Article

Digital Preservation of Indigenous Culture and Narratives from the Global South: In Search of an Approach

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Abstract: This research seeks to digitally preserve cultural histories and artifacts, which are practiced/produced in the underserved indigenous spaces of rural eastern India. This paper is a case study of co-developing *Sangraksha*—a digital humanities application. The application seeks to facilitate the process of writing history from the below by underrepresented populations at the margins. The villages in this research were geographically remote and socio-economically underdeveloped. The research populations represented individuals who possessed low levels of literacy, limited language proficiency in English and mainstream Indic languages (e.g., Hindi and Bengali), as well as limited familiarity with computers and computing environments. Grounded in long-term ethnographic engagements in the remote Global South, this study explored a range of cultural, aesthetic, and contextual factors that were instrumental in shaping and co-generating digital humanities solutions for under-researched international populations. On one hand, the research initiative sought to co-create a culturally meaningful and welcoming digital environment to make the experience contextually appropriate and user-friendly. On the other hand, grounded in visual and sensory methodologies, this research used community generated imageries and multimedia (audio, photographs and audio-visual) to make the application inclusive and accessible. Moreover, the application-development attempt also paid close attention to intercultural, local-centric, community-driven co-design aspects to make the approach socially-embedded and sustainable in the long term.

Keywords: digital divide; indigenous; India

1. Introduction

Increasingly, scholars, practitioners and policy-makers are paying more attention to culture, and preservation of cultural heritage and historical narratives (Brown and Nicholas 2012). For example, in its Sustainable Development Goals towards making the world a better place by 2030, The United Nations emphasized cultural aspects (both tangible and intangible ones) for the first time (United Nations 2018). Such accentuation of culture and its preservation is particularly relevant to the underserved contexts of the global South, where cultural and historical narratives are continually and severely eroding (Turin 2012).

Critical/cultural scholars argued that the West is mainly interested in hearing its own voices and interpretations, and called for inclusions of local/indigenous knowledge and perspectives in the spaces of discursivity (Smith 2012). In previous research, scholars have noted that the tendencies of misrepresentation (including distortion and exoticization) of indigenous realities, either intentional or simply as a result of ignorance, were based on uninformed assumptions and misunderstandings (Ryan 2016). Moreover, in previous instances, not only the contributions from within the communities

were infrequent, but local/indigenous people also had little control over how local information was interpreted and presented to the wider community. Such misappropriations of indigenous heritage and history were not without costs; some of the consequences were—(i) loss of ancestral knowledge and historical information, (ii) delegitimization of certain cultural narratives and distinctiveness, (iii) inauthentic representations of indigenous cultural symbols and practices, and (iv) loss of cultural heritage and expressions (Brown and Nicholas 2012).

Increasingly, digital humanities scholars call for decolonizing the process of archiving to foreground locally situated narratives/history (Risam 2018). Questioning and challenging the existing form of representation and knowledge production in digital spaces, they talk about legitimizing marginalized voices in cyberspaces (Thorat 2015). Such attempts, according to these scholars, would encourage participation and collaboration of underserved communities as well as facilitate sustainable practices of storytelling for the purpose of ensuring preservation, plurality and ecology of voices and knowledge production (Risam 2018). To decolonize digital humanities, scholars called for using technology to undo techno-determinism and colonial praxis; more specifically, they talked about exploring avenues grounded in the indigenous knowledge and methodologies that were strategically ignored for long and/or appropriated in the West-centric approaches (Brown and Nicholas 2012). Thus, to undo the epistemic violence of the West, it is important to develop (or co-develop) new methods, tools and approaches through reflexive engagements with underserved communities at the margins (Scott 2011).

In most of the underserved contexts of the global South, both material and communicative resources are limited; moreover, these communities have to constantly negotiate challenges of survival and rapid changes (including technological) (Dutta 2018). In addition, structural, communicative and technological barriers pose challenges to their access to digital spaces. Indigenous regions of rural India are not an exception, where this research was conducted. By embracing the values of inclusivity, cultural diversity, local-centricity, co-designing, reflexivity, and with active involvement and ownership of local communities, this research explores an innovative approach to digital knowledge production to invert the discursive erasures and facilitate write history from the below. Specifically, we (indigenous villagers and I) attempted to co-develop a digital humanities application—*Sangraksha* (a Sanskrit word, which means careful preservation and protection) in a remote, underserved region of eastern India.

1.1. Literature Review

Digital storytelling in indigenous contexts is conceptualized as a process of integrating indigenous narratives with digital contents (e.g., images, audio-visuals) (Shelby-Caffey et al. 2014). Such storytelling reflects indigenous epistemologies and ontologies created (or co-created) by (and with) and/or for indigenous communities (Ryan 2016). While representing indigenous ways of knowing, being and doing, this narrative-sharing process both legitimizes indigenous worldviews and perspectives as well as safeguards community values and praxis (Leclair and Warren 2007). Moreover, scholars opine that the acts of storytelling foster local capacity building, create collaborative and dialogic spaces, and help enhance community cohesion (Duxbury et al. 2011). As the local/indigenous people own and control the process of storytelling through self-representation, they fundamentally challenge the taken for granted presuppositions and stereotyped misrepresentations in discursive spaces (Iseke and Moore 2011).

Colonial ways of knowing and designing often pay insufficient attention to local and contextual needs, practices, aspirations and expectations (Risam 2018). In non-digital eras, oftentimes it was difficult to overcome geographical isolation and other barriers to information dissemination as well as to defy stereotyping/discriminations particularly in face-to-face interactions. In comparison to non-digital research interventions, digital technologies and processes—(i) open up new possibilities and provide more access to information and knowledge; (ii) explore new modes of communication (including symbolic and diagrammatic archiving); (iii) help overcome geographical remoteness by ensuring faster communication; and (iv) foster better opportunities for conducting systematic

research (e.g., by embracing improved documentation opportunities). In addition, transformations in digital spaces—e.g., less costly information storage, availability of a variety of media formats, less labor-intensive computing practices, catalyze possibilities for a more efficient, community-relevant, and pluralistic research. Espousing postcolonial and indigenous epistemologies, the practices of decolonial computing strive for inclusion of local imageries, signs, languages, values and narratives to make the design process and outcomes culturally- and contextually-appropriate (Ali 2014). In other words, such locally sensitive design processes are fundamentally driven by community views, visions, and inputs (Wang and Hannafin 2005). Moreover, community-driven designs are iterative in nature as they allow for multiple attempts and many trials and errors—scholars conceptualize such journeys as "research through mistakes" (Anderson and Shattuck 2012, p. 17).

Designing interventions at the margins is deeply intertwined with asymmetrical power relations in social and cultural spaces. Smith (2012) argues that researchers need to be cognizant about the structural (e.g., availability of infrastructure, access to resources, poverty etc.), communicative (e.g., linguistics, literacy, and nonverbal/visual aspects) and representational matters (e.g., depiction, analysis and interpretation of marginalized contexts) (Dutta 2018). Therefore, by embracing de-colonial approaches, it is crucial to dismantle the attempts/agendas that portray indigenous people as deficient and agency-less. Scholars further note that to bring forth indigenous history, worldviews and narratives, research engagements needed to be respectful, responsible and engaged (Brayboy et al. 2012).

