE EVOLUTION OF ICT4D

Content, Context, and Process

Shirin Madon, Azadeh Akbari, and Silvia Masiero*

Shirin Madon has contributed to the field of ICT4D and witnessed its growth since its first formation days at the 1989 IFIP[1] conference in India. As a Professor of Information and Communication Technologies and Socioeconomic Development at the London School of Economics and Political Sciences, Shirin's teaching includes an interdisciplinary Master's option entitled ICT and Socioeconomic Development, which targets students from international development, information systems, and other degrees.

Shirin Madon is currently engaged in two significant research projects. The first project focuses on primary healthcare in India, where she studies the emergence and evolution of community health governance structures established by the government in 2008 at the village level. Her research particularly hones in on their impact for primary healthcare, with a special focus on sanitation, nutrition, and hygiene. Recently, she is co-authoring a paper on community health resilience, examining the impact of the COVID-19 pandemic in 51 villages in South India. The second research area delves into digital innovation in the humanitarian sector based on research conducted with the United Nations High Commissioner for Refugees (UNHCR) and the International Federation of Red Cross and Red Crescent Societies (IFRC). Here, Shirin explores how new forms of digital technologies used for cash transfer assistance enable organisations in the sector to communicate. The project also investigates the challenges that arise when actors have different strategic priorities for how gathered data is used to assist vulnerable communities.

In our interview with Shirin, we delved into the evolution of ICT4D as a scholarly field, its main debates, challenges, and future research directions. Her insights, based on her extensive experience and research, are invaluable in situating ICT4D in its historical and sociopolitical context. We firmly

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believe that this generational knowledge transfer and reflection on the career trajectory of a female scholar from the Global South will play a crucial role in shaping the scholarship in an inclusive and critical way.

How would you define ICT4D, and what do you see as the distinctive characteristics of this field of research?

We are involved in ICT4D as a field of research, but it's also a field of policy-making and practice. Obviously, there are specific narratives within international agencies about ICT4D, or as they sometimes call it, digital development. I think ICT4D is in this overlapping area of interaction between scholarship and the deterministic position of development agencies about the role of technology in processes of development. We do our research through a sociotechnical lens when we talk about the infrastructure being embedded within situated practices, institutional norms, and policy frameworks. Similarly, in ICT4D policy and practice, there are frameworks and theoretical assumptions too. But these tend to be more prescriptive. It's more about "how" and "solutions". However, we try to learn from each other. I'm currently doing research with the International Federation of Red Cross (IFRC), which has a full unit for digital transformation where humanitarian actors are evaluating the opportunities and challenges of digital cash programmes. Their evaluation might be slightly different from the way academics understand sociotechnical assemblage or infrastructure based on the evolution of ideas in the information systems field. But still, they have their own distinctive characteristics and use different words.

I think that connects really well to our next question, which goes back to the history of ICT4D as a field of research and, as you said, as a way of policy-making and practice. Where in time and space would you locate the "birth" of ICT4D as a field?

Definitely in the 1980s as an offshoot from the field of information systems. I would also say a group of scholars, such as Professors Frank Land, Geoff Walsham, Subhash Bhatnagar, and very many others who held a more humanistic view of systems, formed that early sociotechnical approach. I still remember the first IFIP 9.4 conference in 1988 in New Delhi. I hadn't even started my PhD then, but I was intrigued with this narrative and discourse, which was coming from policy and practice. So, these policy briefs and documents were always coming out, with little arrows and boxes and carrying that optimistic theoretical notion of technology's role in processes of development.

What were the main distinctive features of ICT4D in its early days? What were the main topics of interest back then?

I still remember sitting there next to Geoff Walsham; I was a student and terrified! You know this professor is sitting next to me, and I felt I had so much to learn! To be honest, I felt a bit intimidated. Anyway, the presentations were very much about the potential of ICTs in different sectors. It was

about output, less about the outcome. But this is understandable because, at the time, a lot of pilot projects had been introduced and launched. There was very little we could say about the long-term effect. So it was all about resources, training, and whether information systems should be designed in a top-down fashion or be decentralised – i.e. all issues that had to be thought through in order to accommodate the fourth-generation tools, which were deemed a big thing then. I remember sitting through many presentations on the empirical details of organisational challenges, not so much about connection to macro-level policy and institutions or about the lived reality of the technology at the level of operation. ICT was a new thing coming to many low- and middle-income countries. The topics of interest were directly related to the major themes in information systems, such as the productivity paradox. The idea was that technology on its own cannot improve productivity in either the commercial or public sector unless you adapt your organisational function, the IT function, and IT alignment concurrently. All these things about aligning with organisational objectives had already entered the limelight in mainstream information systems by that time. Consequently, the ICT4D early conferences spoke a lot about that.

We know that Walsham has a taxonomy of different periods of ICT4D; but based on what you just said about the first IFIP conference, what do you think were the main "phases of evolution" in the ICT4D history?

There are many different ways we can carve out the phases, but I was thinking more about the terms "content", "context", and "process". What I mean by that is if I sat through the initial IFIP 9.4 presentations and the discussions we were having with Frank Lnad and Geoff Walsham during my PhD, a lot of it was about the affordances of technology and different visions, both utopian and dystopian, of providing solutions for (in my case) rural development. So it was about what could be changed because of what technology can or cannot do. It was very much about the content of change but not how that change was occurring within a specific contextual setting. The second phase was Geoff Walsham made the important point that the ICTD field of study needed to focus more on the "D". Maybe this was around the mid-2000s. Technology was changing as web interfaces and online forums were becoming widespread. Technology was also becoming much more personalised, and it was the early stages of social networking. Around this time, there was a greater focus on connecting ICT implementation to development perspectives and some important journals started to publish articles with this aim. While the first phase of ICT4D entailed mostly publications in information systems journals, the second phase had that added momentum of addressing the "D". The Information Technology for Development journal started in 1986. By the mid-2000s, there were more and more ICT4D articles in mainstream development journals and also in management journals. When I moved to the International Development department at the LSE in the 2010s, many of

my colleagues said to me, "Oh, you're from information systems. So why you think technology can promote development". They automatically assumed that I had adopted such a deterministic position. I spent the first few months trying to justify my "critical" position on ICT4D – i.e. that I was more interested in unpacking the underlying assumptions behind technology deployment rather than trying to prove that technology was the solution to complex and deep-rooted structural problems. By this time, ICTD scholars, who grappled with ideas of culture, stages of development, bottom-of-the-pyramid approaches, and the meaning of human development, placed focus on the context within which technology was deployed.

The third phase of evolution in ICT4D has more explicitly devoted attention to process. There was a growing appetite among ICT4D scholars for longitudinal and processual methodologies to understand how technology was shaping development outcomes. We cannot say anything about outcomes unless we follow and observe interventions and learn about how the technology is evolving and continuously shaping the context within which it is embedded.

A lot of the material we read now in ICT4D journals focuses on analysing institutional elements that affect ICT interventions and how technology can trigger actions that, in turn, can influence institutional change. In this way, ICT4D scholars now have a chance to engage in policy formulation, implementation, and evaluation.

We find your categorisation of these phases in content, context, and processes very interesting. Can you elaborate on the third phase? What do you mean by the process?

We know that macro and micro contexts are shaped by structural conditions and issues, but there is a dynamic between them. I have tried to understand the processual aspect of this dynamic. Often, it appears that nothing is happening and that either technology has failed or there is a big design-reality gap. The existence of this gap is because of a myriad of different things, such as technology usage, digital divide, conditions of underdevelopment, and perpetual obstacles, which cannot be resolved because they are contingent on external factors. For example, they may be related to geopolitics or dimensions that have nothing to do with ICT interventions. To take a step back and try to understand these issues one might question if the problem at hand can be even partially addressed through non-ICT interventions. This is something that I have come across a lot through my work on primary healthcare where the underlying issues may require attention: policy, human resources, community learning. We, as ICT4D researchers need to be cognizant of the fact that ICT interventions do not exist in a vacuum – they invariably sit together with other interventions which together lead to developmental outcomes.

Would you say that the field of ICT4D is more politicised now in the sense that it pays more attention to non-ICT factors that play a role in this entire field?

Yes and no. That's an excellent question. I would say yes, because it highlights this deep-rooted impediment as a structural issue; but I also think that the way of addressing them is still, after all these decades, about what technology can achieve. My argument, at least from what I've seen in the primary healthcare sector since 2010 in South India, is that I do not think that is the right approach. I think it takes the attention away from the essential and underlying improvement that is needed.

In this specific case, non-accountability of the primary healthcare sector has always been one of the biggest problems. However, accountability can mean many different things. The government wanted to focus on establishing social spaces at the village level so that a form of accountability – more than just reporting – could take place. The government wanted to introduce a peer-to-peer kind of local accountability environment at the village level for primary healthcare. It initially tried to do this by introducing computers in primary health centres, but this only served to reinforce accountability upwards in terms of routine reporting. Our emphasis was more on studying accountability formation among the civil society people, political representatives, and functionaries on the ground. We wanted to see village committees trigger capacity-building. It is only now, in 2023, after 13 years, that my colleague and I have reached a point where these village committees are being recognised by health agencies as important grassroots entities and understand their value for overall improvements in primary healthcare.

You have already discussed the ways in which ICT4D today is different from its early days. What do you think has changed in terms of the theories and concepts used in the ICT4D field?

The sheer speed of digital innovation makes the scope of what can be achieved immensely different from that even 10–15 years ago. We have digital platforms in critical domains such as health and crisis management with their particular logic for value creation and value capture for all sorts of organisations. As a result, I think we need a much greater focus on how these technologies affect governance issues. Much more can be done than the current literature on technological risks. Particularly when it comes to datafication, for example, who is participating in the creation of data sets, or when it comes to machine learning and artificial intelligence, how these technologies interact with development processes. I think we really need to push ahead with criticality on these issues.

In this book, we are contemplating several aspects of what we term critical ICT4D. What potential do you see in a critical approach to the field? What do you think such an approach can uncover? What limitations do you see in such an approach?

At one level, we have tried to be as critical as we can from the 1980s and 1990s. I think one of the limitations, at least what we think here at the London School of Economics, is sidestepping the issue of not understanding or

having a very naive understanding of the interfaces which connect users in the new platform architectures. We are not data or computer scientists, but we need to know more because design affects how the platform is governed and, ultimately, how vulnerable communities could be protected. So I think if we are serious about asking questions about human rights implications, data protection, and privacy, we need to understand better the technology, its design features, and the functionality it affords.

Could you give us an example from your work on digital platforms in refugee management?

With the work on the refugee identity platforms, we were able to understand a lot about the governance aspects of the platform from our respondents. The UNHCR, as the platform owner, told us about its uncertainties regarding the balance between standardisation and control, which is needed when you are the global player for refugee management. This was the very reason why it had a platform in the first place and why it wanted to open it to market players and also to refugees. People within the organisation had a good understanding of the problem but not how the technology could enable a solution. For example, they were unable to articulate what are the downfalls of choosing one particular design route as opposed to another. As development and humanitarian organisations partner up more and more with tech companies, financial service providers, and mobile network operators, there is an ever more pressing need for the focus to be on how the technology orchestrates the coordination between different actors and represents a new form of governance which so far is poorly understood.

You mentioned how these technologies, new designs, and the platformisation of aid are affecting ICT4D now. I want to go back to the "D" and ask what you think has been the effect of the transformation of development discourses in the field of ICT4D. We started with specific understandings of development in the 1980s that have been evolving since then. How does this evolution of development theory influence the field of ICT4D?

Having lots of interactions with students from development studies and development management, I have a feeling that the grand theories of development, such as modernisation, dependency theory and human development approaches, which are still there in textbooks and taught to students, are still relevant. However, these high-level theories need to be complemented by middle-range theories that take into account the specificities of ICT and its affordances. Today, we have many actors, systems, and technologies coming together. We have IoT working with legacy decision support systems of the past, but we lack the understanding of how these systems, technologies, and actors interoperate. A consultant at the IFRC told me that he does not understand the way actors and technologies interoperate. It is not as if they are waiting for us as academics to teach them what interoperability means. They know that it is an issue, but it is too complex for them to penetrate. They will

work away at trying to introduce technologies as part of the current theory of change in both the development and humanitarian sectors. However, those within the sector seldom have the time to reflect on the sociotechnical nature of ICT – often, the reality is that the cost of escalation is too big to pull out of major ICTD interventions. Nevertheless, they are cognizant of the issues at stake as they work towards providing technology-mediated solutions to improve the efficiency and effectiveness of delivering assistance to vulnerable communities.

When I teach human development, it is always interesting to show that the same people who theorised the idea, when forced to make indices to measure human development, fell back to old quantitative patterns because it was very difficult or, as you said, too abstract to use human development in a practical policy-making context.

Yeah, I think it is difficult, especially if we link it to the notion of process. I think development as a field or discipline is really about evaluation. We are evaluating human progress in some way. If we want to do this in a more human development way, using concepts such as capabilities approach, conversion factors, or human agency, we need to engage with the long term or at least the medium term. This cannot be done in a practical sense unless institutions and organisations devote the same amount of energy and resources to the necessary learning loops. In the humanitarian sector, we all know that disasters do not just cause economic costs but also social, psychological, and other costs. Especially in a poor country, where accountability structures are dysfunctional, in the short term, the political takes precedence.

I think you already mentioned the role of international organisations, especially in the first phase of ICT4D as a field. But maybe more generally, how would you assess the role of these organisations, such as the UN, the World Bank, and others, in picking up the ICT4D discourse?

I would say that more attention needs to be given to the careful evaluation of their own policies, the theories behind those policies, and the instruments for bringing about policy change. There is a huge number of pilot projects where there is no historical assessment and no scope for learning from what happened within the pilot and taking action based on that. If the pilot fails, the project must not be rolled out, but we face a "one laptop per child" mentality in which an under-publicised pilot project served as the catalyst for a global initiative for improving education for low-income children in developing countries. This goes back to what we were saying about processes and not neglecting the history of our field and the "D" in ICT4D.

We are looking at ICT4D as a field made by people, researchers like us, and practitioners. How do you think ICT4D has engaged researchers from the Global South? Do you think ICT4D has – acknowledging the phrase's disputed meanings – "empowered" researchers? Or have researchers from the Global South been forced to fit into Western standards?

That's a great question. My initial feeling is yes. For example, one of the ICT4D journals is dedicated to scholars who do not have much experience in writing or crafting articles; that could be deemed positive, though there's slight cynicism with what I'm saying there. That is one positive thing but whatever we have spoken about, the phases and theories, they are nevertheless all Western, in a way.

The entire history of ICT4D is coming from a particular perspective. On the other hand, there are new developments: articles have been written in the recent past that offer alternative perspectives. But I still think there's something missing. I think we should ask scholars or researchers who have lived all their lives in low- and middle-income countries about what they can teach us. It might be something completely practice-based, for example, about technology usage in different sectors, environments, or geographic locations, but it would help us gain a better perspective.

I'm not sure if the way conferences are run is conducive to engaging researchers from the Global South who may be in local institutions. There is a whole procedure of submission and acceptance. It may not work because of the formalities that we force on people instead of enabling them to have a voice. So, the round table or informal events at these conferences, especially in the ICT4D, are the ones where we can learn. We have to find a mechanism to learn from the narratives of scholars coming to these conferences. For example, how technologies have been introduced and by whom. What have been the debates that have taken place, if any? If we have a problem of farmer suicides happening across the world, we might need to accept that they do not see any use of ICTs right now. I really do feel strongly about this. I feel that we should be humble enough to say that technology right now would, on the contrary, distort the issue at hand. But you cannot get a paper published in the ICT4D field if you are not talking about technology. Not so easily.

OK, but what about other journals?

Other journals? Yes. That is the problem I had, and that is exactly why I had to go to two departments. When I started talking about village committees and primary healthcare, while I was talking about information and communication, I was not talking about technology per se. So, in a conventional information systems/management environment, my research did not seem to fit well.

It is interesting that sometimes scholars in a specific field feel that their field's answer to a problem is not the best one. There is also a lot of tension between local activists and scholars, for example, the representatives of the World Bank or the United Nations, when a specific technology is used, and people oppose it for the reasons of context and process that you mentioned earlier and do not necessarily agree with that kind of technological solution. But that tension has never been resolved, in a sense. So, I think what you said about the "T" in ICT4D is also sometimes controversial.

For me, that is what it means to put the "D" first: to try and understand the range of in-house country policy options, human resources, etc. It is not necessarily about technology – even though there might be some technology deployment involved in a policy agenda. However, the agenda might also include other parallel interventions, for example, those related to human resources or something else. When I was looking at outsourcing business process outsourcing (BPO) tasks to remote rural areas in India to provide income and livelihood to low-income youth, I noticed that Western client companies would not go to the rural areas because of poor infrastructure and lack of electricity after five o'clock. This is all context and many will just put it in one section of their paper, calling it infrastructural challenges and all that. But it's more serious. It doesn't mean that we don't work with ICTs, but it means that on the cards, there are a range of different policy options, and there is a sequence with which they should be addressed within a specific country context.

Our last question focuses on the future. What do you see as burning themes, ideas, and theoretical approaches in the future of ICT4D? In other words, how do you see the future of our field?

I can think of three points here: firstly, on that point of being more specific about what we mean by digital innovation, let me give you the example of my PhD student's work on the role of AI in conflict management. What I'm learning from her is the way she looks at two different models. One of them is the classical model of machine learning that data scientists work with, learning from data and making predictions based on the training data sets. But the other model she is focusing on includes a new way of thinking about machine learning based on agent-based simulation modelling, which provides an opportunity for a variety of different actors, such as technologists, data scientists, humanitarians, and government personnel, to have a say in writing and rewriting the rules of the model of behaviour prediction of individuals caught in conflict. This is what I mean by being more specific about technology, in this case, two types of AI systems.

Secondly, I want to emphasise the point about giving equal weight to non-ICT interventions while addressing specific developmental issues. A few decades ago, we decided to be specific about the "D". Let us sincerely continue with that mandate. We should be much more judicious about if and when to use ICTs. It is not always the case that it is the right thing at a particular point in time.

Finally, it's been said before, but I think we should discuss whether it even makes sense to talk about the Global North and South. I have read Pranab Bardhan's "A World of Insecurity: Democratic Disenchantment in Rich and Poor Countries", in which he demonstrates how global issues of economic and cultural insecurities interface between the Global North and South and transcend these boundaries by adversely affecting institutions of democracy.

So maybe the ICTD field of study should focus more on how digital technology is shaping the development outcome of flows of information and knowledge across different societies.

Note

* Interview with Professor Shirin Madon.

1 International Federation of Information Processing Working Group 9.4 on the Implications of Information and Digital Technologies for Development (https://ifiptc9.net/wg-9-4/).

4

BRINGING CRITICAL ICT4D FROM THE MARGIN TO THE CENTRE

Tony Roberts

4.1 Introduction

This paper responds positively to Akbari and Masiero's (2023) call for a shift to a more critical ICT4D. They call for a new research paradigm that decolonises ICT4D research, positions the field within historical relations of power, critically reflects upon structural harm and injustice, problematises the core assumptions of the field, and offers constructive ways to secure equity and social justice. The core assumptions implicit in the uncritical ICT4D theory of change include that a lack of technology understood as the "digital divide" was explanatory of underdevelopment (Norris, 2001) and that an injection of digital technologies would close the divide and thereby deliver development gains (Unwin, 2009). This approach is of course a digital version of the technological determinism and modernisation theory explicit in US President Truman's (1949) inauguration speech, in which he proposed the transfer of US technology as the solution to challenges of underdeveloped countries. As Akbari and Masiero have argued, the recent realisation that digital technologies are major contributors to climate change, gender inequity, and racial injustice have contributed to a collapse in the key assumptions of ICT4D and require us to make a radical reassessment of the field.

In this chapter I 'revisit' the field of digital development (ICT4D) in support of Akbari and Masiero's intent to establish a more critical ICT4D. The research questions that guide this chapter are as follows: what does it mean to be critical in a critical ICT4D?, what are the core elements of a critical ICT4D?, and how would the research agenda of a critical ICT4D differ from the orthodox and dominant ICT4D research agenda?

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I propose that we do not need to build a critical ICT4D from scratch because I argue that critical ICT4D theories and practices have always existed at the margins. If this is accepted, then I suggest one starting point is to bring those theories and practices "from the margins to the centre" (hooks, 2000). This chapter takes some first steps towards that goal by 'revisiting the field' three times: first, to establish historical context I revisit what I argue are three distinct eras of digital development; second, to locate my argument in the context of existing scholarship I revisit the critical ICT4D literature; and third, to avoid what Donna Haraway calls the "god-trick", I locate myself in the field and revisit my own complicity and failings using auto-ethnography.

The remainder of this chapter is organised as follows: The next section will provide some background and propose three historical stages of digital development. The literature review will then attempt to substantiate my claim that there exists an abundance of existing critical ICT4D theories and practices. I then use the three historical eras as a framework to reflexively revisit my own history first as a practitioner and then as an academic of ICT4D. I use this auto-ethnographical approach to show how my own practice was inflected by naïve White saviourism, techno-solutionism, and sell out to funder agendas. I will argue that these influences reflect wider tendencies within the field before making some tentative conclusions about lessons learnt and how they should inform a more critical ICT4D praxis going forward.

4.2 Background: Revisiting the Field

The transfer of technology for development is as old as the project of international development itself. Some historical accounts position President Truman's (1949) inauguration speech as the birth of that project. His speech is marked by claims of US exceptionalism and technological leadership along with promises to make available the benefits of US science and technology to combat poverty in underdeveloped nations. The speech can also therefore be read as the birth of the strand of White saviourism and modernisation theory that constructs the "White Man's Burden" (Easterly, 2007) as the charitable transfer of technology from the Global North to address perceived development deficits in the Global South.

Since Truman there have been several generations of technical aid or technical assistance programmes that involved the transfer of various technologies: originally industrial technologies, then agricultural technologies, and now information and communication technologies (ICTs). The 1960s were the period in which this modernisation theory (Apter, 1965; Rostow, 1971) was encoded into the literature and translated into "technology and development" scholarship (Stewart, 1977). This supply-side theory of technology-push

was encapsulated by Truman's rhetorical construction of a world in which underdeveloped nations should progressively become more modern, more technology intensive, and more developed. According to this worldview, the extent to which nations were (under)developed could be measured by their rate of adoption of US technologies, political economy, and democratic values. Although this model of development has been extensively critiqued, it is notable for ICT4D scholars that much of the early focus on ICT4D was the supply-side push to increase the provision of digital devices and connectivity to close the 'digital divide', and that the Sustainable Development Goals (SDGs) explicitly use the rate of adoption of mobile phones and levels of internet penetration as targets and measures of what qualifies as being developed.

When tracing the roots of the project of technology in international development I argue that it is important to note that there have always been critical voices in academia and critical practitioner even if these perspectives and practices have been relegated to the margins. It is not possible in a short chapter dedicated to revisiting the field of ICT4D to adequately review that preceding literature critiquing the role of technology in social development. However, it would be remis to overlook it entirely. There have long been radical critiques of technology and society, but these heterodox critiques have always been marginalised by dominant narratives. Mumford's (1934) *Technics and Civilisation* examined the motives for mechanisation and the kinds of values embedded in new technologies and practices, claiming that their intensive use regimented humans and made them mechanical, arguing the need to critically revaluate how technology might otherwise be directed to enhance human flourishing and social development. These concerns were echoed by Ellul (1964) who argued that *The Technological Society* too often concerns itself with a perverse quest for continually improved technological solutions to achieve uncritically examined ends. Marcuse's (1964) *One Dimensional Man* explicitly used critical theory to analyse how technology enables new forms of social control and intensified exploitation of the environment and labour. Winner's (1977) *Autonomous Technology* examined the recurrent theme in political thought of technology-out-of-control – serving as a source of domination while diminishing human agency and freedom. Translating these critiques into programmes of practical action was the purpose of Schumacher's (1973) *Small Is Beautiful*. Schumacher argued for human scale, labour-intensive technologies rather than scaling up industrialisation. The intermediate technology movement (Carr, 1984; Powell, 1995) and appropriate technology movement (Dunn, 1978) and international development agencies including Tools for Self-Reliance and Practical Action were derived from this critique of the technological society. It is beyond the scope of this chapter to adequately review all of the approaches under the banner of the alternative, appropriate, intermediate, and participatory technology

movements that were inspired by critiques of technology-out-of-control and by the writings of Schumacher,[1] but they tended to privilege indigenous technical knowledge,[2] labour-intensive innovations, and environmental sustainable processes.[3] To date, the field of ICT4D has rarely drawn upon this legacy of critical approaches to technology and society.

4.2.1 Digital Development

I argue that there have been three overlapping eras of digital development: ICTs *in* Development, ICTs *for* Development, and Development in a Digitalised World. The first era of digital development primarily involved installing computers in the finance and administrative offices of government and development agencies (ICT *in* Development). The second phase involved creating and applying bespoke digital tools, apps, and platforms designed to achieve development goals in the field (ICT *for* Development). Unlike the supply-side focus of the first two eras, the third phase is more responsive and involves navigating the opportunities and risks of achieving international development in a world in which ever-increasing aspects of social, economic, and political life occur online or require digital technologies, connectivity, and competences (Development in a Digitalised World).

4.2.2 ICTs in Development

The use of digital technologies in development is sometimes imagined to have begun around the turn of the millennium. Yet as early as the 1970s, computer engineers from the US and Europe (with flared trousers and inexplicably wide lapels) were already installing mainframes and mini-computers as part of technical cooperation programmes in the Global South. There has not been a decade in my lifetime when information and communication technologies were not being used by practitioners and activists to pursue their development and social justice goals. Social activists and development practitioners have always made creative use of whatever technologies happen to have been available to them in their projects.

This first phase of digital development mainly involved using ICTs in relatively small numbers to enhance back-office administration and finance functions, rather than supporting frontline development practitioners 'in the field'. Within international development agencies, the first use of ICTs was also typically in headquarter offices rather than as part of tailored ICT4D projects in the field. For this reason, I have argued elsewhere that it is perhaps more accurate to refer to this first phase of digital development as ICT *in* Development rather than ICT *for* Development (Roberts, 2019).

By the 1990s, ICT4D was characterised by scaling-up provision of digital devices and connectivity with the aim of closing the 'digital divide' between

those who had digital devices, connectivity, and digital literacy and those being left behind. Supply-side interventions that exemplify this era of ICT4D include the global 'telecentre' and computers-for-schools programmes. National governments and agencies including the World Bank rolled out thousands of 'telecentres' or internet labs in low-income and rural settings to provide excluded populations with access to internet-connected computers.[4] In the 1990s, I was involved in establishing Computer Aid International, a non-profit organisation that went on to provide over a quarter of a million computers to schools and non-governmental organisations in more than 100 countries.

Much of the mainstream academic research in information systems can be characterised as positivist in as much as papers were often experiments involving novel technical solutions or presented quantitative analysis of the relationship between technologies, adoption, and economic development (Bharadwaj, 1996). Although much of this mainstream research was uncritical, I would argue that heterodox critiques and practices were present since ICTs were first used by politically and economically marginalised groups in the Majority World. On early Usenet bulletin boards, for example, discussions took place worldwide across FidoNet connections on subjects including alternative development and alternative technology, allowing activists to create online spaces in which to develop alternative narratives and policies and to challenge dominant narratives, as documented by early digital ethnographers (Bush, 1993). Although most mainstream commentary and analysis of the role of technology in development was uncritical, it is important to note that there were also lucid critiques of the problematic implications of technology development and deployment in those early online spaces. These online critiques ran in parallel to the critical praxis of practitioners. Some of the earliest uses of internet communications in Southern Africa included establishing internet communications between the student underground in Cape Town and exiled leaders of the African National Congress to organise the defeat of racial apartheid in South Africa.

4.2.3 2000–2014: ICT for Development

This second era of digital development was characterised by technology solutionism, the supply-side tech-push of telecentres and computers for school programmes was gradually eclipsed by the supply-side tech-push of mobile apps and online platforms. During this period, mobile phones for development and then a proliferation of development apps were the era's exemplar cases of technology as development solution. The hype of #Apps4Good led to a crisis of over-production: at one stage in Uganda, the Ministry of Health called a moratorium on mobile health app projects because there were so many 'solutions' being piloted by various foreign development actors that Ministry of Health staff had little time for anything else (McCann, 2012).

When I first started attending ICT4D conferences in 2010, they featured a procession of young White men explaining how their new app or platform was the solution to health/agriculture/education in developing countries despite an evident lack of experience or knowledge about local political or cultural realities or any accurate sense of the total cost of ownership beyond their pilot studies. This provision of ICT4D techno-solutionism can be seen as a specific digital example of the wider development paradigm of prescribing pre-packaged development solutions without reference to local social or political realities and without the involvement of local people in conception or design (Easterly, 2007). It can also be seen as an example of Ellul's (1964) critique in *The Technological Society* of the perverse quest for continually improved technological solutions without any commensurate critical analysis with affected populations of the desired ends of development. In 2024, there remain largely uncritical ICT4D conferences that successfully attract corporate sponsorship in which #Tech4Good innovations and initiatives continue to be showcased by uncritical would-be White saviours.

During this era of ICT4D, the interpretivist research paradigm became increasingly popular in digital development research (Lin et al., 2015). Concerns about the high failure rate in information systems projects prompted consideration of the political context beyond the organisation and the integration of qualitative methods to understand the reasons for failure (Walsham, 2006).

