Past Practices, Current Debates and Disputes: Future Engagements and Opportunities Regarding Digital Transformation for Sustainable Development

Working Group 9.4: Implications of Information and Digital Technologies for Development

Robert M Davison [1][0000-0002-7243-3521] (✉), Antonio Díaz Andrade [2][0000-0001-9645-3941], Arlene Bailey [3][0000-0002-7404-3922], Ephias Ruhode [4][0000-0002-5727-7460], Geoff Walsham [5][0000-0002-5730-4043], Jean-Paul van Belle [6][0000-0002-9140-0143], Judy van Biljon [7][0000-0002-4646-1641], Kutoma Wakunuma [8][0000-0002-8236-3221], Kyung Ryul Park [9][0000-0002-6400-4727], Luiz A Joia [10][0000-0002-5903-5190], Manoj Thomas [11][x], Neki Frasheri [12][0000-0001-5928-275X], P.J. Wall [13][0000-0002-5859-4425], Renata Lèbre La Rovere [14][0000-0001-5912-5500], Silvia Masiero [15][0000-0002-1427-0779], and Stan Karanasios [16][0000-0003-0937-6058]

[1] City University of Hong Kong, Hong Kong
isrobert@cityu.edu.hk
[2] Auckland University of Technology, Auckland, New Zealand
antonio.diaz@aut.ac.nz
[3] Universty of the West Indies, Mona, Kingston 7, Jamaica
Arlene.Bailey@uwimona.edu.jm
[4] University of the West of Scotland, Paisley, PA1 2BE, Scotland, UK
Ephias.Ruhode@uws.ac.uk
[5] University of Cambridge, Cambridge, CB2 1AG, UK
g.walsham@jbs.cam.ac.uk
[6] University of Cape Town, Cape Town, South Africa
Jean-Paul.VanBelle@uct.ac.za
[7] University of South Africa, Florida 1709, South Africa
vbiljja@unisa.ac.za
[8] De Montfort University, Leicester, LE1 9BH, UK
kutoma@dmu.ac.uk
[9] Korea Adanced Institute for Science and Technology,Daejeon 34141 Republic of Korea
park.kr@kaist.ac.kr
[10] Fundação Getulio Vargas, Rio de Janeiro, RJ-22250-900, Brazil
luiz.joia@fgv.br
[11] University of Sydney, Sydney, NSW 2006, Australia
manoj.thomas@sydney.edu.au
[12] Polytechnic University of Tirana, Tirana, Albania
neki.frasheri@gmail.com
[13] Trinity College Dublin, Dublin, Ireland
wallp2@tcd.ie
[14] Federal University of Rio de Janeiro, Rio de Janeiro, RJ- 21941-901, Brazil
renataieufrj@gmail.com
[15] University of Oslo, Oslo, Norway
silvima@ifi.uio.no

[16] University of Queensland, Brisbane QLD 4072, Australia
s.karanasios@uq.edu.au

Abstract. This chapter provides a historical account of the development of Working Group 9.4 from its inception in 1988 to the present day. The intellectual and practical issues that have drawn our attention, as well as the debates and disputes that we have had over thirty years are elicited and discussed. More attention is paid to the current opportunities and challenges that enthuse us, and to the impacts that we hope to exert through our work. The chapter concludes with an eye to the future and how the working group may yet develop. The sixteen co-authors of the chapter reflect on how the field of development has morphed over time and on the directions that are opening up.

Keywords: Development, Digital, Practice, Impact.

Working Group 9.4 (WG 9.4) focuses on the implications of information and digital technologies for development. WG 9.4 was established in 1989 following a successful inaugural conference under the auspices of IFIP in New Delhi in 1988. The aims of WG 9.4 are fourfold:

- To collect, exchange and disseminate experiences of information and communications technology (ICT) implementation in developing countries;
- To develop a consciousness amongst professionals, policy makers and the public on the social implications of ICT in developing nations;
- To develop criteria, theory, methods, and guidelines for design and implementation of culturally adapted information systems;
- To create a greater interest in professionals from industrialized countries to focus on issues of special relevance to developing countries through joint activities with other IFIP technical committees.

Since our first conference, we have held a further 15 working conferences, six regional conferences and two joint working conferences. Our regular working conferences move around the global south so as to ensure that members in different locations can travel to a global event that is held locally at least occasionally (see Table1). Regional Conferences are a relatively recent phenomenon, and are organized by regional representatives (see Table 2). Finally, a joint WG 8.2 and 9.4 conference was held in Athens, Greece (2003), and a joint WG 8.2, 9.1 and 9.4 conference was held in Hyderabad, India (2020).

Table 1. Working Conference locations.

Year	Location	Year	Location
1988	New Delhi, India	2007	Sao Paulo, Brazil
1992	Nairobi, Kenya	2009	Dubai, UAE
1994	Havana, Cuba	2011	Kathmandu, Nepal

1996	Cairo, Egypt	2013	Ochos Rios, Jamaica
1998	Bangkok, Thailand	2015	Negombo, Sri Lanka
2000	Cape Town, South Africa	2017	Yogyakarta, Indonesia
2002	Bangalore, India	2019	Dar es Salaam, Tanzania
2005	Abuja, Nigeria	2022	Lima, Peru (Hybrid)

Table 2. Regional Conference locations.