In many mainstream research interventions, marginalized communities are treated as mere recipients or as 'objects', which make their presence and voices invisible in decision making (Schwab-Cartas and Mitchell 2014). In contrast, community-based approaches argue in favor of bottom-up, organic and participatory research. In doing so, scholars call for community-academe partnership, where researchers reflexively understand socio-cultural and contextual dynamics as well as address the challenges to culturally meaningful knowledge productions and representations (Battiste 2017). Guided by active engagements of indigenous people, such research approaches, on one hand, foster local knowledge, embrace local contributors and their ideas to open up inclusive cultural and creative opportunities for local communities. On the other hand, active inputs and ownership of indigenous communities make the outcomes (e.g., contents, and processes) customized, culturally meaningful and oftentimes counter-hegemonic (Duxbury et al. 2011).

Cultural history, a social form of knowledge, is oftentimes communicated orally in various parts of the global South. Recounting cultural history is fundamentally an emic process, and it is not a single story (or version) told by a single person/institution (Flinn 2011). Scholars have noted that independent efforts to writing local/indigenous cultural history oftentimes operate outside the domain of mainstream, professional-/expert-driven practices of knowledge production. Jordan and Weedon (1995) noted that such an approach of writing history, neither dismiss/devalue the importance of rigorous scholarly methods, nor romanticize recovery of oppositional narratives. Rather, they argue for acknowledging the importance of bringing forth underrepresented voices and their narrators. Zinn and Arnove (2004) opined that "people who seem to have no power" are interested in creating (or co-creating) histories, which could be considered as useful cultural narratives.

Participatory histories, emerging from community experiences and everyday realities involve documenting cultural narratives and historical records by/with underrepresented populations (Caswell and Mallick 2014). This process of archiving history essentially dismantles the wall between conventional archives and common people's narratives. Many of the mainstream archives augment the hegemonic version of history by disproportionately drawing from sources with unearned privileges and are often ethnocentric; moreover, such attempts generally do not actively seek or consider contributions and materials from marginalized populations (Gish Hill and DeHass 2018). In contrast, participatory histories actively interrogate silences at the margins, and invert the discursive erasures, so that underrepresented voices and histories can be heard (Caswell and Mallick 2014).

The contemporary era has seen tremendous growth and advancement of digital and online technologies, which provide greater access to information and communication infrastructures (Turin

2012). As our everyday interactions are more and more socially-mediated, technological advancements and greater access could empower and provide opportunities for those at the margins (Risam 2018). However, in reality, the digital divide causes information-poverty in various underserved spaces of the global South, where socio-cultural and political disparities and injustice (e.g., based on gender, ethnicity or caste) have impacted the lives of the vulnerable populations (Murray and Hand 2015). Scholars have further argued that social exclusions of marginalized populations not only exacerbate usage gaps, but other factors such as lack of digital literacy and education also aggravate the same (Gaved and Mulholland 2010; Qureshi 2014). While physical (in)access is a crucial component of digital divide, Van Dijk (2017) opined that actual usage/non-usage of digital resources by users is also an important determinant, which depends on motivations, attitudes, and expectations of the cultural participants. However, among the information have-nots, ICT usages/experiences are not homogeneous; while some users do relatively well in the digital environment, some struggle to operate meaningfully (Selwyn 2006). In other words, equality of (i) distribution of resources, (ii) access to digital technology, and (iii) participation from within society are precursors to overcoming the digital divide for those at the margins (Van Dijk 2017). Recent research on minimally invasive computing could potentially open up opportunities for digital storytelling, particularly where the available computing resources and skills are not necessarily high. Minimally invasive computing enables people with little or no literacy, education or computing training, to participate in digital platforms (such as digital storytelling activities) and thus providing equal access to discursive spaces (Thinyane et al. 2006).

Embracing contextually mindful, rigorous and critically reflexive approaches, digital media and platforms can potentially be considered as a mechanism for preservation of disappearing culture, heritage and histories. Moreover, such digital approaches could not only be considered as economical, but they could potentially facilitate cultural conversations in wider discursive spaces; thereby, such approaches can plausibly bridge the gap between extant depictions and indigenous narratives/perspectives.

1.2. Context

1.2.1. Rural India

A government document suggests that there are 705 indigenous tribes in India, who speak in approximately 480 languages (Planning Commission 2008). Of marginalized indigenous spaces, India's Five-Year Plan document comments, "not only poverty continues at an exceptionally high levels in these regions, but the decline in poverty has been much slower here than in the entire country" (p. 228). Moreover, indigenous people of rural India have to constantly negotiate with discriminations like "untouchability" and exploitations.

1.2.2. West Bengal

Indigenous people of West Bengal are at the margins both socio-politically as well as economically, which prevent them from accessing many resources. For instance, the average income of 85% of the indigenous people in the state is less than Rs. 5000 (USD 83) (World Bank 2017). They experience de-legitimization and discursive violence from hegemon (including educated local elites) and in addition, geographical isolation aggravates their silence or absence in the spaces of discursivity.

1.2.3. Purulia

Purulia, where this research was conducted, is the one of the most underdeveloped districts of eastern India. Approximately 35.52% of the people in the district are illiterate. The 2011 census further showed that about 30% of the population stopped going to school after grade four (i.e., primary/elementary education). In other words, approximately two-thirds of the population of Purulia is either illiterate or semiliterate. Moreover, nearly 39% people of the district are from the lower social economic strata (i.e., Dalits and indigenous people).

1.2.4. Santuri

Santuri is a community development block in northeastern Purulia. More than 55% of the population in this block include Dalits (25.59%) and Indigenous (31.95%). Overall illiteracy (considering both upper and lower caste people) is 22.14% among male populations and 48.55% among female populations. The research was conducted in eight villages of the Santuri block; almost all the populations are from an indigenous community in those villages.

1.3. Contextual Issues and Barriers

1.3.1. Structural

Appropriated by/misrepresented in the mainstream, historical accounts and emic narratives from the margins are largely missing in the spaces of knowledge production. Indigenous histories, worldviews and heritage are not only delegitimized, but also the chances of documenting them are becoming thinner as the indigenous culture and practices are disappearing. Moreover, the mainstream's willingness to preserve indigenous culture and narratives are inadequate. In addition, the scope of active participation of indigenous communities in such efforts is minimal.

1.3.2. Communicative

In preserving indigenous culture, situated communicative barriers and absences pose significant challenges. Dutta (2018) noticed several cultural/communicative barriers among the tribes of Eastern India, some of them are—(a) linguistic barriers: non-indigenous people's lack of knowledge about tribal languages, and/or indigenous villagers' lack of proficiency in mainstream languages affect communication between indigenous communities and outsiders. On one hand, such scenarios prevent indigenous people from sharing their own history in their own languages that are less known to the outside world, and on the other hand, such communication gaps cause confusion, misinterpretations, and misrepresentations; (b) literacy barriers: as most of the tribal population are either illiterate or semiliterate, they face problems in reading and writing. These barriers not only limit their awareness and communication with the outside world, but also pose challenges for them to document their stories and practices; (c) cautious skepticism: owing to prolonged experiences of oppressions and exploitations, indigenous people oftentimes are very reticent and silent in interactions with outsiders or avoid such interactions altogether, or in some cases may exhibit apparent politeness to the outsiders. Thus, they oftentimes say things just to please or at least not to offend the outsiders. These communicative barriers are important to overcome when attempting write an emic version of history from the below.

1.3.3. Technological

Owing to geographical isolation, indigenous people not only experience lack of access to online resources (primarily for little or no connectivity/telecommunication signal), but they also face economic barriers, unable to own advanced digital devices such as smartphones or tablets. Moreover, their lack of proficiency in reading, understanding and writing mainstream languages (specifically English) restrict them in reading and interacting with the standard interfaces/GUI. In addition, unavailability (or less availability) of infrastructures (e.g., intermittent electricity) and online resources (e.g., low-speed internet connectivity) pose challenges to communicating (as well as conducting research) in indigenous spaces.

