Analyzing Digital Practices in Indigenous Communities: A Foucauldian Sociotechnical Demarginalizing Method

Rennie Naidoo
Department of Informatics University of Pretoria, Pretoria, South Africa
rennie.naidoo@up.ac.za.

Funmi Adebesin
Department of Informatics University of Pretoria, Pretoria, South Africa
funmi.adebesin@up.ac.za

ABSTRACT

Responsible Human-Computer Interaction for Development (HCI4D) and Information System (IS) researchers have called for demarginalizing methods for decolonizing digital practices in marginalized indigenous communities. This paper offers an adaptation of the Foucauldian Discourse Analysis (FDA) as a demarginalizing method to assess and theorize what discursive resources participants, within a marginalized indigenous community, appropriate to make sense of digital technologies. Our proposed method integrates Foucauldian discourse perspectives with critical sociotechnical discursive constructions.

The augmented Foucauldian Sociotechnical Demarginalizing Method (FSDM), using critical discourse analysis, can initiate dialog among scholars and inform digital appropriateness and digital sustainability in marginalized communities. Practitioners can also use the proposed method to interrogate how digital development discourses can improve their sustainability goals. We invite researchers who examine their empirical material obtained from indigenous communities to use the proposed FSDM.

CCS CONCEPTS

• **Human-centered computing**; • **Human computer interaction (HCI)**; • **HCI theory, concepts and models**;

KEYWORDS

Foucauldian Discourse Analysis, Sociotechnical, Demarginalization, Indigenous Research Methods

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1 INTRODUCTION

While the COVID-19 pandemic has caused massive disruptions in the lives of people all over the globe, the crisis once again highlights the asymmetrical plight and outcomes of marginalized communities due to race, gender identity, class, sexual orientation, age, physical ability, socioeconomic position, minority group status, immigration status and geographic boundaries [45]. Recent events have reenergized Human-Computer Interaction for Development (HCI4D) researchers to focus on the role of digital technologies in perpetuating these stark inequities, disparities and power imbalances [1, 12, 21]. There is an urgent need to understand the social impacts of digital technologies among people of indigenous marginalized communities in their daily lives. Several scholars have called upon HCI4D researchers to address the urgent need for society to transition to more sustainable information systems with renewed vigour [10, 37, 40, 45, 61].

A growing number of responsible researchers have argued that technology design should be framed from the sociocultural contexts of indigenous marginalized communities [1, 8, 26], while also contributing to equitable practices. The apparent inability of the one-laptop-per-child (OLPC) initiative to attain the anticipated impact was partly attributed to a lack of understanding of the local contexts of developing countries [29]. Compared to the OLPC initiative, the digital doorway, shown in Figure 1, has been arguably more successful because the design and development were rooted in a better understanding of the prevailing challenges faced by rural communities in South Africa [62].

The marginalization of indigenous people is not only limited to the design and development of technologies [8]. Academic scholarship in various fields, including ICT4D and HCI are unevenly skewed toward scholars from the Global North [5, 8]. An awareness of the apparent domination of the Global North in HCI research is underscored by the fact that the AfriCHI initiative was birthed out of recognition of the need to develop a sustainable platform for building local expertise in HCI by the African researchers that attended the 2010 CHI at the United States of America [8, 9]. Consequently, there is a need for academics, policymakers and industry practitioners to proffer new approaches for enabling sustainable development [28, 54, 57].

A major dilemma for IS leaders and designers grappling with marginalization concerns is to simultaneously advance narrow and sometimes deeply flawed economic goals that further exacerbate the plight of marginalized communities [34, 68]. New technology trends in Big Data, Artificial Intelligence (AI) and Machine Learning, Robotic Process Automation (RPA), Edge Computing and the Internet of Things (IoT) may amplify these effects for marginalized communities [70]. In recent discussions, responsible IS and HCH4D research scholars have been addressing the growing ethical, moral, legal and environmental problems arising from the use of digital technologies [1, 36, 45].

Although past HCI and ICT4D research has made significant advances in related areas such as social inclusion [59], we must make

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Figure 1: A three-terminal digital doorway[1]

some fundamental changes to IS research globally to ensure that IS knowledge contributes to demarginalization. We contribute to this debate by studying an important and overlooked contextual space – digital sustainability in marginalized indigenous communities [12, 58, 69].