Year	Location
2014	Aberdeen, Scotland
2014	Belo Horizonte, Brazil
2014	Centurion, South Africa
2018	Tirana, Abania
2018	Pretoria, South Africa
2020	Salford, UK

Table 3. Membership of WG 9.4

Country	Members	Country	Members	Country	Members
Albania	1	Ireland	4	South Korea	2
Australia	2	Jamaica	1	Sri Lanka	1
Bahrain	1	Macau	1	Sweden	3
Brazil	3	Malawi	1	Tanzania	3
Canada	1	Netherlands	1	Uganda	1
Colombia	1	New Zealand	1	UK	29
Ethiopia	3	Nigeria	3	USA	3
Finland	1	Norway	18	Zambia	1
Hong Kong	1	Peru	2	Zimbabwe	2
India	4	South Africa	10		

WG 9.4 currently boasts 105 members, each of whom has attended at least two conferences in the last 5 years (see Table 3). These 105 members hail from 29 countries. We also maintain a mailing list of 683 people who have attended at least one conference during our 33-year history.

In reviewing the development, current state and possible future trajectory of WG 9.4, an invitation was sent to all members in late 2019. Fifteen members responded by contributing information and ideas and all are listed as co-authors of this chapter. The core material in the chapter thus reflects the integrated thoughts of many members. Editing the material into shape has been the responsibility of Robert Davison, the current chair of WG 9.4.

1 Historical Developments

Reviewing the history of the group, Walsham [1] divides time into three periods: early beginnings (mid-1980s to mid-1990s), expanding horizons (mid-1990s to mid-2000s) and proliferation (mid-2000s onwards). In the first time period, which covers the time when WG 9.4 was established, much of the research involved themes from mainstream information systems (IS) that were applied to developing countries.

Subhash Bhatnagar was the first chair of the WG 9.4 (1989–1995). He edited a quarterly newsletter for the group (no longer online), which was published from 1991 to 2016 and which complemented the proceedings of the WG 9.4 conferences (since 1990) and the journal *Information Technology for Development* (since 1986) as the only publication opportunities available to researchers. Many of the researchers at this time were located in developed countries. At the first conference [2], the importance of context was recognized, Robey et al. [3] arguing that "cultural barriers to implementation present more difficult problems than technological issues because they provide the social context within which IS are interpreted and given meaning". Meanwhile, Korpela [4] emphasized the need for cooperative design in computer-related projects, where the participants should include both experts and users. Another prominent theme that is still with us today relates to indigenous practices. Bhatnagar [5] argued that while developing countries can borrow technology, they also need to develop their own technology for their own needs. In the early years, conference participants from developing countries were optimistic and enthusiastic about the possibility that ICT would help in the development of their countries. Indeed, many papers reported on these kinds of positive impacts but the same papers tended to be descriptive rather than analytical and generally did not consider longer term issues or the institutionalization of the technology.

Walsham's [1] second time period witnessed major changes in the technology (notably the World Wide Web) and thus the range and scope of research that was undertaken. Although some descriptive studies were still undertaken, a shift towards a more analytical and critical stance became apparent, with assessments of the meaning of development, for instance. Two open access journals were established: the *Electronic Journal of Information Systems in Developing Countries* (since 2000) and *IT and International Development* (since 2003). Increasingly, we saw researchers in developing countries making their presence felt at conferences and in journal submissions.

Key issues in this second time period include the way local actors adapt ICTs to meet their needs and in-depth studies of particular ICT-based phenomena such as geographical information systems, e-government, information kiosks, telecentres, and increasingly healthcare applications following the initiation of the Health Information Systems Project (HISP) at the University of Oslo in 1994. However, by far the major area of focus was how to provide access to ICT, including reducing the inequalities of access, with a strong focus on the shared-access model offered by telecentres and information kiosks. While one view is that such initiatives failed because of their unsustainable business models, they served their purpose of introducing and domesticating ICTs, thus meeting short-term demands and seeding future opportunities.

From the mid 2000s onwards, we have seen a vast expansion of the field [6] with increasing numbers of researchers who are located in developing countries contributing

high quality papers and new research groups emerging around the world. Some mainstream journals (e.g. *Electronic Journal of Information Systems in Developing Countries, Information Systems Journal, Journal of the AIS, Journal of Information Technology, IT and International Development,* and *MIS Quarterly*) have published special issues on developing countries and ICT4D more generally, some of these drawing on papers first presented at WG 9.4 events. This period also witnessed the broadening of theoretical perspectives that guided our research. Among other theoretical perspectives, members of the WG 9.4 community relied on activity theory [7], actor-network theory [8], institutional theory [9], practice theory [10] and structuration theory [11] to study the ICT4D phenomenon.

Researchers have also adopted an increasingly strident and critical tone, challenging many of the assumptions that we took for granted in the early years. Numerous studies have been undertaken into the impact of the mobile phone in a wide range of application contexts, many of which involve non-urban populations engaged in farming, fishing, and the informal economy. The use of the mobile phone as a device that can access e-banking applications and help to bank the unbanked at the bottom of the pyramid has also been prominent since the development of M-Pesa in 2007.