1.3.4. Cultural

Many indigenous cultures (including the indigenous communities of Santuri block), by maintaining traditional practices, restrict outsiders (like me) from entering certain spaces or participating in some cultural events. Such restrictions essentially prevent externally-driven documentation practices, as well as necessitate community-driven initiatives to write cultural history.

Another barrier to meaningful academic research is its 'seasonal bias'. For instance, most of my research activities in the global South take place during the summer; in other words, I cannot observe the community dynamics during the winter or spring, which limits my interactions to study and document indigenous peoples' cultural activities and practices.

1.3.5. Educational

In India, 86% of the indigenous population do not get the opportunity to attend beyond middle school (grade 8) (World Bank 2017), and most of the schools provided education in vernacular languages. Moreover, the computational skills of indigenous students/populations are not usually high primarily because of their geographical isolation, lack of access to computing resources, which hinders them from becoming competent users of digital devices/platforms. In addition, the indigenous students and youths have limited opportunity to update or train in the latest technologies and accessories. Aforementioned barriers, i.e., structural, communicative and technological, are precursors to the digital divide in indigenous spaces.

1.3.6. Digital Divide

Scholars have argued that unavailability of interfaces/GUI that incorporate local languages and culture make interface designs inaccessible to many marginalized populations (Rao 2005; Wang and Hannafin 2005). Scholars have further noted that due to the cultural inappropriateness of many of the information and communication technology (ICT) based interventions and designs, such initiatives remain largely ineffective (Walmark and Beaton 2011); e.g., more than 80% of ICT projects at the margins were unsuccessful (Smyth et al. 2010). Thus, information poverty in the indigenous spaces, owing to lack of access and participation of local populations, causes absence of underprivileged voices and agencies in the spaces of discursivity.

2. Methods

To make the initiative of '*sangraksha*' culturally meaningful, contextually appropriate, and inclusive, the research methodology was rooted in four key aspects, described below:

2.1. Methodological elements

2.1.1. Co-Design

The approach of co-designing conceptualizes cultural participants as co-creators of knowledge (David et al. 2013). Therefore, guided by cultural and contextual dynamics, such approaches fundamentally challenge dominant portrayals of underserved communities as passive recipients of externally-led design interventions (Bieling et al. 2010). In co-design processes, marginalized populations as co-researchers own, organize and lead innovative initiatives towards building capacities at the margins.

2.1.2. Critical Listening and Dialogue

Critical listening and dialogue are foundational in creating conducive communicative infrastructures to foreground marginalized voices and narratives. On one hand, such engagements, by bridging communication gaps, bring forth cultural histories that are intimately intertwined with the community realities, experiences and values (Ganesh and Zoller 2012). On the other hand, dialogic and listening in solidarity with local/indigenous populations are considered as precursors to informed deliberation and collective decision-making in underserved spaces.

2.1.3. Local-Centric

A local-centric approach values inclusive research engagements with agencies and voices that emanate from the grassroots. On one hand, such practices are grounded in local social norms and

practices; and on the other hand, they reflexively address local needs, aspirations, knowledge and worldviews. In other words, by focusing on contextual realities and barriers, local-centric approaches seek to open up transformative avenues by using locally available social and cultural resources (Galdeano-Gómez et al. 2011). Even if such approaches are centered on the locale, they are not limited to local spaces; rather, they inform and influence conversations at national and international spaces.

2.1.4. Indigenous Perspective

Embracing indigenous methodologies, this research argues for inclusion of indigenous agencies, values, voices and perspectives as the foundational elements of knowledge production. Rooted in decolonizing and de-centering imaginings, such approaches put indigenous autonomy at the forefront to bring about social change (LaVeaux and Christopher 2009). Therefore, to foreground indigenous histories and narratives, this research envisions indigenous communities as a wealth of resources as well as a central and active guiding force for community organization.

The process of co-designing digital environment not only situates community members and their voices/opinions at the center (of *sangraksha* initiative); but also make the interaction design activities bottom-up and organic. Critical listening practices and dialogic engagements with the indigenous populations and their values and aspirations, on one hand potentially make digital experiences de-colonial/de-westernized ones; and on the other hand help participants in overcoming situated communicative/cultural barriers. Moreover, reflexive and immersive research interactions grounded in local knowledge and agency are precursors to bringing about transformations in digital, physical as well as discursive spaces.

2.2. Emergence and Description of the Process

This approach of co-developing '*sangraksha*' organically emerged through the process of immersive engagements with indigenous communities of Santuri, Purulia. Since 2010, I had been regularly visiting villages of Santuri block and conducting research on cultural and communicative practices among indigenous populations. On average, I spent 4–6 weeks every summer with the goal of better understanding the realities and cultural practices at the margins. During research interactions and informal conversations, community members talked about several local cultural aspects, including constant and consistent erosion of cultural resources, as well as challenges in protecting cultural heritage, preservation of cultural artifacts, and expressions such as local art and craft, historical accounts, folktales and performances (e.g., dance, theater and folk songs). For instance, in one such conversation, a community member talked about songs they performed during their spring festival—sometimes lasting for 24 h. Such traditional practices have not yet been systematically documented; therefore, they thought that in the near future the songs could be lost, at least partially. Similar concerns were enunciated by the members of the indigenous communities about preservation of folk-art forms such as wall paintings, and historical narratives, which were primarily communicated within families from one generation to the next. However, in the contemporary era, as the communities were constantly struggling for survival, many of them found it difficult to devote themselves to preserving and promoting local cultures. Moreover, due to instantaneous appeals and the dominance of mainstream culture, many indigenous cultural artifacts and expressions experienced difficulties in competing with the hegemon with limited material and communicative resources. In addition, lack of availability of community-created/*emic* indigenous narratives as published resources (print and digital) further delegitimized the indigenous voices and practices. In inverting such discursive erasures, villagers expressed their interest in documenting their history and cultural resources, so that many of the near extinct narratives and cultural artifacts could be saved from extinction or misrepresentation.