4.2.4 2015–2024: ICT and Negative Development

As levels of connectivity and digital access steadily increased and as social, economic, and political life was rapidly digitalised, the supply-side emphasis of digital development declined in importance. From 2015 onwards, the focus of ICT4D research shifted to include a consideration of the dark side of ICT4D, that is, the adoption of digital technologies introduced new exclusions, new forms of gender injustice, and violations of citizens' rights and freedoms. The "techlash" was a term coined by Woodridge (2013) who predicted that tech companies would be negatively critiqued alongside oil companies and bankers for the adverse effects that they had on society. From 2015 onwards a series of studies documented how big data increases inequality and threatens democracy (O'Neil, 2016); how high-tech tools profile, police, and punish the poor (Eubanks, 2017); how search engines reinforce racism (Noble, 2018); and how digital tools replicate and deepen racial hierarchies (Benjamin, 2019). In the ICT4D literature, there was increasing emphasis on the dark side of ICT4D (Unwin, 2017), the adverse effects of digital development (Heeks, 2018), and the challenge of leaving no one behind in a digital world (Hernandez & Roberts, 2018). Revelations about the work of Cambridge Analytica using social media profiling to manipulate elections in Nigeria, Kenya, UK (Brexit), and USA (Trump in 2016), as well as the

TABLE 4.1 The three digital development eras

	Digital Development Eras	*Technology Focus*	*Research Paradigm & Focus of Study*
1970–1999	ICT *in* Development	- Supply-side focus on computer provision - Technology transfer of mainframes to desktops - Establishing telecentres and desktops for school projects	- Positivist/ Modernisation theory - Reducing the digital divide
2000–2014	ICT *for* Development	- Supply-side bespoke app and platform solutions - Laptops for school projects - #Apps4 dev	- Interpretivist - Techno-solutionism
2015–2024	Development in a Digitalised World	- The dark side of ICT4D - Adverse incorporation - Surveillance & disinformation	- Critical-Emancipatory - Digital rights & justice

Snowden revelations about mass state surveillance, added fuel to the techlash by illustrating how states were using surveillance, disinformation, and internet shutdowns to structure a new digital authoritarianism (see Chapter 2 by Akbari 2025), which closed civic space and curtailed the ideal of open, participatory development advocated in the Sustainable Development Goals.

These negative developments led to renewed calls for a more critical ICT4D. The critical emancipatory research paradigm offers epistemological advantages of enabling those most directly affected by the dark side of ICT4D to play an active role in generating knowledge about the conditions that give rise to injustice and in overcoming them. Table 4.1 illustrates the differences that, I claim, characterise the three eras of digital development.

4.3 Revisiting the ICT4D Literature

Having revisited the field through a historical lens, this section revisits the field through a review of specific critical ICT4D literature. As the term 'critical' is used across social science in a range of very different and contradictory ways, it is first necessary to define terms.

4.3.1 What Does It Mean to Be Critical in ICT4D?

The term 'critical' is used extensively across the social sciences and humanities, most often without definition or explanation, such that its meaning has

become diluted. It is often used to denote that a subject is being critiqued or explored in depth. As doing this is a basic requirement of academic research, the term critical is drained of any analytical value. To avoid this dilution of meaning, in this chapter, I use 'critical' in the emancipatory and political sense that it had for Southern scholar-activists and radical feminists, including in Paulo Freire's (1970) critical pedagogy for creating "critical consciousness", which Steve Biko used in the Black Consciousness Movement (Arnold, 1978), Sarah Longwe (1991) incorporated into her women's empowerment framework, and bell hooks (2000) critiqued and incorporated into her feminist theory and praxis. Freire's method for creating critical consciousness (conscientização in Portuguese) involves those experiencing injustice in a dialogical process of reflection and action to identify the social conditions that cause injustice and collective action to uproot and overcome them (Freire, 1970).

Critical theory goes beyond studying the world to include the objective of changing the world. According to Geuss (1981) critical theory deviates from the positivist and interpretivist paradigms in at least five interrelated ways. First, it provides a theoretical approach to excavating the root causes of structural (dis)advantages and (in)justice. Second, it provides an epistemological method for those experiencing structural disadvantages to critically evaluate, for themselves, the nature of the injustice that they experience. Third, critical theories distinguish themselves from positivist and interpretivist research paradigms by providing a guide for social action to transform experienced injustice. Fourth, critical theory requires researchers to be reflexive about their own positionality and embodied entanglement in the research process. Fifth, critical theories are inherently normative and political in that their explicit aim is emancipation from the unwarranted forms of control and domination that limit people's freedom and development. This final point stems from the belief that it is neither possible nor ethical to be neutral in situations of injustice as Nelson Mandela put it, or as Marx put it: "Philosophers have hitherto merely interpreted the world; the point however is to change it".

This approach to achieving development, understood as freedom and justice (Sen, 1999), is based on creating dialogic spaces in which disadvantaged people themselves discuss and identify the root causes of the injustice that they experience so that they are able to act together to overcome them (Freire, 1970; Fals-Borda & Rahman, 1991). Critical participatory research methods, including participatory action research (Fals-Borda & Rahman, 1991; McIntyre, 2008; Ledwith, 2020), provide a rich repertoire for analysing the "limitation of development as freedoms, that structure the opportunities and freedoms available to members of a particular race or gender and which can be oppressive" (Zheng & Stahl, 2011, p. 74).

In "Pedagogy of the Oppressed", the Brazilian scholar Paulo Freire (1970) elaborated a critical theory and dialogic method that enables those

experiencing injustice to name the conditions that impoverish them and to work together to overcome them. This praxis was adopted by more than 500 development agencies and was applied in over 60 countries (Riddell, 2001; Duffy & Fransman, 2008). Freire's assertion (1970; 1998) that disadvantaged people can and should be actively involved in critically analysing their own reality has underpinned much of participatory rural appraisal and participatory action research (Kesby, 2005; McIntyre, 2008, p. 3; Ledwith, 2020) and stands in stark contrast to extractive research from other traditions.

This legacy of critical theories has informed fields adjacent to ICT4D as well as the field of ICT4D itself. It is not practical to review all of the contributions, but I argue that we need to centre critical approaches to technology from three places: adjacent academic fields, related practitioner communities, and from the margins of ICT4D itself.

4.3.1.1 Adjacent Academic Fields

The other chapters in this book offer a variety of disciplinary engagements with the question of critical ICT4D. Other examples include Information Systems's long history of critical Information Studies research stretching back at least 40 years (Lyytinen & Klein, 1985; Lyytinen, 1992; Brooke, 2002; Stahl, 2008) culminating in the production of the Special Issue of the *Information Systems Journal* dedicated to "Exploring the Critical Agenda in Information Systems Research" (Cecez-Kecmanovic et al., 2008). The Development Studies sub-field of visual methods and critical participatory action research (Kindon, 2003; McIntyre, 2008) contributes critical participatory video, digital storytelling, and photovoice (Wang & Burris, 1994; Strack et al., 2004). In critical security studies (Peoples & Vaughan-Williams, 2021), approaches from critical disinformation studies (Kuo & Marwick, 2021) and critical surveillance studies (Allmer, 2011) have foregrounded the political economy of technology and its reproduction of inequity. Less well-developed in such literature is an explicit analysis of how power operates in digital spaces to structure (dis)advantage along intersectional dimensions, including gender, ethnicity, class, and sexuality.

4.3.1.2 Related Practitioner Communities

Outside of the academy practitioner organisations in civil society there have been a long tradition of critical approaches to ICT4D. For example, the Association of Progressive Communications[5] is a global network of digital activists and civil society organisations working on digital development and justice issues. Since 2007, they have used a critical feminist and rights-based lenses in their annual Global Information Society Watch reports, including special issues on participation (APC, 2007), surveillance (APC, 2014), and

artificial intelligence: "human rights, social justice, and development" (APC, 2019). Recent years has seen the emergence of a global *digital rights* movement, where the term digital rights refers to existing human rights in digital spaces. Digital rights organisations use existing human rights obligations and theory as a lens for analysing the impact of digital technologies on development and social justice. Closer collaboration between ICT4D scholars and digital rights organisations such as Engage Media,[6] ITforChange,[7] Derechos Digitales,[8] CIPESA,[9] and Paradigm Initiative[10] would help expand the field and translate research into practice innovations. Co-locating ICT4D conferences with one of the annual digital rights conferences would be a practical way to bridge such new relationships.

4.3.1.3 Within ICT4D Itself

In the academic field of ICT4D itself, Freire's critical theory was first applied explicitly to ICT4D at least 20 years ago by Beardon (2004) and on more than one occasion since then (Hallberg et al., 2014). It is not the only critical approach that has been applied to ICT4D. Yingqin Zheng opened a dialogue with the wider field of Information Systems when she co-authored a paper with Bernd Stahl on the comparative merits of critical theory and Sen's capabilities approach for ICT4D research (Zheng & Stahl, 2011). Poveda and Roberts were among the scholars who followed Zheng & Stahl's lead by combining Freire's critical theory with Sen's capability approach for ICT4D (Poveda, 2015; Roberts, 2015a; Poveda & Roberts, 2017). Roberts (2015a) made an explicit call for a Critical ICT4D including making some tentative proposals that it should create spaces for those experiencing injustice to reflect critically on their circumstances and interests and produce knowledge to inform their own action for transformational development. In practice, such a process involves posing questions including, "What injustice do we experience and why?", "Whose interests are currently being served?", "How can our common interests better be served?", and "Can technology help us toward that end?". The paper proposed that an initiative is an example of critical ICT4D to the extent that it combines the transformist intent of tackling the structural causes of underdevelopment with the critical-emancipatory practice of making those experiencing injustice the authors and primary protagonists of any ICT4D initiatives.

Periodic calls for an explicitly critical ICT4D continued when De et al. (2017) argued for a strong critical approach to ICT4D; Masiero's (2018) paper "Advancing Critical Theory in ICT4D"; Bon and Akkermans's (2019) proposals for "Elements of a Critical ICT4D Theory and Praxis", and Akbari and Masiero's (2023) call for a Critical ICT4D. In addition to the approaches of Sen and Freire, other epistemologies of the South have been proposed as alternative ways to address epistemic injustice and decolonise the study

of innovation for development in the Global South (Jimenez et al., 2022; Jimenez & Roberts, 2019). Although much more research is necessary in this space, these contributions provide solid ground on which to build.

4.4 Auto-Ethnography: Revisiting a Lifetime of ICT4D Activities

Having first revisited the field of ICT4D historically and by reviewing the Critical ICT4D literature, this section revisits the field using a reflexive method to auto-critique my journey as an ICT4D practitioner and academic over the last 35 years. Despite the discomfort, it is a premise of critical theory that social change cannot be predicated on everyone else changing if we are unwilling to be reflexively self-critical about our own positionality and entanglements. I do so in the hope of self-learning and unlearning and in order to extend an invitation to others wishing to create a genuinely reflexive and critical ICT4D. I see in my own naïveté and shortcomings, both as a practitioner and as an academic, echoes of wider institutional failings that characterise the field of ICT4D and require attention: including the persistence of modernisation theory, White tech-saviourism, an uncritical techno-solutionism, and an ongoing co-option by state developmentalism, technology industry agendas, and funder priorities.

The need to be reflexive about our own embodied entanglement in the field that we study is a central tenet of both critical theory and critical feminist praxis. Positivist and interpretivist research often attempts what Donna Haraway (1988) called the "god-trick": presuming the ability to somehow stand outside of society and study it objectively and neutrally without being part of it or having any bias or ideology. Critical research starts from the position that we are not capable of performing the "god-trick". It follows from this ontology that we need to be epistemologically reflexive and explicit about our positionality and commitments in our research. It is also argued that seeing ourselves as needing to (un)learn and change is essential if any wider project of social change is to be possible.

Autoethnography is a qualitative research approach that uses personal experience (*auto*) of specific cultural experiences (*ethno*) to document and systematically analyse (*graphy*) a social phenomenon. The approach challenges research orthodoxy by treating research as a conscious act normatively directed at furthering social justice (Ellis et al., 2011). Autoethnography is an autobiographical method of research that uses a researcher's personal experience to describe and analyse cultural beliefs and practices by self-reflection, or reflexivity, to determine the relationship between the self and society and between the personal and the political in order to inform the meaning and guide an action (Adams et al., 2015). Chang (2016) characterises autoethnography as divided into three separate forms: descriptive/self-affirmative; analytical/interpretive; and confessional/self-critical. It is the confessional/self-critical form that I use in this chapter.

In the following three sections, I use the three eras of digital development discussed earlier as an organising device to frame analysis of my own complicity and naïveté in the field of ICT4D.

4.4.1 1970–2000: Solidarity Naïveté

The fallacy that transferring technology to 'close the digital divide' was synonymous with development is one of the false assumptions in the ICT4D theory of change that has led to the current crisis in the field. Personally, I had no excuse for believing it as I had spent six years first studying and then lecturing in Science and Technology Studies (STS) on an undergraduate programme in Innovation Studies. That involved teaching that technology has politics (Winner, 1977), that it is inevitably shaped by its social and economic context (MacKensie & Wajcman, 1985), and that it therefore reflects and reproduces (dis)advantage along dimensions of gender, race, and class (Levidow & Young, 1981; Webster, 1990; Wyatt et al., 2000). Despite this solid education, I still harboured the naïve belief that if we could only somehow transfer the right digital technologies to the right organisations, then these patterns could be broken.

As a working-class White male growing up in the UK, I was depressed by the politics of Thatcherism and, as a feminist and anti-racist, had become deeply frustrated by the failure of the British labour movement to address its own institutional racism and sexism. The political climate under Thatcher became increasingly repressive with systematic attacks on basic welfare provision, violent police attacks on peaceful protests and Black communities, and her labelling of Nelson Mandela a "terrorist". For hope and inspiration in my early twenties, I looked overseas to the popular movements for social justice that had recently removed a dictator in Nicaragua and were fighting to end apartheid in Southern Africa. I volunteered via a political solidarity organisation to provide computer training to workers in Nicaragua, where the new government had earned awards from UNESCO for a nationwide literacy campaign and was embarking on a primary healthcare programme which was radically transforming the lives of millions of ordinary Nicaraguans (Hanemann, 2005). For six years, I spent the summer months volunteering with a solidarity organisation, learning how change was possible.

My first job, which later came to be called ICT4D, was to install personal computers in the Nacional Assembly of Nicaragua in 1988. I provided software training to civil servants in the National Parliament in Managua. After several years, a group of volunteers from the UK became self-critical of the White saviourism evident in the volunteer sending model and instead transformed the organisation into a small project-based international development agency. I became the Executive Director of Coda International Training for its first ten years. On my first visit to Nicaragua in the 1980s, I bought a copy of "Pedagogy of the Oppressed" by the Brazilian activist and scholar Paulo

Freire. Reading it in Nicaragua – where that pedagogy directly informed the award-winning national literacy campaign – made a lasting impression on me about how change was possible, which would (intermittently) inform my practitioner work and later academic research.

In 1990, on the basis of our work in Nicaragua, we were approached by the African National Congress (ANC) to establish a similar technical assistance programme in Southern Africa. At that time, the ANC was still a banned organisation in South Africa and was organising in exile. We were asked to set up a programme of technical solidarity to train comrades who were struggling to overthrow the racist apartheid regime from bases in the 'frontline states', including in Zimbabwe and Zambia. For the ANC, we built systems for the student underground in Cape Town to communicate with Umkhonto we Sizwe freedom fighters in Angola. Once the ANC was unbanned in South Africa, we moved our operations into Johannesburg, and in preparation for the country's first ever democratic elections, we built ICT systems for the trade union federation, COSATU, and ran computer training programmes for the South African National Civic Organisation (SANCO).

During this period, we found that we were able to source funding to run large multi-year projects from the UK overseas development administration (DFID). Margaret Thatcher had branded Nelson Mandela a 'terrorist' leader, but by 1990, the UK government read which way the winds of change were blowing and became keen to demonstrate support to the next government of South Africa.

Over time, the work of securing these funds and the endless cycle of project management drew us away from solidarity mode and into development administrator mode. We became very competent at securing large DFID grants and expert in parroting the changing narratives of international development. It became clear to us that we had 'sold out': allowed funder priorities and fashions to divert us from our founding political motivations. The organisation had become depoliticised by the 'anti-politics machine', that is, professional international development (Ferguson, 1990). Just as Ferguson explained, we were progressively drawn into the narratives, practices, and funding cycles of professionalised international development. Eventually the original politics of the organisation was effectively obscured by a depoliticised technical mission and the need to score the next grant. Burnt out and dismayed, in 1997, we pledged to each other that we would never again submit funding proposals to DFID. We spun off the computer-focused element of Coda International to form a new organisation: Computer Aid International, and I jumped ship to run the new entity.

4.4.2 2000–2015: Techno-Solutionist Naïveté

Computer Aid International's original board included Professor Denis Goldberg, a Rivonia Treason Trialist who spent 22 years in apartheid jails before

heading into exile to join the ANC office in London. It also included representatives of the Nicaraguan Solidarity Campaign and Cuba Solidarity Campaign. The Board's composition, and our resolve not to take any funding from DFID, were symbolic of our determination to retain a political focus and avoid co-option by professional developmentalism.

Although there were no full-time paid staff for several years, Computer Aid International grew quickly. We went on to provide over a quarter million refurbished computers to non-profits and educational organisations. Computer Aid eventually had a two million dollar per year turnover and 50 staff. We accidentally found ourselves running a medium-sized factory with a logistics and distribution arm shipping to 100 different countries. The organisation became relatively well known in the UK, partly by riding the wave of publicity around the 'digital divide', which was a popular narrative in mainstream media. Computer Aid International was adopted as the unofficial charity of the ICT industry in the UK. We provided 50,000 computers to the Nairobi-based non-profit "Computers for Schools Kenya", who developed the national ICT curriculum for schools and trained thousands of teachers in the use of ICTs across the curriculum. We worked closely with the African Medical and Research Foundation (AMREF) to build a tele-medicine programme to support their flying doctor programme and helped them expand their in-service nurse training programme.

This was the era of *peak ICT4D* and interest in the 'digital divide'. Between 2000 and 2010 I was making monthly visits to some of the most impressive ICT4D projects in Africa and Latin America, as well as participating in some of the key ICT4D conferences and events, including the World Summit on the Information Society (WSIS) in Geneva in 2003 and in Tunisia in 2005 which marked what was perhaps the peak of tech-optimism and tech-solutionism. The WSIS events were seminal gatherings at which it was possible to see the rise and fall of the telecentre movement, the One Laptop per Child (OLPC) hype, as well as the later #Apps4Good excitement.

Failing to learn the lessons both of book learning, and previous experience, I was once again sucked in by the idea of 'bridging the digital divide' and applying #Tech4Good. Being able to ship tens of thousands of computers per year to amazing organisations around the world meant that the fallacy of techno-solutionism had crept back into my worldview (and any critical political analysis exited once more). Computer Aid invested in a department for developing apps and innovated a preconfigured solar-powered computer lab in a sea container.

The ICT4D conferences that I attended in the early 2010s regularly featured young White men showcasing their 'digital solutions' to 'development problems', with a few quantitative and technical studies aimed at measuring their effectiveness. The studies were almost exclusively focused on the technology itself (proof of technical concept in pilot projects) or studies

on uptake using technology adoption models (TAM). There was an almost complete absence of studies with or by marginalised groups themselves. The theoretical and epistemological approaches adopted were a mixture of positivism and interpretivism with little if any participatory or action research conducted with or by the 'intended beneficiaries' or using critical theory or epistemologies of the South.

The challenges of running Computer Aid International meant that over time the original board members were replaced by IT industry professionals with business management competencies that we needed in logistics and financial management. As the years passed, a dwindling percentage of the computers found their way to political organisations with the majority going to schools and colleges. Once again, the politics was drained out of the organisation, and it increasingly became a mainstream 'charity'. The politics of both Coda and Computer Aid International was slowly watered down by financial imperatives, by funders' agendas, and by my failure to apply lessons learned. The founding politics of solidarity and social justice were gradually replaced with pragmatism about financial survival.

The economic crash of 2008 hit Computer Aid hard, as it did every other organisation. After spending two years post-crash getting the organisation back on its feet, I was burnt out once more. I left Computer Aid in 2011 and went back to school. As a form of therapy, I completed my PhD at the ICT4D Centre at Royal Holloway, University of London. After ten years running Coda International and 13 years running Computer Aid, I was happy to have the opportunity to bury myself in the academic literature for four years. It was a great luxury to have this option and a reflection of my privilege as a White male living in the Global North. The PhD provided a chance for me to reflect deeply on 25 years as a practitioner and to see whether Freire's theories still held water in a digital world and whether a critical ICT4D was even possible. I had begun reading Freire again and was looking for research that went beyond positivist and interpretivist explanations of how ICT4D works to apply critical and conceptual lenses to understand who benefits from disinformation and what interests are served.

4.4.3 2016–2025 Academic Naïveté

Having bought my first copy of Freire's (1970) Pedagogy of the Oppressed three decades earlier, and recently read Amartya Sen's (1999) "Development as Freedom", I used the four years of the PhD to reflect deeply on whether these 'epistemologies of the South' could contribute towards a framework for a more critical ICT4D. Free from the need to land the next big contract or grant and from the pressure to pay the rent of a rapidly growing workforce, academia created the space in which to reflect critically on both the ideal and the failings of decades of practice. I was able to carve out time to think

through what a critical ICT4D might look like – not one that tried to save people with tech-solutionism but one that created space for collective reflection about the social conditions that give rise to social and digital divides and informs collective action to secure social justice.

My doctoral research was with a women-in-technology organisation in Zambia called Asikana Network (Roberts, 2015b). They used participatory video as a methodology for their members to ask each other why women were under-represented in the technology sector in Zambia and what they could do together to overcome this experienced injustice. The resulting methodology was a form of feminist ICT4D: participatory research and action that used digital tools to create a space for participants to reflect critically about the conditions structuring the gender injustice that they experienced and use their findings to inform their own collective action to shift power relations towards achieving gender justice (Roberts, 2015a).

4.4.4 Returning Home

After completing my PhD, I was lost in the ICT4D academic wilderness for three or four years, failing to work out how to carve out a critical ICT4D practice as a researcher in a neoliberal university in the Global North. I still haven't figured it out. However, since 2020, I have had funding to convene the African Digital Rights Network (ADRN), a virtual network of 60 African researchers from 25 different African countries. ADRN researchers have two interrelated research streams: one on *digital citizenship* studying how citizens are making creative and positive use of digital technologies to open civic space, expand digital rights, and further social justice. The second research stream is on *digital authoritarianism* studies of how governments and corporations make negative use of digital technologies to close down civic space, curtail digital rights, and diminish social justice.

Working with the African Digital Rights Network has helped me to put flesh on the bones of the tentative proposals that I made towards a more Critical ICT4D in 2015 (Roberts, 2015a). The African Digital Rights Network have succeeded in bringing together activists, practitioners, and academics from multiple disciplines. We have taken small steps to bring academic communities into dialogue, and shared research programmes, with human rights defenders and digital rights practitioner organisations. We are bringing workers' rights movements together with disability rights organisations and digital rights actors. Doing so forces us to build bridges between very different approaches and conceptual frames. Although the language of rights provides us with a shared framing (because all of our governments have at least rhetorically signed up to them), in practice our research aims increasingly to frame questions in the language of power, collective agency, and justice.

In the series of collected edition books that we are producing (Roberts & Bosch, 2023; Roberts & Karekwaivanane, 2024; Roberts & Mare, 2025), we have synthesised an analytical approach that combines approaches from critical theory (Freire, 1970), critical feminism (hooks, 2000), participatory action research (Fals-Borda and Rahman), critical disinformation studies (Kuo & Marwick, 2021). These approaches build upon Geuss's (1981) definition of critical theory arguing the need for a reflexive, dialogical process in which Critical ICT4D researchers distinguish themselves in the following ways:

1. By situating ICT4D practices in their specific historical, cultural, and political contexts.
2. By foregrounding how agency and power operate in digital spaces, platforms, and tools.
3. By studying how ICT4D practices reflect or (re)produce intersectional dimensions of (dis)advantage including along lines of gender, ethnicity, class, and sexuality.
4. By moving from extractive research towards participatory and reflexive research by or with participants who themselves experience injustice, disadvantage, or exclusion.
5. By having clear normative commitments to equality and justice and by translating research findings into practical guidance for collective action to secure social justice.

We are not puritan in our approach to Critical ICT4D. We do not assert that research is only critical ICT4D if it maximally accomplishes all elements of the above. None of our own research has accomplished this. However, we do try to locate every study in a specific historical and political context. We are progressively increasing the degree of power and intersectional analysis. And we are working towards translating our findings into actionable recommendations to guide practice.

4.5 Conclusion

This chapter set out to address the research questions: What does it mean to be critical in a critical ICT4D?, what are the core elements of a critical ICT4D?, and how would the research agenda of a critical ICT4D differ from the orthodox and dominant ICT4D research agenda?

By revisiting the field historically, this chapter argued that critical ICT4D has always been a heterodox tradition at the margin of ICT4D research and practice. This finding leads to this chapter's claim that establishing a more critical ICT4D can be usefully kick-started by bringing these heterodox studies and practices 'from the margins to the centre' to use them as foundations on which to build.

By revisiting and reviewing the field's literature, the chapter was able to show that what it means to be critical is usefully defined by existing critical theory with reference to five core elements of a critical ICT4D: by being historically and politically situated, foregrounding agency and power, attentive to intersectional dimensions including gender, ethnicity, class, and sexuality; reflective and participatory; and with normative commitments to equity and social justice.

By revisiting the field through auto-ethnography, the chapter showed that even when schooled in critical approaches to technology studies, ICT4D practitioners and academics are fallible. They may have unconsciously internalised elements of dominant narratives and neoliberal worldviews and be susceptible to co-option by funder and corporate agendas.

Pushing back against ICT4D orthodoxy and creating an enabling environment for the (repeated) unlearning and (re)learning that are necessary to sustain a truly critical ICT4D is a long-term venture. This chapter has made some tentative suggestions about how to lay foundations. It has argued that we need to (a) explicitly acknowledge the existing heterodox tradition within ICT4D, (b) reach out to adjacent critical technology fields such as critical disinformation studies and critical data studies, and (c) build bridges to non-academic practitioner communities such as the burgeoning digital rights sector. Co-locating conferences and collaborative research and publishing is recommended as a practical confidence-building mechanism.

Notes

1 Schumacher's Philosophy and how it guides us today: https://practicalaction.org/news-media/2021/06/30/e-f-schumachers-founding-philosophy-and-how-it-still-guides-us-today/
2 Evolution of participatory approaches: https://naarm.org.in/focarsrepository/files/7.%20Participatory%20Technology%20Development.pdf
3 Alternative technology and the environment: https://web.mit.edu/12.000/www/m2016/finalwebsite/solutions/alttechnology.html
4 World Bank Telecentres: www.worldbank.org/en/news/feature/2014/03/03/telecenters-link-malawis-rural-areas-to-the-modern-world
5 Association for Progressive Communication. www.apc.org/
6 Engage Media. https://engagemedia.org/
7 ITforChange. https://itforchange.net/
8 Derechos Digitales. www.derechosdigitales.org/
9 CIPESA. https://cipesa.org/
10 Paradigm Initiative Nigeria. https://paradigmhq.org/

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5

THE INTERFACE POSITION OF ICT4D RESEARCH

Silvia Masiero

5.1 Introduction

This book's first section brought contributions that, from different perspectives, illustrate multiple reasons that pave the way for the need of a critical ICT4D. We started with the digital development dilemma described by Akbari (2025): we then unpacked it through the interview with Madon (2025), who narrated the history of the field from the first days' promises to the present problematisations. We have then moved to the narration from Roberts (2025), whose autoethnographic account illustrated the practical issues, doubts, and ambiguities that increase the already pressing need for a critical ICT4D. In this chapter, I take stock of the book's first section to examine where it leaves us and what core message it brings for the present and future of ICT4D.

Our thematic positioning, which inspired the idea of critical ICT4D in the first place, has been stated since the beginning of this book. The field, this section has noted, was born with strong assumptions on "development" and ICTs within it: the idea that a "development" was there to be pursued and that ICTs were there to play a role in it took many years to be questioned (Akpan, 2003; Madon, 2009). The consequent vision that split the world among "developed" and "developing" countries, heavily problematised in the last decades (Qureshi, 2015), was no more than a byproduct of this. Such a division made sense from an etymological perspective: and yet it is a world of contradiction, of ambiguity, of unclear technology–user relations that today's ICT4D calls us to make sense of. In such a world, the older vision of an ever-all-solving logic of ICT *for* development (Brown & Grant, 2010) finds little place for existence. It is here that a critical ICT4D, with its inquisitive nature, can contribute to drawing ways forward for the field.

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This chapter positions itself in relation to this new phase of ICT4D history. Throughout the chapter, I make sense of this position by conceptualising the present-day ICT4D as a field at the *interface*: first, as conceived by Corbridge et al. (2005), I define the interface as a locus of encounter between different realities, encounter that can be milder or, in many ways, violent and troublesome for those who take part in them. I then proceed to conceptualise three different dimensions that characterise the interface position of ICT4D work: past-present (where the present threatens the assumptions of the past), research-practice (where practice acquired a new role of problematisation), and cross-disciplinarity (indicating how the field entered closer conversation with other disciplines, especially critical data studies). The chapter's conclusion introduces the next two sections of this book: in them, the chapter contributors unpack the notions of problematisation and constructiveness, illustrating how they play out in the ever-progressing making of critical ICT4D.