While the dominant development narratives relating to mobile communication technologies have emphasized their use and usefulness in narrowing the socio-economic disparities across genders, countries and regions, Stark and Wamala Larsson [12] argue that digital and communication divides are influenced by age, gender, socio-economic status, education, geography and language. Meanwhile, Sen's [13] capability approach proved to be influential, with many scholars examining its applicability in the ICT4D space. For instance, Zheng and Walsham [14] used it to challenge the assumptions of living in an idealized information society. By the time of the 2019 conference, the breadth of the field was far more considerable than had been the case 30 years previously. No fewer than 12 tracks were in place:

1. Digital platforms for development
2. FinTech and development
3. ICT4D for the indigenous, by the indigenous and of the indigenous
4. Recognizing African expression of technology
5. Harnessing agriculture
6. Land administration and public financial management for ICT4D
7. ICT for displaced populations: How it helps? How it hurts?
8. Communities, ICT-enabled networks and development
9. Pushing the boundaries: New research methods, theory and philosophy in ICT4D
10. Southern-driven human-computer interaction
11. Locally developed process and method innovations in ICT4D
12. Sustainable ICT, informatics, education and learning in a 'turbulent' world: "Doing the safari way"

Healthcare contexts still occupy much of the focus of our research, now propelled further by the ongoing COVID-19 pandemic. Solutions to challenges like pandemics may lie at the confluence of many disciplines such as medical science, computational science, engineering, management and social science, and organizational studies.

However, information systems approaches, involving mapping models and predictions based on big data analyses and machine learning, can help reduce complexity sufficiently to enable the identification of potential solutions. The advancement and increasing availability of big data and the rise of artificial intelligence [15], combined with the ubiquity of mobile phones and the rollout of fiber and 4G networks across the global south, will have the potential to empower governments, organizations, individuals and communities. As a result, we could see greater social change, an improved quality of life and strengthened public health and education systems. This critical mass of infrastructure presents the possibility of addressing many of the challenges outlined in the United Nations' sustainable development goals [16] including the eradication of poverty, zero hunger and good health. However, the operative word here is *potential*. As we will see below, sometimes our hopes for the future are little more than naïve optimism.

2 Current Debates

In this section, we review some of the topics that are currently popular and yet where members of the community are debating what kind of research we should be undertaking. The topics include: open data for development; north-south, south-south and triangular cooperation for ICT4D initiatives; the role of digital technology to support sustainable development goals; indigenous worldviews in ICT4D research; the dark side of ICT use, and making the world a better place with ICTs.

The theme of our 2019 conference was "Strengthening Southern-Driven Cooperation as a Catalyst for ICT4D." Geoff Walsham delivered a keynote speech devoted to South-South and Triangular Cooperation [17]. Walsham is critical of the UNDP's [18] position, viz.: "Southern-driven partnerships between two or more developing countries, supported by a developed country(ies) or multilateral organization(s) to implement development cooperation programmes and practices." As Walsham [17] observes, while the objectives seem laudable, there are unaddressed concerns, notably that of power: "what are the power relations between the 'equal' partners?". He suggests that it is necessary to dig much deeper into who controls the sources of funding before pronouncing on the equality of the erstwhile partners.

Considering bibliographic studies on the contribution of scholars from the global south based on three premier journals in the area of ICT4D, Bai [19] found southern scholars to be generally underrepresented. The findings are supported by van Biljon and Renaud [20], who investigated human-computer interaction for development publications and found that the number of first authors and second authors from some southern countries were disproportionately lower than might be expected given the number of studies conducted in those countries. There is no simple explanation for why the contribution of southern researchers is lagging in terms of the recorded publication scope and impact, but power asymmetries should be considered as one of the reasons. Nevertheless, we expect that southern-driven, south-south and triangular cooperation arrangements will persist and will also be the subject of research investigations. We

suggest that researchers should adopt a critical approach in these matters and be sensitive to the potential for inequalities to be perpetuated.

When these partnerships turn out to be unequal, we may witness one of the many dark sides to ICT. Emerging evidence suggests that people in the global south may be subjected to structural asymmetries that make them even more susceptible to the dark side [21]. There are numerous examples of dark side phenomena: identity theft, cyber bullying, data injustice [22, 23] and the panopticon of surveillance technologies employed by governments to monitor and control, to name but a few. Surveillance technologies provide those who are collecting data with the power to control those whose data is being collected. Collectively, these issues raise ethical concerns related to the invasion of privacy, mismanagement of data and use of data for purposes for which it was never intended when initially collected, whether permission was granted for it to be collected or not. Two other major concerns for developing countries are the ways in which digital platforms can enable new forms of pervasive exploitation (e.g., the gig economy) and the role of algorithmic interference in decision making processes (e.g., approving bank loans).

In a related vein, we perhaps naïvely used to imagine that if only we could give everyone in Africa access to a computer, what it would do for education, economic development, emancipation, freedom. Today, every (second) African has a mobile phone with 10 times the power and memory of the one laptop per child (OLPC) project (first envisioned in 2005 by Nicholas Negroponte at the world economic forum in Davos), with a camera, and Internet access to all human knowledge (via Wikipedia) and high-quality education (via MOOCs). Nevertheless, the hoped-for development failed to materialize. Despite the high-flown rhetoric, it turns out that we humans are, after all, all pretty much the same: instead of educating ourselves, we take selfies, gossip with our friends, surf for porn, fall for scams and generally waste time. As a result, the hoped-for impact, whether economic, gender, educational, creative, or entrepreneurial, has not yet been manifested.