Marginalization can be defined as "the process through which persons are peripheralized based on their identities, associations, experiences, and environment" [17:25]. This definition implies that marginalization forces certain groups of people or communities to the periphery away from the thriving areas of society. This definition also implies that a dominant and powerful culture or group tends to exert sociopolitical, economic, and psychological control over vulnerable groups. However, the current conceptualization of marginalization that emphasizes social barriers lacks a critical focus on the experiences of vulnerable groups due to the inequitable distribution of IS affordances [55]. We extend the above definition to incorporate a broader sociotechnical dimension of marginalization by highlighting the role of digital technology [53]. In particular, we assert that discursive practices about digital technologies can contribute to the marginalization process by mediating and reinforcing existing boundaries and barriers that preclude certain groups from participating in the thriving areas of society or disrupting their traditional forms of life.

HCI4D and ICT4D researchers have also drawn from postcolonial theory to understand and critique imperialism, colonialism, and certain forms of Western knowledge that marginalize indigenous communities [37, 49]. IS demarginalization and postcolonial researchers have observed that discourses about digital technologies are not value-free or neutral, but highly contextual and political [13, 33, 52, 56]. Recent discussions on IS demarginalization research have called for the development of demarginalizing analytical frameworks and demarginalizing methods to investigate and theorize the complexities of IS in marginalized indigenous communities [12, 58]. In this paper, we develop a Foucauldian discourse analysis, underpinned by the assumptions of a critical realist position, to 'give voice' to participants' experiences about the marginalizing and demarginalizing impacts of digital technology. Critical realism assumes that discursive and material practices (or non-discursive elements) are interrelated [38]. Unlike constructionist approaches, critical realism does not treat discourses as the primary unit of analysis because discourses are intimately related to material conditions. "Social practices are concept-dependent; but, contrary to the hermeneutical tradition in social science, they are not exhausted by their conceptual aspect. They always have a material dimension" [6:4]. In other words, while critical realism acknowledges that meaning is social, non-discursive elements also impact that meaning [38, 39]. Discourses can therefore be constrained by existing social and material structures, and non-discursive elements (or material practices) also impact discourses [43].

HCI4D and IS researchers conceptualize IS phenomena as striving for an optimal interaction between the social and technological subsystems to achieve both instrumental and social goals [22, 53, 55]. According to Sarker, et al. [53], this suggests that the axis of cohesion of expert IS discourse resides in the sociotechnical perspective. For Foucault [16:64], academic discourses such as the sociotechnical perspective give "rise to certain organizations of concepts, certain regroupings of objects, certain types of enunciation" that enter the lay discourses of the larger society. For example, there is a real danger that rational IS expert discourse that push forward digital technologies that can fulfil the economic needs of all types of communities can become a regime of truth that is broadly accepted in society [3, 25]. By using a Foucauldian Discourse Analysis (FDA) approach, we can begin to understand the danger of expert discourses about digital technologies that shape how laypeople think, feel and behave in marginalized communities [2, 14].

The key contribution of this paper is the proposed demarginalizing analytical framework based on a Foucauldian Discourse Analysis (FDA) as a demarginalizing method to assess and theorize what discursive resources participants within a marginalized indigenous community use to make sense of digital technologies. The paper addresses two weaknesses in the extant literature: First, conducting research in marginalized indigenous communities is inherently difficult due to the challenge of gaining access and maintaining meaningful relationships with the participants, making exploring the role of digital technologies in these contexts scarce. Second, there have been calls for HCI and IS researchers to develop demarginalizing frameworks and methods to assess the dangers of the dominant discursive practices that are deployed to conceptualize

[1] http://www.digitaldoorway.org.za/index_main.php?do=hardware

information systems phenomena and to develop demarginalizing research approaches for IS [12, 18, 69].

Consequently, we propose a Foucauldian Sociotechnical Demarginalizing Method (FSDM) to guide the analysis process to deepen our current understanding of how discursive constructions of digital technologies emerge and are shaped in a marginalized indigenous community. This paper assumes that the discursive resources present in our augmented version of Foucauldian discourse analysis can 'give voice' to the various shared and contradictory accounts of digital technologies in a marginalized indigenous community.