2.3. Conducting a Community-Centered Research

After learning about participants' interest in preserving historical and cultural discourses, and after receiving IRB (Institutional Review Board) approval from my university, since 2014, I conducted
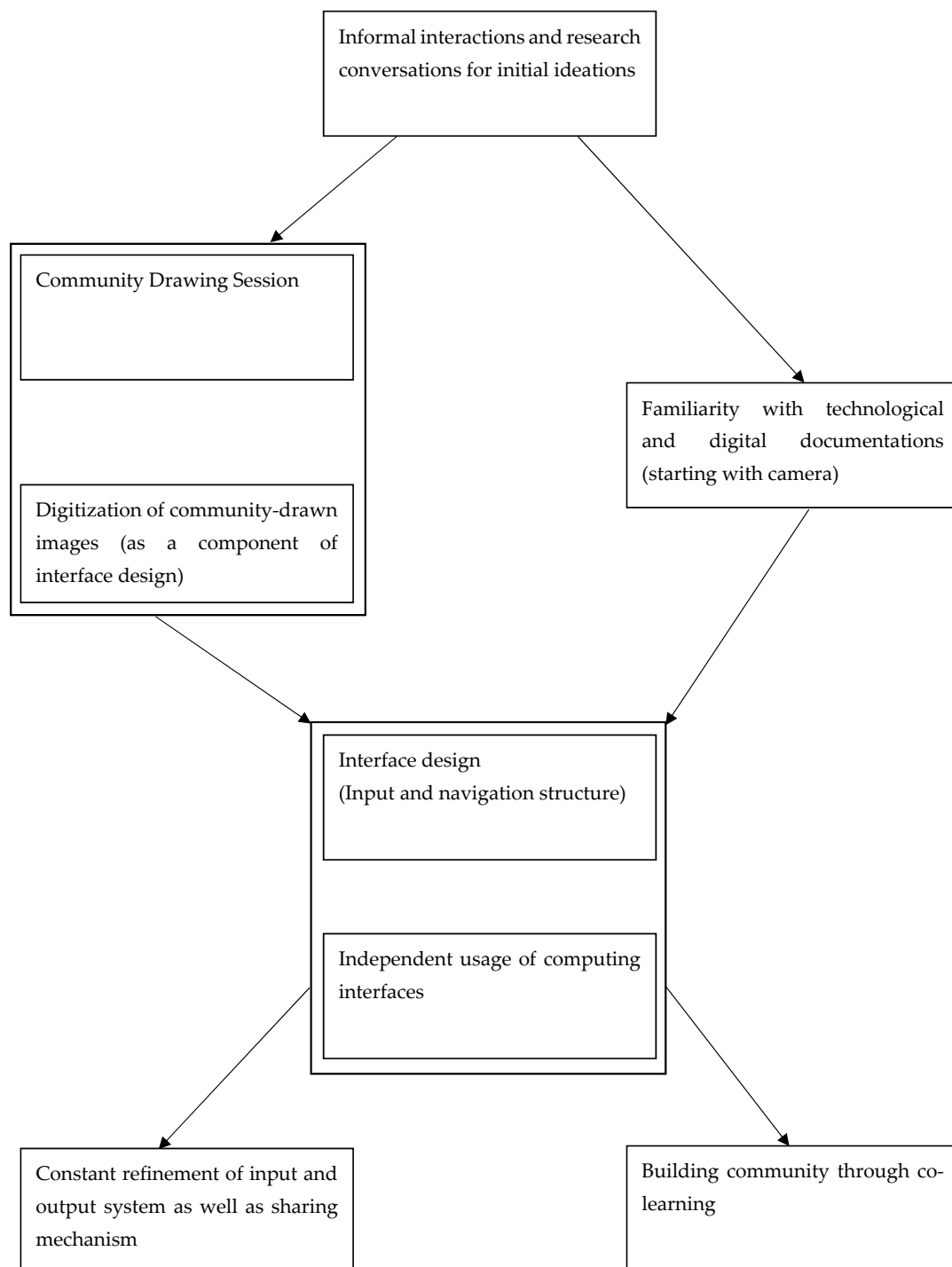
research in eight villages, which were predominantly indigenous. The two indigenous tribes that participated in this research were—Santhal and Mahali. Ethnographic observations and qualitative interviewing were the two key field-research methods. During the research interactions, we (villagers and I) primarily explored, (i) possibilities of overcoming contextual barriers and documenting various indigenous cultural artifacts; (ii) the scope of co-developing approaches to independent knowledge production and foregrounding indigenous discourses (i.e., through elimination/reduction of potential distortions and misrepresentations); (iii) indigenous communicative capabilities and agentic contributions in the process of preserving and sharing cultural resources within the community as well as with the outside world.

　　In addition to conducting 17 qualitative interviews (a mix of individual in-depth interviews, and focus group discussions), eight co-creative sessions were organized, where the villagers dialogically contributed in co-designing the interface and the documentation processes (ref. Figure 1). Since many of the participants were not familiar with the computing environment (e.g., smart phone, computer, Internet etc.), a co-designing-based approach to innovation was adopted. In doing so, a two-prong process was followed—(i) embracing a visual/sensory route, for example to a create culturally meaningful image, and (ii) co-developing a documentation approach without solely depending on text/textual means.

　　During the initial phase, a few collective drawing sessions were organized, where villagers drew their visual depictions about local lives and social phenomena (ref. Figure 2). After drawing, the villagers collectively selected their preferred visual representations. Later, those hand-drawn images were re-drawn using graphic software, and subsequently refined based on community dialogue. In the next phase, 16 digital cameras (for capturing photographs and videos) were distributed among the villagers. The participants kept the cameras for 3–7 days to document their cultural expressions and histories; later during research interactions, they explained their experiences and thoughts. When they expressed their familiarity in documenting local cultures and histories by using digital devices, we (villagers and I) decided to use digital-tablets for subsequent stages of research. Accordingly, 7″ digital-tablets were distributed among villagers; the community members used them for documentation as well as provided their feedback on interfaces, navigational aspects, and their overall experience. In addition, three full-time community members were recruited as resource persons who dialogically contributed in co-developing '*sangraksha*', and also facilitated dialogue in community settings to gather feedback at every stage of the research initiative.

　　In total, 79 villagers (42 males and 37 females) participated in those research interactions. During research conversations, *Simantararhi and Jharkhandi Bangla*—a dialect of Bengali language, was used. This dialect was significantly different from the formal/urban Bengali as it included several indigenous words/vocabularies (Karan 2002). Following IRB guidelines, informed consents were obtained before initiating each research interaction. Interviews and focus group data were transcribed from local languages into English. After translation and transcription, the audio recordings were destroyed and pseudonyms were used to represent the cultural participants, so that the responses could not be traced back to individual villagers.
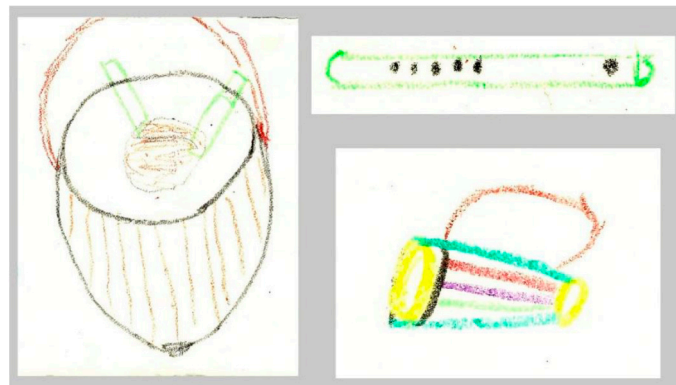
Informal interactions and research conversations for initial ideations

Community Drawing Session

Digitization of community-drawn images (as a component of interface design)

Familiarity with technological and digital documentations (starting with camera)

Interface design
(Input and navigation structure)

Independent usage of computing interfaces

Constant refinement of input and output system as well as sharing mechanism

Building community through co-learning

Figure 1. Process Diagram.

Image of 'culture' drawn by the villagers.
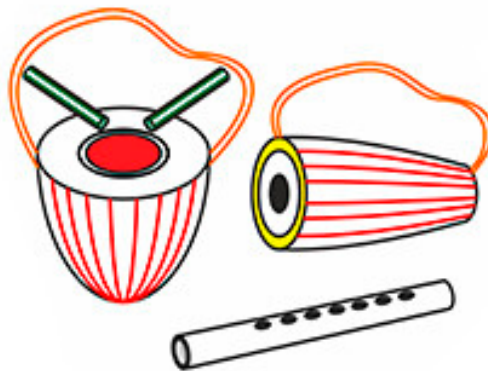
Figure 2. Community-Drawn Imageries.

3. Results

To analyze the collected data, I closely studied the transcribed texts sentence by sentence and noted the key aspects and phrases. After comparing and examining the relationships and associations with and among the noted aspects/phrases, I categorized and aggregated them to identify themes that emerged from the texts. Thematic analysis of the transcribed texts is presented in the next few sub-sections.