Exploiting technologies in this way pushes problems from one dimension to another, perhaps solving one yet simultaneously creating another. The Internet is a good example because while it greatly facilitates global integration, it also provides an efficient platform for the undertaking of activities and dissemination of information that, although perfectly legal in one jurisdiction are illegal elsewhere [24]. For instance, it is not always easy to distinguish between real and fake news, with the consequence that the Internet itself is contributing to what we now term a ‘development paradox’: the widespread diffusion of Internet-based ICTs (mostly mobile but also others such as the cloud) that has not resulted in the expected sharply-upward development trajectory.

Slowly we have come to realize that it is wildly inappropriate to give a drought-stricken farmer or an abused wife a mobile phone with ‘our’ custom-developed app and expect ‘their’ problem to be solved. Their situation is far more complex than we realize, interlinked with norms and culture far beyond our ken, and thus needs to be approached in a much more holistic way that fully recognizes contextual details. As Davison and Martinsons [25] note, context is critically important to the successful practice of research. However, across many developing countries some authors have developed the view that a sufficient contribution to knowledge can be achieved by peddling North-

derived theories in their local spaces without any attempt to contextualize in or theorize for the local situation. Thus, we see the technology acceptance model (TAM), the universal theory of the adoption and use of technology (UTAUT) and countless other similar northern theories tested *ad nauseam* by researchers in developing countries without any attempt to identify or measure locally relevant variables. The resulting research is utterly a-contextual: we learn nothing about the local context, there is no useful contribution to knowledge and as a rule these papers are firmly rejected. The EJISDC, for instance, has guidelines for authors [26] that specifically proscribe the submission of these papers, but still they keep coming!

Even worse, this very same excess of replication studies in the global south informed by models developed in the global north constitutes an instance of academic neo-colonialism, albeit one that is unconsciously reproduced by the colonized not the colonizers! By willfully and unreflectively accepting imported models as universal truths, many researchers in the global south inadvertently adopt a subordinated position in the mistaken belief that they are adding supposedly scientific rigor to their studies. Through no effort or intention of their own, the dominant discourses are continuously reinforced. On occasion, the authors themselves exhibit puzzlement that their supposedly rigorous articles are rejected. As Davison and Martinsons [25] narrate, when a team of Indian authors were asked why they had not bothered to provide explicit information about the context where they undertook their research, they replied that a) no one is interested in India, and b) the results are globally generalizable, so it does not matter where the research was undertaken. Alas, this kind of perspective is all too commonly encountered in research designs with the result that the research itself is generally unpublishable in conferences or journals, such as those affiliated with WG 9.4, whose editors do believe context to be of critical importance.

Notwithstanding this dark side, in much of the work that we do an implicit goal is to make the world a better place. This is an abiding theme for the WG 9.4 community and can even be considered an existential issue. Walsham [27] first formalized the notion that we should be trying to make the world a better place in a research debate that attracted a number of commentaries. We recognize that there are many ways to achieve the goal and while we celebrate each instance of making the world a better place, we are nevertheless reluctant to dictate how it should be undertaken.

3 Current Disputes

It can be argued that WG 9.4 needs to be more critical with respect to the way it engages with the context of development since research in the WG 9.4 community has been dominated by western paradigms such as positivism, interpretivism and, to a lesser but emerging extent, critical realism. Heeks and Wall [28] similarly observe that the field of ICT4D has been dominated for many years by the philosophical duopoly of positivism and interpretivism. They too suggest that there are many advantages to the increased adoption of the “third way” research paradigm of critical realism in ICT4D. However, the indigenous paradigms of the developing countries themselves, such as *pūrākau* and *buen vivir* [29] have been ignored, even by the people who live in contexts

where these paradigms are practiced, and so who should be best placed (socially, culturally, linguistically) to undertake investigations that are sensitive to these indigenous paradigms.

There is clearly a need to be more critical. Global capitalism and the developmental paradigm adopted by the dominant world groups have presented and promoted the increasing adoption of ICTs by developing countries as an enabler for faster development [30]. While this view may be consistent with the expectations of developed countries, it is also imbued with rationalist and uncritical premises of how business must be managed in the new interconnected economy [31, 32]. However, there is increasing evidence to suggest that this view of development is too simplistic and fails to take into consideration the specific nuances of local contexts, cultures and social structures [33, 34]. In other words, while the meaning of the word *development* is consistent with the developmental paradigm adopted by the developed countries, it is inconsistent with the specific reality of the developing countries themselves. It is also dangerous because it invites the development of a cargo cult mentality [32] where some people in developing countries expect technological solutions to be delivered without either much effort on their part or indeed any attempt to ensure that the same technological solutions are in any way relevant for their local needs. As a result, perhaps we should abandon the 'developing countries' label altogether, not least because many members of the WG 9.4 community conduct research in the so-called 'developed countries', where enormous pockets of deprivation reveal profound inequalities. As Escobar [35] convincingly argues, the construction of the 'developing world' presupposes an asymmetric relationship. It is germane to note here that:

> the reproduction of western hegemony is assured through long established practices of production and dissemination of knowledge. The criteria of what counts as knowledge continue to be defined in the academic centres of the West. The dissemination of this knowledge is based on notions of transfer of knowledge from the West to the South [36, p.16].

This view is consistent with the above narrative (development, developing countries) and thus prompts critical debate about the nature of ICT4D research itself. In similar vein, Walsham [17] trenchantly asks: Who is doing the driving in ICT4D projects? Who benefits? Are the poor and disadvantaged included in the project? Why is Southern-driven research not well represented in the top journals? Are our methods and theories still appropriate? These are the questions that lead us into the next section: the work that remains to be done.