2 OVERVIEW OF DIGITAL DISCOURSES

2.1 Sociotechnical Discursive Practices

We draw on Foucauldian concepts such as power/knowledge, discourses, counter-discourses, discursive objects, action orientation, subject positions, practices, and subjectivity, to explore how IS discursive practices play a role in constructing the objects and subjects that marginalize/demarginalize communities using digital technologies [65-67]. Foucault's work focuses on groups that were on the margins of society and offer conceptual tools that are appropriate for this study [15, 65]. Although the above concepts do not address information technologies directly, as Foucault was mainly interested in soft behavioral or disciplinary technologies rather than material technologies, the concepts mentioned above have demonstrated their applicability in theorizing in the IS field over a sustained period [24, 25, 32, 48, 65].

Foucault uses the term power/knowledge to denote the inextricable link between power and knowledge. For Foucault, power is imbricated with various bodies of knowledge [18, 65]. For the purpose of this study, the concept power/knowledge is deployed to demonstrate how different groups advance their interest by targeting and marginalizing other groups [3, 19]. Social groups use digital technologies to legitimize their actions in the hope of improving or benefitting the conditions of marginalized groups. Yet, these technologies cannot be disconnected from power relations and their potential for danger [15, 65]. For example, IS experts who have little doubt that promoting the transfer of digital technologies to rural farmers in underdeveloped countries is a morally legitimate action are implicated in dominating and dangerous power relations and unintended consequences [11, 15]. At the same time, there is always the possibility for marginalized groups to resist the discourses surrounding these development practices by reconfiguring the microrelations of power [44].

Foucault conceives power not simply as negative and restrictive, but as a relational and productive force that operates beyond suspicion from the bottom up instead of some kind of central command [65]. In other words, to change the prevailing social conditions of marginalized groups, experts need to understand the discursive worlds marginalized communities inhabit and the norms, 'truths' and actions they have come to accept in their everyday lives [2, 4].

A discourse can be defined as "sets of statements that construct objects and an array of subject positions" [46:245]. Discourses in IS research make certain points of view and behaviors available which has implications for the subjectivity of individuals, such as end users and developers. These discursive constructions also provide IS research groups and experts with discursive resources. For IS research constructions dominated by theories of economic rationalism, development and implementation is accomplished by the rational performance of technical experts. However, a counter-discursive construction provides an alternative possibility that development and implementation is achieved through politics and power involving multiple stakeholders [3].

Discursive objects are constructed by research groups, and their discursive constructions about the object can reveal the meanings group members share about the object in question. The way the IT artifact is constructed in IS research depends on whether scholars have the computational view, the tool view, the proxy view, or the ensemble view of technology [42]. From a Foucauldian perspective, how these different constructions in IS research are deployed serves a function – that is, it has an action or practice orientation. For instance, IS researchers that draw from wider discourses such as psychology attribute the cause of poor performance of the IT artifact to the end user [63].

As already alluded to, discourses also deliberately or inadvertently construct subject positions. IS research offers a range of positive to negative subject positions for end users, such as 'champions', 'grumblers', 'resistors', and more broadly as 'social actors' [30, 31]. Rewarding the 'positive' behavior of technology acceptance and habitual use is also a familiar positioning in mainstream IS research and has implications for how end users experience their subject position in the workplace.

These discursive constructions and subject positions can enable or constrain action or practices – i.e., what end users can talk about and do in their social context. For example, the practice of continued use of technology becomes a legitimate form of behavior from a particular discursive perspective [7]. Taking up the subject positions available through the prevailing discourses has implications for the subjectivity of indigenous community members – i.e., how they feel, think, and experience their world. For example, a marginalized community participating in a digitalization initiative within a discourse of modernity may resist digital technology as they fear the loss of traditional values and norms [30].

From a Foucauldian viewpoint, the Sarker et al.'s [53] synthesis of IS sociotechnical perspectives can be re-casted as a discursive formation made up of six main discursive constructions (see Figure 2). The Type I perspective can be viewed as a discursive construction that is predominantly social and focuses mainly on human factors and their impacts.