5.2 Conceptualising the Interface

> At the doorstep of [a district-level government office], we recognised one of our village respondents, a poor tribal women. She explained that she had been waiting for four hours to see the officer and was afraid of losing her "turn" if she left for a few minutes to have her lunch. By contrast, the peon allowed a large group of men led by netas [political leaders] to enter the office immediately. This group stormed in while we were still having our discussion with the district-level bureaucrat.
>
> (Field note, Malda district, West Bengal, 28 Jan. 2000; Véron et al., 2003)

The quote above comes from Véron et al.'s (2003) work on India's Employment Assurance Scheme (EAS), a social protection programme aimed at generating short-term employment opportunities for families living in poverty. Launched in 1993, the programme was a demand-driven scheme with no fixed annual funds: all adult members of poor families who requested it were assured employment for 100 days a year in public works that resulted in the creation of durable community assets.[1] To access the programme, households had to be registered in the village *panchayat* (council) and were provided with family cards: technology here did not coincide with a computer, a mobile phone, or a digital device of any sort. It was a material, a paper-based card that mediated the encounter of the citizen with the state, both at the time of requesting work and, equally crucial, of signing in and out of work shifts.

The cruciality of Véron et al.'s (2003) work for understanding the notion of the interface comes both from the theoretical significance of this concept and from its application to practical situations such as the vignette illustrated

above. From a theoretical perspective, the same authors' work – most known for the book "Seeing the State: Governance and Governmentality in India" (Corbridge et al., 2005) – conceptualises the interface as a *locus of encounter* between different realities, a locus that can be variously mediated by spaces, people, and, crucially, technologies through which people experience the state. In the case of the poor tribal woman waiting in vain at the district-level office, the interface is a locus of unresponsiveness, silencing, and – on top of that – frustration resulting from seeing the group of politicians being let in with no wait. From the practical perspective, the interface powerfully tells the stories of recipients of development interventions, affording the narration of the lived experiences that citizens or users had of these.

So conceptualised, the notion of the interface supports this chapter in making sense of the current status of the ICT4D field. If, as conceived by Corbridge et al. (2005), we see the interface as a locus of encounter, we can visualise at least three such encounters that characterise the status of the field today. The first one is a *past-present* encounter: the older assumptions of ICT4D, viewing ICT as inherently workable for development, clash with the present-day stories of adverse digital incorporation. The second one is a *research-practice* encounter: we are witnessing the increasing prominence of practice works in the field, with practitioner conferences, among others, bringing forward new ways to appropriate ICTs for development. Finally, a *cross-disciplinary* encounter illuminates the increasing exchange of ICT4D with other fields, where works from critical data studies acquire special prominence in delineating the current outlook of ICT4D. In what follows, I use the notion of the interface to illuminate all three encounters.

5.2.1 First Encounter: Past-Present

Every field of science, it can be argued, is a byproduct of the works that have characterised its history. From that flows the encounter of past and present, the assumptions made at the beginning of the field's history, and the confirmation or evolution of such assumptions over time, shaping the present-day outlook of a given field. What is then so special in the case of ICT4D?

Understanding this brings us to unpack some largely tacit but strong assumptions that characterised the early days of our discipline. In an article titled "Should We Still Be Doing ICT4D Research?" I have detailed three such assumptions derived from an analysis of early-days literature on the ICT4D field (Masiero, 2022). As noted in the article, it is difficult to establish a "date of birth" marking the onset of ICT4D as a field. While computer usage in less wealthy nations started in the 1960s (Heeks, 2014), it was in the 1980s that publications connecting ICTs to "development" started to appear systematically. If we reason with these dates, the first two decades of the

field's history bring to light three important assumptions, which are largely problematised in the present-day ICT4D.

The first assumption pertains to the founding notion of "development" in ICT4D. In my literature review of early-day ICT4D research, I noted that many authors have remarked on the importance of defining "development", but only a few of them have really provided working definitions for the term. An exception is Akpan (2003): while noting the subjectivity of the term's interpretations, she defines "development" as "the fulfilment of the necessary conditions for the realisation of the potential of human personality, which translates into reductions in poverty, inequality, and unemployment. (It is also) the increasing satisfaction of basic needs such as food". Reflected in much early-days literature (cf. Walsham & Sahay, 2006), this definition crystallises the first core assumption of past ICT4D: that of seeing "development" as an objective to tend to, an overarching goal to which the use of ICTs, however defined, was to be plied.

Long established in the field, this first assumption is, however, the main one to be problematised by the present-day ICT4D. While older ICT4D works portrayed "development" as inherently desirable, the term came under much scrutiny with the years passed. A milestone of its problematisation came with the work of Escobar (2011) and its analysis of the colonial valence implicit in the term: he noted that, largely from being apolitical, the "development" discourse enforced a highly intruding process, which left the so-called "third world" deprived of any agency in shaping its future. We will later detail how the field of critical data studies, unfolded in the second decade of the 2000s (Dalton et al., 2016), built on the same problematisation to figure out the role of ICTs and, especially, data in colonial extractivism (Couldry & Mejias, 2019). For now, it is important to note how the core assumption, seeing "development" as a central objective to tend to, has come under severe questioning as the field moved through the decades.

A second related assumption pertained to the use of the term "developing countries", which was utilised in early-day ICT4D and, indeed, in the outlet of the broader Information Systems (IS) discipline. Similar to "development", the term was rarely defined: it remained without a definition even when used in the title of papers' collections (such as the MIS Quarterly Special Issue on Information Systems in Developing Countries in 2007) or associations (such as the old denomination of IFIP 9.4 as Social Implications of Computers in Developing Countries). The term, however, came under scrutiny along with the questioning of the terminology of "development": as noted in Qureshi (2015), a dichotomy of "developed" and "developing" nations risked perpetuating the same extractive logics that Escobar (2011) identified. The term went, as a result, from being widely used to openly questioned, targeted by exposure of its association with the logic of exploitative colonisation.

A final assumption, reflected in the field's early days, pertained to the role of ICTs in development, a role whose conceptualisation resulted in the field's denomination as ICTs for development (Brown & Grant, 2010). The field cautioned, since the late 1980s to early 1990s, against deterministic understandings connecting ICT4D to positive socioeconomic outcomes: at the same time, such outcomes were implicit in the logic that motivated ICT4D interventions in the first place. The early work of Walsham and Sahay (2006) offered a particularly clear depiction of the prescribed developmental role of ICTs:

> There was at one time some debate as to whether information and communication technologies (ICTs) were relevant to the developing countries, but this debate has been resolved with a clear "yes" answer. The question has now become not whether, but how ICTs can benefit development.
>
> *(Walsham & Sahay, 2006, p. 608)*

And yet, such a clear "yes" became much less clear as the field evolved. Not only did reducing the digital divide prove insufficient to improve the conditions of people suffering from structural violence around the globe, but research clustered, over time, around the plainly harmful outcomes that are being incorporated into digital systems produced on people. Research around adverse digital incorporation, a term coined by Heeks (2022), reflected this new reality: once the study of how ICTs could foster development, ICT4D largely became the study of how the same technologies, becoming an integral part of broader harmful processes, could hinder it. It is in the landscape of this new ICT4D, mindful of the harmful and degenerative outcomes of ICTs, that we work today.

5.2.2 Second Encounter: Research-Practice

Several milestones have been associated with the birth of ICT4D as a field of science. As noted above, two of them are the birth of the *Information Technology for Development* journal in 1986 and the establishment of the IFIP 9.4 Working Group following the first IFIP 9.4 Conference in 1988. In an agenda paper for the discipline, Heeks (2014) identifies a "pre-history" of ICT4D marked by papers that engage early instantiations of the use of computers in low-resource contexts. Beyond the focus on computing and "development" across its multiple meanings, a common denominator of these milestones is its focus on research: a journal, a conference, and paper publications are marked as indicative of the birth of a new field of enquiry.

Practice, the reader may note, has conversely played a less prominent role in the field's history. A "views from practice" section exists, for instance, in the *Information Technology for Development* journal: it was not until

recently, however, that such a section has started systematically operating as a publisher of works that illuminate practical advances in the making of development-related technologies. Historically, the lack of practical perspectives in symposia of the discipline, remarkably the IFIP 9.4 Conference and the tracks of IS conferences dedicated to development, has been lamented by multiple voices. At the 16th IFIP 9.4 Conference in Yogyakarta, Indonesia, the point on the lack of views from practice – specifically public sector, corporate, or civic organisations working with ICT4D – was noted in one of the debates and contrasted by an academic's point that researchers' work should end with theorising, without transcending into practical implications.

Recent evolutions in the ICT4D field have disputed this point. Born as a branch of academic research, the field has witnessed two parallel evolutions that led to reassessing the role of practice in it: the shift away from a tech-transfer vision and the revised role of civil society in the research outputs of the field. As Roberts (2025) noted in his chapter, the first decade of the 2000s saw the presence of corporate actors using symposia of the discipline (especially privately sponsored ones) to demo-test new applications for "developing countries", enacting a technology transfer logic as described by Avgerou (2008). Such dynamics are for sure still present: for instance, this chapter was written shortly after the 2024 edition of ID4Africa, which describes itself as "an NGO Movement that accompanies African nations on their journeys to develop robust and responsible identity ecosystems in the service of development and humanitarian action". The "movement" concretises, however, in an annual meeting where private providers of digital ID technologies meet exponents of government and civil society, underpinned by an "ID for good" ideology that is largely oblivious of the harm inflicted by ID-induced exclusion and surveillance (Masiero, 2024a).

At the same time, facts demonstrate that a tech-transfer vision, problematised over time, is now less than dominant in the ICT4D sphere. In May 2024, the ICT4D Conference took place in Accra, Ghana, grouping around 700 advisors and senior executives from public, private, and civil society organisations across the humanitarian and international development community. Organisations gathered together from within contexts were historically constructed as recipients of development aid: comparing and discussing experiences, they imagined new localised ways of building technology for developmental purposes, inspiring the work of the academics present at the gathering. This is in opposition to the implicit tech-transfer model that forums like ID4Africa propose: innovation comes from the context of application, reflecting the tenets of Indigenous theory that invite decolonial approaches to the field (Davison & Díaz Andrade, 2018).

A parallel, equally important development is the role that civil society plays in the outputs of the field, characterised by some as "digital development" and contemplating the latest evolutions of ICT4D research. A powerful

instantiation of this is the publication of three edited volumes – "Digital Surveillance in Africa", "Digital Disinformation in Africa", and "Digital Citizenship in Africa" (Roberts & Bosch, 2023; Roberts & Mare, 2025; Roberts & Karekwaivanane, 2024) produced through the contribution of actors that, coming from and based in the African context, provided lived perspectives on experiences of digitally mediated surveillance, disinformation, and citizenship. The volumes represent a way of doing research that, instead of bypassing practical perspectives, actively constructs them as part of the discipline, giving a novel meaning to what constitutes ICT4D knowledge. Along similar lines, the "Views from Practice" section of Information Technology for Development has acquired new lifeblood: in relaunching it, Hussain and Brown (2024) have leveraged practical expertise to discuss challenges and solutions for addressing the mobility needs of Rohingya refugees with disabilities. Articles of this type illuminate how the knowledge of civil society, rather than existing in isolation from science, makes an integral part of today's ICT4D research, presenting the research-practice interface as another site of encounter characteristic of the field.

5.2.3 Third Encounter: Working Across Disciplines

The assumptions that marked the early days of ICT4D research also affected the disciplinary scope of the field. The genesis of IFIP 9.4 from a group of academics, mostly belonging to the information systems domain, largely wrote the field's history as a subdiscipline of Information Systems (IS). Nevertheless, this initially unproblematised view has been increasingly disputed over time. The prominence of ICT4D outputs across disciplines and their increasing interchange with fields, especially represented by the domain of critical data studies, present a third interface that this chapter sets to explore.

From the days of the first IFIP 9.4 Conference, ICT4D narratives were largely written as contributions to the IS field. The idea that ICTs could participate in "development" – a term again widely used, though not necessarily clearly defined – inspired multiple tracks of IS conferences and Special Issues in the Senior Scholars' Basket of Journals with programmatic titles such as "Information Systems in Developing Countries" (Walsham et al., 2007) and "ICTs and Societal Challenges" (Majchrzak et al., 2016). Such a trend, continued for over two decades in the discipline, exposed, on the one hand, the initially unquestioned sense of belonging of our research to the IS disciplinary domain. On the other hand, it also highlighted the niche space carved for us in IS: for many years, we have been the discipline of the Special Issues, which often had to wait for a dedicated issue call to hope for a publication in a high-ranked journal. When panels or symposia were carved out for us in conferences, this was allegedly largely seen as fulfilling an obligation to create a space for socially responsible research. This space rarely fulfilled the need

for critical engagement that concepts such as adverse digital incorporation bring to the field today (cf. Masiero, 2024b).

Such a disciplinary encapsulation was, however, directly challenged over time. The past-present tension examined earlier in this chapter affected this point: a past dominated by a technology transfer view, embedding an underlying idea of technology as finalised to enacting development, has become contrasted with realms of adverse digital incorporation, which at least juxtaposed existing views of ICT "for" development to the sorting of the opposite effects. Inscription of allegedly developmental ICTs into routes to surveillance, tech-induced violence, and data harm prompted the participation of ICT4D work in debates on data justice (Dencik et al., 2022), surveillance studies (Gandy, 2021) and, more at large, the relatively new discipline of critical data studies. Such debates illuminate multiple threads of discourse that the chapters of this book will contribute to unpacking.

With *data justice*, we refer to "fairness in the way people are made visible, represented and treated as a result of their production of digital data" (Taylor, 2017, p. 1). Originally a concept deemed to make sense of social justice in an increasingly datafied world, the idea of data justice gave rise to what can arguably be seen as a sub-field, centring on ways in which data justice can be enacted, problematised, or denied by technologies in societal contexts (Dencik et al., 2019, 2022). A landmark in the emergence of the field was the first Data Justice Conference, held at the Data Justice lab in Cardiff in May 2018. While visibly interested in dynamics taking place in the Majority World, the same conference saw only a few ICT4D scholars participating and a limited number of presentations from the same domain. In contrast, the 2023 edition of the conference was characterised by sustained visibility of the topic and debates on how ICT4D was to become, and is indeed in the process of becoming, an integral part of conversations in the data justice space. The chapter by Hoefsloot and Jimenez (2025) in this book constitutes a practical instantiation of how a data justice framework enables articulation of ICT4D research insights.

The field of surveillance studies arises as an equally important partner of conversation. Having held its latest edition in May 2024, the Surveillance Studies Network Conference is a forum where surveillance studies – in their socio-technical vision as framed by Gandy (2021) – have entered dialogue with disciplines including law, informatics, and other domains of historical pertinence to the surveillance theme. The conference track, one that received the highest number of submissions, pertained to "Surveillance in the Majority World". The track enabled discussions of surveillance as related to contexts of structural violence in the Majority World, including digital security in Myanmar, the Indigenous use of drones in the Amazon, and the erasure of critical articles from archives in Kashmir. Articulated over the conference's three days, the track witnessed novel horizons of ICT4D research, where adverse digital incorporation is consciously and analytically embraced.

It can be argued that the emerging field of critical data studies, described by Dalton et al. (2016) as the study of data and its criticisms, offers a common denominator for the novel fields of action in which ICT4D work participates. Arguably stemming from the early work of Dalton and Thatcher (2014), the field sets the promise to note how, in response to the overarching promise of "big data", research needs perspectives that examine criticisms as well as the hype, noting how data can participate in social improvement as well as in the perpetuation of existing injustice. The epistemological roots of the field are ascribed to boyd and Crawford (2012), who note the sociotechnical nature of the phenomenon and the problematic processes it can generate. With its engagements of adverse digital incorporation, ICT4D is increasingly engaging the world of critical data studies: the chapter by Wernick et al. (2025) in this book, centring smart cities as a site of surveillance, offers an important instantiation of the issue. A similar task is performed in the chapter by Lopez (2025), whose discussion of algorithmic welfare in Colombia is underpinned by the vision of Sisbén – an algorithmic system scoring households in terms of economic prosperity – as a route to arbitrary denial of needed benefits. The chapter further questions the data-for-development orthodoxy that a critical ICT4D engages with and which alternatives capable of amplifying problematising voices are to be devised based on the knowledge shared in this book.

5.3 The Way Forward: Problematisation and Constructiveness

We started this chapter by positioning ICT4D as a field at the interface, conceived by Corbridge et al. (2005) as a *locus of encounter* between people, ideas, and concepts. We then elaborated on three aspects that the interface, so conceived, takes when looking at the present-day ICT4D research. First, a past-present interface has illuminated how the realm of the present, in which ICT4D researchers are called to be aware of adverse digital incorporation and engage it in their work, clashes with the positive assumptions that marked the field's genesis. Second, a research-practice interface has shown how practice, shifting from a locus of preeminent tech transfer (Roberts, 2025), is increasingly becoming a locus of constructive problematisation. Third, the field's novel research horizons have underpinned its interactions with other domains of science, marking a shift from being a sub-discipline of IS to a field in conversation with data justice, surveillance, and especially critical data studies (Masiero, 2024b).

Such considerations bring an end to the first section of this book, centred on *reflection* as a topic of discussion. The two further pillars of *problematisation* and *constructiveness,* respectively, centred on questioning key assumptions from the early days of ICT4D and building viable alternatives to them, constitute the thread that the book follows. Chapters in the second section

chiefly take on the task of problematisation: this means critically engaging the assumptions that the field made us familiar with and proposing viable alternatives to the same. Discourses on the violence of automated decision systems in social policy in Colombia, the role of private vendors in digital humanitarianism, and reimagining smart city transplants in the Global South offer practical instantiations of how such problematisation occurs.

Building directly on this, chapters in the third section offer instantiations of what constructiveness means in the context of critical ICT4D. They leverage open countering of the field's founding assumptions to show how alternatives can be built: fairer forms of technology-based interventions, it is suggested, can only stem from contesting the overly unfair and, consequently, harmful outcomes that technologies may yield. The invocation of epistemological plurality for enabling a critical turn in ICT4D, the co-development of tools for equitable cities in designing water justice, and the leverage of *sororidad* (sisterhood) in countering and denouncing gender violence in a Facebook group in Latin America, all illustrate the aspects of the same point. It is only through constructiveness, consciously built on reflection and problematisation, that critical ICT4D acquires its flesh and that the next pages of this book can be written.

Note

1 Over the years, the EAS was replaced by the Mahatma Gandhi National Employment Rural Guarantee Act (NREGA), which guarantees a minimum of 100 days of employment a year to at least one member of each rural household who requests it (Maiorano, 2014; Veeraraghavan, 2021).

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PART 2
Problematise

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6

THE VIOLENCE OF ALGORITHMIC SYSTEMS IN SOCIAL POLICY IN COLOMBIA

(Re) Localising the Digital Welfare State in the Postcolonial Context

Joan Lopez-Solano

6.1 Introduction

Critical research on the implementation of algorithmic systems (automated decision-making systems, machine learning technologies, or artificial intelligence) in the implementation of social programs has been centred on its newness and the challenges of a future that appears inevitable but, at the same time, disconnected from the majority of the world. However, the experiences of the postcolonial context expose a more complex picture in which the implementation of technologies follows international actors that promote experiments and bureaucracies controlled by elites. These want not only to expand their control over the state's infrastructural capacities but also to grow in a context of structural violence against communities that are active political actors demanding justice, reparation, and recognition. For this reason, the explanations around the violence of implementing new technologies in the social security sector require a localised exploration of the dynamics, actors, and histories that (re)produce the state actions.

The objective of this text is to expose how the use and design of Sisben and the Household Registry, the systems used to classify the Colombian population in terms of poverty to access social citizenship, reproduce a long-standing history of systemic violence against marginalised communities. Colombian state institutions have been constructed using regulations, institutions, and technologies to render the population legible and resources to protect the interests of elites. In contrast to the active social and political participation of Colombian, mainly white and urban elites who benefit from state practices and resources, rural communities, ethnic peoples, and impoverished urban populations have been seen by the state merely as sources of

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exploitable resources, potential security threats, or targets for land accumulation (Comisión de la Verdad, 2022b, p. 38). The sectarian use of the state coexisted with public policies aimed at modernisation, innovating with new developments, and creating a favourable climate for international investment.

Research on the use of digital technologies in social security has focused on countries such as the Netherlands (Bekker, 2021; van Schendel, 2019), the United States (Almedom et al., 2020; Eubanks, 2018), and Australia (Mann, 2020). However, the postcolonial world has been a testing ground for experimenting with social policies like Conditional Cash Transfers (Barrientos & Santibáñez, 2009) and individualised private pension funds. These policies have become transferable, promoted, and implemented worldwide artefacts. Moreover, the postcolonial context has also been a space to test digital technologies in social security, such as biometric systems for social security access, automated selection of social program beneficiaries, fraud detection systems, and prediction of social risk systems (Aiken & Ohlenburg, 2022; López, 2021; Relatoria Especial sobre la extrema pobreza y los derechos humanos & Alston, 2019).

Digital technologies have transformed these systems' transferability, speed, and standardisation capabilities. The Bretton Woods institutions, aid agencies, companies (such as biometrics, mobile technologies, and financial technologies), and governments collaborate to implement new systems for constructing, assessing, and delivering social services. However, the changes in the politics of distribution and digital technologies will come from neither the futuristic utopias of Silicon Valley nor the dystopias of a high-tech Big Brother governing us. Violence stems from the structural legacy of discrimination, and we do not have to search for theoretical consequences (Arora, 2019). Therefore, I hope this localised description could pluralise the debate and resonate better with the postcolonial world than the universalist claims from the colonisers.

This book chapter employs a discourse analysis methodology using various sources, including academic articles, freedom of information requests, public policy documents, contracts, state agreements, Constitutional Court rulings on Sisben, Sisben training materials, news articles, press releases, and data from public databases. This research was conducted over four years and combined academic inquiry with advocacy efforts in Colombia at Fundacion Karisma (Lopez, 2020, 2021; Lopez-Solano, 2022). This chapter is organised into six sections: (1) an analysis of the history of the state's selective visibility and its role in perpetuating structural violence and dispossession of marginalised communities; (2) an exploration of the history of the social state in Colombia and the emergence of data-intensive targeting of social resources; (3) an examination of the problems of this system according to the Constitutional Court; (4) a discussion of the digitalisation of the social registry, its objectives, and challenges; (5) an analysis of the emergence of

the Household Social Registry, an automated classification system; and (6) some conclusions on how the use and design of databases and systems for accessing social resources perpetuate systemic violence against impoverished communities in Colombia.

6.2 Selective Visibility and Structural Violence

We should read about implementing any digital system within the Colombian state framed by a history of over 50 years. The state's institutions supported violence against peasants and Indigenous and Black communities to benefit the white elites in urban areas (Comisión de la Verdad, 2022b). The construction of the Colombian state followed the path of protecting the interests of mainly white and urban elites by legal and illegal means to exclude access to resources for impoverished peasants and Indigenous and Black communities.

Landowners confiscated peasant lands and expanded into public lands marked as unoccupied since the 19th century. Leveraging their influence, landholders strategically shaped the state's vision, controlling property ownership registrations and concealing property claims to selectively recognise certain property holders, excluding communities living there, but they also remained blind to the true value of their properties for tax purposes (Sánchez-Talanquer, 2020). This manipulation of state institutions by landlords' interests perpetuated an unjust land distribution system under the guise of impartiality.

Likewise, the government shaped the territories of Indigenous, Afro, and peasant communities as fertile lands for developing megaprojects linked to investment in exploiting natural resources by transnational capital. Amid these processes, state actors, international corporations, and landlords used paramilitary groups to force land sales, crop theft, and forced displacement of thousands of families to inhospitable regions or urban margins (Comisión de la Verdad, 2022b).

During the conflict, the movements that advocated for social justice were stigmatised. The conflict hid social problems, and violence was naturalised and almost justified through this stigmatisation. The Colombian government has persistently promoted a narrative that depicted the social movements as a menace to national security and as foes of the state (Comisión de la Verdad, 2022b).

Even though the armed conflict affected most of the population, some actors used it to profit. They shaped the state's vision that, under the guise of impartiality, legalised the expropriation of lands, hid the violence, and limited the possibility of taxing the real value of properties. Likewise, state institutions defined the lands of communities as fertile land for expropriation to benefit international corporations and local elites while stigmatising social movements that claim social justice as threats to national security

and enemies of the state. Considering the relationship of structural violence between the Colombian state and the marginalised communities, the next section will explore how care practices have been produced in a way that renders the structural violence acceptable, the rights products of charity, and the claims for justice as representations of the opportunistic mentality of the communities.

6.3 Construction/Exclusion of the Social State

Considering the history of structural violence, the construction of social security made visible only the privileged communities in the urban setting as subjects of care. From the 1930s to the 1980s, Colombia adopted social programs based on contributions and focused on the urban elites and the small urban working class (Carbo, 1997). This framework systematically excluded most of the population, mainly racialised, who worked outside the formal economy in major cities, who were expelled from their lands by land grabbers, or who were exploited in large plantations in rural areas.

The crisis in the 1990s and the pressure of international organisations resulted in a restructuring of the state towards privatisation and targeting of public services (World Bank, 1990). In the 1990s, during a debt crisis, Latin American governments quickly started to liberalize their economic and social policies (López Restrepo, 1995; Sarmiento et al., 1999). These policies followed the recommendations of the World Bank and the International Monetary Fund on resource targeting, privatisation of public services, and austerity measures in public spending (Carnes & Mares, 2015; Deacon, 2007; Hall, 2007).

In 1991, diverse social movements and efforts for peace reached the milestone of a new Constitution that included social security as a basic state function based on efficiency, universality, and solidarity. However, the Constitution also created the possibility of restructuring the State by allowing the private sector to fulfil public functions.

The most far-reaching privatisation and targeting measures in Colombia were the reforms of the social security sector (Carbo, 1997). The healthcare system reform introduced the subsidised regime to provide health insurance coverage to marginalised populations. Following the new duty of social security, the social classification of targeting social spending played a crucial role in identifying and enrolling eligible individuals in the subsidised regime. Consequently, the state needed to collect more individualised data to find and classify individuals who deserved social assistance (McGee, 1999).

In this context, the government created the System for Potential Beneficiaries of Social Programs (Sisben in Spanish) in 1994 as a proxy means test to classify households individually in terms of poverty (Castañeda & Fernández, 2005; Sarmiento et al., 1999; Vélez et al., 1999). The Sisben has two

components: (1) a database that contains personal data of each member of a household; this information is collected through a 77-question survey performed by local governments but designed, financed, and regulated by the national government; and (2) an algorithm, an abstraction of the specific characteristics of the poverty defined by the national government, to classify them (Castañeda & Fernández, 2005). The resulting classification is used by each entity that administers social benefits, such as the Ministry of Health, the Ministry of Labor, or Social Prosperity, to determine if a person can request access to a social program.

Here, we can see how social registries are an example of algorithmic governance in which a secret model built by the government is used to make decisions that affect the lives of marginalised communities. These systems are often seen as a recent development, but social registries have used algorithms for decades to classify communities and determine who deserves social rights. In other words, it is a conscientious effort of the government to produce poverty as a measurable and coherent frame controlled in the bureaucratic offices of the capital city rather than dealing with local governments and communities and an algorithmic system to channel the social expectations of the communities claiming social change.

6.4 Constitutional Court and the Structural Problems of Sisben

In the 2000s, the state returned to financing social programs by transferring money directly to impoverished households, mainly in cities, in exchange for fulfilling conditionalities of school attendance and regular checkups for 18-year-old minors (Barrientos & Santibáñez, 2009). This new social assistance system needed Sisben as the main instrument to target these resources and connect social security with the objectives of financial inclusion. This tendency will mark the future developments in social security where people are required to be classified by Sisben in order to access expanding social transfers that push people towards the financial system.

The mainstream history of social policy in Colombia has characterised the movement towards targeting social expenditure as inherently beneficial. Sisben's coverage expanded with the years and with the relative number of people receiving some social alleviation (Bottia et al., 2012; Cortes Nieto, 2012). This trend coexisted with the new state revenues of mineral extractive activities and the influx of people moving to the cities expelled from their territories by armed actors (Comisión de la Verdad, 2022a).

Sisben, originally designed for the healthcare system, expanded in size and functions to be transformed into the main entrance to social citizenship for Colombians. The system underwent multiple iterations that changed the algorithm and collected data, and hid the model rules. Currently, Sisben is used to select who could be beneficiaries of 21 social programs that include housing,

cash transfers, elderly support, healthcare, higher education loans, and childcare (Departamento Nacional de Planeación-DNP & Consejo Nacional de Política Económica y Social-CONPES, 2016).

The institutionalisation of Sisben, its implementation of digital technologies, and the legal actions of impoverished Colombians to access social rights tell another story. The Constitutional Court rulings around Sisben between the 1990s and 2010s reveal the communities' barriers to accessing social rights. The problems that the Court found in the Sisben design expose the systemic violence tendencies in the system's design. In the 1990s, the Court acknowledged three problems that limited the social rights of the impoverished communities in Colombia through the Sisben.

The first problem is the direct exclusion of marginalised communities from the Sisben registry and the need to update their information. The central government and local governments fund the first or registry surveys, but the surveys for updating information are funded solely by local governments. This means that people who need to update their classification may have to wait a long time to do so, if they do so at all. The national regulations determine that surveys can only be conducted once every six months, which means that people who need to update their classification may have to wait a long time to do so (Decreto 441 de 2017, 2017; Lopez-Solano, 2022). Despite the requirements of inclusion and availability of social rights, the Constitutional Court recognised limited access to the survey as the primary human rights concern.

Secondly, the Court mentioned the problems of accountability and the limitations of the model used to classify households (Sentencia T-177/99, 1999). The responsibility of designing the survey and the algorithm and the administration of the database and the guidelines for implementation of Sisben were delegated to technocrats at the national level without meaningful participation or control of the communities experiencing poverty (Lopez-Solano, 2022). Therefore, the government controls all the functions behind the Sisben, except for collecting information and updating data. The algorithm that determines the classification of individuals is secret and, therefore, impossible to challenge or verify. This transforms the Sisben into an arbitrariness machine that can exclude or include people from accessing vital social services without any justification or appeal.