4 Future Engagements and Opportunities

Avgerou et al. [37, p.332] propose some questions for ICT4D research that need attention, as follows: How do micro-level achievements scale up to lead to long-lasting developmental changes of the socio-political circumstances of developing countries? How does the ICT innovation capacity of specific user communities of developing countries enable them to improve their position in the political economy of a globalized

world? How does their ICT innovation capacity articulate with the dynamics of the relentless ICT-driven transformation of industrialized countries?

Regarding the first question, Walsham [17] recounts how, as a volunteer in the Philippines in the mid-1960s, he was "often assured that 'trickle down theory' would work and that therefore the gap between rich and poor would lessen." Half a century later, he remarks that trickle down theory is insufficient and instead we need to focus much more on the people at the bottom of the pyramid. At our 2013 conference in Jamaica, the organizers enabled participants to visit field projects demonstrating how ICT4D research makes a difference to such people, many of whom work in informal businesses [38]. The NGOs and CBOs running these projects are the practitioners with whom we should be working as we consider the SDGs and their impact in local communities. It is critical for these information systems to be designed such that they meet the needs and match the abilities of ordinary citizens, who may not be qualified to navigate the labyrinthine morass of legal rules and specifications common to government websites. Unfortunately, it is easier for system designers to follow the technical advice of project funders, decision makers and specialists, some of whom are scarcely aware either of the levels of knowledge and ability among the ordinary citizens who will be directly affected by the project, or about local realities on the ground.

However, given the possibility that the north drives the research, with the south doing little more than acquiesce to play a subordinate role, we need to challenge systemic inequalities and create new paradigms for research that place the stakeholders at the bottom of the pyramid firmly in the driving seat. In doing so, we also need to consider how this research can exert more influence on politicians, policy makers and research funders, in all contexts. To achieve this objective, we need to deconstruct our disciplinary silo and share our (few) lessons learned with experts in other disciplines. We may usefully theorize why what works, works: a theory of action that leads to a body of knowledge about what to do in order to achieve a specific outcome. Needless to say, this theorization should be undertaken from the perspective of the stakeholders at the bottom of the pyramid, not the researchers in the North eager to line their curricula vitae with more publications! At our 2019 conference [39], a track was organized on indigenous perspectives of ICT4D. This is all too apposite since it is important to develop localized knowledge that pertains to the phenomena we study, framed by contextually-developed lenses [25]. A special issue on indigenous theory was recently published in the Information Systems Journal [40], with papers describing indigenous theories among digital entrepreneurs in China [41], among Māori IT professionals in New Zealand [42] and among digital entrepreneurs in South Africa [43].

We need to reconsider how we assess these projects, considering that the extent to which ICT4D interventions achieve their intended long-term development goals often remains largely unanswered. Existing assessments tend to be generic (broad) or focused (e.g., gender equality, technology centric or discipline centric). None of the assessment frameworks are multi-level so we need to develop impact assessment frameworks that may be used to systematically and longitudinally evaluate ICT4D outcomes, including social, political, economic, and institutional implications.

- Concerning the second question and in line with critiques of development, an emerging theme at WG 9.4 relates to the way we see ourselves. We may have been too dependent on the WG chair for ideas, suggesting that more grassroots initiatives are needed. In the next few paragraphs, we outline one such initiative.
- For some time, there has been debate about the name of WG 9.4. Although 'social implications of computers in developing countries' is not an incorrect description of what we investigate (notwithstanding the suggestion that we let go of the term 'developing countries'), there is much else that we are engaged in. We can expand our ambit to investigate the political, economic, legal, ethical, environmental, emancipatory and inclusive implications of these technologies, not only in developing countries, but also in the developing regions of developed countries.
- Meanwhile, the development of a consciousness of the social implications of ICTs beyond the academic world, i.e., amongst "professionals, policymakers and the public" as our principles state, has acquired a whole new importance since digitality has become part of development policies worldwide. A wide variety of 'new' topics have landed on our plate, including: the datafication of governance, digital development policies, new routes to e-commerce, digital work and socially motivated outsourcing, and digital platforms for socio-economic development, the last of which is also the focus of a special issue [44]. These new topics reveal the mutual shaping of development trajectories and digitality, and position WG 9.4 as an active citizen in the digital development landscape. Interactions of academic work with practice and civil society are an important embodiment of this principle. We experienced these first hand with field visits during our conference in Jamaica. More recently, WG 9.4 has established a blog (https://ifip94.wordpress.com/), which shares research from members of the group with the world. Since March 2020, this blog has been running a series of posts on COVID-19, aimed at sharing ICT4D best practices for health emergency management. These COVID-19-related posts narrate struggles of economic, social and redistributional natures, including impacts on informal workers, digital laborers and more vulnerable communities in the global south.

Concerning the third question and taking the new digital perspective further, we may challenge, reshape and reimagine activities further by creating new opportunities for development, specifically calling on the emerging paradigm of digital transformation, which may rupture how ICT projects, initiatives, impacts and research are conceptualized and undertaken. While prior research has used new technologies to complement existing activities, digital transformation presents new opportunities that can change activities and institutions. Digital transformation in the 'developing country' context is slowly becoming a reality and is the subject of special issues that focuses on the African [45] and Latin American [46] contexts. Whether this digital transformation should be considered a new dawn or merely an aspect of ICT4D remains to be seen. It is likely to incorporate the many mobile technologies that proliferate in 'developing countries' as well as emerging technologies such as artificial intelligence for development (AI4D), and big data for development (BD4D). It is also central to the ever-evolving phenomenon of healthcare IS.