Type II, or the social imperative, considers how social aspects influence the technical component and resulting impacts. Type III considers how social-technical factors additively deliver such impacts. These discursive constructions assume no interplay between technical and social components. Type IV discursive constructions consider the sociotechnical interplay and how these results in impacts. Type V, or the technical discursive construction, assumes that technology is a significant antecedent to social impacts. The Type VI discursive construction is predominantly technical and focuses on developing or improving the technical component, with little or no consideration of the social aspects. Although the Sarker et al.'s [53] study focused on examining the discursive constructions of IS researchers, we believe that these discursive constructions, together with discourses on marginalization reviewed in section

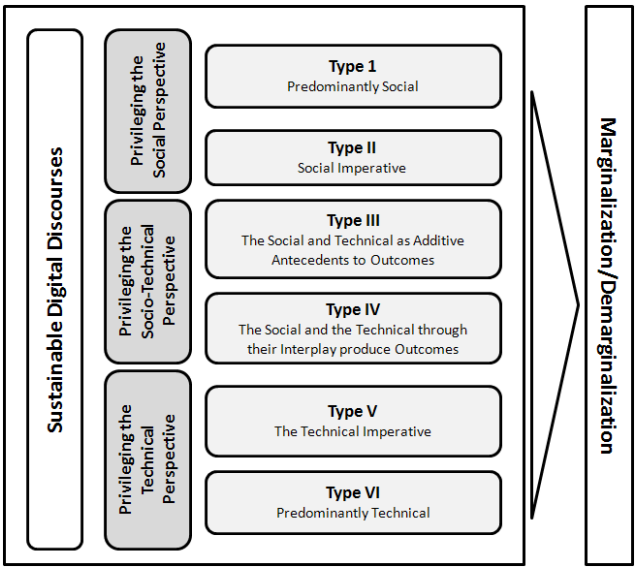

Figure 2: A sociotechnical framework for demarginalization research (Adapted from [53])

2.2, are appropriate starting points for a demarginalizing analytical framework for IS research.

2.2 Marginalization and Demarginalization

Discursive constructions about digital technologies can produce and reproduce social and economic equity and inequities, which can play a fundamental role in sustainability concerns. IS constructions about sustainability can also be used to guide future research and offer contributions that can help make a 'better world' [51, 64]. For Pan and Zhang [45], digital sustainability involves using an interdisciplinary approach that aligns digital technologies and sustainability imperatives. From an IS perspective, digital sustainability constructions are understandably broader and refer to organizational activities working towards achieving the United Nations' (UN) sustainable development goals (SDGs) by leveraging information technologies and electronic data [60].

We draw on Burke's social contract that explicitly extends this compact between the generations of the living, the dead, and the unborn [50]. Despite the enormous benefits of digital technologies, communities mustn't be coerced into assimilating the values of a universal global culture, as this approach is both idealistic and unsustainable. We need to be sensitive to the fact that people's identities are rooted in their past traditions, and their common cultural identity of tomorrow will depend on the changing narratives of today. At the same time, we should be aware of the dangers of a nostalgic past and 'invented traditions' (e.g. patriarchy) that persist within indigenous communities that can exacerbate marginalization, and strive to promote sensible humanistic values (e.g. gender equality) as part of our demarginalizing efforts [23, 35].

Hall et al. [17] identify several properties of marginalization that relate to IS research. This includes power (lack of access to resources and enforced conformity), voice (dominant myths that silence other forms of expression), exteriority (exclusion from the dominant groups' access to protection and resources), global perspectives such as Eurocentrism (the historical narrative about the superior values and technologies of Europe and North America and the denigration of Third World people as undeveloped, and widespread ideologies about the virtues of global capitalism, neoliberalism, and consumerism). Furthermore, this interdisciplinary perspective considers economics (resource access, including education, transportation, health, and ecological issues), resilience (the ability of the body to carry memories over time, such as the memory of overcoming past injustices through political independence from colonial powers) and hope (positive view of the future based on sociopolitical reforms not necessarily based on Western ideals and the risk of hopelessness due to Western political interference) [17].

While a lot is known about how IS can empower communities [58, 59], the role of IS in maintaining or pushing communities further to the periphery of society and creating barriers that block their entry into mainstream society needs further exploration [20]. IS affordances can create, define, maintain, and enforce margins and boundaries between individuals and groups within and across communities, thus impeding their participation in just and equitable sociopolitical, economic, and cultural practices [2]. At the same time, although digital technologies can mediate and reinforce the marginalization of communities, they can also create opportunities for demarginalization [13, 41]. Demarginalization researchers investigate social groups in unfavorable spatial, social or economic situations and observe whether digital technologies improve or worsen their situation [12, 47]. The sociotechnical framework for demarginalization research presented in Figure 2 is used as a sensitizing device to investigate the multiplicity of available digitalization discourses in our case and aid in developing interventions that can improve their social impact.