Finally, in 1999, the Court stated that "the individual targeting (. . .) only measures what was taken into account when designing it, and the Sisben's regulation includes abstract poor entities and not people in (poverty)" (Sentencia T-307/99, 1999). In this case, the Court recognised that a social registry could not grasp the whole experience of marginalisation of the communities. Likewise, the Court recognised that the effort of seeing the communities to access social citizenship is inherently political because it only considers the interest of the bureaucrats who designed the system. Therefore,

the system could not consider diverse marginalisation experiences that were not considered in their design, such as being a victim of the conflict and having a catastrophic disease or a disability (Sentencia T-177/99, 1999; Sentencia T-476/10, 2010; Sentencia T-627/14, 2014; Sentencia T-747/15, 2015).

These are the kinds of experiences in which the concept of justice comes into play to collide with a technocratic view of poverty in which income could explain every marginalisation and in which social citizenship expands towards a recognition of systemic and historical violence and its claims for reparations. The government considers Sisben an "objective" tool that does not require control, transparency, and community participation mechanisms. Thus, when design problems arise, people are systematically excluded from their rights and are revictimised by the state.

The Court rulings not only highlight the systemic barriers to accessing social justice but also demonstrate the resistance of the communities to continue to be neglected from social citizenship. By suing the state, these communities actively assert their rights and demand recognition as full and equal members of society. This resistance is a powerful reminder of the agency and resilience of impoverished communities despite systemic violence and exclusion.

The Constitutional Court rulings present the structural violence of that system in which the communities that claimed rights were excluded from accessing social rights, unable to be recognised as vulnerable by the state, and limited in their capacity to challenge the decisions of the bureaucratic institutions. This structural violence is inherent in the state and operates in a way in which normal bureaucratic procedures depoliticise the marginalisation of rural, Afro, and Indigenous communities.

The mainstream history of social security in Colombia has failed to recognise the importance of the procedural rights of communities and the history of violence and dispossession that characterised state action. The expansion in social spending or people registered in social security systems is not equal to the real enjoyment of social rights, the protection of dignity, autonomy, and accountability to those who have been victims of the violent actions of multiple state and non-state actors. The systems designed to provide care were technical and neutral at first glance but arbitrary and violent in their results.

6.5 The Modernisation of the Social Classification Algorithm

Even though during the 1990s and 2000s, the Constitutional Court highlighted the Sisben problems, the successive governments did not engage with the structural changes required but rather reformed the system to make it more difficult to be challenged.

In the 1990s, the valuations of each feature of the algorithm used for the final score or classification were public; but in 2003, the government

determined that this design was easily manipulable by fraudsters. The government made the algorithm secret because if impoverished individuals understood the system, this could lead to too many people accessing social citizenship, which threatens the country's macroeconomic stability. They even created distractive questions aiming to confuse people trying to access social assistance (Departamento Nacional de Planeación & Ministerio de Salud, 2003).

In 2016, with the participation of the World Bank and the Economic Commission for Latin America and the Caribbean, the government decided to modernise the system, arguing that people were manipulating their classification and the algorithm was outdated. They implemented two changes aligned with historical tendencies but armed with new technological tools. The modernisation process of Sisben opened the door for implementing new data technologies that automatised and further abstracted the process of accessing social citizenship.

First, they changed the algorithm used to define poverty and classify households from a model that privileged the consumption of durable goods as proxies of their economic situation towards a predictive model of income generation capacity. The machine learning model was trained on data collected in a survey by the National Administrative Department of Statistics (DANE in Spanish). Afterwards, the model was deployed into Sisben's data, and the income generation capacity of households was determined and grouped according to the parameters set by the DANE information (DNP & CONPES, 2016). For the government, the Sisben data is unreliable, even though it is updated by the impoverished communities when they require social services and contains information from almost 80% of the population (Departamento Nacional de Planeación, 2019e). Therefore, the government looked for other data sources that allowed them to predict the characteristics of a household in poverty according to their parameters. Then, the government used the trained algorithm to classify the communities with patterns unknown to them. It was assumed that the communities will lie because they want to access social assistance and try to take advantage of the system.

The second change was the fraud detection system, currently in implementation, which will flag each inconsistency between the self-reported information in Sisben's surveys and any databases to which the government has access (DNP & CONPES, 2016). They have planned to connect Sisben to 36 public and private databases that include financial data brokers such as Experian and Transunion (Departamento Nacional de Planeación, 2019a, 2019b, 2019c, 2019d, 2019e, 2020). In exchange, they could use the publicly available data of Sisben to develop financial products targeted to impoverished communities (Lopez, 2020). Likewise, public entities can now "make the information available without agreements to update and apply the validation and quality control processes". In other words, it is almost like

the government behaving like a data broker but also allows them to create an infrastructure that would make it possible to interoperate the information and recalibrate the patterns that define who deserves social citizenship (Decreto 441 de 2017, 2017; Lopez, 2020).

Another change was regulatory. Since 2017, the government has had the regulatory capacity to determine and change without any notice the grounds for excluding communities from accessing social services (Decreto 441 de 2017, 2017; Lopez-Solano, 2022). The inconsistencies trigger a process in which households will lose access to basic social services if they do not demonstrate their innocence.

According to the government, the change in the algorithm also followed a systemic problem of the previous version: the communities understood how the system worked. The previous Sisben used the consumption of durable goods as representations of the communities' social conditions and the access to basic public services as proxies of their standards of living (Castañeda & Fernández, 2005; DNP & CONPES, 2016). Therefore, the communities were able to understand, that is, according to the government, to cheat the system.

The images of communities hiding their goods to cheat the system and access social benefits were common in the press and were openly promoted by the government. The media outlets published innumerable articles about the so-called colados or fraudsters; the government used this narrative to promote the modernisation of Sisben and deployed media campaigns like #Nomascolados that portrayed deserving poor (hard workers, committed and well-behaved) being excluded by people representing traditional images of white privileged elites.

The profound inequalities and the state's violence against impoverished communities in Colombia have long coexisted with public policies aimed at modernising the state and creating a favourable climate for international investment (Comisión de la Verdad, 2022a). Despite efforts to address social and economic disparities, the state has prioritised the interests of foreign investors and elites over the needs of the communities. This has resulted in a complex and often contradictory relationship between the state and the impoverished communities, where violence and exclusion are perpetuated, while the state portrays an image of modernity on their legal, institutional, and systemic construction.

6.6 Alternative Data Sources and the Perpetual Abstraction of the State

In 2021, the national government implemented an experimental social program that used only databases to select beneficiaries of pandemic support (López, 2021). The Solidarity Income program, an unconditional cash transfer program for 3 million citizens, was established in response to the

COVID-19 pandemic. The program was set up in just two weeks, and its beneficiary selection process relied solely on data already held by the government and provided by private actors. When they faced problems and public backlash because of the results, the government used new and non-related social protection databases to recalibrate, including databases of the prisons and the Forensic Medicine Institute (López, 2021). These databases have varying levels of quality, and some were unknown to many Colombians. In other words, the Solidarity Income program altered the relationship between the data used to assign benefits and the participation of people in the system.

The Solidarity Income experiment opened the door to automatically updating household information using the registries they have access to. Since 2021, the government has been developing a new interoperable social registry called the Household Social Registry (HSR) to update Sisben's algorithm and its data automatically using the interconnections tested in the Solidarity Income (Decreto 518 de 2020, 2020). Rather than simply detecting inconsistencies with the self-reported information collected in Sisben, the registry would automatically update the data and the social classifications without needing a new survey; however, without any meaningful participation, transparency, and accountability mechanisms for the communities. The HSR would be more opaque and less accountable than Sisben, making it impossible to challenge. As a result, marginalisation would no longer be determined by people's bodies, communities, or neighbourhoods but rather by the alternative data sources that people leave behind in their limited interactions with the state.

Automating Sisben's data could save funds by eliminating the need for a large-scale survey and bypassing local authorities. However, there is also the risk that database errors or unexpected changes in social conditions could result in individuals being excluded from social benefits, as even the World Bank recognises (Banco Mundial, 2021). The government may justify these exclusions as acceptable errors or collateral damage in pursuing efficiency and experimentation. This illustrates how seemingly neutral and technical systems can legitimise arbitrary decisions about who is eligible for social rights and how indifference to arbitrary outcomes can become normalised. As Gupta (2012) notes in India's case, such arbitrary decisions may have no negative consequences for officials who believe they are doing their best under the circumstances. However, for those affected by these decisions, the consequences can be significant and even life-threatening.

The Colombian case is key for the future development of the politics of distribution in the postcolonial context. The creation of an interoperable framework is an objective that is shaping social security for the future. The new politics of distribution based on the rise of direct cash payments to low-income citizens is reshaping the vision of state institutions (Barrientos & Leisering, 2013; Barrientos & Santibáñez, 2009; Ferguson, 2015). These

developments require huge amounts of personal data, automated decision systems, distant identification systems, and payment infrastructures. Colombia, with systems developed since the 1990s and 2000s, would be at the forefront of this reshaping of social security in the postcolonial world.

The new politics of distribution requires social sciences to reimagine how we analyse the history of these developments and critical data studies to understand the complex nature of these abstraction systems. The funds and information used to provide care are clearly expanding, but the fulfilment of social rights and reparations to construct a just society could not be defined by that trend. This situation requires analysing how the systems render legible the marginalisation of the communities, how they treat them, and how communities could defend themselves from arbitrariness. The struggle would be how the state sees the citizens: as rights holders and victims of the conflict who need reparations or as objects for extraction, risks, and charity.

6.7 Discussion and Conclusion

The idea behind this chapter was to analyse the case of the systems used by the Colombian state to define who is eligible for social rights, flowing through historical and localised analysis that recognises the complexity of the relationship between state institutions and marginalised communities. The Colombian case shows a more complex picture of the datafication of social programs: a disentangled state trying to expand its bureaucratic apparatus as cheaply as possible, a conscientious effort to depoliticise the historical claims of impoverished people using complex systems to channel their claims and to render technical the political claims of communities by defining poverty almost like a product of the unpredictability of nature and social rights as the product of benevolence or good luck.

The formation of the state vision in the 19th century followed the interest of the white and urban elites, who concentrated power and land to create systems that appeared to be neutral but justified the violence and dispossession of marginalised communities. The state also defined the resources and territories of those communities as sources for exploitation and their resistance as security risks and representations of the opportunistic tendencies of their mindsets.

The emergence of the social state followed the same path. The recognition of state institutions' responsibility in the formulation of the structural conditions of marginalised communities was overshadowed by the creation of a data-intensive system that allowed the national and local elites to define who was eligible for social citizenship. The Sisben system allowed the classification of communities to render acceptable the arbitrariness of determining who deserved care in a country with the most population torn by years of violence that left some in privileged positions to decide the future of the state.

The system allowed the expansion of the action of the state by rendering it visible to more people, as well as by expanding social expenditure following new revenues of the mineral extraction business. However, the inner workings of the system continued the reproduction of historical violence by excluding communities from accessing the resources, limiting the definition of poverty to what a small technocratic elite provided, stigmatising the social claims of communities as opportunistic behaviours to cheat the system, and creating legal and regulatory mechanisms that limited the contestability of social movements that claim for social reparations.

From an experimental social program and the regulatory powers of the pandemic state of emergency, Sisben was transformed into a part of the Household Social Registry that unified all the public registries with personal information to classify the households. This system aims to extract information from any data source determined by the government, classify the population with any parameters decided unilaterally from Bogota, and select the beneficiaries for social programs without interaction/friction of local politics. The HSR aims to reduce the expenses of massive surveys, negotiate with local governments, and interact with social movements to create frictionless social security. The system could fail massively to recognise the complexity and unpredictability of social conditions. However, the arbitrary decisions that such a system produce are deemed acceptable for the sake of a modern and digital government.

The new technologies did not simply emerge from the dystopian future to change the relationship between the state institutions and the marginalised communities; but rather they followed the historical tendencies of structural violence. The government developed a system to predict the social conditions in a more abstract and obscure way, claiming the opportunistic tendencies of people depending on social services, a fraud detection system to verify the information provided by people, and unilaterally decided what were the reasons to sanction the liars while keeping total control over the system. These changes created the infrastructure needed to reshape the state vision according to the new needs of direct cash transfers and more individually targeted solutions.

The global explanation of this phenomenon, based on the experiences of the North, has been either a surveillance state that wants to know everything about everyone or the product of a mindless implementation of digital technologies promoted by Silicon Valley. However, the Colombian case shows a more complex picture of the datafication of social programs: a disentangled state trying to expand its bureaucratic apparatus as cheaply as possible, a conscientious effort to depoliticise the historical claims of impoverished people using complex systems to channel their claims and to render technical the political claims of communities.

Even though the national government wants to disconnect poverty from the historical claims of marginalised communities, victims of a war promoted by the elites, and bureaucratic violence, they will continue to go to the streets to remind the elites that they cannot hide their claims behind data and algorithms.

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7

DIGITAL HUMANITARIANISM

Orthodoxy and Lived Realities

Silvia Masiero

7.1 Introduction

Along its first decades, the field of ICT4D has been based on solid working assumptions, which directly influenced the research conducted on it (Heeks, 2008; Tsibolane & Brown, 2016). Such assumptions concerned both the role of technology in socio-economic development and the definition of the entities that, at the local and transnational levels, were concerned with the making of development. Arisen in the early days of the field, one of these assumptions concerned the role of the state, quite uniformly seen as the primary entity tasked with providing development measures on the ground (Akpan, 2003). Combined with the role of a private sector in corroborating an efficient public sphere, a state-centred focus animated the first decades of the field, giving rise to the notion of "E-Governance for Development" as a key driver of ICT4D research (Madon, 2005, 2009; Walsham, 2017).

With the field's evolution, such assumptions have however started to crumble. Section 1 of this book has engaged the problematisation of key assumptions on the role of ICTs in development, pointing to issues of adverse digital incorporation, meaning that the negative effects are included in ICT systems (Heeks, 2022). At the same time, the assumption depicting the state as the core actor of development processes saw a similar kind of problematisation, coinciding especially with the increasing scope of supranational organisations in executing mandates of humanitarian assistance (Coppi et al., 2021). Humanitarianism is, in its own nature, needs-driven and operated through organisations with the mandate to cater to vulnerable populations across borders and nations.

With cross-national humanitarian work, the orthodoxies of ICT4D underwent multiple adaptations to respond to the role of supranational

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assistance bodies. In a core conceptual shift, humanitarian work disputes the assumption that sees the state as the core service provider and combines it with the large-scale operations that supranational bodies put in place for groups – including refugees, displaced persons and forced migrants – whose assistance is designed to operate across countries. As a result, a central idea of e-governance in which ICTs supported primarily state-level actors has given rise to new, multi-actor governance models that ICT can support in many ways. Digital humanitarianism, the conceptual core of this chapter, constitutes one of the models that such evolution has generated.

This chapter examines the concept of *digital humanitarianism*, which I define as the assemblage of processes, means and technologies through which the practice of humanitarian work is digitised. Emerging from the ongoing crisis of the core assumptions of ICT4D research (Masiero, 2022), digital humanitarianism relies on a novel orthodoxy on how digital technologies, converting individuals into machine-readable data, can support the humanitarian operations that supranational organisations routinely conduct. Drawing on core texts in humanitarian work, I unpack the notions of *mapping*, *providing* and *empowering* as core building blocks of digital humanitarianism, detailing their ability to sustain a data-for-humanitarianism orthodoxy. At the same time, I draw on empirical research to dispute all three notions: research on digital humanitarian contexts reveals substantial issues of design injustice (Costanza-Chock, 2020), leading to the need for discussing the extent to which, and the possibility for routes how, digital humanitarianism can aim to fulfil its promises.

The chapter is structured as follows: After having defined the notion of digital humanitarianism, I detail the building blocks – *mapping*, *providing* and *empowering* – of the data-based orthodoxy that animates it. I then use empirical works on digital humanitarianism to problematise such an orthodoxy, illuminating issues at the levels of mapping, providing and empowering. The discussion conciliates the orthodoxy with its empirical grounding, illuminating gaps to fill and an underlying issue, that of design injustice, to be directly faced.

7.2 Data-for-Humanitarianism: Anatomy of an Orthodoxy

With the shift from the state to a multi-actor space as the empirical centre of ICT4D research (Madon, 2009), digital humanitarianism has entered the array of topics that the field of ICT4D is concerned with. I draw on recent works on the topic, especially the work of Schoemaker et al. (2021) and Madon and Schoemaker (2021), in defining digital humanitarianism as the assemblage of processes, means and technologies through which the practice of humanitarian work is digitised. Such a definition is purposefully broad, and may partially contrast with narrower, field-centred definitions

focusing on technologies operated for humanitarianism or on their surveillance affordances (Sandvik, 2017). With my assemblage-centred definition, I blend together technical approaches to the subject with more sociotechnical visions, which leave more space to the organisational and societal implications of digitising long-established humanitarian practices.

Orthodoxies, meaning shared sets of assumptions linking ICTs and various aspects of development, have emerged at multiple times in the ICT4D history (Heeks, 2014; Walsham, 2017). Such orthodoxies differ according to their fields of application: in earlier days, ICTs were conceptualised as "the missing link" between basic needs and globalisation (Akpan, 2003), a philosophy then problematised by the field's researchers (Avgerou, 2003; Madon, 2009). With its evolution, the ICT4D field started developing theoretical links between precise technologies and particular aspects of development, also engaging in active problematisations of the functioning of such a link. One such case is the emergence of a "digital identity for development" orthodoxy, linking new technologies of digital identification (Nyst et al., 2016) to objectives of service provision, inclusion of minorities and social assistance, all seen as constituents of a human-centred vision of socio-economic development (Masiero & Bailur, 2021).

Against this backdrop, a data-for-humanitarianism orthodoxy links datafication, viewed as an emerging trend within studies of society and technology at large, to humanitarian work practices enacted in a cross-border way by mandated organisations. With *datafication* I refer, with Mayer-Schönberger and Cukier (2013), to "the rendering of existing processes into data", resulting in machine readability of the objects of conversion. Such machine readability makes the conversion objects amenable to administration, for example, by matching a person's datafied identity with the entitlements they are due to receive under a development scheme or social protection programme. The datafication of individuals, especially coming from largely unidentified populations which require assistance according to their needs, is the central operation informing a data-for-humanitarianism orthodoxy (Taylor & Broeders, 2015; Martin & Taylor, 2021).

As noted by Madon and Schoemaker (2021), populations in need for humanitarian assistance are largely unidentified. Forced migration often implies the loss of documents, ranging from foundational proofs of identity to educational and professional attestations, to which the construction of a life in the host country – and indeed the very ability to obtain legal status in it – is conditional and whose absence seriously hampers perspectives of life in the host country. Faced with the dire need to register undocumented individuals and households, humanitarian organisations find in datafication the opportunity to leverage digital technology for the execution of accurate, service-catering operations for their beneficiaries. A powerful attestation of the data-for-humanitarianism orthodoxy is found in the public

communication of the World Food Programme (WFP), after announcing its partnership with the private software company Palantir:

> The sheer scale of WFP's operations, assisting some 90 million people in about 80 countries, means that even small efficiencies in operational and supply chain management can lead to dramatic savings. (. . .) Making this data accessible across the organization will help WFP become even more efficient in multiple programme areas, including cash-based transfers, supply chain optimization, and nutritional requirements.
>
> *(WFP, 2019)*

Two points are particularly relevant in the WFP's declaration. First, such a statement accompanied the launch of a partnership with a private tech giant, a type of actor that – with its material provision of technologies necessary for digitisation – plays a substantial role in datafied humanitarianism. Second, the rationale to partner with Palantir for datafying WFP's beneficiaries acquires multiple facets, which transcend the strict process of data conversion that digital registration alone involves. The notions of mapping, providing and empowering are all part of this orthodoxy, and below they are described along with their interrelationships.

7.2.1 Mapping

With this notion I refer to the operation of making quantitative and qualitative sense of a target population, for the humanitarian provider to establish entitlements and, in turn, be able to disburse them. Madon and Schoemaker (2021) note how mapping a target population can be especially challenging in contexts of forced displacement: studying the Population Registration and Identity Management Ecosystem (PRIMES), a digital platform adopted by the United Nations High Commissioner for Refugees (UNHCR), they note how converting people into machine-readable data can be challenging in the absence of breeder documents (Nyst et al., 2016). They also note, however, that population management platforms like PRIMES allow matching people's datafied identity with their entitlements, enabling organisations to cater the right entitlements to all entitled beneficiaries. Having the mandate of "providing international protection (. . .) and of seeking permanent solutions for the problem of refugees", the UNHCR crucially needs to map its served population, assigning to each recipient the services, goods and provisions they are entitled to.

7.2.2 Providing

The authorisation to provide services, as noted by Nyst et al. (2016), is predicated on people's successful authentication as someone who is entitled to

access such services. Difficulties in mapping refugee populations hence tend to result in difficulties of service provision: faulty or absent recipient registration, or a lacking linkage between recipient identity and entitlements, may affect the ability of beneficiaries to access the food, cash or shelter they may need. Accuracy of service provision is a widely cited reason for humanitarian organisations to take up datafied technologies: the Biometric Identification Management System (BIMS), based on PRIMES, is used by the UNHCR and WFP to associate each registered refugee with biometric credentials so as to access in-kind and cash subsidies in a securely verified way. Such technologies, argues a data-for-humanitarianism orthodoxy, enable the disbursement of basic-need commodities in a way that also protects the user, and the scarce-resource humanitarian system is tasked with serving a vulnerable population.

7.2.3 Empowering

A primary, datafication-centred view of the orthodoxy could end up with service provision, which is the core purpose of the collection of people's data. Research on digital humanitarianism has, however, found that the effects of datafication transcend the authorisation-authentication nexus and involve practices seeking to empower communities that have been made dependent on service providers. In her work on blockchain-based biometric applications, powered by UN Gender (GEN) in refugee camps in Jordan, Cheesman (2022) notes that cash-for-work programmes are a route fostering refugees to pursue self-sustenance, earning cash to fulfil their needs rather than having to rely on humanitarian assistance. Digital technologies are purposefully tailored to the making of such empowerment: as noted by one of the respondents of Madon and Schoemaker (2021, p. 940), "there is a really big push by many agencies such as WFP, ECHO, STC and Mercy Corps to go large on cash, pushing new technologies and trying to enable individuals to choose their own path".

Figure 7.1 summarises the three, interlocked channels of the data-for-humanitarianism orthodoxy. On the one hand, mapping responds directly to the need to quantify recipient populations, qualitatively classifying them to optimise service delivery (WFP, 2019). On the other, service provision is predicated on mapping, which in turn enables individuals to pursue empowerment opportunities that go beyond the sheer reception of services. Digital technologies are implied in all three components of the nexus, which could not exist without the provision and use of digital technologies. While well-articulated as it is across humanitarian programmes, a data-for-humanitarianism orthodoxy needs the test of empirical research to be observed in practice.

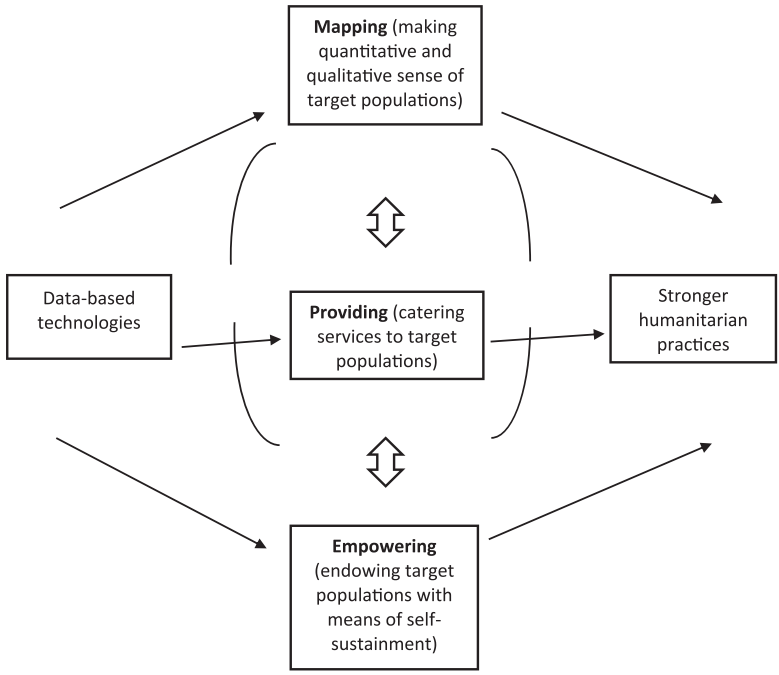

FIGURE 7.1 Components of the data-for-humanitarianism orthodoxy.

7.3 Data-for-Humanitarianism: The Orthodoxy in Practice

All three notions of mapping, providing and empowering are integral to the fulfilment of an orthodoxy centred on data-for-humanitarianism. At the same time, empirical studies focused on different angles of the same orthodoxy, which resulted in accounts that – focused on different organisations and fields of operation – ended up problematising all three building blocks. Below I provide a review of such questionings and their consequences for the recipients of humanitarian aid.

7.3.1 Mapping

The point made by WFP (2019) above highlights a core aspect of the problem: it is "the scale of (the organisation's) operations", along with the need to produce accessible data, that strengthens the importance of quantitatively and qualitatively mapping the beneficiary population. Generating reliable estimates of the population to be served is supposed to lead to efficient management of scarce resources, towards which datafication is crucial. While well-articulated, the orthodoxy clashes with empirical research on refugee

registration: in fact, issues of *double registration* and *informational injustice* are especially prominent in questioning the basis of the "mapping" notion.

Double registration is a term utilised across contexts in the field of humanitarianism. One context, that of refugee registration in Kenya (Weitzberg, 2020a; Haki na Sheria, 2021), associates the concept to a particular case: occasions of forced migration, such as the outbreak of civil war in Somalia in the 1990s, coincided with intra-national issues including a drought in north-eastern Kenya, leading many Kenyans to flee, in turn, to refugee camps. With a large influx of people in the camps, the UNHCR staff in charge of assistance struggled to distinguish people who qualified as refugees as they fled Somalia from national Kenyans who, while in desperate need of vital supplies, did not qualify as such. Many Kenyans across the years, as Weitzberg (2020a) noted, turned up at the refugee camps, claiming Somali citizenship in order to access food and shelter provisions needed for survival.

Biometric registration was first introduced for refugees in Kenya in 2007, and in 2011 its systems began to be shared with Kenya's Refugee Affairs Secretariat. On the one hand, such systems fully followed the "mapping" part of the orthodoxy: refugees were identified with their unique biometric credentials and the household size and the entitlements connected to them were determined. But on the other hand, registration of Kenyans in need for commodities was to come with a high price in the years to follow. Registered as refugees in the UNHCR database, residents were turned down at the Kenya National Registration Bureau when applying for a national ID card, a condition that many people found out about only when turning 18, the legal age for a Kenyan national ID card (Haki na Sheria, 2021). Through the voice of a victim of double registration, Weitzberg (2020a) details such an impact:

> "If I want to open an M-Pesa line," (. . .) "I can't register without an ID. If I get a bit of money, I don't have a place to put it. It's necessary for me to keep it at home. And at home, it can be lost. I don't have any kind of [bank] account".[1]

A different perspective is provided by humanitarian organisations' staff, in some cases problematising the ethics of registration of people who, while not qualifying as refugees, still need provisions that a refugee status would afford them. As noted by a UNHCR official interviewed by Iazzolino (2021, p. 120) in the context of double registration in Kakuma refugee camp, northern Kenya:

> It is a matter of fairness, because not everybody is entitled to aid. Those who are claiming aid without being refugees, or using the card of someone else are robbing other refugees.

The ethical judgment of "robbing", about people claiming benefits without which their livelihood and lives would be in serious predicament, raises

more questions on what situations of double registration can yield on people. A similar case is described by Canzutti (2019): studying the legal status, and the associated service provision, of Vietnamese residents settled in Cambodia, she notes how rapid policy changes led to "downgrading" of Vietnamese to foreign resident status, directly affecting the basic-need provisions associated with them. Rather than challenging a rights-depriving idea, the digital registration system ended up reinforcing its provisions, leaving Vietnamese residents in Cambodia unaware of the impact that such changed status would yield on them (Aradau & Canzutti, 2022).

The problem illuminated by Weitzberg (2020a) and Aradau and Canzutti (2022) acquires the guise of what Masiero and Das (2019) refer to as *informational injustice*. The concept points to a condition in which people are not informed, or are outright misinformed, on how their data are handled: in Kenya's double registration, people could not know that machine readability, or indeed the establishment of "machine-readable refugees" (Weitzberg, 2020b) could affect so deeply the provision of direly needed goods in the future. In the case of Vietnamese residents in Cambodia, the downgrading to "foreign citizens" happened silently, so much so to leave people having to contend for benefits that were, till shortly before, automatically granted with citizen status. In both cases, informational injustice added to the difficulties that recipient populations lived from the time of migration.

In sum, a data-for-humanitarianism orthodoxy directly relates the mapping affordance of datafication – quantifying, and qualitatively assessing, a vulnerable population – to the ability of serving that population more accurately. Issues that affect mapping, such as double registration and informational injustice, still leave an open question on the extent to which the conversion of recipient populations into data can inspire solutions. More questions emerge when the problem, from population mapping, is viewed in the light of the provision of services.

7.3.2 Providing

The data-for-humanitarianism view is crucially predicated on the notion that authorisation to access goods or services is predicated on authentication for the same. Recipient populations reveal high awareness of resource scarcity, reason for which beneficiaries – concerned with obtaining the right entitlement for their households – give many positive reports on the introduction of biometric applications in service delivery. In the words of a recipient of BIMS interviewed by Schoemaker et al. (2021, p. 22):

> Associating [food] distribution with [registration], they should use biometrics because there is corruption. They should use biometrics because it builds confidence.