3.1. Writing History

For years, senior members as well as youths of the indigenous communities communicated their concerns about the constant erosion of cultural values, expressions, and histories. Based on their collective-experiences in the colonial era as well as in independent India, they became cognizant of the prevalence of discrimination as well as distortions of their identities and cultural histories. During conversations, they expressed their pride in their indigenous heritage, cultural artifacts and historical legacies as well as articulated their interests in preserving and promoting them, which marked the beginning of this research journey. While discussing meaningful history and authorship, Rantu, a villager, shared his opinion,

> Interviewer: If history is written from my point of view; then, will that history be complete?
>
> Rantu: No, it will not be complete . . .
>
> Interviewer: Why not?
>
> Rantu: Incomplete as in, you cannot know everything—what is going on in our community and in our families, how it is going on . . .
>
> Interviewer: So, you are saying that if you tell your story then a more complete narrative will emerge . . .
>
> Rantu: Yes. Suppose I tell my own story, he tells his own story. This way, gradually the entire story of the society will come up . . .
>
> Interviewer: In this research, we want this to happen. Also, in this way, your stories are going to reach the people of different regions . . . right?
>
> Rantu: Yes. Sure, it will reach, and by that way, something constructive will be going to happen . . .

In this digital era, villagers enunciated their strong desire to tell their stories by themselves, using computing resources as well as to share them with wider populations.

When I was discussing aspects of communicative barriers with villagers such as illiteracy, lack of proficiency in mainstream languages, particularly in the context of writing a cultural history in digital spaces, many of the villagers communicated their confidence in their collective agencies. Jitu, an indigenous villager, was one of them, and in his words,

> Jitu: Let me tell you something—people of this place, they might look uneducated, but they have really sharp minds.
>
> Interviewer: Sure. One more thing, do you think it is possible for non-literate people to use digital devices?
>
> Jitu: Yes. Maybe there are more non-literate people, but there are a few partially literate and a few literate people as well. Therefore, if we will work together, then we will be able to write our own history.

Instead of losing faith in the capabilities of indigenous people at the margins, Jitu argued in favor of gradually overcoming the contextual/communicative barriers through the process of collective co-learning. Such convictions fundamentally rupture the dominant claims of marginalized communities as agency-less, as well as situated the villagers at the center of alternative knowledge production activities.

3.2. Contextual Realities and Barriers

As previously mentioned, several contextual barriers are a reality in many underserved spaces of the global South. The villages of Santuri block were just another example. Along with many other structural and communicative barriers, one of the barriers they experienced particularly in the context of digital participation was the lack of access to computers as well as acquiring computing skills. Being at the margins, the villagers never got the opportunity to learn computers, and at the same time their impoverished situations made it impossible for them to access computing resources. Sona and Kanu, two young villagers were commenting,

Interviewer: Have you ever used a computer or digital-tablet?

Sona: No, never.

Interviewer: Have you ever used a touchscreen?

Kanu: No. However, I have seen touchscreen in smartphones; some of my friends own them. Once, I took a group photograph using the touchscreen as they told me to do so.

Interviewer: And what about using the Internet?

Kanu: Never used personally. However, my friends use internet data to use Facebook.

Interviewer: Do you know the English language?

Sona: Not much . . . comparable to not knowing.

Villagers' responses showed that even if they do not own computing resources, they were not unaware about the possibilities and scopes of the digital environment. While the conversation showed that some of the villagers previously accessed computing resources with the help of others, it seemed that gradually indigenous villagers were also starting to own smart phones (oftentimes they bought cheaper duplicate versions, i.e., not the original/branded ones). Even if there were a few smart phone owners at present in those villages, their lack of proficiency in English and mainstream languages prevented them from fully participating in digital platforms.

Next, to examine the appropriateness of mainstream/popular visual representations of indigenous people and cultures, I downloaded some images depicting tribal lives of West Bengal. Currently, there are about 44 indigenous tribes in the state of West Bengal including the Santhals and the Mahalis. When I showed those downloaded images, and requested their comments about their representativeness, Biru, a senior indigenous villager said,

Interviewer: Do these pictures represent your culture and history?

Biru: These visual images are not like us. They need improvement.

Interviewer: OK, sure. Now, if I request you to create your own images, can you please participate in the process? I believe those images will represent you better.

Biru: Yes, sure.

Popularly available images (particularly on the web) at most can be labeled as generic; they did not capture the nuances of the cultural realities of specific indigenous communities. To come up with culturally meaningful and more authentic visual representations, the villagers took ownership in generating community-centric and culturally-appropriate imageries.

3.3. Cultural Imageries Created by the Community

In generating cultural imageries, villagers created two types of images—first, hand-drawn images, and later they took digital photographs using the cameras that they were provided as a part of the research. In the hand-drawn image creation process, the junior members of the community oftentimes assisted the senior villagers. For conducting the drawing sessions, paper and writing materials were supplied. The villagers were requested to draw images on the topics of local importance, social processes, including abstract concepts like '*culture*'. After gathering 6–10 images on each topic, the villagers as a collective chose their preferred visual representations. In one such session, Bhola, a middle-aged indigenous participant, was interacting with me,

> Interviewer: Now that you have participated in the process of creating images, can you please select the drawings which you liked the most?
>
> Bhola: Can we choose multiple pictures?
>
> Interviewer: Yes, sure.
>
> Bhola: We chose these two pictures for this category.
>
> Interviewer: Sure, no problem. As a next step, now we will re-draw these pictures using computers; then we will show you how to use them for the interface.
>
> Bhola: Hmm.

As a next step the chosen images were digitized (i.e., re-drawn as vector images), and based on the villagers feedback the digitized images were refined and subsequently used in the interface.

In the next stage of community-driven image production, villagers were provided with digital cameras (one camera [with video capturing facility] per participant-family); the villagers were requested to click 15 culture-and history-related images/videos. Later, during follow-up interactions, they talked about their experiences as well as significances of some of the images/videos captured by them. Sarama, a woman participant, shared her thoughts,

> Interviewer: Who has clicked these photos? You . . . right?
>
> Sarama: Yes, I have clicked them. My daughter taught me, and she also clicked some of the pictures. I did not know how to click photos, I learnt it on Sunday.
>
> Interviewer: Tell me which picture comprises of what? For example, this wall painting of peacocks and snakes, what is its significance?
>
> Sarama: Yes, two snakes and two peacocks are there in this picture. Snake oftentimes bite humans. Peacock are their enemies, and therefore friends of humans, as they eat snakes.

As a part of the image production process, villagers also learnt from one another about how to digitally capture culturally relevant images. For some villagers, it was the beginning of their journey for digital storytelling. Culturally produced images made more sense to the villagers as they were contextually relevant, and grounded in local imaginings.

3.4. Understanding Navigational Aspects

When the villagers became familiar with the digital environment, i.e., learned how to capture photographs and videos independently, computer tablets were provided to them. During the first iteration of '*sangraksha*' with computer tablets, a digital interface with four options was presented to them (ref. Figure 3). The interface used the graphics that they usually see in their regular mobile devices (non-smart phones). Even if a few villagers had some initial hesitations, villagers were able to use the tablet-interface to capture digital images. Bishu and Tilak, two elderly villagers, were commenting on the understandability of the interface,

Interviewer: Here, four features are presented as input options; do you think that everyone will be able to remember?

Bishu: People who can operate mobiles and the Internet, for example, our boys, they will be able to do that.