3 RESEARCH GUIDELINES FOR THE FOUCAULDIAN SOCIOTECHNICAL DEMARGINALIZING METHOD (FSDM)

Since Foucault does not offer a fully developed methodology, we considered several approaches to conducting discourse analysis [27, 46]. We adapted Willig's [67] six stages of Foucauldian discourse analysis to analyze the discourses about the impact of digitalization (See Figure 3) by integrating this approach with Sarker et al.'s [53] six types of IS sociotechnical constructions (see Table 1).

Analysis should begin with developing a coding template to identify and analyze the similarities and differences in participants' discursive practices. The coding template contains the initial sensitizing discourses and definitions, as informed by Sarker et al.'s [53] six types of IS sociotechnical constructions (see Table 1). In this stage, researchers should read the interview transcripts and observation data several times to familiarize themselves with the texts. During this stage, the researcher(s) should search for discursive objects in the transcribed texts and examine how the discursive objects are being constructed. The key discursive objects of the digitalization initiative found are highlighted in our hypothetical case example in Figure 3. For example, participants in an ICT4D project may present digital technology as playing an empowering role by enabling the country to participate in global trade.

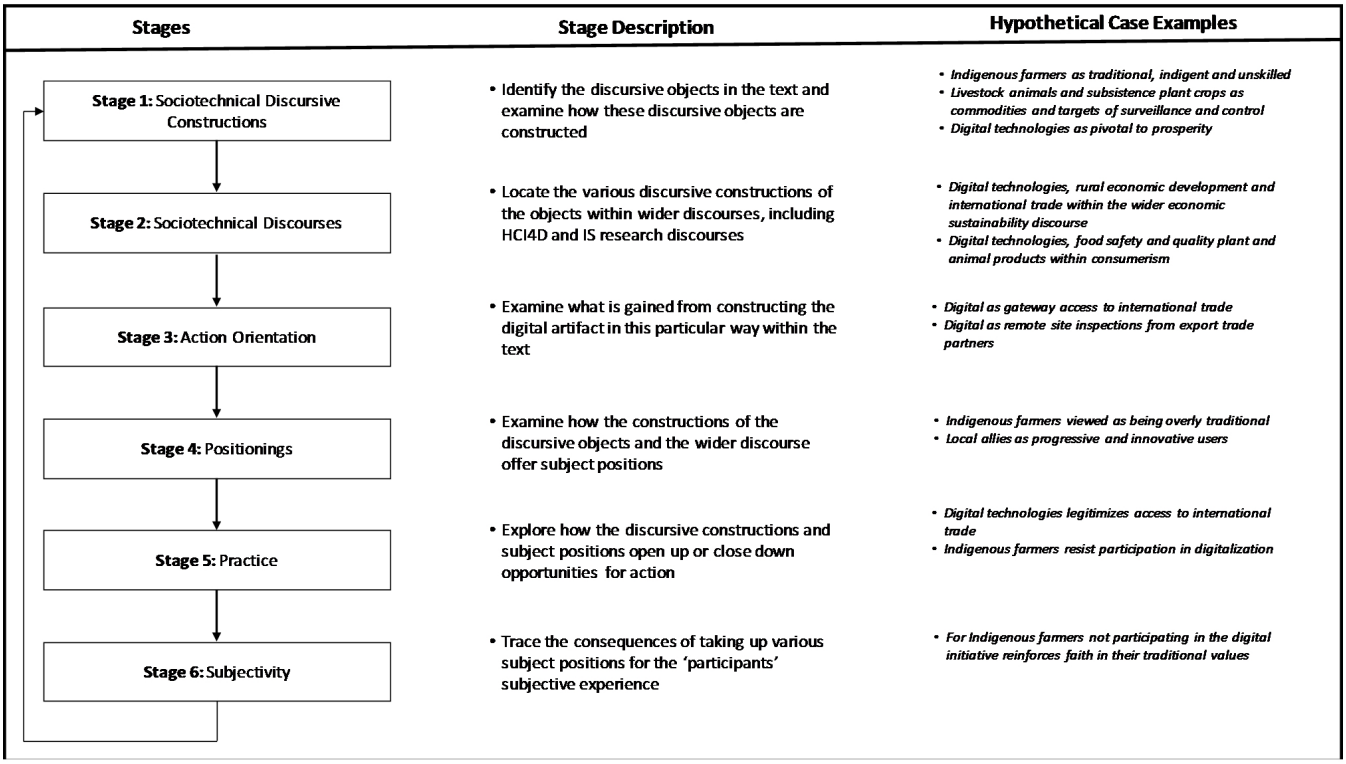

Figure 3: Foucauldian Sociotechnical Demarginalizing Method (FSDM) (Based on [67]and [53])