With their ability to uniquely identify individuals based on biological aspects, biometric technologies are directly associated with the opportunity of distinguishing entitled recipients from non-entitled ones. Such an opportunity, needful recipients argue, is especially important when limited resources are to be distributed on an urgent basis (Schoemaker et al., 2021; Weitzberg et al., 2021). Even beyond assistance to refugees, biometrically verified provision of services is associated with the linkage of individuals with their entitlements: this, the digital-identity-for-development view argues, combats both *inclusion errors* (the erroneous inclusion of non-entitled beneficiaries) and *exclusion errors* (the erroneous exclusion of entitled ones). Such discriminating capabilities of biometrics arguably fostered their entrance in the humanitarian sector, beyond public service provision at the national level (Gelb & Clark, 2013; Gelb & Metz, 2018).

But seen from the eyes of recipients, the use of biometric technologies in service provision appears more multifaceted than the orthodoxy would show. Relevant examples come from social protection, defined by Devereux and Sabates-Wheeler (2004, p. 1) as "all public and private initiatives that provide income or consumption transfers to the poor, protect the vulnerable against livelihood risks, and enhance the social status and rights of the marginalised". The use of biometrics in social protection comes with the promise of combating inclusion and exclusion errors at the same time: biometrics act, on the one hand, at the authentication level, where the person is recognised with unique credentials as being who they claim to be. But it also acts at the level of authorisation, based on the matching of the person's credentials with entitlements in cash, services or in-kind goods. The binomial relation between credentials and entitlements have made biometrics a fundamental tool in the global array of social protection tools (Gelb & Clark, 2013; Dahan & Gelb, 2015).

A recipients' perspective, however, problematises this linear relationship. Widely cited examples are made in relation to India's Aadhaar, the world's largest digital identity infrastructure which enrolled more than 1.3 million people in January 2023. Provided on a free basis and initially deemed as "voluntary" (Nilekani & Shah, 2016), Aadhaar enrolment affords the matching of biometric credentials to access key governmental services, including food security under the Public Distribution System (PDS) and employment guarantees under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). Aadhaar's proponents highlight significantly reduced corruption in such schemes owing to biometric authentication (Sharma, 2017): at the same time, studies of recipients report spikes in exclusions associated with the introduction of biometric verification (Drèze et al., 2017; Khera, 2017). In a study of the state of Jharkhand, Muralidharan et al. (2020) show a 10% reduction in benefits for the 23% users who had not linked an Aadhaar card to benefit rolls, of whom 2.8% received no benefits

at all. In the same state, hunger deaths have been reported in association with the introduction of biometrics, with people becoming unable to claim food rations due to the inability to authenticate biometrically (Singh, 2019).

These types of concerns populate digital humanitarianism, resulting in situations of open opposition to programmes introducing biometric authentication in humanitarian aid. In his study of BIMS in Kenya's Kakuma refugee camp, Iazzolino (2021) describes how registration of fingerprints, urged for refugee household heads, was met with open resistance from recipients: some elders, as Iazzolino (p. 111–112) described, suggested accompanying the introduction of biometric recognition with an increase in food rations to compensate its perceived disadvantages. Met with surprise by UNHCR officials upholding the data-for-humanitarianism orthodoxy, such concerns predate the introduction of BIMS: with fingerprinting being deeply inscribed in Kenya's colonial legacy (Weitzberg, 2020c), biometrics have become part of the relation between Kenya's state and its large ethnic Somali population (Iazzolino, 2021, p. 112). Crystallising a situation of otherness that Somali refugees have long lived (Weitzberg, 2017), biometrics are met with suspicion, adding to the concern that authentication failure will lead to deprivation of essential goods.

Adding to unwanted exclusions, changes introduced in humanitarian policy with digital tools reveal one more layer of concern among the recipient population. One such case is the digitally enabled transition from in-kind aid, such as food rations, to cash transfers, often enacted through mobile technologies that enable the transfer of money (Aker et al., 2011). From an economic perspective, cash transfers eliminate the distortion that in-kind subsidies generate: in addition, they act directly on corruption by eliminating "intermediaries" incentivised to siphon off goods (Government of India, 2015). Perspectives from recipients, such as women refugees interviewed in Uganda's Bidi Bidi camp by Madon and Schoemaker (2021, p. 946), are however different:

> Money is nothing to us here. Food is more important. Men would say yes [to cash transfer] because they are drunkards and would use the money for drinking alcohol and smoking. They don't mind if the children eat or not. Moreover, in Yumbe there is food starvation. Even if we had the money we would wonder where to buy food from.

The women interviewed by Madon and Schoemaker (2021) reveal two orders of concern. A first one is with the diversion of cash to goods, such as alcohol and smoking, which are of no use to the self-sustenance of households, a problem that food rations avoid. A second issue lies in the practical feasibility of a cash transfer system, in a situation where starvation prevents the possibility of using cash to buy food in markets. Both concerns are echoed by early

studies on how India's Aadhaar was prospected as a cash-transfer enabler: when faced with this possibility, recipients of rations met it with widespread concern, motivated by similar reasons of food security (cf. Aggarwal, 2011; Puri, 2012; Khera, 2014). The mobile-enabled move to cash transfers adds a layer of concern to digital humanitarianism, enabling a shift that refugees meet with widespread fear and preoccupation.

Issues of exclusion, reification of colonial legacies, and unwanted policy redirection cast a shadow of doubt on the notion of providing in the data-for-humanitarianism orthodoxy. The empowerment that should stem from that service provision, also digitally enabled, is itself questioned.

7.3.3 Empowering

The logic tying digital technologies, such as biomtrics or mobiles placed directly in the hands of recipients, to recipients' empowerment, is in turn problematised by users. In her study of a cash-for-work programme for Syrian refugee women in Jordan's Al-Azraq camp, Cheesman (2022) noted how an iris-scan reader allowed women to withdraw their salaries through paper receipts, provided by a machine located in the camp's supermarket. Powered by GEN, the scheme had the purpose to "empower" women to collect their salaries from the bank, equipped with paper receipts that would state their exact earnings for precise time periods. This allowed, at the same time, transparent accounts of salaries provided by GEN to beneficiaries, achieving the accountability standards demanded by donors and embedding them in the organisation's working practice.

The reality that Cheesman (2022) found on the ground was, however, very different. Rather than empowerment, the refugees she interviewed displayed multiple concerns in relation to the new system: before its introduction, their salary would come in envelopes with cash that they could readily use and that revealed exactly which working days the salary was for. In the biometric system they have, instead, to experience frequent eye scans, a practice that they associate with fear and uncertainty (Osseiran, 2022). Such a system results in receipts that enable cash withdrawal from the bank, but this differs profoundly from the prompt, readily usable cash-in-hand to which they were used. "When they talked about 'receiving my salary,' Cheesman (2022) notes, they meant having the cash in their hands, not the digital value in their GEN wallet".

Inability to access cash-in-hand adds a layer of complexity to refugees' lives, ultimately eroding the very empowerment that physical envelopes – related to precise working days and times – instead guaranteed to the same beneficiaries. Further erosion is arguably provided by yet another layer of informational injustice: data shared by refugees during registration, as noted by Schoemaker et al. (2021), are often unclearly associated with the benefits provided and not clearly related with the entitlements received by households

(Janmyr & Mourad, 2018). Experiences of refugee registration in Uganda, reported by Schoemaker et al. (2021, p. 13), reveal such opacity:

> They did not explain [why they need this information]. They were also asking under pressure because the population was too big. That did not give us time to ask.

Opacity in the treatment of refugee information is, in turn, related to issues of undue surveillance, which put refugees in positions of serious predicament throughout their journey. As Pelizza (2020) noted, a shift in the EURODAC database of asylum seekers in 2015 made such a database interoperable with national police authority databases across Europe. Profiling of displaced persons during and after migration can result in outcomes of capture, deportation and even death: as Newell et al.'s (2016) study of migrants at the US-Mexico border reveals, it is these concerns that lead to the use of "secure" mobile devices, to be abandoned at the time when their ownership represents further danger for the migrant. The linking of data-based profiling to tracing and repression (Akbari & Gabdulhakov, 2019) contrasts the logic of empowerment, casting doubt on whether this component of the data-for-humanitarianism technology is effectively being realised.

Table 7.1 summarises the problematisation of the notions of mapping, providing and empowering contained in the data-for-humanitarianism orthodoxy. Questioning all three components, such an analysis leaves us in doubt on the effective ability of digital system to create a fairer humanitarian sector, which knows the needs of beneficiaries and actively responds to them.

TABLE 7.1 Problematisation of the notions of mapping, providing and empowering contained in the data-for-humanitarianism orthodoxy

Concept	*Definition*	*Hurdles*
Mapping	Making quantitative and qualitative sense of a target population, for the provider to establish entitlements and be able to disburse them	Double registration: people incorrectly registered as refugees cannot claim citizenship rights, risking statelessness and a lack of access to essential provisions (Weitzberg, 2020a; Haki na Sheria, 2021) Informational injustice: people being opaquely classified in ways that deprive them of essential rights (Canzutti, 2019; Aradau & Canzutti, 2022)

(*Continued*)

TABLE 7.1 (Continued)

Concept	*Definition*	*Hurdles*
Providing	Delivering services to target populations in the forms indicated by humanitarian organisation policies	Exclusions from essential services due to inability to authenticate biometrically (Drèze et al., 2017; Muralidharan et al., 2020) Preservation of colonial legacies in biometric systems, strengthening people's dependency (Iazzolino, 2021; Weitzberg, 2020c) Distortion of policy towards undesired outcomes, such as the transition from food rations to cash transfers (Madon & Schoemaker, 2021)
Empowering	Enabling target populations to reach self-sustenance and make independent decisions on their lives and livelihoods	Inscription of adverse logics into technology, such as the replacement of cash envelops with iris-scan recognition (Cheesman, 2022) Profiling of recipients for policing purposes, such as EURODAC's interoperability with national police authority databases across Europe (Pelizza, 2020)

7.4 Discussion: Fair Data-for-Humanitarianism?

I have started this chapter by elucidating the data-for humanitarianism ideology, illuminating the notions of *mapping*, *providing* and *empowering* that constitute its core. I have then problematised all three building blocks of the orthodoxy, relying on empirical studies of recipients for whom the promises of data-for-humanitarianism did not materialise. How to conciliate the orthodoxy with the shortcomings it meets in recipients' lived reality?

As a first pointer, Winner (1980) illuminates an important aspect. Artefacts, he notes, have politics designed within them: few examples are more popular than Winner's reflection on the low height of overpasses on the parkways to New York's Long Island, designed by chief master Robert Moses to impede the passage of buses, mostly used by poor people and Blacks. Just like Moses' bridges embed a discriminatory logic, digital artefacts are very capable of embodying policies adverse to refugees: the move from food to cash transfers, informational injustices and undue surveillance of profiled refugees are all examples of this. Artefacts that embody policies adverse to

refugees are not designed for their sustenance, and they generate detrimental outcomes which the system writes in itself.

The notion of design injustice, theorised in Costanza-Chock (2020) on the basis of principles elaborated by the Design Justice Network, help us understand the issue with artefact policies. Rather than a "dark side", a term widely utilised across fields to indicate unintended, negative consequences of technology, we are facing injustices that are designed directly into artefacts and are therefore a lot deeper than a "dark side" literature would tell. By way of example, Martin and Taylor (2021) compare SIM card registration policies for displaced persons in Uganda and Bangladesh: Uganda's liberal system, where refugees are entitled to legal recognition and allowed SIM card registration, differs from Bangladesh, where selling a SIM card to Rohingya refugees is forbidden by law. Such a prohibition is not an incidental consequence of the system: it is directly designed into it, resulting in the injustices that Martin and Taylor (2021) illuminate.

Design injustices, however, do not necessarily tell the story of the artefact till its very end. My contention is that understanding injustice – with the impact it has on users – is crucial for designing just, responsive technologies, which meet the needs of recipients on the ground (Access Now, 2024). An example comes again from Kenya, where the civil society organisation Haki na Sheria – literally, "justice and law" in Swahili – has combated long battles to support victims of double registration, arriving at the issuance of national ID cards for many such victims in 2021/2022 (Haki na Sheria, 2022). The organisation's commitment does not end with advocacy: over the last months, Haki na Sheria has conducted mobile birth registration to ensure rights in conditions where birth registration cannot be easily achieved. Predicated on awareness of the injustice that double registration has perpetrated, the birth registration effort of Haki na Sheria constitutes an important example of fair identification, which the data-for-humanitarianism logic can leverage to convert the promise of "empowerment" through registration into reality.

And it is here that design literature makes an important, final contribution to the topic of digital humanitarianism. It is crucial, argue Schoemaker et al. (2021), to involve recipients into digital efforts: that is, to appraise recipients' needs in ways that are not merely consulted but effectively inscribed in the design of technologies aimed at them. Issues like the undue transition to cash transfers when refugees need food rations, or the transition to iris-scan machines when cash envelopes ensured the security recipients valued, are actively countered by direct involvement of beneficiaries in the making of technologies themselves. In combating such issues, participatory experiences like those of Haki na Sheria (2022) are especially illuminating in pursuing the objective of fairer enactments of a data-for-humanitarianism view.

7.5 Conclusion

This chapter has illuminated the founding logic of data-for-humanitarianism, elucidating the building blocks of *mapping*, *providing* and *empowering* of which it consists. It has then problematised all three building blocks, noting the shortcomings of the orthodoxy as experienced in people's real lives. In conciliating these two realities, the notion of design justice has helped us illuminate how the shortcomings of data-for-humanitarianism can be leveraged to build fairer technologies, which respond more directly to recipients' needs. Embodying the spirit of Critical ICT4D, such shortcomings have inspired a discussion of how digitality can be involved in the production of fairer humanitarian practices.

Note

1 The reference is to M-Pesa, the mobile-based money transfer service that constitutes a key infrastructure for money transactions in Kenya (Jack & Suri, 2011).

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8

REIMAGING SMART CITY TRANSPLANTS FOR THE GLOBAL SOUTH

A Post-Colonial Lens on Human Rights and Digital Sovereignty

*Alina Wernick, Gabriel Udoh, and Emeline Banzuzi**

8.1 Introduction: Transplanting Smart Cities to the Global South

Digitalisation through the adoption of smart city technologies, as well as the urbanisation of Africa, with the exponential expansion of its megacities, are identified as essential megatrends in the future of cities (ESPAS, 2019, pp. 3, 7; United Nations, n.d.a). The future of Lagos, Nigeria, as a smart city, has indeed also captured the imaginations of the Global public with the recent Disney+ series Iwájú, in which digital technologies are deployed against crime and "to turn Lagos into a utopia" (Latif, 2024). In this chapter, we examine the relationship between smart cities in the Global North (GN) and the Global South (GS) through a critical analysis of smart city transplants, with particular locational reference to Lagos, Nigeria, and a technological focus on safety-enhancing smart city technologies. The chapter also highlights the necessity of context-aware and human rights-based approaches to smart city development.

There is no single definition of a smart city (see, for example, Söderström et al., 2014; Kitchin, 2022), but two main interpretative models are commonly applied to compose a definition: a technocentric view and a human-centred view (Mora et al., 2017). The technocentric view arguably simplifies urban challenges to issues that are most efficiently solved by different technology applications. In line with this view, smart city technologies can be characterised "as computational models of urbanism and data-driven and algorithmically intermediated technologies" which, in the municipal context, are perceived to enhance efficiency (Botero Arcila, 2022, p. C48 S1), safety (Lacinák & Ristvej, 2017), and sustainability (Osipov et al., 2018). The concept

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of "smart cities" is, for example, associated with the use of ICT and the Internet of Things (IoT) in urban planning and management in a wide range of sectors, such as transportation to energy and utility management, education, and medical and security services (Osipov et al., 2018, p. 2). According to the human-centric view, on the other hand, the building of smart cities should emphasise citizen participation to address the local needs of city dwellers (Schaffers et al., 2012; Manville et al., 2014). Within this context, smart cities are cities "... that combine[s] information and communication technologies, social infrastructure (human and social capital) and public institutions to dynamize its economic, social, environmental, and cultural development" (Kozlowski & Suwar, 2021, p. 509). In Lagos, for instance, smart city projects have been aimed at enhancing transportation, connectivity, and productivity by building a rail network, upgrading roads and fibre-optic cables, promoting STEM education, improving public service delivery, and connecting the city to the global knowledge economy (Ogunrinde, 2021).

Cities are economic hubs, driving societal development, providing access to knowledge, and playing a significant role in poverty reduction, environmental improvement, and infrastructure improvements (Ogunseye et al., 2022, p. 30). A commonly established motivation for building smart cities in the GN is to enhance public safety (e.g. Joh, 2019). A dramatic surge in smart city initiatives has been witnessed throughout the African continent in recent years. Africa seems to have joined the race for high-paced smart city developments from Kenya's Konza Techno City to Ghana's Hope City, across South Africa's Lanseria Smart City and Rwanda's Vision City (Boyle et al., 2023). Nigeria's Eko Atlantic City has even been viewed as Africa's "Dubai" and has been reported to attract investments from the US Consular Office (U.S. Mission Nigeria, 2022). Nevertheless, these glossy, elitist visions of African smart cities often neglect the realities of the human, societal, and infrastructural context of urban life in Africa (Watson, 2015), which risks exacerbating the marginalisation of the poorer population (Watson, 2014).

The idea of smart cities is neither neutral nor universal; its development depends on the historical, cultural, and political circumstances of different regions and countries. For instance, Šulyová and Vodák (2020) opine that cultural aspects influence smart city development by shaping policies, management strategies, community engagement, and urban planning approaches. The fact that the imaginaries fuelling Western conceptions of smart cities fail to account for the needs of African cities (Bandauko & Nutifafa Arku, 2023). Moumen et al. (2024, p. 13) also affirm that the distinctive nature of different African cities in terms of geography, history, and culture makes the application of a uniform smart city model impossible. We stress that from large greenfield projects to grassroots interventions, these smart city initiatives often borrow or derive inspiration from or import models created and promoted in the GN by multinational corporations, international

organisations, and academic institutions. First, smart city initiatives in the GS are often supported by investment and technology corporations from the GN (Willis & Aurigi, 2020, p. 126). This underscores that smart cities in African contexts are shaped by corporate interests, portraying what Willis and Aurigi (2020) call "a techno-utopian" vision. Examples like Eko Atlantic and Centenary cities in Lagos and Abuja, respectively, have been funded by foreign investments (Willis & Aurigi, 2020). The former and the Imperial International Business City initiative were designed by an engineering company from the Netherlands (Bandauko & Nutifafa Arku, 2023). Notably, Nigeria's Smart Cities Summit 2017, sponsored by Huawei, reflects the significant international influence on these techno-utopian narratives surrounding African smart cities (Willis & Aurigi, 2020). Moreover, partnerships between governments and foreign entities, as seen in Addis Ababa implementing a smart parking solution with Chinese technology, further illustrate the impact of "Western" interests on shaping smart city developments in Africa (Moumen et al., 2024).

In this chapter, we employ the term *smart city transplants* to describe instances where initiatives, technologies, policies, or legislations designed for one city or community are copied, adopted, and implemented without taking into account the unique challenges, opportunities, and needs of the receiving community – in this case, the GS.

The critical literature on smart cities has drawn attention to the power relations and inequalities associated with smart cities (Kummitha & Crutzen, 2017). In the GN, smart cities have been criticised for technological solutionism and reinforcing neoliberal logic (Cardullo & Kitchin, 2019), representing urban planning driven by business interests and drive to attract capital (Hollands, 2020). This pushes for scalability instead of devising local solutions (Greenfield, 2013; Kitchin, 2015; Cardullo & Kitchin, 2019), turning the everyday life of city dwellers into measurable and usable data, i.e. "datafication" (e.g. Sadowski, 2019), digital (neo)-colonialism (Mouton & Burns, 2021), enabling surveillance (Galdon-Clavell, 2013) and control of citizens (Krivý, 2018). The development of Lagos is highly influenced by neoliberal ideology (Olajide & Lawanson, 2022) and is reflective of a top-down imposition of technological solutions largely disconnected from citizens' challenges and needs (Lawanson & Udoma-Ejorh, 2020). As mentioned earlier in this chapter, the Eko Atlantic and Centenary smart cities in Nigeria (heavily reliant on foreign funding) lack provisions for lower-income groups, contradicting the idea that such smart cities can address urban slum issues (Willis & Aurigi, 2020). On the contrary, Lagos smart city initiatives are associated with the evictions of thousands of people from poorer waterfront communities (Ajibade, 2017; Emeka, 2017; Ike & Esioba, 2017; Bandauko & Nutifafa Arku, 2023). Discussing the impact of the superimposition of Western signatures over smart city ideologies in the GS, Fernelius (2020) describes the

Eko Atlantic City as "a project launched with glossy veneer and devoid of social, political and historical context" and "an offshore account rendered in concrete".

Based on these, we hypothesise that when transplanted to the GS without adjustment and adaptation to the local context, smart cities risk reproducing power relations and epistemic violence associated with (neo)-colonialism, while disregarding lived realities and aspirations of the dwellers in these regions and reinforcing the region's technological dependency on the GN. This paper critically analyses the phenomenon of smart city transplants in the GS, with particular reference to Lagos, Nigeria, and focuses on applications enhancing safety. As we explain in more detail below, smart city initiatives in the GS have a track record of exacerbating inequalities, while safe, smart city applications feature high risks for human rights. We aim to contribute to the emerging literature on postcolonial smart cities in Africa (Odendaal, 2021; Boyle et al., 2023; Bandauko & Nutifafa Arku, 2023) and research on critical ICT4D (Tsibolane & Brown, 2016; Davison & Díaz Andrade, 2018; Masiero, 2022; Akbari & Masiero, 2023) by examining the transplantation of safe, smart city technologies and two human-rights-driven approaches (Wernick & Artyushina, 2023) to the context of Lagos. In our analysis, we rely on Edward Said's (1983) postcolonial travelling theory and dependency theory (Randall & Theobald, 1998; Kvangraven, 2021) to challenge the fitness of technology governance regimes developed in the GN to Lagos (see Tsibolane & Brown, 2016; Bradford, 2023). Besides localised approaches to human-rights-driven technology governance, we discover that postcolonial safe, smart city technology adoption in Africa should put digital sovereignty at its centre.

8.2 "Safe", Smart City of Lagos

We focus on safety as one of the main aims of smart cities by highlighting its integration of technology with people to increase safety, enhance crime reduction capabilities, tackle terror threats, provide a healthy environment for its citizens, and achieve readiness and quick response to emergencies. Some researchers have even asserted that "safety is a crucial component of life quality in every city", further equating smart cities to safe cities (Lacinák & Ristvej, 2017, p. 524). Based on this, our work emphasises that safety is a necessary constituent of smart cities, especially those with features such as smart traffic systems and routes, smart safety systems, crisis management systems, and centrally operated security apparatus. So, smart city adoption is often motivated by a desire to enhance safety, especially in African megacities – like Lagos – grappling with issues like violence and high crime rates (Echendu & Chiedozie Okafor, 2021). The Lagos state police commissioner has expressed interest in the technologisation of the state's law enforcement

(Chinweuba, 2022). Lagos suffers from epidemic violence (Ziebold Jorquera et al., 2017), whereas Nigeria has a high income inequality rate (Uduu, 2022), a factor contributing to high crime rates (Sugiharti et al., 2023; de Courson & Nettle, 2021). However, the absence of safety and trust causes another worry. In 2020, reports stated that government officials removed security CCTV cameras installed at the Lekki Toll Gate in Lagos, the venue of the EndSARS protest (Amnesty International, 2020). These cameras reportedly captured videos and images that would indict the government in the Foundation for Investigative Journalism's (2021) report of mass shootings by the Army. Citizens are unlikely to trust government-controlled technologies due to trust and safety issues such as these.

Lagos is the largest populated city in Africa, with a population of approximately 16 million and a projection of 24 million inhabitants by 2035 (Statista, 2023). By 2100, Lagos will become the world's largest megacity, with an expected population of 88 million (UN, 2022). In the last 20 years, Lagos has transformed from what once was perceived as an ungovernable city left to its own devices by military governance to an exemplary African city governed with a technocratic vision (de Garmont, 2015). Currently, Lagos is the fastest-growing tech hub in Africa, hosting a significant part of the African technology ecosystem. Okoye (2016) highlights the rise of "smart Lagos" in Lagos, facilitated by digital platforms like mobile phones and social media. One such initiative is ReVoDA, which crowdsources election data and allows citizens to report events. Other citizen-led initiatives include Truppr, WeCyclers, Gidi Traffic, ride-sharing service Jekalo, and taxi services like Tranzit, Easy Taxi, and Afrocab. However, megacities like Lagos also present challenges and opportunities for development – specifically, digitalisation, one of the global megatrends shaping their development in the coming decade (ESPAS, 2019, p. 3).

Lagos has experienced rapid urbanisation and economic development while simultaneously facing significant challenges related to poverty, inequality, informality, congestion, pollution, insecurity, and climate change (Olajide et al., 2018). To combat this problem, various actors have proposed or implemented solutions such as e-governance platforms, intelligent transport systems, digital surveillance networks, smart energy grids, or eco-city developments, often drawing inspiration from models such as Dubai's Smart City project or IBM's Smarter Cities initiative (Siba & Sow, 2017). For example, in February 2022, the Lagos State Resident Registration Agency (LASRRA) unveiled its LAG ID smart card initiative; this process collects biometric data of residents for use when accessing government services while also acting as payment cards during public transport trips, supermarket purchases, or cash withdrawal from ATMs. Furthermore, LAG ID holders may even use them "to apply for loans through the Lagos State Employment Trust Fund" (Perala, 2022).

Smart city transplants may not always be appropriate or effective in Lagos' urban context; they tend to ignore or erase complex sociocultural dynamics and historical legacies that define its urban fabric. Similar to what has been observed with smart city projects in India (Datta, 2018), the initiatives often favour elite groups or external actors over marginalised communities or local stakeholders and promote existing forms of inequality, exclusion, and vulnerability within Lagos' urban space (Willis & Aurigi, 2020), leading to the displacement of informal settlements (Bandauko & Nutifafa Arku, 2023), privatisation of public services (Olajide & Lawanson, 2022), surveillance/criminalisation of dissident voices or digital authoritarianism, and over-relying on foreign expertise/capital (Da Vinha, 2023). Siba and Sow (2017), lamenting the absence of inclusivity in smart city project planning, note:

According to Siba and Sow (2017):

> Kigali's Smart Neighborhood project, Vision City, creates a tech-enabled neighborhood with solar powered street lamps and free Wi-Fi in the town square. Critics, though, state that the project ignored the socioeconomic realities of a city where 80 percent of its population lives in slums with monthly earnings below $240 (Vision City Homes cost $160,000).
>
> *(Siba & Sow, 2017)*

Our discussion in this section indicates how these concerns have been replicated in similar scenarios around Africa and in the rest of the GS. Currently, the African smart city journey can be defined by brute urbanisation, inequality, and government restrictions (Achieng et al., 2021). Analysts have complained that, for instance, the Eko Atlantic City's designs appear to be tailored solely for the benefit of wealthy upper-class Nigerians and multinational companies, rather than with genuine consideration given to improving socio-economic prospects and sustainable use of the environment – as promised by its developers (Olumodimu, 2015). Generally, there is a huge deficit in trust between people and the government in Nigeria. This has grown over time due to corruption and worsening public services such as roads, electricity, potable water supply, quality education and healthcare provision (Abdulkareem et al., 2015, p. 78), and even human rights breaches (US Government, 2022). Based on this, government-controlled technologies are received with this same level of distrust.

Safe, smart cities are not a panacea to urbanisation challenges and require considerable legislative and governance measures to succeed (ESPAS, 2019, p. 5) and to gain citizen's trust. Neglecting the regulation and governance of smart cities exposes their citizens to human rights risks. Smart cities can create strata in societies that encourage discrimination and enhance existing irregularities. Implementing smart city technologies often implies an enhancement of policing and surveillance power through urban infrastructure (Botero Arcila, 2022). While increasing public safety is, in itself, a

common motivation for building smart cities, any smart city technology generally designed to increase the efficiency of city management can also be used for policing (Joh, 2019). The surveilling nature of smart cities raises risks to citizens' enjoyment of numerous human rights and freedoms, such as the rights to privacy (Article 12 of the Universal Declaration of Human Rights (UDHR)), to liberty and security (Article 3 of UDHR), to non-discrimination (Article 7 of UDHR), and to freedoms of expression and information (Article 19 of UDHR) and assembly (Article 20 of UDHR). Digital surveillance may also undermine democratic processes in Africa by chilling the enjoyment of these rights (Stevens et al., 2023; Murray et al., 2023). Particularly within the GS, where most urban populations live with multiple forms of inequality, exclusion, and vulnerability – smart city development presents both challenges and opportunities to overcome those circumstances.

8.3 Smart City Transplants as Digital Neocolonialism: On Technology Imports and Dependency

The dependency theory explains that the underdevelopment of the GS results from its integration into the capitalist world system dominated by the GN. It has been defined as "a situation in which the economy of certain countries is conditioned by the development and expansion of another" (Theotonio dos Santos, cited in Kvangraven, 2021, p. 78). Generally speaking, the development of the GN draws from the active underdevelopment of the GS, for example, through colonial control over its people and resources or, more recently, multinational ownership technology (Peet & Hartwick, 2015, pp. 188–189). In line with the theory, the GS depends on the GN for technology, capital, markets, and political support, creating an unequal and exploitative relationship that hinders its development (Randall & Theobald, 1998).