Tilak: And suppose, people like us who do not know the mobile functions—you are asking can we possibly learn and use them . . . right? Yes, we can surely learn them.

Tilak: We will not face any problems, particularly in this case, no problem.

Figure 3. Input Screen.

Along with capturing images and videos, some literate participants also tried to write short messages using the interface. The initial version used English letters to describe the image-prompts of the interface. Villagers suggested changing the language of the prompts as well as language for inputs to Bengali (most preferred non-indigenous language in the local context).

After changing the language of the interface, when I talked to the villagers, Seema and Reba, two young female participants, said,

Interviewer: Okay. Now check these four functions, there are square spaces. Now, can you write in those spaces? Please tell me if you face any difficulties. After the last meeting, we have removed the English letters; now everything is designed using Bengali language.

Seema: For writing purposes, it is certainly helpful; that is the Bengali feature is better . . .

Interviewer: And for readability, is it better?

Seema: No, in terms of readability, some problems are there.

Reba: If you can make them (fonts) larger, then it will be better.

Based on their (and other participants') suggestions, the readability aspects were re-designed. Afterwards, Kusum and Minu, friends of Seema and Reba, shared their feedback,

Interviewer: Now, the font can be magnified; in fact, it can be enlarged quite a bit. Look at this. Now, can you read?

Kusum: Now I can read the letters, even those small letters.

Minu: That is very good. Everything is understandable, the images are more visible, and the writing too.

In the co-design process, users' feedback was sought after every iteration. Through listening and dialogue, the '*sangraksha*' interfaces were continually modified until they met the expectations and aspirations of the cultural participants.

3.5. Accessing and Structuring the Contents

Along with deciding and fine-tuning the input mechanisms, the villagers also provided their feedback on the data structure. Initially, a few broad umbrella topics were discussed, and then their subtopics were also decided. For example, under the category—history, the subcategories considered were ancient history, history of revolution, history of pride and local/community history. As the villagers started documenting their songs and stories by themselves, they were asked to decide the categories under which they want to store their documented resources. Sudha, a locally well-known woman singer, shared,

Sudha: As a performer of Santali songs, I noticed that indigenous songs were not given too much attention, and are not documented well. In '*Adivasi jatras*' (indigenous rural theatres), we also use songs, and they are popular; however, here I am not talking about those songs. I am talking about individual or stand-alone songs, for example, songs of *ulgulan* (indigenous revolution against the British colonizers).

Interviewer: In this output screen, we have some options. Where do you think these songs should be kept?

Sudha: In this screen, you have kept History and Culture separate, so I would suggest that you could keep the songs of our *ulgulan* under History.

Through such discussions, on one hand, the participants shared their preferences and priorities to store their cultural resources; for example, the *ulgulan* songs could have been stored under both 'performance' and 'history' categories. To Sudha, the songs were historical resources, and not usual performance-pieces. On the other hand, during interactions, oftentimes new subcategories emerged (e.g., 'mythologies', 'traditions and history') in storing different resources captured by the villagers.

As most of the villagers could not read or write, a visual/sensory approach was used in '*sangraksha*' for log-in purpose, more specifically for inputting the passwords. Forty images (by replacing words and numbers) were used in the password screen, the combination of which could be used as passwords. For example, instead of typing an alphanumeric password such as ABC123, villagers could use a combination of images such as a combination of 'one fruit', 'one flower', 'one vehicle', and 2 'dress items', as her/his password (ref. Figure 4). Barin, a young villager, after creating and using passwords, shared his thoughts,

Interviewer: Are you facing any difficulty understanding this?

Barin: It is very much understandable from the pictures. The moment you see them you can figure it out. I have a suggestion: please improve the image of the scarecrow and the shovel.

Interviewer: Sure. Let me ask, in the case that illiterate participants are using these pictures to create a password, will they be able to remember their password or not?

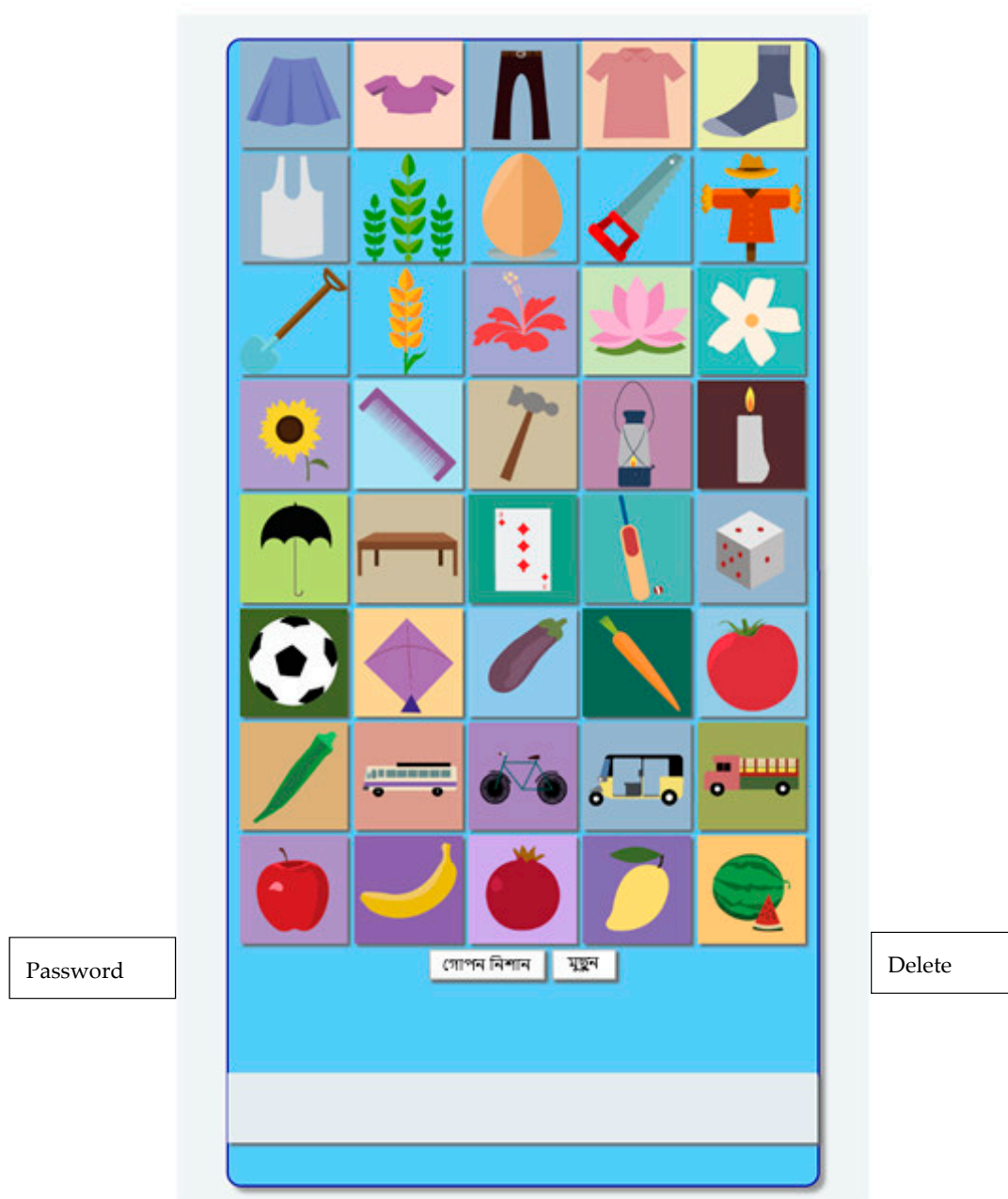Barin: Definitely, they will be able to . . . this will be perfectly alright.