In the second stage, the researcher(s) should locate the various discursive constructions of the objects within broader discourses. The sociotechnical framework should be used to sensitize the researcher(s) to the discursive resources available to participants. For example, the economic imperative discourse, which is also entrenched in mainstream ICT4D and IS research discourse, typically finds their way into how local allies construct the digitalization initiative. In the third stage, the researcher(s) should examine what is gained from constructing the object in a particular way. For example, locating the digitalization initiative within an economic discourse makes it morally acceptable as it benefits the indigenous community financially.

The fourth stage should examine the subject positions offered by these constructions of the discursive objects. For example, in mainstream research, the community members may be positioned as irresponsible beneficiaries. The fifth stage should explore how these discursive constructions and subject positions enabled or constrained opportunities for action – i.e., the practices of indigenous farming communities. For example, by positioning the farmers as problematic, local allies of digital initiatives could legitimize their expertise and digitalization as an instrument of control. In the sixth and final stage, researchers should explore how the discursive practices taken up influenced participants' subjective experiences. For example, lack of resources can make it difficult for those championing digital initiatives in indigenous communities to conduct their work effectively.

Researchers should work collaboratively and iteratively through these steps. Qualitative data analysis and research software tools can be used for data storage and analysis.

4 CONCLUSION

This paper presents the Foucauldian Sociotechnical Demarginalizing Method (FSDM) as a framework for analyzing how discursive constructions about digital technologies are shaped within marginalized indigenous communities. Based on the six stages of Foucauldian discourse analysis of Willig [67] and Sarker et al.'s [53] six types of IS sociotechnical constructions, the FSDM addresses the need for a framework that can be used as alternative lens to analyzing the sociotechnical discourses when digital solutions are implemented in indigenous marginalized communities. The proposed FSDM has implications for practice and theory building.

4.1 Implications for Theory Building

Our FSDM has the potential to contribute to theory in three crucial ways: First, the study can contribute to debates about the scientific status of the HCI4D and IS discipline with a specific focus on its role in demarginalizing communities [12, 69]. A Foucauldian perspective views all forms of knowledge as discursive practices and provides researchers interested in the status of HCI4D and IS discipline with novel conceptual resources [18, 65]. For example, a Foucauldian discursive analysis provides researchers with conceptual tools such as power/knowledge to critically reflect on IS knowledge claims as discursive constructions. These discursive

Table 1: Discursive Constructions and Researching Marginalized Indigenous Communities