Internationally, smart city developments have been driven by ICT giants such as Cisco and IBM (Sadowski & Bendor, 2019; Bandauko & Nutifafa Arku, 2023), followed by Siemens (Townsend, 2013). The market involves actors such as US-based Big Tech Companies such as Google and Microsoft, European Telecommunications companies such as Ericsson and Nokia, and Chinese tech conglomerates such as Huawei and Alibaba (D'Amico et al., 2020). Integrating exported smart city technologies into the infrastructures of African smart cities raises questions about neo-colonial control. On the one hand, US-based Big Tech companies are associated with surveillance capitalism (Zuboff, 2019) and digital colonialism, characterised by market dominance and controlling digital architectures, connectivity, and data (Kwet, 2019). Western Big Tech companies may also engage algorithmic colonialism by deploying AI solutions that fail to account for the African context and needs (Birhane, 2020).

However, China has also been viewed as engaging in digital neocolonialism through its policy of funding, supplying, and digital infrastructures in

Africa (Gravett, 2020). In 2021, China accounted for two-fifths of Nigeria's total imports of electrical machinery and electronics (totalling nearly $5 billion, including telecommunication, data processing and office equipment, and integrated circuits and electronic components) (OEC, 2021; Trading Economics, 2023). The Chinese government even offers soft loans to encourage the transfer of these technologies that potentially infringe on citizens' rights – sometimes where the government uses these as surveillance tools against the population. China's involvement in Africa through initiatives like the Digital Silk Road further facilitates this transfer (Roberts et al., 2023). This infrastructural power of China is associated with concerns of state surveillance, technological dependence (Bradford, 2023) and exporting more authoritarian internet governance practices that limit the freedom of expression and repressive surveillance (Gravett, 2020). In Kenya, concerns were raised regarding security flaws in Chinese-powered surveillance technology that could serve as a "backdoor" for data access by Chinese state entities (Jili, 2022, p. 47). Chinese companies like Huawei and ZTE supply infrastructure for mass surveillance – including street cameras and even mobile phones – in African countries, including Ghana, Malawi, Morocco, Nigeria, and Zambia – raising concerns regarding citizens' privacy rights (Roberts et al., 2023). While human rights violations cannot be assumed to be a direct consequence of relying on Chinese technology, it may facilitate governments with authoritarian inclinations (Bradford, 2023).

Moreover, relying on imported technology also increases dependence on exporting countries. The dependency theory suggests that Nigeria's underdevelopment is partly caused by its dependence on Western technologies and tech laws that are not suitable or sustainable for its own development goals. Nigeria has been exporting its natural resources, such as oil and minerals, to the GN (EIA, 2023, p. 9) and importing technologies such as computers, telecommunications, and automobiles. In 2022, Dr Dan Azumi Mohammed Ibrahim, Director-General of the National Office for Technology Acquisition and Promotion, revealed that over 90% of technologies that power Nigeria's economy are imported (ITPulse, 2022). However, these technologies have not improved most Nigerians' living standards or productivity but rather increased their vulnerability and inequality (Nwokoye et al., 2019). Therefore, the dependency theory argues that Nigeria needs to develop its own technologies and tech laws that are appropriate and responsive to its development challenges and aspirations.

8.4 Human Rights-Based Approaches Through Postcolonial Lens

Previously, we established the human rights vulnerabilities associated with introducing safe, smart city solutions to the technologically dependent

context of Lagos, Nigeria. In this section, we review the applicability of the two human rights-based approaches to govern (safe) smart city technologies in the same context. Furthermore, we adopt the lens of postcolonial travelling theory (Said, 1983) to challenge and problematise the approaches' direct suitability to facilitate ICT4D (Akbari & Masiero, 2023; Chatterjee & Davison, 2021).

Wernick and Artyushina (2023) view that adopting a human rights-based approach (HRBA) allows cities to ensure that algorithmic, biometric, and smart city technologies take into account fundamental human rights protections when being implemented in cities. Such an approach helps future-proof cities by mitigating adverse consequences associated with algorithmic governance while ensuring that its deployment does not violate human rights. They identify two HRBAs: *HR by design* and *HR in cities*. The former presumes that technology embodies values and should be designed in a manner that avoids breaches of human rights but also aids in the fulfilment of those rights (e.g. Winner, 1980; Nissenbaum, 1998; Hildebrandt, 2015; Koulu, 2021). It has been openly embraced by the EU legislator (e.g. Gellert, 2021). The latter advocates for human rights-informed city governance and citizen empowerment in connection with technology adoption in the city (e.g. Oomen & van den Berg, 2014; Galdon-Clavell, 2013; Morozov & Bria, 2018; Kempin Reuter, 2020; Kitchin et al., 2019).

The HRBAs serve as frameworks for just governance of safe, smart city technology. However, being identified and developed in the GN, they are likely to lack nuance concerning the needs of the GS cities (see Arora, 2018; Masiero, 2022). Introduced by Edward Said in his book "The World, the Text, and the Critic" (1983), the travelling theory examines how theories travel from one place and context to another. It inspects what happens to a theory when it is used in different circumstances or for new reasons and what this discloses about the theory itself – its limits, possibilities, and inherent problems. Said identified four stages in the travel of theories and ideas: (i) a point of origin, (ii) a distance traversed, (iii) a set of conditions of acceptance or resistance, and (iv) a transformation (Said, 1983, pp. 226–227). Initially used for literature analysis, we deployed it to review if the theories on HRBAs developed in the GN travel to the GS, specifically to the context of Lagos, Nigeria. As we apply Said's descriptive theory to socio-legal analysis, we also adapt it to carry normative weight. Hence, the processes of local contestation, adaptation, and transformation of the theory are viewed as prescriptive. This normative viewpoint parallels the focus of critical ICT4D research. For example, Odendaal (2003) studied the local organisational context in the governance of the smart city of Durban, South Africa, as early as 2003. Anchoring in post-colonial science and technology studies, she stresses the importance of studying the local, human–material relations that contribute to the emergence of smart city infrastructures in the GS (2020). Furthermore,

critical ICT4D further underscores the relevance of indigenous understandings of ICT (Davison & Díaz Andrade, 2018; Masiero, 2022), while decolonial privacy studies stress the exploration of the local understanding of privacy in the GS (Arora, 2018).

8.5 Human Rights by Design

European law-making concerning digital technologies (the General Data Protection Regulation [GDPR], the Digital Services Act [DSA], and the Artificial Intelligence [AI] Act) increasingly reflects the human rights (HR) by design approach. Also coined as the "rights-driven model" for technology regulation (Bradford, 2023, p. 106), it aims to contain both governmental and company surveillance and uphold democratic values (Bradford, 2023). The approach is expressed, for example, through legal instruments that require data controllers (Articles 25 and 35 of GDPR), large social media platforms (Article 34 of DSA) or deployers of high-risk AI systems (Article 29a of AI Act) to identify the risks their activities pose to fundamental rights and to mitigate them in advance. Each act features a range of detailed obligations, the non-compliance with which is enforced with fines.

The European risk-oriented and fundamental rights-driven approach to technology regulation has influenced the laws of non-EU countries (Bradford, 2020). So far, numerous African countries have adopted the GDPR standard (Bryant, 2021, p. 397), which also shaped the Nigerian Data Protection Act of 2023. The travel of the European "theory" of HR by design (Said, 1983) to the Nigerian jurisdiction is driven by the so-called de jure Brussels effect (Bradford, 2020, p. 114). This effect is attributed to the quality and flexibility of EU law-making, the lack of resources to invest in local law-making, the appeal of European values, and local and multinational companies' interest in accessing the European market (Bradford, 2012, 2020). Albeit offering a high standard of data protection, the Brussels effect has been viewed as a form of regulatory imperialism (Scott & Cerulus, 2018), which the EU deploys to compete against the influence of market-driven imperialism of the US and the state-driven, infrastructure-focused Chinese imperialism (Bradford, 2023).

Said presupposed that an introduction of a theory into a new context involves a process of either resistance or tolerance and adaptation. At the final stage of travel, the theory is wholly or partly adapted to its new time and place and may have been transformed by its new uses (Said, 1983). Several factors suggest that the HR by design approach does not travel to Nigeria in a manner that accounts for local context and needs. Without adaptation, it fails to support the development and adoption of human rights-compliant, safe, smart city applications.

When it comes to legal transplants, the laws being transplanted may not be suitable for direct application in the GS because they were created and

primarily adapted for the GN. Although laws may travel, their context of application does not travel with them. Legal rules are culturally embedded (Legrand, 1997), and legal transplants cannot be isolated from the history of their initial legal system. Therefore, they display a path dependency concerning the institutions with which they were initially connected (Husa, 2018).

We observe several dimensions where transposing technology regulation originating from the EU to Nigeria may fail to reach its goals in fostering local human rights compliance. First, the dissonance is present on the level of human and fundamental rights recognised in each jurisdiction. Human rights protected in Nigeria do not correspond to those protected in the EU. For instance, the right to marry has been recognised to include same-sex marriages in the US (see Obergefell v. Hodges, 2015). In Nigeria, same-sex marriages are criminalised (Same Sex Marriage Prohibition Act, 2013). Second, concerning technology law, legal transplants from the GN also carry assumptions about the state of technological infrastructure and know-how in the GN. For example, enjoying the protections provided by the GDPR rests on the assumption that citizens have high digital literacy (Arora, 2018). Varying levels of digital literacy and technical expertise may weaken the application and enforcement of technology-related legal transplants in the GS. BusinessDay Nigeria (Onyedinefu, 2022) reports that as of 2022, more than 50% of Nigeria's over 200 million population lacked digital skills. Third, regulating safe, smart city technology, which is used for law enforcement adjacent purposes, is particularly dependent on how effective fundamental and human rights protection frameworks in the jurisdiction are – including such issues as the guarantees of enforcement and the practice of the rule of law. For example, when transposed into an authoritarian context, the Digital Services Act, which aims, inter alia, to protect the citizens against hate speech on online platforms, could be appropriated to empower the spread of state propaganda and suppress dissenting opinions (Chander, 2023).

Albeit the AI Act prohibits specific AI applications that pose too high risks for fundamental rights (Article 5), it generally relies on ex-ante risk-mitigation (Article 9). The solution has been criticised for giving too slim protection against fundamental rights risks. The risk-based approach also represents a normative choice in favour of adopting technologies rather than exercising a more critical, precautionary approach of questioning whether it is desirable to apply the technology to the given problems (Kaminski, 2023). Furthermore, the EU data protection laws and the AI Act feature exceptions from protections in favour of law enforcement. These flexibilities have raised human rights concerns throughout the EU, particularly about the rights to privacy and non-discrimination (e.g. Galič & Schuilenburg, 2020; Pali & Schuilenburg, 2020). Indeed, to ensure that the flexibilities are not misused, the exceptions rely on strong fundamental rights protections and a strong respect for the rule of law. Over 60 human rights organisations expressed

concerns about the AI Act's national security and law enforcement exemptions based on their potential to be exploited to weaken democratic institutions and processes and the rule of law (Amnesty International, 2023). Transposing similar legislation to Nigeria would feature much higher risks for human rights, given that Nigeria ranks 118th (World Justice Project Report, 2022) in World Justice Project's rule of law index.

National data protection laws are essential for protecting GS citizens from unchecked technological surveillance (Purandare & Parkar, 2021), as well as the human rights risks of safe, smart city technologies. However, transplanting European technology regulation, such as the GDPR, to Nigeria without sufficient contestation and adaptation to the local context would not suffice to protect human rights locally. Such transplants, which rely on universalist perceptions of key values and citizens' needs, may unintentionally create neo-colonial effects by failing to consider the idiosyncrasy and heterogeneity of those in the GS (Arora, 2018). The Nigerian legislation must be tailored to reflect the local context in line with the overarching normative goal of digital sovereignty. By this, the law must consider the specific challenges faced by Nigeria, such as poor infrastructure and connectivity, lack of digital skills and innovation, limited regional integration and cooperation, corruption, and others. Legislation should be aimed at addressing these challenges and promoting digital sovereignty by supporting the development of local digital infrastructure, fostering digital skills and innovation, promoting regional integration and cooperation, combating corruption, and establishing robust legal frameworks that protect the rights of Nigerian citizens in the digital space. Ultimately, such legislation may represent the Nigerian vision of HR by design or take a completely different route to technology regulation.

8.6 Human Rights in Cities

The human rights in cities approach advocates for cities' commitment to human rights beyond what is expected from municipalities under international law (Oomen & Baumgärtel, 2014) or constitutional law (Rubinstein & Petkova, 2020). It presupposes more localised technology regulation and governance (Rubinstein, 2018; Marcucci et al., 2022; Wernick & Artyushina, 2023; Nielsen, 2024) than the HR by design approach, which presumes the state to hold a key role as a technology regulator. The HR in cities approach covers municipality-level initiatives to commit to human rights (Oomen & Baumgärtel, 2014). Also, when embraced by the UN-Habitat programme (United Nations, n.d.b), the approach strives towards people-centredness, citizen participation, and agency's role in the decision-making on and governance of the technologies adopted in the city (Galdon-Clavell, 2013; Kempin Reuter, 2019, 2020). Some of its expressions are rooted in Lefebvre's concept of the right to the city (see Purcell, 2014), reinterpreted as "a rallying cry for

transformative political mobilisation to create such a humanising urbanism, a more emancipatory and empowering city" (Kitchin et al., 2019, p. 16). The right to the city is also connected to calls to expand individual human rights to cover the collective rights of urban citizens and establish legal protection for common goods in cities (Fernandes, 2021). Both the academic literature and policy initiatives on HR in cities often promote respect for citizens' digital rights (e.g. Cardullo et al., 2019; Kitchin, 2022; Calzada, 2018).

From the perspective of Said's (1983) theory, the HR in cities approach is supportive of transforming both technologies and their governance frameworks to the local context. It parallels the anthropological discourse on translating human rights to convey local meanings and effects in indigenous communities (Merry, 2006). However, the HR in cities approach is normatively open-ended, also covering values and digital rights that are not expressly protected on the level of human and fundamental rights (Wernick & Artyushina, 2023). Hence, it allows for local definitions of values that matter besides human rights in technology governance (see Sanfilippo & Frischmann, 2023a; Wernick & Artyushina, 2023). It, therefore, supports articulating the GS's vision of the "just smart city" and right to the city (Alizadeh & Prasad, 2023). Furthermore, the HR in cities approach also emphasises decoupling from the neoliberal logic of smart city initiatives and advocates for cities' digital sovereignty (Morozov & Bria, 2018). Although this approach has been developed in the European context, it can be considered conceptually more sensitive towards problems of technological dependency in the GS.

In practice, implementing HR in the city of Lagos would take considerable adaptation. The UN-Habitat programme proposes a people-centred, multi-stakeholder approach to the governance of smart city developments. It aims to include all levels of city government and citizens to determine the city's core digital values and formalise them into implementable commitments concerning the governance of digital technologies in the city (United Nations, 2022). However, in the Global North, citizen representation in smart city development has been found lacking or "tokenistic", reflecting a neoliberal view of citizenship (Cardullo & Kitchin, 2019; Shelton & Lodato, 2019; Mattern, 2020), with similar performative democratic participation models observed in India (Ghosh & Arora, 2022). Moreover, people-centredness may be particularly difficult to implement in connection with safe, smart city technologies used for surveillance.

Moreover, surveillance technology is challenging to observe, and its installation decisions and governance are often non-transparent and opaque (van Zoonen, 2021). Lagos is a radically diverse, polycentric city with wide social and digital divides. This raises questions about how to ensure that ordinary citizens' voices are heard and that smart city solutions also serve others apart from elites and do not result in unchecked surveillance or oppression.

The slow-governance approach suggested by Sanfilippo and Frischmann (2023a) seems to offer a solution for this; proposing deep transparency – where community members are not just passively informed but also capable of taking action (Sanfilippo & Frischmann, 2023a). The proposed slow-governance approach is all about systems where both sociotechnical systems – like the technologies and the governance frameworks and the regulations and policies – are contextually appropriate and fit for legitimate purposes (Sanfilippo & Frischmann, 2023a). The contextual appropriateness must be ascertained in the pre-planning stages of smart cities. To enable this, Sanfilippo and Frischmann proposed a set of questions to be asked regarding issues such as the impact of the proposed smart system on people and others (Sanfilippo & Frischmann, 2023a, pp. 18, 29). The slow-governance framework in smart cities builds upon the research on governing knowledge commons. It is an adaptation of an empirical questionnaire focused on uncovering interactions between actors, rules, resources, and governance practices of commons as institutions (Madison et al., 2010, 2023; Sanfilippo & Frischmann, 2023b).

This holistic approach to technology governance could facilitate the adoption of "locally appropriate urban technologies" in Africa (Bandauko & Nutifafa, 2023, p. 82). It could address one of the major problems discussed – where most technologies are designed to fit the rich and advantaged. The slow-governance approach (Sanfilippo & Frischmann, 2023a, p. 21) insists that even ordinary residents are involved in the pre-design conversations. By this, the decision-making framework proposed by Sanfilippo and Frischmann (2023a) underscores taking contextual considerations, such as polycentricity and governance needs, into account when purchasing and deploying smart technologies in cities. Here, local norms are also considered while answering the key questions at every step of planning and implementing smart city projects. It provides for a governance framework rooted in institutional theory and human rights principles through empirical case studies, with special attention paid to slow-governance mechanisms, public knowledge dissemination strategies, and participatory mechanisms as key means for aligning human values and interests within smart city projects. The slow-governance framework thus seems fitting for ICT4D because it is open to accommodating additional theoretical or empirical insights or normative values (see Sanfilippo & Frischmann, 2023a, 2023b; Madison et al., 2023) and draws also from capabilities approach (Sen, 2015; Sanfilippo & Frischmann, 2023a). Being open to contestation and adaptation (Said, 1983), it could, for example, be tailored further to address the development or indigenous context (Joia & Kuhl, 2019).

That said, the HR in cities approach alone may not suffice to govern safety enhancing smart city technology. Multiple levels of governance are responsible for safety in Lagos, with law enforcement agencies reporting to the federal

administration. Nevertheless, the contextual awareness gained through HR in cities approach should inform the Nigerian vision of governing and regulating safe smart city technologies on the national level.

8.7 Localising Smart City Ideologies: Digital Sovereignty in the Global South

Produced by Christina Chen, the Disney+ series *Iwájú* presents a story of the future Lagos; it currently can barely be viewed by the city's inhabitants. Mirroring this discrepancy, most smart city technologies adopted in Lagos are not developed in Nigeria and, therefore, risk failing to cater to the citizens' needs. For this reason, the regulatory and governance approaches to safe, smart cities in Africa must be coupled with the normative goal of digital sovereignty.

While sovereignty itself is "a form of legitimate, controlling power" (Floridi, 2020, p. 5), digital sovereignty is commonly understood as a country or region's ability to exert control over its digital data and infrastructure while protecting citizens' digital rights and privacy. It is the ability of a state or a community to exercise control and autonomy over its own digital resources, infrastructures, and policies (e.g. Couture & Toupin, 2019; Pohle & Thiel, 2020). According to Venske (2023), the concept was first formulated by Pierre Bellanger in 2008 and subsequently referenced in his book *La Souverainete Numerique* as "control of our present destiny . . . guided by the use of technology and computer networks" (Venske, 2023, p. 6). Digital sovereignty is a contested and contextual concept that reflects different values, interests, and power relations in the digital domain. In this respect, Mwangi (2022) opines that digital sovereignty is an elastic ideology that denotes a distribution of power, not as such a fixed conceptualisation – and should not be viewed as such. In the GS, for instance, there is usually the vagueness associated with the conceptualisation of sovereignty itself. This could also stem from the perception that "countries have viewed digital policy as a subset of their technology policies" (Sampath & Tregenna, 2022, p. 8). In European contexts, having digital sovereignty is perceived as Europe's ability to act independently in the digital world (European Parliament, 2020, p. 1). It has formed a core area of concern in regional discussions, especially at the realisation of how influential non-EU tech companies have become in policy-making, their impact on the EU's data economy and innovation potential, and their capacity to ignore EU privacy and data protection policies (European Parliament, 2020, p. 2).

In the African context, the concept of digital sovereignty is intertwined with the goal of transforming the continent from mere consumers in the global digital economy to becoming innovative producers. For instance, the vision of Africa's digital transformation strategy by 2030 is, among others,

to "ensure continental ownership with Africa as a producer and not only a consumer in the global economy" (AU, 2020). The examples of Brazil and India investing in their local technologies can be emulated. India's software industry, originating from its defence sector, is recognised for its significant contribution to the global software services market. Its Capability Maturity Model reputation is globally recognised. Brazil's software industry, worth $7.7 billion in 2001, was similar to China's, contributing 1.5% of GDP. Both India and Brazil have developed robust software and technology industries, demonstrating their ability to create local technologies (Ojo et al., 2008).

Africa's transformation involves taking ownership of value chains and digital processes, a goal also aligned with the African Union's 10-year digital transformation strategy (The African Union, 2020; see also Venske, 2023). In Lagos, digital sovereignty becomes particularly important, given concerns of safety, human rights, and misuse of imported technology – and the need for self-determination and greater strategic autonomy from foreign providers like those from the US (Akinyetun, 2023) and China. Concerns about the misuse of imported technologies and potential infringements on human rights due to increased state surveillance are impacted by public safety, state control over the internet infrastructure, and even the influence of foreign multinationals. African governments, like those in Cameroon and Uganda, have tended to assert unilateral control over their digital domains, often justifying this as a measure necessary for maintaining security and societal peace (Basu, 2023). Some African governments have exercised digital sovereignty with their rights over digital communications using tactics like internet shutdowns, often invoking national security concerns. According to Basu (2023, p. 22), "Justifying such actions through the language of sovereignty recalls similar abuses exerted by Western colonisers in previous eras". This approach, thus, is not always received positively due to the implications for human rights and concerns about repression. In Lagos, videos from surveillance cameras during the 2020 EndSARS protest were adjusted to suit the narrative of the State Government that nobody was killed by security agencies (Busari et al., 2020), as against the Amnesty International Report indicating otherwise (Amnesty International, 2020). This raises questions as to how imported technologies could be used in ways that support human rights abuses already predominant in Africa.

On the other hand, Lagos holds massive amounts of data on vital areas such as national defence, energy and water infrastructure, national registries, financial transactions, industry, mining, and other sensitive government institutions – highlighting the importance of digital sovereignty to counterbalance the disproportionate influence that a small number of Big Tech companies, such as Amazon, Facebook, Google, and Twitter, have over the digital ecosystem (Akinyetun, 2023).

Digital sovereignty also underscores the importance of African nations having control over their own digital space, data protection laws, and internet governance rather than being subjected to external regulations and norms imposed by foreign entities (Bryant, 2021, p. 439). This empowered, decolonial stance towards improving society (Tsibolane & Brown, 2016) is critical considering the historical and contemporary trends in internet governance that have not catered to the specific needs of African users (Bryant, 2021, p. 395). Furthermore, it stresses the importance of understanding and improving upon existing frameworks to meet the particular contexts, challenges, and circumstances of African societies. Digital sovereignty in Lagos and other parts of Africa involves creating legal and extralegal enforcement mechanisms that safeguard human rights, promote dignity in the digital space, and address challenges such as data privacy breaches (Bryant, 2021, p. 389).

So, understanding the implications of digital sovereignty in Lagos and Africa at large and advocating for it would require not just looking at countering power asymmetries against the Global North and dominant global tech companies but also dealing with potential repression via legislations or misuse of technology and the power it wields by African governments.

8.8 Conclusion: Rethinking Safe, Smart Cities for Africa

In this chapter, we emphasised that while digitalisation surges alongside urbanisation, techno-legal smart city transplants often fail to account for the Global South's unique social, political, and technological realities. Currently, the smart city development of the GS is influenced by technologies and technology regulation approaches exported from the US, China, or the EU (see Bradford, 2023). Our article contributes to the discourse on the GS interests in technology regulation and governance (Arora, 2018; Gehl Sampath, 2021; Png, 2022) and the scarce literature on human rights-based governance in smart cities in the GS (cf. Ramiro & Cruz, 2023; de Jonge, 2023) and to ICT4D research (Masiero, 2022) with a socio-legal perspective. We deploy the term smart city transplants to describe situations where technologies, policies or legislations are adopted in another community without considering the context and needs of the receiving urban community. We focus our study on Lagos, which is expected to become the world's most populous megacity by the end of the century (UN, 2022), and safe, smart city technologies.

Safety is a significant need in Africa. The security agencies in Lagos have also affirmed that technologisation can bring the much-needed safety solution to the city (Chinweuba, 2022) against prevailing violence (Ziebold Jorquera et al., 2017) and high crime rates (Echendu & Chiedozie Okafor, 2021). However, safe, smart city technologies expose inhabitants to surveillance (Joh, 2019) and involve human rights risks, especially when deployed by oppressive governments (see Williams, 2021; Mwangi, 2022; Akbari, 2022).

Africa heavily relies on imported technology from large tech companies, with over 90% of revenue and profits coming from the Global North (Venske, 2023). China plays an active role in supplying safe, smart city technologies to Africa, and its surveillant capacity raises concerns about empowering authoritarian regimes in the region (Gravett, 2020; Bradford, 2023).

The human rights-based approaches can be applied to govern algorithmic, biometric, and smart city technologies and to contain their human rights risks (Wernick & Artyushina, 2023). Since the approaches originate from the GN, we adopted a postcolonial lens of travelling theory (Said, 1983) to review their fit to the context of Lagos, Nigeria.

The fundamental rights and risks-based approach to technology regulation adopted in the EU cannot effectively be transplanted to Nigeria without accounting for local values (see Arora, 2018) and vulnerabilities, differences in technological context, and legal institutions, including weaknesses in the rule of law (see World Justice Project Report, 2022).

In contrast, the human rights in cities approach (Wernick & Artyushina, 2023) more fully accounts for local values and empowers citizens of the city in question, thus making it better suited for governing a postcolonial smart city. While ensuring that citizens' needs are heard in the large, polycentric city of Lagos is a challenge, Sanfilippo & Frischmann's slow-governance approach that promotes contextual appropriateness of smart city technology (2023a) is worthy of practical exploration.

However, postcolonial adaptation of human rights-based approaches cannot resolve the problems associated with smart city transplants without simultaneous commitment to digital sovereignty. Digital sovereignty empowers African nations and cities to make informed decisions about how technology is developed, deployed, and governed within their borders. We conclude with a call for action, outlining suggestions for empowering African nations – on regional, national, and city levels – to achieve greater self-determination in the digital age. Africa can ensure that its smart megacities are genuinely safe, inclusive, and human rights-compliant by placing priority on human rights, fostering local innovation, and building robust legal frameworks.

Note

* Dr. Wernick introduced the human rights-based approaches and held the primary responsibility for analysing the human rights-based approaches and the overall interdisciplinary integrative work. Udoh introduced the dependency theory and took the main responsibility for the section on digital sovereignty and contextualisation concerning Lagos, Nigeria. Banzuzi introduced Said's theory and contributed to the analysis of each section. We are grateful for the valuable feedback and help in editing and background research provided by Alexander Mörelius-Wulff. The authors were funded by a grant from the Kone Foundation in the context of "Long-term human rights risks of smart city technologies" project.

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PART 3

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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

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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 un/intended 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 (Tammpuu & 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 glocalisation 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 hypostatised 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

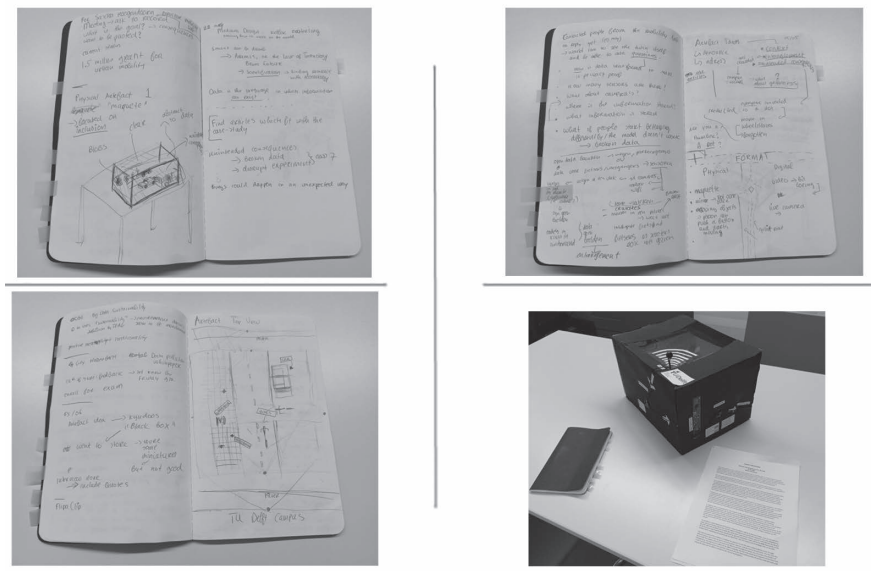

FIGURE 9.1 Some pages from the student's journal and the final artefact for the course "Ethics for the Data-Driven City".