As digital transformation comes to the fore, with AI4D and BD4D, we expect that we will need to increase our engagement with ethics and the "ethical turn" in ICT4D [28] which has primarily been driven by the use of Sen's [13] work and the renewed interest in ethics and social justice within the wider development community [47, 48]. This engagement will grow as the increasing use of the transformative technologies brings new and challenging ethical issues and concerns. Thus, practical tools and frameworks which can be applied to digital projects in the Global South that have the ability to highlight, visualize and resolve any ethical issues which may arise are needed. These tools will need to be inclusive, iterative and responsive and ideally be designed by, or in collaboration with, researchers in the global south. Further, we note that many countries in the global south do not have legal frameworks to cover AI application contexts, with the consequent potential for ethical violations to take place.

Another aspect of digital transformation, though on the dark side, is the surveillance that is undertaken by governments, private organizations and their proxies. This surveillance of citizens is common; moreover, citizens usually are not aware that they are being surveilled. In the Global South the situation is more serious because concerns about ethics and loss of privacy often come second to the personal benefits that may be realized through the use of the technology. Often users remain blissfully unaware of how their data might be used or whether there is any recourse for them to take if and when their data is misused and/or mismanaged. This is very different to the situation in Europe where the GDPR offers a measure of protection to citizens. Most of the global south lacks robust laws to protect the privacy of citizens. Nevertheless, citizens can also engage in sousveillance, i.e., the reverse monitoring of those in power through the use of social media [49]. Sousveillance is a form of both resistance against control initiatives and subversion of the same. Nyabola [50] has illustrated how citizens in Kenya have used social media such as Twitter to organize, participate and hold elected authorities to account and/or to challenge them. Dwyer and Molony [51] indicate that social media and smartphones are increasingly playing an important role in African politics which allows grassroots to organize, share ideas and participate in politics. This has led to some African states imposing a ban on social media use. Chad is one such example which had a 16-month social media ban for alleged security concerns [52].

Our final topic for the future is also one of our oldest topics: healthcare. Dating back to the HISP that was initiated in 1994, one of the essential themes in ICT4D is exploring the theoretical links between ICTs and public health. A huge diversity of technologies has been discussed in applications to enhance development outcomes, such as health information systems [53], mHealth [54], and telemedicine [55]. Increased affordability of digital technologies and innovations for health is exerting a profound effect on the delivery of health services in local communities [56, 57], the management of national health systems [53, 58] and the contextualization of design in health systems [59]. The emerging use of ICTs in epidemiology and public health is critical for providing opportunities for ICTD researchers to expand their horizons and provide contextual understanding of ICTs. We argue that much collaborative work remains to be done by WG 9.4 researchers with experts in other disciplines such as public health, medical science, and development studies, in order to provide an analytical framework, contextual

understanding, and deeper critical insights that will continue to make the world a better place.

5 Conclusions

As WG 9.4 enters its fourth decade, it is important that we not only understand where we have come from, but also evaluate where we might be going. In this chapter, both aspects of the journey have been considered. Existential questions about the very nature of WG 9.4 have been asked and thus suggestions have also been made as to how we might change our name to reflect our current and emerging ethos more accurately. We can argue that 'making the world a better place' is our quintessential goal, and that we have had some modest success in achieving it. However, we are not alone in the ICT4D space: other groups are emerging and the ubiquity of digital technology, ICTs, mobile devices and information systems more generally means that just about anyone can claim that they are undertaking ICT4D research, irrespective of whether that research actually contributes to making the world a better place or not.

Thus, one of our challenges is to redefine our niche in such a way that we build on our many achievements, yet also look ahead to future opportunities that will demonstrate our continued relevance. One idea is to rebrand WG 9.4 as "digital transformation for sustainable development." The UN's sustainable development goals, which many of our members take very seriously, are similarly not restricted to the global south. Poverty and disadvantage may be particularly prominent characteristics of the global south, but they are by no means limited to it. There are many examples of impoverished and disadvantaged communities within ostensibly developed countries. The act of rebranding will provide us with the opportunity to create a more accurate description of the context in which we conduct our research. It will also allow us to ensure that ICT4D research moves from the periphery to the mainstream. This is important because, at least in some quarters, the label 'developing countries' still evokes the idea of marginality, with the consequence that it is deemed to have very little relevance.

Beyond our identity, the last topic that I wish to engage with in this chapter concerns our members. Currently about 60% of our 105 members either live in the global south or were born there before relocating northwards. This figure is certainly higher than was the case in the past, yet while some of these people take up leadership positions in the group, we need to create more opportunities for them to do so. A more detailed analysis of the members in the global south suggests that many come from Anglophone countries, with the Francophone, Lusophone, and other indigenous languages represented to a much lesser extent. I hope that we can develop a more inclusive group and reach out to a wider base of researchers in the global south.

References

1. Walsham, G.: ICT4D research: Reflections on history and future agenda. Information Technology for Development 23(1), 18-41 (2017).