Discursive Category	Discursive Subcategory	Description	Application to future HCI4D research
Privileging the Social	Predominantly Social	HCI4D researchers focus mainly on how human factors explain sustainability outcomes.	*Using Digital Technologies to Prioritize Economic Sustainability over Local Indigenous Community Sustainability.* In HCI4D research, marginalization can include multiple groups and individuals, from end users to community members. Globalization, sociopolitical, cultural, economic, organizational and traditional factors contributed to the marginalization process. Mainstream research tends to focus on the individualistic experiences of end users or pays more attention to the role of global socio-political and economic discourses that can be potentially harmful to indigenous communities. Future HCI4D and IS research should be more mindful and inclusive, and consider understanding the broader range of discursive constructions and counter-discourses in marginalized communities and the related social impacts.
	Social Imperative	HCI4D researchers consider how social aspects influence the technical component and outcomes.	
Privileging the Sociotechnical	The Social and Technical as Additive Antecedents to Outcomes	HCI4D researchers consider how social plus technical factors additively deliver outcomes.	*Using Digital Technologies to Sustain Asymmetrical Lifestyles between the Modern and Invented Traditional* Historically, the economic basis for the modernity of the West was based on the exploitation of land and labor of the colonies. Digital technologies can sometimes disrupt indigenous communities' traditional ways of life, leading to community resistance. A sociotechnical framework based on a critical discursive analysis offers a lens through which marginalized communities can be studied. The novelty of this perspective lies in the fact that viewing sustainability from the standpoint of marginalized communities through Foucauldian, feminism and postcolonial lenses can suggest nuanced avenues for IS interventions for exploration that go beyond the economic imperatives that inequitably benefit dominant nations and consumer groups.
	The Social and the Technical as Producing Outcomes Through their Interplay	HCI4D researchers consider how the joint sociotechnical interplay delivers outcomes.	
Privileging the Technical	The Technical Imperative	HCI4D researchers with a technical imperative assume that technology is significant to social outcomes.	*Marginalizing the User Community by Restrictive local ICT Regulations, Policies and Spending* This type of analysis shows how an overfocus on technology imperatives to support global economic institutions which neglects to address the cherished values of the local indigenous community. Researchers could investigate how community-based HCI4D could harmonize the social and technological subsystems to improve the community's economic development while valuing the traditional practices of the local community. What are appropriate designs of digital sustainability transformations that can 'harmonize' the social and technical subsystems in indigenous communities?
	Predominantly Technical	HCI4D researchers focus on how to develop or improve the technical component with little or no consideration of the social component.	
Social Impact of Digital Technology	Positive Social Impacts	HCI4D researchers refer to the benefits and areas of success afforded by digital technology.	*Using digital technologies can simultaneously generate positive and negative social impacts* This type of analysis shows how digital technologies can render benefits that support indigenous communities. At the same time, it can show how the indigenous community resists digital practices that can lead to the compromise or loss of traditional ways of life from being preserved for future generations. Future HCI4D research should further the development of demarginalizing methods and demarginalizing conceptual frameworks to understand the social impacts of digital technologies on indigenous communities. A Foucauldian method of discursive analysis and an IS sociotechnical framework can be an appropriate starting point.
	Negative Social Impacts	HCI4D researchers refer to the disbenefits and the impediments of digital technology.	

resources can complement or challenge the instrumental rationality discourses that dominate the field [2, 4].

A Foucauldian sociotechnical discursive analysis also offers HCI4D and IS researchers interested in using critical or postcolonial theories as a demarginalizing method or a form of 'methodological decolonization' [12]. Moreover, by situating sustainability, marginalization and demarginalization within the IS sociotechnical framework, researchers can work towards developing a demarginalizing conceptual framework. An adapted version of the IS sociotechnical lens can form the basis for an inclusive demarginalizing framework that can improve the reflexive awareness of HCI4D and IS researchers. Furthermore, such a demarginalizing conceptual framework can sensitize HCI4D and IS researchers to construct knowledge claims that minimize the danger that IS knowledge and theories become implicated in marginalizing local end users and marginalized indigenous communities, thereby facing criticisms of working solely in the interests of global forces [58, 69]. This approach implies that demarginalizing methods and demarginalizing conceptual frameworks should be extended to develop an understanding and awareness of the history and context of communities at the margins involved in digital initiatives [65].

Second, this paper extends prior research showing how discursive properties are inscribed in digital technologies and how these technologies can play a mediating and reinforcing role in power relations. In other words, this paper is similar to previous work that challenges the notion that the IT artifact is neutral. Theorizing digital technologies as a complex ensemble of material-discursive constructions and practices can help HCI4D and IS researchers to approach research problems in marginalized indigenous communities in novel and innovative ways [12, 33]. For example, marginalization can include multiple groups and individuals, from end users to community members. Factors such as age, gender, and socioeconomic status can intersect and influence the impact of digital technologies within these communities. Mainstream IS and HCI research tend to focus on the individualistic experiences of end users or pay more attention to the role of socio-political and economic discourses that can be potentially harmful to indigenous communities. Future research should also be more mindful of discursive constructions and power dynamics in their treatment of intersectionality within these communities.

Third, demarginalization conceptualized within the IS sociotechnical framework also expands our critical lens to include 'invented tradition' [23]. The notion of invented tradition should not be conflated with the resilience of an indigenous community [17]. Traditional leaders and elites can deploy invented traditionalism to distort the memory of overcoming past injustices, which is central to resilience. The notion of invented traditionalism challenges the assumption that communities at the margins will readily accept the development of sustainable digital interventions and takes issue with the claims made by some postcolonial and critical researchers that Western sociopolitical and economic forces alone can explain marginalized communities [33, 52, 56]. Discursive constructions and practices of 'invented tradition' present as much danger to community resilience at the margins as Western or Eurocentric invented traditions. In marginalized communities, the decision to resist digital technologies is sometimes related to the need to maintain or enhance the symbolic need for a community's supposed continuity of traditional values and to signify resistance to Western values. This study extends Lamb and Kling's [30] social actor concept by including the considerations of the discursive constructions of 'invented tradition' of community members. Current understanding of cultural inertia, routines, and resistance in marginalized communities are somewhat obscure and can be one-sided [31]. There is an urgent need also to theorize how the traditional values and norms of social actors belonging to marginalized indigenous groups are sometimes counterproductive to their future and impede the role of digital technologies in accomplishing broader sustainability goals.