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-ocultural 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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10

DESIGN FOR WATER JUSTICE

Co-Developing Tools for Equitable Cities

Fenna Imara Hoefsloot, Andrea Jimenez, and Liliana Miranda Sara

10.1 Introduction: The Observatorio Metropolitano de Agua

In recent years, the idea of major cities in the Global South running out of water due to climate change has received considerable attention, e.g. Cape Town, Mexico City, and Chennai (Harvey, 2023; Masih & Slater, 2019; Sengupta & Cai, 2019). To address this, governments are prioritising data and digital technologies to address the numerous social and environmental concerns associated with water management and service delivery (Daigger et al., 2019). Digital tools such as urban dashboards, digital observatories, and indicator systems are used to integrate multiple data sources and visualisations to assist governments, citizens, and businesses make decisions (Kitchin et al., 2015; Mattern, 2015). These digital technologies serve to inform planning, increase transparency in policy-making, and inspire future scenarios for the city (Valenzuela-Montes & Carvalho-Cortes Silva, 2015). While this topic has gained attention in the academic literature, most scholarly work has focused on the economic or operational value attributed to digital technologies for water management, the risks of datafication for surveillance and privacy concerns, or how digital technologies can change managerial structures in the water distribution system (Amankwaa et al., 2021; Hoefsloot, Richter, et al., 2022). There is a need to analyse the implications of the digital transition in urban water governance from a relational perspective – acknowledging its social and material elements – and explore more just and collaborative pathways for future developments (Luque-Ayala & Marvin, 2015).

Therefore, this research explores how digital information infrastructures can support just urban water governance. Specifically, we analyse this question through the development of a tool that aims to contribute to

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a fairer distribution of water resources among urban residents by exploring the potential of collecting and disseminating data regarding water access in *Observatorio Metropolitano de Agua para Lima-Callao*[1] (Metropolitan Water Observatory for Lima-Callao, referred to as the MWO hereafter).

In essence, the MWO (Figure 10.1) is a collaboratively designed data platform that collects and distributes data regarding water access in urban Lima and Callao from the perspective of its residents. The MWO has two core attributes: a geo-visor depicting the various data layers in space and the form through which urban residents can share information about their water access. Users have the flexibility to expand the map to full-screen width, zoom in/out, toggle data layer visibility and transparency, switch between base maps, and access information by clicking on data points. The map includes a legend, a scale bar, and an information box at the bottom.

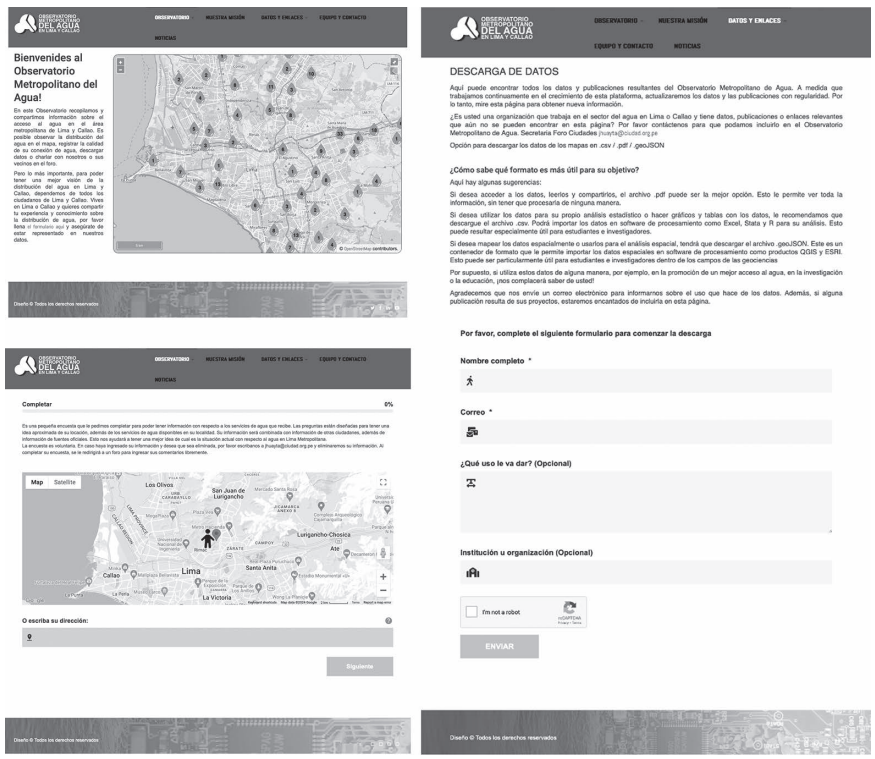

FIGURE 10.1 Screenshot of the MWO prototype. The top left screenshot shows the homepage with the map presenting data in a desktop browser. The bottom left screenshot shows the data input form in a desktop browser. The right screenshot shows the menu and data download page in a mobile phone browser.

The MWO incorporates diverse data-sharing methods, such as the data input form, chat function, photo uploads, and dedicated hashtags on social media. The questionnaire, developed in collaboration with participants, adjusts dynamically based on respondents' water sources and experiences. The data fields and indicators on which data are collected within the MWO represent the main issues within the water sectors from the perspective of Lima's urban residents. Additionally, a chat forum allows residents to share information and experiences in written text. To ensure protection against malware and privacy, registration is required, whereas to reduce participation barriers, it allows the use of pseudonyms and passwords without the need for personal information. Lastly, residents have the right to invisibility by being able to delete their shared data at any time. Users can request the removal or revision of their submitted data, with location privacy ensured.

Initiated by Foro Ciudades para la Vida, a non-governmental organisation working on the development of just and sustainable cities in Peru, the MWO was designed in collaboration with residents from three districts in Lima: academic researchers (the authors of this chapter), civil society organisations, and a web developer. The idea of the MWO was conceived from the frustration of our civil society partners in trying to access information and data about equality in water distribution in the city from the public water company, SEDAPAL. By making inequalities visible through the MWO, the transdisciplinary team collaborating in the MWO's design aimed to create a space to critically engage with the current water data, increase transparency, and influence action for a just water distribution system.

In this chapter particularly, we want to discuss the MWO and its contribution to exploring how we can design digital infrastructures that contribute to just water governance as an ongoing conversation between theory and practice. This is informed by design science approaches in action research and information and communication technologies for development (ICT4D), which emphasise the iterative process of designing information technologies to contribute to the dual goals of knowledge generation and creating a useful technological artefact (Islam & Grönlund, 2012; Sein et al., 2011). Specifically, we reflect on the MWO's development through the lens of design justice and its implications for theory, methods, and ethics. Inspired by bell hooks (1991), this research aimed to contribute to theory as a practice of 'liberatory activism'. This means that theory and methods are used to expand our thinking in support of justice approaches and assist in the struggle to oppose classism, racism, and sexism. This project is directed to assist residents who live in situations of injustice to bring about change.

Continuing this chapter, we will first introduce design justice as a guiding framework for research and praxis, and specifically how a commitment to design justice informs our theoretical, methodological, and ethical approach. Following, we will provide a brief background on the digital

infrastructures developed for water governance in Lima and reflect on how the MWO challenges the modernist approaches to water management embedded in the infrastructure. We end with a reflection on the questions remaining and future steps to be taken to design digital information systems for water justice.

10.2 Design Justice: Theoretical, Methodological, and Ethical Implications

Design justice is an approach to design that is led by marginalised communities and that aims explicitly to challenge, rather than reproduce, structural inequalities. It has emerged from a growing community of designers in various fields who work closely with social movements and community-based organisations around the world (Costanza-Chock, 2020). As Costanza-Chock (2020) wrote, the goal of design justice is to go "beyond the frames of *social impact design* or *design for good*, to challenge designers to think about how good intentions are not necessarily enough to ensure that design processes and practices become tools for liberation, and to develop principles that might help design practitioners avoid the (often unwitting) reproduction of existing inequalities" (p. 6). On a broader scale, design justice decentres the big technological companies in the Global North by shining a light on the many valuable ways innovation happens through social movements, in the Global South, or emergent from marginalised communities (Costanza-Chock, 2020; Jimenez et al., 2022). Hence, design justice serves as a route to counter inequality and intervene in unjust structures. In doing so, design justice builds on a long history of related approaches, such as value-sensitive design, universal design, and inclusive design.

Advocates of design justice argue that this approach helps centre people who are typically marginalised by design and employs collaborative and creative practices to address the most pressing issues confronting them. The Design Justice Network, for instance, promotes ten principles that guide the design process, ranging from the relationship with communities to the role of the designer, the process, and the design outcome. What these principles suggest is that this approach does not begin and end with merely the act of designing something, but it incorporates a broader way of thinking, where justice is about ensuring that the communities affected by the technology are at the core of the design process (Design Justice Network Principles, 2018). This departs from the notion that social global justice, specifically in relation to feminist and decolonial work, is a practice, not only a theory (Khene & Masiero, 2022). The designer then adopts the role of a facilitator whose job is to centre the voices of those impacted by the design process instead of an expert. This implies drawing on what is already working instead of bringing new ideas altogether.

Regarding our work on the MWO, design justice has theoretical, methodological, and ethical implications for research practice. Theoretically, design justice implies an approach that goes beyond the narrow modernist goals of digital development. Instead, it adopts a relational approach that allows a rethinking of digital infrastructure that accounts for its social and political lives. Throughout this chapter, we urge readers to think about water and digital infrastructures beyond their material features and consider people, landscapes, and knowledge as part of the infrastructural systems. Additionally, following Masiero (2022) we embrace multidisciplinary theoretical approaches from fields such as urban geography, critical data studies, ITC4D, and design studies to push the boundaries and bridge the gaps between research and practice. This stems from the commitment to understanding technology, data, knowledge, water, or the everyday city from a relational perspective.

Within our research, this is reflected in our understanding of urban governance as the regimes of decision-making and coordination between state and non-state actors for the planning, development, and management of urban space and life (Gupta et al., 2015), which is increasingly reliant on the production of digital data for decision-making, and the urban society, materiality, and economy are intertwined with coded algorithms (Datta, 2018; Shaw & Graham, 2017). Urban operational processes such as water distribution and traffic control are digitised to make their measurement and monitoring more efficient and equitable (Amankwaa et al., 2021). Specifically, with regard to urban infrastructures, supervisory control and data acquisition (SCADA) systems have been extensively rolled out in cities globally to monitor and control flows in water, traffic, and electricity grids (Kitchin & Dodge, 2017).

Following in the footsteps of 'smart city' developments, which are often informed by technocratic and neoliberal approaches to urban governance (Odendaal, 2023; Verrest & Pfeffer, 2018), 'smart water' is characterised by a belief that more data lead to better control over urban infrastructure (Amankwaa et al., 2021). It is argued that new opportunities for big data and crowdsourced information may create possibilities for more open, complete, and democratic data collection (Elwood, 2008; McFarlane & Söderström, 2017). Moreover, the developments in computing and measurement technologies that have allowed for the generation and analysis of big data have spawned the idea that, with sophisticated and reliable technologies, it would be possible to reduce human idiosyncrasies in the management and governance of urban flows (Taylor & Richter, 2017). Design justice steers away from these modernist understandings of infrastructure and instead promotes embedding community values in design.

Methodologically, a design justice framework means we approach citizens as active agents in the smart city (Calzada, 2018; Vanolo, 2016). Using digital tools for public engagement and accountability holding and their

datafied movement through and consumption of the city, urban residents have become a central part of thinking about and developing the digitalised city. Specifically, in the contemporary city, characterised by complex public-private governance and ownership structures, data can help trace actions and responsibilities and help inform policy decisions. This observation aligns with that of Pfeffer (2018), who states that digital technologies can create opportunities for residents, as knowledge actors, to contribute to understanding urban infrastructure and, untimely, the city at large.

To facilitate a more collective and democratic process of knowledge generation for urban water governance, our methodological approach departed from the idea of *concertación*. As a concept, *concertación* is original to Peruvian governance culture and refers to the cyclical and "highly sensitive and complex process of dialogue– negotiation – *concertación* – conflict management and consensus-building (or not)" among stakeholders (Miranda Sara & Baud, 2014, p. 506). Embracing this complex and deliberative process instead of pursuing more technocratic approaches opens space for dialogue about fundamental conceptualisations of water, knowledge, and good governance. Miranda Sara (2021) applies this in her research to analyse and facilitate the formulation of different scenarios for Lima's water governance in the future, an approach she labels "espacio de concertacion" (space for concertation). We built on this work during the development of the MWO. While Miranda Sara (2021) analysed this process from an institutional perspective, we aimed to create a digital information infrastructure which can serve as an *espacio de concertación* and visibilise and exchange knowledge between stakeholders.

However, the "(or not)" in Miranda Sara and Baud's (2014) definition of *concertación* mentioned above is important and carries much weight. Opting for dissensus rather than consensus by stepping out of the dominant methods, debates, and technologies for inclusive collaboration can be a powerful approach for communities and civil society organisations to break with predefined roles and potentially redistribute power in the negotiation over the smart city (Kaika, 2017).

Finally, ethically design justice entails a strong commitment to justice in both research and practice. By engaging in the design of the MWO, we moved from descriptive and theoretical analysis towards action-oriented and collaborative design approaches aiming at influencing policy and practice. We are not only analysing what was happening but also actively trying to intervene in Lima's water governance and data practices by introducing a new technological artefact and collaborating with fellow scholars, activists, and community members.

The choice to engage in action-oriented design research as part of the MWO project has forced us to position this work within the debates on the varied forms of injustice experienced by residents in Lima and speaks to the ways in which feminist and decolonial researchers relate to and interact

with the multiple forms of resistance against patriarchy, (neo)-colonialism, and capitalism. We hope our research and involvement in the development of the MWO can support these struggles. As Kabeer (1994, p. 80) wrote: "the 'ways of knowing' that have dominated the production of knowledge [. . .] have played an important role in defining and legitimating particular viewpoints and methods. The production of knowledge is, therefore, a logical place to begin the project of reversals".

The first step herein is questioning the dominance of modern sciences, which is often based on a rationalist, secular epistemology that emphasises the relevance of science, economics, and technology (Jimenez et al., 2022). Due to its perceived universality, other forms of knowledge (e.g. local and indigenous) are typically viewed as less relevant and deficient (Escobar, 2016; Mignolo, 2011; Mignolo & Walsh, 2018). Much of this dominant knowledge is characterised by temporal realities, categorising things into binaries and placing the value of Western/scientific thinking above anything else (Hlabangane, 2021). It also means that only the parts of reality which can be captured are considered truth, neglecting the knowledge, experiences, and realities that lay beyond the capture of modernist scientific methods.

Authors suggest that to address the coloniality of knowledge, there needs to be a decentring of the Western geopolitics of knowledge to make space for alternative ways of thinking and being. This involves entering into a dialogue of knowledges, all situated in equal terms (Reiter, 2018). This stems from a recognition that knowledge is not created in a vacuum but shaped as part of a system of knowledge claims, values and standards, structures, and epistemologies (Muñoz-Erickson et al., 2017) and is profoundly emergent from the region (Wijsman & Feagan, 2019). To contribute to the production of knowledge rather than its erasure, we have aimed to stay close to the stories shared with us by many people in Lima and the region and to do justice to their experiences in our analysis of the events through theory and by our effort to understand their struggles through a lens of socio-economic and colonial injustice.

Within this positioning, we understand just water governance as the collective of administrative, material, political, and social systems that work towards the fair allocation of water and the recognition of the social, political, and epistemological dimensions of water (Zwarteveen & Boelens, 2014). Hence, to be able to contribute to water justice, we must acknowledge how our position in the world and past and current experiences have informed the choice of area and study, our experience of fieldwork in Lima as a Latin American city, our initial conceptualisations of water, justice, and the city – all fundamental notions within this work – through modernist and Western lenses. Recognising the limitations of our thinking is a process of learning new theories, approaches, and methods and unlearning colonial and patriarchal thinking and frameworks (Aguilar & Icaza, 2021). We write this in the present tense since this process is by no means near completion.

10.3 Findings: Designing Information Infrastructures for Just Water Governance

There is value in creating and theorising at the same time. As explained by Milan and Treré (2019), the parallel acts of exploring alternative data imaginaries and creating alternative data practices can be valuable exercises for thinking about data justice in design and how we might overcome the injustices in the system. The MWO fits within this tradition. In creating an artefact, we were required to decide who should participate in the design and use, what features should it have, what purpose does it serve, and how will people interact with it. (Young & Kitchin, 2020). This invites us to reflect on how values are inscribed in the technology, forces us to place the developed technological artefact within its sociotechnical assemblage, and gives insights into what theory might mean for society.

In the design and development of the MWO, we approached these questions from both theory and practice, and the process up to now shows how designing according to the principles of data justice has implications for the process and the outcome. Data justice and its commitment to visibility and anti-discrimination requires engaging with plural perspectives and values right from the initiation of the project through to the use of the artefact. This calls attention to the issues of privacy, discrimination, and access, considering the importance of approaching information infrastructures within the social, political, and material context in which they are implemented, and centres the agency and needs of residents in the creation and mobilisation of digital information infrastructures (Hoefsloot, 2022).

In Lima and Callao, SEDAPAL uses various information systems that collect data to govern and manage the water distribution system within the metropolitan area (Jimenez et al., 2024). To manage the operational side of the water distribution system, SEDAPAL has implemented a supervisory control and data acquisition (SCADA) system. Essentially, current SCADA systems entail the implementation of sensors in non-digital technologies, which are connected through software that allows the registration and monitoring of measurements. The sensors applied to the infrastructure measure the volume of the water at any single time and at multiple locations within the system. Together, these single measurements produce large data sets that record the water volume in the complete system in near real-time. Like other 'smart city' technologies, these SCADA systems have become increasingly autonomous in that they currently allow for automated interventions to change settings in the system. To understand the implications of these changes for the city and the just distribution of urban resources, we must look at the transformation of the infrastructure through the introduction of digital elements.

The SCADA system and the commercial, informal system are the two primary sources of structured data. Yet, there are also a variety of information

systems which directly or indirectly generate unstructured data, such as customer service centres collecting consumer-reported data regarding breaches in the system, the use of drones equipped with lidar collecting spatial data to map new urbanisation patterns and water needs, the use of a georadar to collect data about the exact location of underground pipes and detect potential unregulated water connections, and the use of Google products such as Google Earth and Streetview to validate outliers flagged in the data in the consumption information system.

These systems have embedded in them the conceptualisation of water as a commercial resource whose flows and consumption must be managed to reduce losses. This is reflected in the categorisation of leaked water as 'non-revenue water' and the labelling of auto-constructed pipes as 'clandestine', and the design and mobilisation of specific digital technologies such as the georadar and Google products to surveil and counter unregulated water consumption. Together, these various information systems and partially interoperable datasets create a layered view of the water distribution system in which some areas and types of water consumers are fully legible while others are (partially) out of sight (Hoefsloot, Richter, et al., 2022).

This lack of transparency has to be considered in relation to the Peruvian governance structure in which data is considered leverage. In addition to informing policy-making, data are important for the negotiation between various governmental actors and between administrations (Filippi et al., 2014). Filippi et al. (2014) explain how the control over data also signifies the control over the narrative and can serve to maintain the status quo in Peruvian water governance and the vested interests of big capital, such as mining companies.

By presenting an alternative data practice which centres justice rather than efficiency or control, the MWO brings to the fore the biases and embedded values in SEDAPAL's data practices. Most importantly, it illustrates how knowledge and data regarding water can be conceptualised and scrutinised in different ways. It follows that designing information infrastructures that contribute to just water governance, particularly in a context of societal, climate, and material transformations, requires a transdisciplinary approach and novel alliances between stakeholders. The MWO is an intervention that aims to contest the current data practices and empower those working towards overcoming injustices in the field of water governance. This speaks to critical strands of data studies and scholarship on digitalisation, which pursue the dual aims of contributing to knowledge and dismantling unjust orders in society (e.g., D'Ignazio & Klein, 2020; Eubanks, 2018).

Moreover, the collaborative, bottom-up development of the MWO shows how digital information infrastructures can be civil society-led, diverse, and small, as opposed to the dominant image of corporate-led, homogenising, and big (Taylor & Broeders, 2015). Within digital infrastructure, 'smart citizens'

participate as important nodes in the infrastructure by generating data and validating knowledge claims. On the other hand, 'expert-amateurs' – a concept used to refer to urban residents with tacit knowledge of the water infrastructure (Hoefsloot et al., 2020) but broadened here to include rural and indigenous experts on water governance – while situated on the side-line of the digital infrastructure, in turn, challenge the norms embedded in the technology, readjust it according to what they see fit, and self-govern the water distribution within their communities. Contrary to conceptualisations of citizens' participation in urban development and governance departing from top-down, organised, and consensus-oriented interactions, these types of participation or involvement are bottom-up, sometimes subversive, which are examples of auto-constructing urban infrastructure (Holston, 1991; Watson, 2009).

The development of the MWO illustrates how digital infrastructure, when designed in collaboration with residents and following design and data justice principles (*Design Justice Network Principles*, 2018; Hoefsloot, Jimenez, et al., 2022), can potentially serve as a tool for residents to help transform the system to meet their needs. However, a central challenge we encountered was balancing and engaging with widely diverging conceptualisations of fundamental concepts, such as 'water' and 'knowledge', in developing digital technologies to be able to use them as a tool for integration rather than differentiation. The scope of the MWO – being the metropolitan city – and its emphasis on generating numerical data to engage with policymakers automatically positions it within the modern-scientific knowledge system and its related utilitarian definition of water as a resource for people.

From the perspective of everyday life of Lima's residents, it is possible to see how the impact of the digital infrastructure is double-edged: it can undercut the common aspirations of improving the water distribution system and, at the same time, allow us to see people's knowledge, labour, and capacity for organisation to better water governance. These findings underscore the value of making bottom-up infrastructural practices the focal point, locating residents' agency and capabilities at the centre of the debate on the digitalisation of the city (Milan & Treré, 2019), and explore how a decolonial approach to innovation may result in digital infrastructures which are better aligned with social concerns (Jimenez et al., 2022).

Yet, pluralising the cultural and political understandings of water and knowledge embedded in infrastructure proves to be difficult, abiding work. We note this challenge not only in our work but also in the literature on water governance in general. We increasingly see the concept of 'digital water' used in academic research to refer to how water is datafied and managed through digital technologies (Amankwaa et al., 2021). At the same time, there is a growth of attention to ancestral, indigenous, and nature-based approaches to water governance, which present plural ontologies about water (Hartwig

et al., 2021; Vera Delgado & Zwarteveen, 2008; Viaene, 2021; Wilson & Inkster, 2018). Very rarely do these two bodies of literature speak to each other, something we have attempted to do in this research. Only by combining an urban focus with a regional focus did it become possible to understand Lima's digital water management infrastructure within the region's plural knowledge systems.

10.4 Discussion: Centring Residents' Experiences of Injustice in Design

With the MWO, we offer an alternative imagination of information infrastructure as a bottom-up development that functions by its residents' agency. In this infrastructure, residents can give direction to future design, use, and application of knowledge in urban governance. We are essentially grafting another element onto Lima's water and digital infrastructure, which makes the digital infrastructure decentralised and communal and highlights the expertise of residents. We hope that by democratising digital technologies and envisioning and materialising critical technologies for urban futures, we will be able to mitigate unintended consequences and contribute to the collective interest of society.

Moreover, this chapter shows how this relational approach is useful not only for the analysis of the information infrastructure in Lima's water governance but also for informing its design practices. Given the continuous development of digital information infrastructures for urban governance, one of the most important contributions of this research to previous work on urban infrastructure from a sociotechnical perspective (e.g. Amin & Thrift, 2017; Anand, 2017; Salamanca, 2015; Simone, 2004, 2015) is that we work towards bringing the fields of urban geography and ITC4D into conversation by bridging the gap between theory and practice through the conceptualisation and design of a participatory urban observatory.

Drawing on our experiences designing the MWO, we argue that the digital information infrastructures designed for just water governance should engage with and be based on the experiences, needs, and plural knowledges of diverse residents at all stages of development. This argument has roots in the work of Shklar (1990) and Zwarteveen and Boelens (2014), who argued that theories about justice, be it in general or specifically focused on water, should pay more attention to citizens' experiences of injustice. Specifically, with the acknowledgement that the data infrastructure is part of a larger water governance system where competing interests are at play, we need to assess the fairness of and access to participation in knowledge generation and mobilisation. Centring residents' experiences of injustice in the formulation of the data justice design principles thus becomes a powerful tool to bring the water distribution system into conversation with the voice of residents.

Although many digital technologies that emerged during neoliberalism can reproduce long-term asymmetries in knowledge production along the lines of coloniality and capitalism (Mattern, 2021), we agree with Couldry and Mejias (2021), who argued that the value of designing critical and experimental platforms lies not directly in the accuracy of the data generated, but rather in showing the messiness and complexity of the city and visualising a perspective on the city that is not the dominant one. For us, this is not a failure but continues to explain the idea of ontological completeness. We argue that as long as the approach to justice is clear, it should be seen as a process rather than a final product.

10.5 Conclusions and Ways Forward

It is unlikely that technological development will slow down to fully accommodate other narratives and visions for the future of water in Lima. In the meantime, we need to continue exploring ways to overcome the juxtaposition between water and data justice. Zwarteveen and Boelens' (2014) framework for water justice, which grants equal importance to the distribution and acknowledgement of knowledge systems, may form a good starting point. If water justice can only be achieved when plural conceptualisations of water are respected and listened to, we need to steer our digital systems and their inscribed ontologies to recognise the value of other ways of knowing. It is through the pluralisation of knowledge that the symbolic boundaries drawn up between the city and landscape, urban and rural, scientific and indigenous, and producer and consumer seem to be slightly redrawn.

To be able to do so, we need to centre people as experts, users, and beneficiaries in our design practices. Putting forward a novel approach to designing digital tools for participation in urban infrastructural governance contributes to advancing approaches for governments and citizens alike to develop information infrastructures that contribute to just water governance. We hope this inspires the development of information infrastructures that bring together an assemblage of tools to accommodate the different voices and purposes in urban governance.

Nevertheless, also within the MWO, we risk reproducing the dominant modernist approaches to water governance in the city. Our decision to focus on quantitative data and data justice in the MWO was partly informed by the fact that data is considered a powerful asset within the fragmented yet entangled institutional network that is Lima's water sector (Filippi et al., 2014; Miranda Sara, 2021), yet is still exclusionary to the plural ontologies of water prevalent in the region. Additionally, we have focussed firmly on how data (in)visibilises, structures, and can be made more transparent but not yet on people's capacities to mobilise data and digital technologies to improve the water infrastructure according to their needs and ambitions. This should

and will be the focus of the next steps of the MWO project. This is relevant to understand not only the utility of the MWO but also the challenges related to people's access and capabilities to use digital technologies and data.

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Note

1 https://observatoriodelagua.ciudad.org.pe.

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11

SOCIAL MEDIA AND SISTERHOOD IN LATIN AMERICA

Discourses and Practices

Illari Diez and Juan Bossio

11.1 Introduction

Gender-based violence is a huge problem that mainly affects women all around the world. Globally, one in three women has been the victim of any gender-based violence during her lifetime (OHCHR, n.d.). While the global average of sexual violence reaches 6% among women aged 15–49, Latin America almost doubles this average with a rate of 11% (Smit & Fraser, 2022). Furthermore, the region has the highest femicide rates in the world. It is also estimated that 75% of violence against women is perpetrated by their intimate partners (ECLAC, 2022) and that 70% of femicides occur in the victim's home (Wilson Center, n.d.). For example, in Mexico, approximately 70% of women have suffered some violence in their lifetime: 52, 50, 35, and 27% have experienced psychological, sexual, physical, and economic violence, respectively (INEGI, 2021). Moreover, although exact statistics are difficult to obtain, it is estimated that between 25% and 85% of women experience sexual harassment in their workplace and that the incidence is even higher for women from marginalised groups, such as LGBTQ+ women and women of colour (Cedeno & Bohlen, 2022). In addition, most of this violence is never reported to official entities; for example, 83% in Colombia (Palermo et al., 2014) and 98.6% in Mexico (México Evalúa, 2021).

As a response to this violence, many women have joined forces through the use of social media to denounce it, call for mobilisations, discuss social reality, act to improve women's situation, and engage in other collective action (Escalona Castro, 2019). Furthermore, social media, especially Social network services (SNS), have been used by women to build sisterhood networks oriented towards bringing and receiving help, as well as acting collectively

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against this violence. However, it should be considered that there are asymmetries and inequalities based on gender, class, race, and culture in cyberspace (Aráoz, 2020).

The aim of this chapter is to critically reflect on whether the use of social media by feminist women benefits sisterhood (solidarity between women). To do so, we present relevant concepts and ground information. Firstly, theoretical concepts on sociotechnical, collective action, and social networks are presented. We then outline the particularities of Latin American feminism, specifically focusing on intersectionality and power. Those ideas serve to review ways in which sisterhood is understood. The chapter then describes experiences of sisterhood in Latin America, demonstrating the mechanisms that facilitate sisterhood through social media. Final thoughts are presented in the conclusion.

11.2 Analytical Concepts

Systems tend to drift beyond planned uses (Ciborra et al., 2000) because of users' adaptation processes, which revamp them (Walsham, 2001). The catalyst for social change is not the technology per se but rather the ways it is employed and the interpretations and meanings attributed to it (Grint & Woolgar, 1997). Artefacts' meanings are shaped by social groups, are context-specific, and are subject to change depending on the circumstances (Siri, 2008). Increasingly, people integrate the digital technologies into their lives in a hybrid space made by digital and physical interconnected experiences (Castells, 2012). Given they are made up of groups of people that use technology, social movements appropriate technology (Castells, 2012; Walsham, 2001), using their capacities following a purpose (Toyama, 2011).