Figure 4. Password Screen.

Scholars have shown that visuals are cognitively easy to remember, and they also produce less fatigue (Pauwels 2015). Villagers, both literate and illiterate users, were affirmative to/approved the attempt to use visuals as passwords.

3.6. Creation and Sharing of Contents

Villagers shared their thoughts and feedback while using the interface to create content and for sharing the content with others. For many illiterate villagers, and for most illiterate villagers, it was important to learn (and co-learn) the navigational sequences and operations (typical to digital environments) to use the computing-features effectively. In the following conversation, Ramu, a middle-aged participant, was both clarifying doubts as well as sharing his feedback,

Ramu: So, the song we just recorded was based on our creation stories. What do I do next?

Interviewer: Just press the button and save it. The video will be stored in the device. Additionally, a few more things will be stored automatically like 'media type' and your 'geographical location' (ref. Figure 5).

Ramu: As you said earlier, we can add a short description before sharing it with others . . . can I do it later?

Interviewer: Of course, you can. One more thing, before sharing with others you have to choose two things—one, your preference of sharing . . . that is local or global audience, and two, the topic of the recording such as History or Culture.

Ramu: Yes, that will be OK.
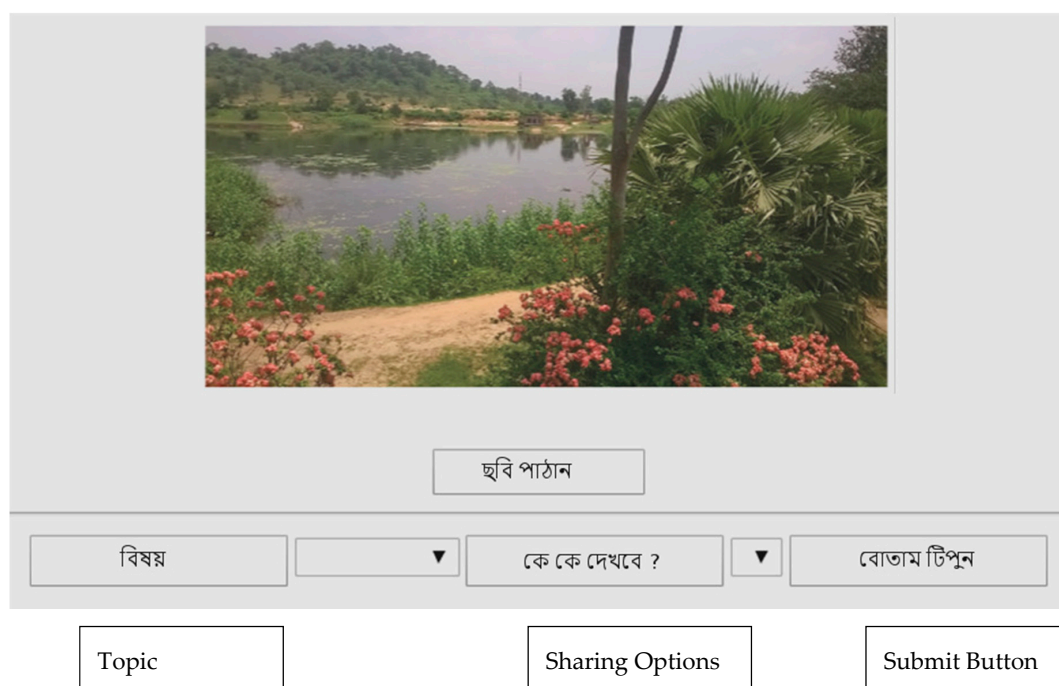
Figure 5. Tagging before sharing documents.

Apart from creating content, and sharing them with outsiders, villagers discussed the output screen/interface as well. As the output screens were designed for community members as well as literate populations from the mainstream, both visual and textual information were used. Along with capturing and submitting their recordings, villagers examined some of the "sample" output screens (ref. Figure 6), and provided their feedback, Lata, a young female villager, said

Lata: If my teacher wants to watch my previous recordings, she has to visit the webpage. That I understand, and what next?

Interviewer: This is what the output screen will look like. Here is your video and the basic description you shared.

Lata: So, to play the video, she has to press the play button . . . right?

Interviewer: Yes. And later we will add transcriptions of the video in Hindi or English, so the outsiders can also understand the content.
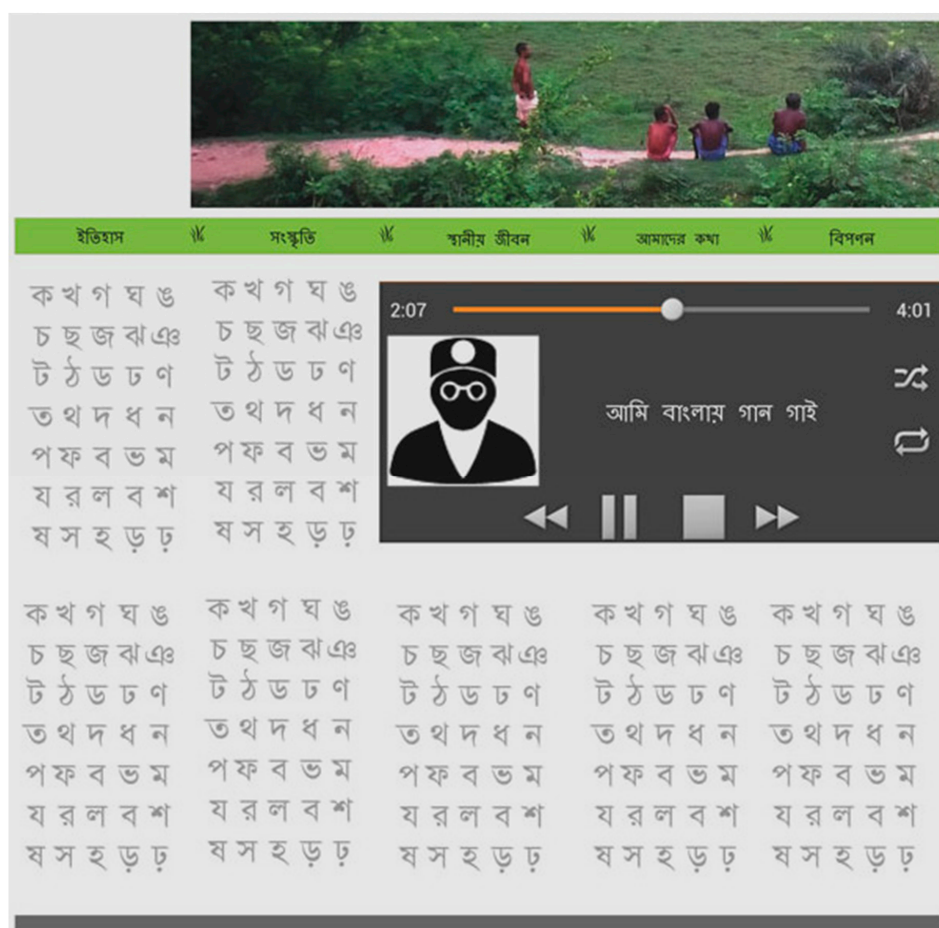
Lata: Hmm.

Figure 6. Output Screen.