4.2 Implications for Practice

Information system professionals can interrogate practitioner discourses by drawing from concepts such as community resilience and 'invented tradition', or risk being positioned as insensitive or unethical in their design and implementation of digital technologies for marginalized communities. For example, practitioner discourses can overfocus on technology imperatives to support global economic institutions and neglect to address the cherished values of the local indigenous community. An FSDM approach could help practitioners to investigate how community-based IS could harmonize the social and technological subsystems to improve the community's economic development, while valuing traditional practices of the local community. While the discourses of the 'old' traditions of indigenous communities at the margins can seem impenetrable to change, small changes are possible if HCI4D and IS professionals are mindful of the language used in the complex power relations within these traditional discursive practices [44]. Perhaps more importantly, HCI4D and IS professionals have the moral obligation to design and implement digital technologies in ways that are culturally sensitive and not damaging or dangerous to indigenous communities. This type of care can only be achieved if HCI4D and IS professionals are mindful of the impact of their contemporary discursive practices and are flexible enough to tinker with them appropriately to implement novel digital interventions that are more considerate of the discursive constructions of these communities.

One useful mindset to adopt when working with marginalized communities is satisficing, as opposed to optimizing. As an aside, the surveillance of subsistence farming and domesticated livestock animals for food safety and quality via digital technologies may be viewed as legitimate and morally acceptable within the broader discourse of consumerism and mainstream culture. However, the danger of extending the track and trace affordances of surveillance technologies for arguably morally deplorable acts about the natural habitat and other animals is always present [70]. For example, digitally supporting canned trophy hunting of wild game species as a lucrative income stream for the leisure of wealthy Western tourists is just one of the potential dangers of IS practitioners in facilitating questionable modern traditions that also impede broader sustainability goals. Practitioners need to recognize that ICT discourses can conceal the interests for which they are working – Both discourses, traditionalism and modernism, are potentially dangerous [16, 66].

4.3 Limitations and Future Research

In this paper, we propose that understanding the role of digital technologies in demarginalizing communities is a sociotechnical discursive accomplishment. The paper also highlights the key social and technical perspectives that underpin the discourses in marginalized communities and how these insights can be leveraged by designers, providers and policymakers to simultaneously achieve instrumental and humanistic goals. The uniquely traditional context of indigenous communities globally and in the Global South, and the experiences of the participants in our fieldwork can shape our insights about digital sustainability in marginalized communities. This paper views demarginalization as a dynamic process that is situationally specific and therefore acknowledges that the proposed sociotechnical discursive conception is not a final word on this phenomenon. Notwithstanding, the adapted sociotechnical analytical approach, using a critical Foucauldian discourse analysis can initiate dialogue among HCI4D and IS scholars and inform digital sustainability and future social impact studies on digitalization in marginalized communities.

In particular, our conceptions of digital sustainability and marginalization derived from a sociotechnical Foucauldian understanding may also broaden our understanding of other concepts noted in HCI4D social impact research such as social inclusion, digital divide, privacy, disinformation and sustainable design. The proposed framework suggests that current digital sustainability constructions risk over-focusing on technical perspectives and instrumental outcomes. Therefore, how sustainability perspectives mediate and reinforce the marginalization of communities requires a more balanced investigation. Studies of sustainable HCI4D using a sociotechnical lens can provide practitioners with new insights on how to demarginalize communities (see Table 1). A discursive conception of digital sustainability in marginalized communities has the potential to enable practitioners to create more inclusive policies and designs. For those who study digital sustainability in marginalized communities, this paper calls for assessing the importance of the interplay between technology and human aspirations in demarginalizing community members to be a greater part of their agenda. We hope that responsible HCI4D and IS researchers will contribute to the concept of demarginalization in future theory building and create a more inclusive and sustainable world through digital technologies that will benefit current and future generations of people in all their diversity.

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