Social movements are characterised by collective challenges pursued by groups of people who share common objectives, foster solidarity among their members, and interact with authorities, opponents, and elites (Tarrow, 1994). Social movements, including feminist movements, have historically sought recognition for their demands, a prominent theme in contemporary times (Castells, 2012; Melucci, 1996; Tilly & Woods, 2009; Treré, 2015). Nowadays, social movements have leveraged Internet resources and platforms, particularly social media, leading to the emergence of net movements (Castells, 2012; Jenkins et al., 2016; Postill, 2018). Notably, feminism has been at the forefront of adopting information technology as an essential tool for its international advocacy (Gajjala & Oh, 2012; Escalona Castro, 2019). Social movements operate through different repertoires, with some adapting to digital environments, such as collecting money or provisions for protesters through social media. Other novel digital strategies include video mapping, hashtag campaigns like #MeToo, viral performances such as "El violador eres tú" ("You are the rapist") from Las Tesis, and hashtag crashing (Bossio,

2020; Jenkins et al., 2016; Treré, 2015). Interestingly, the notion of a repertoire is derived from anthropology and performance studies, as culture develops in a theatrical way (Fuentes, 2019; Schechner, 2011; Taylor, 2011). Social movements, therefore, perform in social life, acting out their ideas and demonstrating to the public, either or simultaneously in physical and digital forms (Castro, 2019; Fuentes, 2019). Digital media also plays a crucial role in facilitating the sharing of opinions, coordinating actions, learning street action tactics (e.g., tutorials on handling tear gas canisters), and expressing or showing solidarity (Bossio, 2020; Treré, 2015).

11.2.1 Latin American Feminism

While we use the term "feminist movement," it is essential to acknowledge the existence of numerous forms of feminism, each with its own perspectives, ways of living, and modes of activism. In Latin America, feminist movements exemplify a specific blend of cultural, ethnic, social, and linguistic diversity, encompassing a wide range of demands that go beyond the pursuit of gender equality (Rivera, 2018; Sardiña, 2020). It is important to point out that Latin America bears the profound imprints of European colonialism, evident in its predominantly Catholic nature, the influence of a market economy controlled from outside the region, and the existence of a social structure characterised by patriarchy, racism, and discrimination (Gargallo, 2007).

The historical process called colonialism, initiated at the end of the 15th century with the arrival of the Iberians in America, introduced a new concept to categorise the population: race. This allowed an essentialist justification of social hierarchies structured by power since ethnicity is classified not only as different but also in terms of superiority and inferiority (Quijano, 2022). Additionally, ethnicity influences the two levels where social relations take place: personal interactions and long-lasting micro-regional, regional, and national socio-political processes (de la Cadena, 1992). Even though the colonial period has ended, the idea of race remains present in the social dynamics of the population, especially under the idea directly associated with colour. Moreover, this colonial matrix of power is defined through four interconnected levels: control of the economy (appropriation of land and exploitation of labour), control of authority (form of government), control of gender and sexuality (concept of woman, heterosexuality as a norm and family as a social nucleus), and control of knowledge and subjectivity (educational institutions and media that create discourses) (Mignolo et al., 2008). Authors such as Rita Segato (2015), Antonio Quijano (2022), and María Galindo (2022) agree on the fact that racialisation is a fundamental pillar of what is known as colonial modernity, that is, the current process in which the capitalist system is sustained, among other factors, by the idea of race. This places certain social groups below the regular valuation of any person; their

rights are limited, their demands minimised, and their motivations criminalised. This systemic racism typical of colonial modernity, added to the roles imposed by the patriarchal system, places racialised women in a doubly relegated position: on the one hand, she is a woman, and on the other hand, she belongs to an inferior race, that is, she is not only an "other" within the patriarchy, but she ends up becoming the other of the other. Furthermore, as Galindo (2022) points out, as men freely navigate between different ethnocultural groups without facing repercussions, women face intense scrutiny and criticism if they dare to engage in similar behaviour that could entail both the right to belong and expulsion. Also, women can be perceived as more racialised by their own community (de la Cadena, 1992).

Amidst the wealth and complexities of feminisms, questions have arisen about the evolution they have undergone. These issues focus on the construction of the feminist political subject, its singular viewpoint, its Eurocentrism, and even the concept of womanhood and its universalising character. Moreover, dissident voices within other social movements, such as indigenous, Afro-descendants, human rights, migrants, and environmentalists, have also expressed criticisms, highlighting the lack of specific gender-related demands and discussions about power dynamics between men and women within these movements (Gargallo, 2007). Finally, driven by reflections on post-coloniality and the convergence of various anti-systemic struggles, certain feminist perspectives aim not only to unveil power dynamics within social organisations but also to question the state and its adherence to neoliberal principles (Coba & Herrera, 2013).

This diversification of feminism has been a gradual process, gaining momentum in the 20th century and undergoing significant transformations in recent decades. Latin American feminism is connected to international feminism and has gone through the same three waves, but it has done it in its particular way, embedded by historical and contextual particularities. During the early 20th century, feminist women were dedicated to campaigning for the right to vote, equal educational opportunities, and supporting various causes, including the rights of workers and indigenous people (Barrientos & Muñoz, 2014; Varela, 2019). From the 1970s onwards, the feminist movement shifted its focus towards advocating for equal citizenship in all aspects of life in what is considered the second wave. During the 1970s, women organised street demonstrations to enhance their visibility (Barrientos & Muñoz, 2014), and specialised institutions emerged to address women's workplace concerns (Vargas, 1985). In the 1980s, new autonomous groups emerged aligned with a left-wing ideology and focused on addressing women's issues from a Marxist standpoint (Vargas, 1985). During this period, women began to embrace a broader understanding of rights. As the 1990s unfolded, feminist movements became more intricate and divided, leading to the emergence of new forms of expression (Vargas, 2004). However, liberal

feminism was prominent, securing some rights for women regarding gender equality but also adapting to the principles of neoliberalism and undergoing institutionalisation within NGOs and state offices, losing its countercultural character (Coba & Herrera, 2013). Third-wave feminism became associated with notions of sexuality. In this context, groups advocating for sexual diversity rights aligned with the ideals of feminist radicalism. However, an ongoing debate revolves around whether to prioritise defending gender identities when basic conditions for women have not yet reached an acceptable standard (Barrientos & Muñoz, 2014). For example, as Gargallo (2007) outlined, women who participate in the Zapatista Movement, the coca growers in Bolivia, and the Amazonian and Andean indigenous people are denouncing the relationship between colonialism, racism and economic inequalities, opportunities and access to public services that they marginalise them.

Between the second and third waves, there were common themes concerning legal abortion, violence, patriarchy, child pornography, and other related issues. Some of the divisive questions within feminist circles include the relationship (or lack thereof) between patriarchy and capitalism, the inclusion of trans women as feminist subjects, the regulation or prohibition of sex work, and other such matters (Bossio & Diez, 2021).

As the new century started, feminist movements began to address issues of globalisation, critiquing the impact of American Westernization while also confronting racism and the enduring effects of colonialism (Gargallo, 2007). The first decade shows the emergence of questions regarding how differences, inequalities, and exclusions have been processed among women with different social and cultural locations (Coba & Herrera, 2013).

Furthermore, several authors argue that a fourth wave of feminism is currently evident in Latin America (Barrientos & Muñoz, 2018; Muñoz, 2019; Varela, 2019). This wave is characterised by the recognition of the diversity of feminist ideologies and movements, the widespread use of the Internet, the emphasis on sisterhood, the centrality of the body in certain feminist discourses, and other distinctive features (Barrientos & Muñoz, 2018; Muñoz, 2019; Natalucci & Rey, 2018). In this diverse landscape, it has been found that factors such as ethnicity, social class, and race have become sources of contention and have been utilised to create hierarchies among feminist movements (Muñoz, 2019). Also, women's and feminist movements simultaneously advocate for the rights of people and nature (Coba & Herrera, 2013). Consequently, the concept of intersectionality has gained importance within the realm of gender (Barrientos & Muñoz, 2018), leading to the emergence of intersectional feminism, which seeks to encompass the diversity of all women (Silgado, 2020). Feminist actions and mobilisation – on the streets and Internet – had grown and expanded during this century. As examples, we may mention the Slut Walk – originated in Canada – reproduced all over Latin America; the fight against femicide and the need of special policies has

had several cases, being the most expanded NUM ("Ni Una Menos"/"No One More less"); denunciation of rape and claims against a "rapist State" or "rapist society" included several mobilisations and demonstrations, being the most known performance "El violador eres tú" ("You are the rapist") by "Las Tesis" collective form Chile; and the battle for the right to abort with some of the biggest street demonstrations in Argentina and other countries.

11.2.2 Intersectionality and Power

Intersectionality is a concept that helps illustrate how differences between people can generate hierarchies, along with different life experiences. It was first mentioned by Kimberlé Crenshaw when she studied how gender and race affect African American women in different ways, particularly in relation to their experiences of gender-based violence (Crenshaw, 1989). She wanted to define a methodology that helped "disrupt the tendencies to see race and gender as exclusive or separable" (Crenshaw, 1991, p. 44) and that can be expanded to include characteristics such as sexual orientation, age, and class, among others (Crenshaw, 1991). Intersectionality can thus be defined as a perspective which refers to how two or more characteristics that define a person's identity (race, age, ethnicity, gender, and religion, among others) combine to generate inequalities and place people in a certain social position (whether it is higher or lower) (Rios Bellagamba, 2022).

Vich and Zavala (2004) emphasised that it is crucial to contextualise power and social identity, as these experiences are events that take place in a certain space and time, giving them meaning. Subjects participate in the construction of discourses and this negotiation is based on the beliefs and daily practices embedded in the mechanisms of power. Intellectuals play a crucial role as they establish the credibility of their messages within their communities or broader societal contexts (Vich & Zavala, 2004). In contrast, the subaltern subject is a subject whose identity is formed in relation to hierarchical structures and experiences a tangible power imbalance in its construction; in other words, who "can not speak". Thus, there are subjects with power who produce the discourses that are taken into account and subjects who do not have that power.

This is important to take into account because Latin America and Latin American feminism are full of diversity; there are different feminisms because there are different positions, lived experiences, ways of getting livelihoods, and ideologies that shape them. There is a middle-class feminism which is honestly worried about gaining more representation of women in politics, universities, academia, enterprises, and other decision-making positions, which are still disproportionately held by men. Without diminishing the importance of this struggle, it's important to highlight that it has limits when discussing changing gender (and other) inequalities and their consequences. Because of that, there is a necessity for a broader and more critical feminism

that reflects and faces Latin American diversity. Related to that, there are other feminisms concerned with (or centred on) other issues such as violence, sexual work, the representation of subaltern groups due to race, culture, or economic status, the feminisation of poverty, and reproductive and sexual rights. Issues such as intersectionality and others permeate how feminisms debate, interact, and disseminate ideas on the Internet and in social media, influencing how individuals act, join, argue, and, sometimes, collide. For example, the so-called community feminism, which begins with the assumption that the revolution is a communal effort, is particularly relevant in Latin America (Sardiña, 2020). Another aspect of feminism gaining significance within the specific context of Latin America is decolonial feminism.

11.2.3 Conceptualisations of Sisterhood

The notion of sisterhood has been conceptualised from various perspectives in feminism. For Lagarde (2011) sisterhood is a universal alliance between women that implies a pact between peers and a common agenda. She proposes a change from a focus on women's friendships/enmities and moving towards friendship. Then, sisterhood implies friendship between those created as enemies by the patriarchal world. This alliance between women aims at the search for gender equality, equality between women and the political struggle for a life of dignity and freedom for all.

On this basis, Lagarde (2011) defines sisterhood as an ethical, political, and practical dimension of contemporary feminism. Thus, the sisterhood urges women to seek positive relations and political alliances with other women, to carry out specific actions against oppression, and to provide support for empowerment (Lagarde, 2011). It is important to highlight that one of the conditions for the existence of sisterhood is equality between women, connected to the fact that they recognise each other as interlocutors. In the same perspective, bell hooks (2000/2017) mentions that sisterhood goes further than the recognition of women's experiences and the affinity for common afflictions. As a consequence, sisterhood implies a shared commitment to fight patriarchal injustice. Moreover, if women use power to dominate over other women, it's not possible to fully achieve sisterhood.

Torcuato et al.'s (2017) perspective is a complementary way of understanding sisterhood, which focuses more on constructing supportive links between women. Thus, the authors define sisterhood as the construction of relationships of complicity, mutual support, and solidarity between women to generate support networks in various areas of their lives (Torcuato et al., 2017). Furthermore, building upon Lomnitz's concept (1978) that social networks serve as crucial survival mechanisms for marginalised individuals, it can be argued that sisterhood functions as a vital survival tool for women within a system that lacks comprehensive support.

In addition, Liedo (2022) proposed that nowadays the sisterhood concept can be analysed by focusing on different components, such as trusting women's testimonies, the appeal to the emotional, shared care and vulnerability, and valuing women's togetherness over their differences. One of those points concerns rehabilitating epistemic justice (Liedo, 2022). Epistemic injustice is understood as a way of discrimination that happens when a person, consciously or unconsciously, undervalues or belittles another person concerning their status as an epistemic subject (Fricker, 2021); in other words, it would be a subaltern subject (Vich & Zavala, 2004) because it is not seen as capable of sharing insights, valuable commentaries, and truths, among others. There are two types of epistemic injustice: *hermeneutic injustice* and *testimonial injustice*. The first occurs when the subject does not have the concepts to name and understand what has happened to them. The second form of injustice occurs when the person listening to the testimony makes judgements, influenced by their own prejudices, about whether the person giving the testimony has credibility or not (Fricker, 2021). In other words, the person giving the testimony is seen as epistemically inferior and therefore disregarded, with negative consequences in other areas of their lives. This also shows an example of how power relationships can influence who is capable of creating truth discourses, showing the existence of subaltern subjects (Vich & Zavala, 2004). As a response to this epistemic injustice, sisterhood proposes restoring legitimacy to women and their testimonies, restoring its status as an epistemic subject. This can be summed up in the phrase "sister, I believe you" (Liedo, 2022). Then, sisterhood helps address gender violence as it is an alliance (Lagarde, 2011) based in trust and togetherness (Liedo, 2022) fighting patriarchal injustice (bell hooks, 2000/2017) by the means of supportive links between women (Torcuato et al., 2017) believing the victim (Liedo, 2022).

However, when applied in practice, the sisterhood concept is not free of tensions. One of these tensions is related to the link between sisterhood and identity. Littler and Rottenberg (2021) argued that solidarity in feminist contexts is seen as being able to go beyond identity categories (such as age, nationality, class, and ethnicity) without reducing women to essentialist categories. Furthermore, they highlight the need for women to recognise and respect their differences without being colonised. However, tension can emerge because sisterhood as a concept promises to transcend difference, but to operate in the political realm it reinforces difference by solidifying the existing categories of identity (Littler & Rottenberg, 2021).

There are at least three more tensions around the concept of and practice of sisterhood that criticise its idealisation. The first position comes from second-wave Black feminism, which questioned an idealised sisterhood uniting all women. This critique is based on the existence of diverse oppressions and inequalities based on characteristics such as race, class, and

sexual orientation (Liedo, 2022), which is related to intersectionality. For example, Fernandes de Negreiros (2022) argued that "there are pitfalls in a colour-blind sorority [sisterhood] idea" (p. 28). The second position emphasises the "cheating homogeneity" that would be built on a certain way of being a woman that is not universal in reality. In other words, in this case, it criticises when sisterhood is understood as a set of experiences and situations common to all women. In response, what Lorde argued (as cited in Liedo, 2022) is that sisterhood between women (cis and trans) should show an active opposition to the various injustices, forms of oppression, and inequalities that affect women's lives in order not to reproduce those injustices. This is directly linked to Lagarde's (2011) idea, which mentions equality between women and their recognition as women as a condition for the existence of sisterhood. The third tension points out that a general appeal for sisterhood can become a way of exercising discipline within feminist groups. This would result in dissent not being taken into account to maintain unity within the group or in a member's failure to comply with sisterhood being seen as a betrayal (Liedo, 2022).

The case analysed by Bossio and Diez (2021) illustrates all or some of these tensions. On one side, there is a debate on whether every woman should deserve sisterhood if they have shown to be against it by being right-wing, religious, employing housekeepers, being policewomen, xenophobes, and so on, which is connected to the first two tensions mentioned above. On the other side, moderators of the group debated whether members who exclude or attack others should be expelled from the group or "educated". Thus, it has been observed that complying with the idea of sisterhood of the group is a guideline that can affect the permanence of people in this space.

In summary, sisterhood can be a really powerful tool among women to fight against the injustices of the patriarchy. However, it is necessary to refrain from romanticising it to practise it in reality, as well as to avoid masking the differences that characterise all women and the possible pillars of inequality or oppression that may intersect in their relationships. Furthermore, according to Silgado (2020), the consistent practice of sisterhood within women's relationships can foster a greater global acceptance of feminism, thereby enhancing the effectiveness and inclusivity of feminist movements. Undoubtedly, sisterhood centres around supporting others and striving to diminish women's oppression (Littler & Rottenberg, 2021). Thus, it is essential to have an intersectional view of sisterhood that aims to construct a fairer world for all women (Liedo, 2022).

Johnson (2020) considered that women's solidarity plays a crucial role in bridging the divide between feminist theory and its practical implementation. We add that it could be thought of as feminism in action (Bossio & Diez, 2021). Moreover, social media is crucial to go against rules or practices that affect women's rights, and impulse collective action (Alcaraz, 2018).

Furthermore, "new technologies connect the bodies and transform them, as well as their ability to communicate to each other and build affective solidarities" (Souza, 2019, p. 105). In this sense, social media becomes a space where women can exercise political repertoires, help each other, and build sisterhood networks, among other actions which will be further elaborated upon in the following section.

11.3 Social Media: The Practical Applications of Sisterhood

We have demonstrated how sisterhood acts as a political repertoire of feminism. However, it is also a principle or a "mandate", an ideal, or a tension field, among other things. Taking that into account, this section will present many cases of sisterhood as they have manifested on social media, highlighting its characteristics as a political repertoire and its tensions or limits.

Manifestations of sisterhood on social media can include mutual support and companionship, especially in gender-based violence circumstances and pregnancy interruptions. In other words, these messages provide different types of support, such as emotional support, in which people are aware that they can show affection (High & Buehler, 2019); esteem support which "reminds recipients that they are worthwhile individuals, despite their problems" (High & Buehler, 2019, p. 722); informational support when people receive advice or opinions related to how to solve their problems (High & Buehler, 2019); and tangible support given "through actions involving practical aid, such as lending money or helping with chores" (High & Buehler, 2019, p. 722). Some Latin American cases will be presented below as examples.

First, Castañeda y Baca (2018) studied the case of a Facebook group whose members were Mexican women who had mainly moved to European countries. Participation in the group allowed the immigrant Mexican women to find support and get information from their peers when they were victims of gender-based violence. Moreover, it helped create the space for women to trust their peers and share their experiences as victims as well as receive direct help, such as with translation, companionship to file a complaint, accommodation, or financial support for the victim to travel to her country of origin (Castañeda & Baca, 2018). This is extremely useful for the victims to escape from their violent environment. This case exemplifies how women can get together through social media to find informational, emotional, and tangible support (High & Buehler, 2019). Also, it can be observed that these women constructed sisterhood by taking their common characteristics as a starting point, such as being foreigners and probably being subaltern subjects in that context.

Second, Soto (2019) wrote about the experience of Peruvian women promoters of the "Ni una menos" ("Not one woman less") mobilisation in their interaction on a Facebook group. Before the mobilisation, they shared their

testimonies, which helped to produce emotional support (High & Buehler, 2019), comprehension, and sisterhood; despite this, after the mobilisation, the number of testimonies was lower, and a more rational space emerged, where criticism prevailed, and conflicts arose over positions, judgements, and recriminations (Soto, 2019). This is related to what Vich and Zavala (2004) mentioned about the influence of power in discourse construction and epistemic justice or injustice (Fricker, 2021). Furthermore, on a community level, many women found the meaning of sisterhood and started different initiatives which grouped psychologists and lawyers, among others, so as to provide informative, tangible, and networking support (Soto, 2019). This case exemplifies the positive and negative aspects of using technology: the Facebook group allowed for communication and sisterhood but also created conditions for exercising power (Soto, 2019). Moreover, the case shows how power dynamics among women can influence the practice of sisterhood in social media.

Third, Diez (2020a) studied how women can provide different kinds of support in a Peruvian Facebook group and how tangible support (High & Buehler, 2019) can happen in the interaction between them in this digital space. Also, the women members of the group constructed sisterhood networks owing to the interaction that helped to build bonds of complicity, empathy, and trust – which are sisterhood elements (Torcuato et al., 2017) – and also reciprocity (Diez, 2020a). This allowed them to give and receive help such as emotional support, accommodation, and providing or help with finding abortion pills, among others. It is crucial to highlight that safety (meaning that the members will not be judged) is required for women to feel confident to talk about their problems and receive support (Diez, 2020a, 2020b). In addition, there are rules for participating in the digital space, and moderators have a primary role in compliance. Finally, it is important to mention that this group is not the only one where women find help or build sisterhood networks, as there is a 'constellation' of feminist groups specialising in various topics such as mental health and job searches. This case exemplifies how women sometimes can consider intersectionality to go over their differences to provide and receive help (Littler & Rottenberg, 2021). However, achieving this is not always possible, and the group moderators' role is crucial to maintaining cordial relationships in the space.

Fourth, Silgado (2020) focused her investigation on feminist collectives with an intersectional perspective in Latin America. In these cases, Silgado defined feminist narratives as those in which women feel comfortable sharing their experiences and receiving empathy, which helps form bonds and connections between those with similar lived circumstances. Some of the collectives she studied opened spaces for women to share intimately. While there was no lack of sisterhood in these collectives, there were some comments in which women were critical of the experiences that were shared,

such as making negative remarks or taking the side of the aggressor. Another example of posts that lacked sisterhood was that related to abortion or other non-traditional topics (Silgado, 2020). Similar to the previous case, it's observed that sisterhood can overcome differences (Littler & Rottenberg, 2021), but tensions related to the identity or personal situations of each woman are still present. This shows how power dynamics in discourses, the creation of subaltern subjects (Vich & Zavala, 2004), and the presence of epistemic injustice (Fricker, 2021) can influence sisterhood practices.

Fifth, Banks-Weston and Kolski (2022) conducted an ethnographic study focused on the experiences of "culturally diverse women participating in an online business strategy course and to evaluate the impact of virtual collaboration on social connectedness among this group" (Banks-Weston & Kolski, 2022, p. 68). They found that the tools made for virtual collaboration enabled participants to build a support network and develop skills which helped their career progression. This was possible owing to one-on-one and group interactions. Furthermore, these interactions among the participants made those women feel less isolated and had both personal and professional positive impacts on them. Thus, the use of technology can help women with similar backgrounds, experiences, or goals build strong and intimate relationships (Banks-Weston & Kolski, 2022). Moreover, virtual collaboration can offer the possibility of access to safe spaces, allowing them to be "free of the discrimination, sexism, marginalisation, and oppression they face in their day-to-day lives" (Banks-Weston & Kolski, 2022, p. 75). It can be observed that sisterhood can be present in different kinds of interactions and situations in women's lives. In this case, women received informational support (High & Buehler, 2019) and overcame their differences to achieve that.

The final case presented in this section examines a case in Spain. During the COVID-19 confinement, many women with disabilities had difficulties reporting violent situations or receiving specialised resources. Women with disabilities in Latin America face similar challenges to those in Spain, as highlighted by the Economic Commission for Latin America and the Caribbean (ECLAC, 2021) report. Despite the lack of specific data on disability and gender-based violence during the pandemic, the increase in domestic violence against women and girls suggests a probable rise in violence against individuals with disabilities. Reporting violence is particularly difficult for persons with disabilities due to limited access to domestic violence services and assistance, often resulting in their exclusion from support systems and the unavailability of accessible technical support (ECLAC, 2021). The Fundación CERMI Mujeres launched an initiative based on mutual support groups for women with disabilities who were victims of gender-based violence as well as female caregivers of people with disabilities (Castellanos-Torres & Caballero, 2020). In that virtual space, women built bonds, developed support strategies, and had a forum useful for sharing concerns and needs and discussing

common interests while implementing a feminist policy based on sisterhood (Castellanos-Torres & Caballero, 2020). Moreover, it is important to mention that this construction of sisterhood was done with critical thinking and with a commitment to the awareness of the presence while also renouncing power dynamics of class, race, and the empowerment of some women over others (Castellanos-Torres & Caballero, 2020). Thus, these women tried to put into practice a sisterhood model that takes into account the different experiences and forms of oppression that each woman can live. This case reflects a more critical perspective on constructing sisterhood relationships that address the tensions surrounding identity and the power dynamics between women. In other words, this experience reflects Lagarde's (2011) idea, which mentions equality between women and their recognition as interlocutors as a condition for the existence of sisterhood. Furthermore, it tries to avoid the existence of subaltern subjects (Vich & Zavala, 2004) and the reproduction of the injustices that women can experience.

At the same time, other manifestations of sisterhood were related to helping members find a job, obtain a service, or buy/sell products. These actions were related to fighting against economic violence through actions, such as paying the "right price" and not haggling over prices. One example of this is the case analysed by Aráoz (2020), who focused on a Spanish Facebook group which worked as a space to find job vacancies and exchange or buy products and services between women. However, the space is more than that because its members meet, recommend products or services, (de)construct gender stereotypes, discuss certain topics of interest, share common gender experiences, and form support relationships among them (Aráoz, 2020), which are oriented to subvert the patriarchal system that oppresses them. This exemplifies the necessity to fight against injustices to avoid reproducing them (Lorde, as cited in Liedo, 2022) when constructing sisterhood. Finally, rules such as appreciation, good treatment, respect, and consent reflect the kind of bonds that are intended to be generated in the digital space (Aráoz, 2020). In Latin America, we saw different Facebook groups with similar characteristics; however, to date, we have not found any relevant studies on these groups.

11.4 Social Media: Facilitating Sisterhood Practices

Sisterhood is a practical expression of feminism that enhances the links between members and provides them help, support, stability, camaraderie, friendship, and more, which Silgado (2020) states were common practices for all the groups she studied. Taking stock of the experiences described above, this section aims to present what actions, mechanisms, tools, or actions would be helpful to enjoy sisterhood in virtual communities or open social media.

Internet spaces are good for interacting, sharing opinions, and getting and staying in contact with friends and acquaintances, but they can also be insecure or violent spaces: private images or data could be openly shared, attacks or insults could come from unknown individuals, and assets or liberty could be placed at risk. Participants in such spaces should trust others, considering that providing information or help may put them in danger, such as when helping contract clandestine abortion services. As long as members of online communities trust the group, it is possible to develop trust that results in mutual support and sisterhood (Cadena Agudelo, 2021; Diez, 2020a, 2020b; Soto, 2019).

Safety implies more than just the absence of danger; it also implies controlling the conditions that could generate physical, psychological, or material damage to maintain the well-being of individuals and the community. Thus, security has an objective dimension, linked to the behaviour and environment in which the person is and a subjective dimension, connected to the person's perception of safety, that is, whether or not they feel safe in the space (Diez, 2020b).

While zero-risk or fully safe virtual spaces are hard to imagine – as is with physical spaces – some practices or considerations have been shown to provide healthier environments (Diez, 2020b). The actions to be taken ought to control risks and generate feelings of confidence and security; participants should feel comfortable sharing information, sentiments, and opinions, be able to ask for help, and be confident in who offers help. These actions include having some control over anonymity and setting some rules.

Anonymity, a beloved characteristic of the Internet, helps individuals express their own opinions, beliefs, and identities and protects oneself from information phishing and state censorship, but it also helps trolls or haters act. Thus, anonymity should be managed to avoid some risks and have some social control.

To develop a safe space, online communities should agree on some rules or guidelines (Aráoz, 2020; Castañeda y Baca, 2018; Diez, 2020a, 2020b), such as prohibiting aggressive comments or offensive language, respecting privacy and not sharing internal information, and acting with sisterhood to other members without considering views or political opinion of the others. In addition, aspects that help develop feelings of safety are those that build community, where there is confidence to share one's problems and the members share common characteristics or interests, the existence of an echo chamber, and the use of certain platform affordances. Members of feminist groups share information, news, readings, opinions, etc., which enhance confidence among them. Furthermore, those who do not share the rules on how the debate should occur are separated from the group, which can promote feelings of security.

Platform affordances may be appropriated by groups to build safe places for sisterhood. For example, setting procedures to accept members, considering

privacy configuration options, having closed groups (Aráoz, 2020; Diez, 2020a, 2020b; Soto, 2019), or defining moderators' roles (Aráoz, 2020; Castañeda & Baca, 2018; Diez, 2020a, 2020b). Also, it's important to take advantage of virtual collaboration tools. One example is upvoting or sharing pictures, including a word to make asking for help posts more visible so the person can receive the support needed (Diez, 2020a).

11.5 Final Thoughts

The appropriation of social media by allied women and feminist to perform sisterhood can be a powerful tool for women to fight against gender-based violence, build support networks, find friendships, etc. However, these spaces are not exempt of tensions – they are just not related to the application of sisterhood itself – which should take into account not only intersectionality and power but also the characteristics of the Social Networking Services (SNS), such as anonymity, the ease of sharing content, and how this affects privacy. Because of this, it is crucial to take advantage of the tools provided by the SNS as well as those constructed by its users to build safe spaces where sisterhood can flourish, always remembering that all women have different life experiences and necessities.

Digital social studies – particularly anthropology – has shown to be useful to comprehend the how and why women adapt appropriate technologies for sisterhood. Concepts, perspectives, and methods from ICT studies could be more integrated to such studies. Feminist studies had been looking at ICTs mainly as means for diffusion and call to action, but we consider they may look at how sisterhood is enacted by the use of such technologies.

Policies against violence, programs to enlarge and improve participation of women in policy and in the labour market, abortion legalisation, scholarship for women, and redistribution of unpaid caregiving work, among others, are all important and needed. But we argue that understanding, enlarging, and practising sisterhood is crucial. Sisterhood is critical for overcoming episodes of violence, getting livelihood, and even surviving, with an intersectional perspective that it would help give voice to subaltern subjects. Social Media, despite some negative aspects, has proved to be a useful space for women enacting sisterhood.

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