2. Bhatnagar, S.C., Bjørn-Andersen, N. eds.: Information Technology in Developing Countries. North-Holland: Amsterdam (1990).
3. Robey, D., Gupta, S.K., Rodriguez-Diaz, A.: Implementing information systems in developing countries: Organisational and cultural considerations. In Bhatnagar, S.C., Bjørn-Andersen, N. eds.: Information Technology in Developing Countries, pp. 41–50, North-Holland: Amsterdam (1990).
4. Korpela, M.: The role of information systems ergonomics in developing countries. In Bhatnagar, S.C., Bjørn-Andersen, N. eds.: Information Technology in Developing Countries, pp. 265–275, North-Holland: Amsterdam (1990).
5. Bhatnagar, S.C.: Computers in developing countries. In Bhatnagar, S.C., Bjørn-Andersen, N. eds.: Information Technology in Developing Countries, pp. 3–11. North-Holland: Amsterdam (1990).
6. Gallivan, M., Tao, Y.: A scientometric analysis of research appearing in post-millenial IFIP 9.4 conferences. Proceedings of the 12th IFIP WG 9.4 International Conference on the Social Implications of Computers in Developing Countries, Ocho Rios, Jamaica, pp. 144-165 (2013).
7. Karanasios, S., Slavova, M.: How do development actors do "ICT for development"? A strategy-as-practice perspective on emerging practices in Ghanaian agriculture. Information Systems Journal 29(4), 888-913 (2019).
8. Díaz Andrade, A., Urquhart, C.: The affordances of actor-network theory in ICT for development research. Information Technology & People 23(4), 352-374 (2010).
9. Silva, L.: Institutionalization does not occur by decree: Institutional obstacles in implementing a land administration system in a developing country. Information Technology for Development 13(1), 27-48 (2007).
10. Singh, H., Díaz Andrade, A., Techatassanasoontorn, A.A.: The practice of ICT-enabled development. Information Technology for Development 24(1), 37-62 (2018).
11. Bernardi, R.: Health information systems and accountability in Kenya: A structuration theory perspective. Journal of the Association for Information Systems 18(12), 1 (2017).
12. Stark, L., Larsson, C.W.: Rethinking gender and technology within intersection in the Global South. In. Stark, Larsson, C.W. eds.: Gendered Power and Mobile Technology, pp. 1-22. Routledge, London (2019).
13. Sen, A.: Development as freedom. Oxford University Press, Oxford (1999).
14. Zheng, Y.Q., Walsham, G.: Inequality of what? Social exclusion in the e-society as capability deprivation. Information Technology & People 21(3), 222-243 (2008).
15. Zheng, Y.Q., Hatakka, M., Sahay, S., Andersson, A.: Conceptualizing development in information and communication technology for development (ICT4D). Information Technology for Development 24(1), 1-14 (2018).
16. United Nations Sustainable Development Goals: http://www.sustainabledevelopment.un.org
17. Walsham, G.: South-south and triangular cooperation in ICT4D. Electronic Journal of Information Systems in Developing Countries 86(4), 1-6 (2020).

18. United Nations Development Programme on South-South Cooperation http://www.undp.org/ssc
19. Bai, Y.: Has the global south become a playground for western scholars in information and communication technologies? Scientometrics, 116(3), 2139–2153 (2018).
20. van Biljon, J., Renaud, K.: Human-computer interaction for development (HCI4D): The Southern African landscape. In the IFIP 9.4 International Conference on Social Implications of Computers in Developing Countries pp. 253-266. Springer, Cham (2019).
21. Qureshi, S.: Why data matters for development? Exploring data justice, micro-entrepreneurship, mobile money and financial inclusion. Information Technology for Development 26(2), 201-213 (2020).
22. Heeks, R., Renken, J.: Data justice for development: What would it mean? Information Development, 34(1), 90-102 (2018).
23. Masiero, S., Das, S.: Datafying anti-poverty programmes: Implications for data justice. Information, Communication & Society 2(7), 916-933 (2019).
24. Beqiraj G., Frasheri N.: Internet complexity and social integration. Symposium on Complexity & Integration in Nature and Society, European Academy of Sciences and Arts, March 1st, Salzburg (2019).
25. Davison, R.M., Martinsons, M.G.: Context is king! Considering particularism in research design and reporting. Journal of Information Technology 31(3), 241-249 (2016).
26. Guidelines for authors. https://onlinelibrary.wiley.com/page/journal/16814835/homepage/forauthors.html
27. Walsham, G.: Are we making a better world with ICTs? Reflections on a future agenda for the IS field. Journal of Information Technology 27(2), 87-93 (2012).
28. Heeks, R., Wall, P.J.: Critical realism and ICT4D research. Electronic Journal of Information Systems in Developing Countries 84(6), 1-11 (2018).
29. Jimenez, A., Roberts, T.: Decolonising neo-liberal innovation: Using the Andean philosophy of 'buen vivir' to reimagine innovation hubs. In Proceedings of the 15th International Conference on Social Implications of Computers in Developing Countries (pp. 180-191), Springer, Cham (2019).
30. Sein, M.K., Harindranath, G.: Conceptualizing the ICT artifact: Toward understanding the role of ICT in national development. The Information Society 20(1), 15-24 (2004).
31. Montealegre, R.: Implications of electronic commerce for managers in less-developed countries. Information Technology for Development 7(3), 145-152 (1996).
32. Davison, R.M., Vogel, D.R., Harris, R.W., Jones, N.: Technology leapfrogging in developing countries: An inevitable luxury? Electronic Journal of Information Systems in Developing Countries 1(5), 1-10 (2000).
33. Avgerou, C.: Contextual explanation: Alternative approaches and persistent challenges. MIS Quarterly 43(3), 977-1006 (2019).
34. Joia, L.A., Kuhl, A.: Smart city for development: A conceptual model for developing countries. In Proceedings of the 15th International Conference on