Unlike most parts of this research, the designing of output screens mostly followed the standard web designing process/style as of now. In the future, more co-designing involvements from the villagers as well as more feedback from the mainstream participants will be sought to make the design culturally appropriate.

3.7. Community Creations and Co-Learning

Along with co-designing, learning from each other was another aspect of this design process. Peer-learning (i.e., exchanges between knowledgeable participants and less-knowledgeable participants), were strongly encouraged throughout the process (Dutta and Das 2016). During research interactions, villagers were asked to share their opinions about the practicality and feasibility of implementing the peer-learning practices. Shibu, a middle-aged participant, said,

Interviewer: In the case of illiterate villagers, how much time do you think it will take to learn?

Shibu: If it is explained to them for two to three days, they will be able to understand.

Interviewer: In the next phase, if this research project appoints you to train less-knowledgeable participants for two to three days, will they be able to do it?

Shibu: Yes, they will be able to use it independently.

As a part of the peer—learning process and for the sharing of knowledge, three young villagers were recruited to facilitate dialogue, to train fellow villagers, as well as to seek/to collect feedback from the community (Dutta and Das 2016). This process not only added value to the in-situ design process, but also helped the researcher to obtain better quality feedback on '*sangraksha*'. In one such session, Dulal, a community resource person, was interacting with Sanjay and Manik, residents of another village,

Dulal: Suppose you are singing or saying something, if you press 'audio' button, then your voice can be recorded and stored here. Afterwards, if you want to write something about the song . . . with this one you can write. Then you can send them together.

Sanjay: Ok. I understand.

Manik: Apart from recording audios and videos and labelling them, I have a question. Suppose . . . if I switch off this tablet, will they (the recorded file and the texts for labeling) still stay in the tablet?

Dulal: Yes. For sure. You need to re-open, and click to send them. The same thing will also apply for video recordings.

Manik: Hmm.

Dulal: One more thing—suppose someone is unable to digitally write in Bengali, he or she can write down his or her message in his or her own language on a piece of paper. Then he or she can simply click a photo of that writing to send it.

Thus, communicative engagements facilitated by indigenous villagers (as community resource people) fostered the intra-community co-learning practices. Such community level dialogic interactions and relationships were instrumental in making the research initiative sustainable.

4. Discussion

Increasingly the scholarship of digital humanities calls for multilingualism, decolonization of knowledge, and cultural diversity (Fiormonte 2017). This call is particularly relevant for the underserved contexts of the global South, where the erosion of historical resources and cultural expressions are severe. Embracing the values of plurality and ecology of culture, this research initiative ('*sangraksha*') explored the avenues to writing history from the below through addressing and overcoming cultural and communicative barriers that operated in the indigenous spaces of rural eastern India.

The process of writing history in this digital era by bringing indigenous narratives to the center has been never easy, as the populations at the margins are constantly negotiating with structural and communicative barriers. Scholars have noted that modernist and top-down dominant interventions to bridge the digital divide remain largely unsuccessful, particularly in marginalized contexts (Smyth et al. 2010). In the case of this research, geographically remote and socioeconomically underserved indigenous populations were experiencing a number of communicative barriers, including illiteracy, lack of proficiency in mainstream languages, lack of computational skills, among others. In terms of structural barriers, they were not only fighting against hunger and poverty, but they also had to negotiate with technological and infrastructural challenges, including lack of access to computing

resources, the Internet, and steady supply of electricity. Such structural and communicative absences were the precursors to making the marginalized indigenous population incapacitated, and unable to participate in digital spaces. Therefore, it was crucial to address the contextual factors and experiential realities in overcoming the aforementioned barriers as well as technological inexperience (and phobias) in a culturally and aesthetically appropriate way.

To facilitate indigenous presence and active involvement in the digital spaces, the approach to co-develop '*sangraksha*' embraced the values of inclusivity, dialogue and reflexivity. First, this study argued in favor of long-term immersive engagements at the margins, which were foundational to trust building as well as to breaking the barriers of silence and cautious skepticisms that were historically mounted as a consequence of dominant oppressions and exploitations. Second and more specifically, this research suggested that critical listening and dialogue were crucial to create open and conducive communicative infrastructures, so that marginalized communities could participate unobtrusively and with less (or no) inhibitions. Moreover, a critical reflexive strand was essential in this research context to introspectively examine dominant ethnocentrisms and coercions as well as the researcher's cultural baggage, presumptions, and unearned privileges. Being reflexive and inclusive was instrumental in order to examine power dynamics and structural barriers, and also to bring forth and nurture emic voices and narratives in the spaces of discursivity.

In order to facilitate digital storytelling through overcoming cultural and communicative barriers, this study situated co-designing at the heart of the research initiative. Moreover, to address and overcome technology barriers, including low-speed Internet connections and lack (or absence) computing skills among the users, the majority of the research was conducted in-situ. In the process of co-designing, active participation of the community members in every step of this research was ensured to address and incorporate the cultural aspirations, values, and practices. Starting from organically generating visual images to co-constructing contextually meaningful interfaces, the villagers participated in collectively designing and deciding *sangraksha's* navigational strategies as well as determining data input/output mechanisms. As many of the community members were not conversant with digital environments, they were involved in the research process in stages—i.e., they initially produced images on paper, then they used a camera for taking photographs and videos, and at the end, digital tablets were utilized to document historical and cultural narratives. Other key challenges were villagers' unfamiliarity with the English language as well as limited proficiency in local mainstream languages; to make the research inclusive, visual and sensory elements (instead of texts-only) were emphasized while designing the digital interfaces. Again, throughout the research, villagers' feedback was sought and duly incorporated on a constant and consistent basis in making the process culturally-meaningful. As a part of the co-designing process, co-learning was strongly encouraged in this research to ensure ownership and control of community members in creating and sharing cultural history in the digital spaces. Moreover, (i) recruitment of community members, and seeking their inputs in every stage of co-development of '*sangraksha*' as well as (ii) their participation in facilitating dialogue, and seeking users' feedback in community settings made the process bottom-up and organic.

Lack of inclusive engagement as well as access of the 'others' in digital spaces warrant active participations of marginalized communities of the global South in digital spaces. In inverting hegemonic depictions of indigenous knowledge and practices as primitive and pseudoscientific (Harding 1998), community members took the collective initiative towards achieving a common cultural goal. Espousing a culture and communicative lens, this research notes that digital storytelling at the margins (i) could potentially resist ascribed and disproportionate representations by legitimizing nonmainstream cultural histories as well as (ii) will digitally reveal hidden and absent histories, which have been long concealed (Martin and Nakayama 2013). Therefore, considering indigenous communities as a wealthy source of knowledge and wisdom, more research is necessary to bring forth insiders' perspectives from within the underserved communities to question and disrupt the dominant grand narrative as well as to foster local-global exchanges and mutual learning.

Limitations and Future Directions

This research is a small step towards overcoming massive structural, communicative, and technological barriers to writing history from the ground up in the marginalized spaces of the global South. In the spirit of continually and consistently improving this ongoing research, a few rounds of immersive engagements at the margins are required to make the digital space more culturally appropriate and safe for narrative cultural history. For example, instead of doing research primarily during summertime, future research needs to include more village-assistants to make the intervention a more continuous process. Another aspect that has been less explored concerns data security and copyright matters. After co-developing improved and relatively seamless digital interactions, more research is required to make the digital repository safe and secure under the control/discretion of the community members. In addition, along with foregrounding cultural histories and expressions from the indigenous spaces, in the future many endangered indigenous languages of the global South could also be potentially preserved by using such a bottom-up, organic and identity approach.

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