Social Implications of Computers in Developing Countries (pp. 203-214). Springer, Cham (2019).
35. Escobar, A.: Encountering development: The making and unmaking of the third world. Princeton University Press: Princeton, NJ, USA (2012).
36. Holtendahl, L., Gerrard, S., Njeuma, M.Z., Boutrais, J. eds.: The power of knowledge from the Arctic to the tropics (Le pouvoir du savoir de l'Arctique aux tropiques). Karthala, Paris (1999).
37. Avgerou, C., Hayes, N., La Rovere, R.L.: Growth in ICT uptake in developing countries: New users, new uses, new challenges. Journal of Information Technology 31(4), 329-333 (2016).
38. Heeks, R.: Decent work and the digital gig economy: A developing country perspective on employment impacts and standards in online outsourcing, crowdwork, etc. Development Informatics Working Paper 71, https://hummedia.manchester.ac.uk/institutes/gdi/publications/ workingpapers/di/di_wp71.pdf (2017)
39. Nielsen, P., Kimaro, H.C. eds.: Information and communication technologies for development. Strengthening southern-driven cooperation as a catalyst for ICT4D: 15th IFIP WG 9.4 International Conference on Social Implications of Computers in Developing Countries, Dar es Salaam, Tanzania, May 1–3, Vol. 551. Springer: Cham (2019).
40. Davison, R.M.: Special issue: Indigenous theory. Information Systems Journal 31(6), 767-768 (2021).
41. Xiao, X., Tan, B., Leong, C., Tan, F.T.C.: Powered by 'qinghuai': The melding of traditional values and digital entrepreneurship in contemporary China. Information Systems Journal, 31(6) 769-802 (2021).
42. Díaz Andrade, A., Techatassanasoontorn, A. A., Singh, H., Staniland, N.: Indigenous cultural re-presentation and re-affirmation: The case of Māori IT professionals. Information Systems Journal, 31(6), 803-837 (2021).
43. Abubakre, M., Faik, I., Mkansi, M.: Digital entrepreneurship and indigenous value systems: An Ubuntu perspective. Information Systems Journal, 31(6) 838-862 (2021).
44. Nicholson, B., Nielsen, P., Saebo, J.: Special issue: Digital platforms for development. Information Systems Journal 31(6), 863-868 (2021).
45. Davison, R.M.: Special issue: The digital transformation of Africa. Electronic Journal of Information Systems in Developing Countries 88(3), 1-2 (2022).
46. Davison, R.M., Joia, L.A.: Digital transformation in Latin America: Challenges and opportunities. Electronic Journal of Information Systems in Developing Countries 89(2), 1-2 (2023).
47. Kleine, D.: Technologies of choice? ICTs, development and the capabilities approach. The MIT Press, Boston (1990).
48. Oosterlaken, I.: ICT4D and ethics, in: Mansell, R., Ang, P.H. eds.: The International Encyclopedia of Digital Communication and Society Vol 1, pp. 353–361. Wiley-Blackwell, Chichester (2015).
49. Ali, M.A., Mann, S.: The inevitability of the transition from a surveillance-society to a veillance-society: Moral and economic grounding for sousveillance.

IEEE International Symposium on Technology and Society: Social Implications of Wearable Computing and Augmediated Reality in Everyday Life, Toronto, ON, pp. 243-254, (2013).
50. Nyabola, N.: Digital democracy, analogue politics. How the Internet era is transforming politics in Kenya. London: Zed Books (2018).
51. Dwyer, M., Molony, T.: (Eds) Social media and politics in Africa: Democracy, censorship and security, Zed Books: London (2019).
52. Dwyer, M. & Molony, T.: Analysis across Africa shows how social media is changing politics. https://theconversation.com/analysis-across-africa-shows-how-social-media-is-changing-politics-121577 on 29/6/2020 (2019).
53. Sahay, S., Sundararaman, T., Braa, J.: Public health informatics. Oxford University Press, Oxford (2017).
54. Jamison, J.C., Karlan, D., Raffler, P.: Mixed-method evaluation of a passive m-health sexual information texting service in Uganda. Information Technologies & International Development 9(3), 1-28 (2013).
55. Mengesha, G.H., Garfield, M.J.: A contextualized IT adoption and use model for telemedicine in Ethiopia. Information Technology for Development 25(2), 184-203 (2019).
56. Venkatesh, V., Sykes, T.A., Zhang, X.: ICT for development in rural India: A longitudinal study of women's health outcomes. *MIS Quarterly* 44(2), 605-629 (2019).
57. World Health Organization: mHealth: New horizons for health through mobile technologies: Based on the findings of the second global survey on ehealth (Global Observatory for eHealth Series, Vol 3, http://whqlibdoc.who.int/publications/ 2011/9789241564250_eng.pdf. (2011)
58. Walsham, G.: Health information systems in developing countries: Some reflections on information for action. Information Technology for Development 26(1), 194-200 (2020).
59. Holeman, I., Kane, D.: Human-centered design for global health equity. Information Technology for Development 26(3), 477-505 (2019).