

Envisioning Across Generations: A Multi-lifespan Information System for International Justice in Rwanda

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ABSTRACT

With this research we investigate how to account for multi-generational perspectives in the design of multi-lifespan information systems, particularly in support of long-term peace-building and international justice. We do our work in the context of the publicly available Voices from the Rwanda Tribunal testbed, a historically significant collection of video interviews with personnel from the International Criminal Tribunal for Rwanda. In the research reported here, we worked with 109 Rwandan adults and youth from perpetrator and survivor communities in three provincial cities in Rwanda (Byumba, Kibuye, and Gisenyi) to understand the potentials and challenges they envision for the interview collection. Participants envisioned five categories of long-term positive outcomes for individuals and society from a multi-lifespan information system for the interview collection; and eight categories of challenges to realize those potential outcomes. In terms of multi-generational perspectives, while adults and youth tended to share an overall vision for the long-term potential of such a system, adults emphasized actionable tasks while youth educational benefits. Based on the findings, we highlight issues for appropriation of multi-lifespan information systems and reflect on our methods for eliciting multi-generational perspectives on information system design in a post-conflict society.

Author Keywords

Multi-lifespan information system design; value sensitive design; peace-building; justice, cyclical violence; cultural sensitivity; generational perspectives

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

The one constant in life is change. Those who are young, become older. Those who at one point in time personally

experienced historical events construct meaning in their lives from those experiences; those of the next generation construct their meanings from both their own experiences and the stories they hear of others' experiences of past events. All of the above – events, stories, constructions – interact with governments and socio-political contexts to shape people's experiences of their worlds. Information system design that seeks to support long-term peace-building in post-conflict societies must necessarily attend to the experiences and perspectives of multiple generations, often differently situated with regard to events of widespread violence. How information systems represent those events likely will need to adapt over time – as the individuals change, new generations emerge, and the society evolves.

Within the human-computer interaction (HCI) community, the perspectives of different generations of users in the context of information systems and tools have not yet received a great deal of attention. Perhaps the one place we see such work is in the development of technologies for the elderly, where attention is paid to how both the older person and their caregivers will interact with the system [2, 8, 12]. By and large, this work appropriately assigns a unitary role (e.g., elder, caretaker) to each stakeholder and is inter-generational in structure; in contrast, in our work, the roles tend to shift over time, as younger stakeholders age and as the society evolves. Some of the emerging work on cultural heritage implicitly engages similar issues to those in this research [3, 10]. That said we know of no other work that specifically takes up the question of multi-generational perspectives and societal evolution for system design.

With this research we investigate how to account for multi-generational perspectives in the design of multi-lifespan information systems [6], particularly in support of long-term peace-building and international justice. We do our work in the context of the publicly available Voices from the Rwanda Tribunal testbed, a collection of 49 video interviews with personnel from the International Criminal Tribunal for Rwanda (ICTR) [18]. In the research reported here, we worked with 109 Rwandan adults and youth from perpetrator and survivor communities in three provincial cities in Rwanda (Byumba, Kibuye, and Gisenyi) to understand the challenges and potentials they envision for the interview collection. Our analyses focus on community

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and generational perspectives tied to the information system design. The paper is organized as follows: We first provide background on multi-lifespan information system design, and then describe the current situation in Rwanda and the testbed. From there we provide a detailed account of our methods, with attention to working in a post-conflict environment; and report our results. Discussion emphasizes appropriation of multi-lifespan information systems and reflection on our methods for eliciting multi-generational perspectives on system design in a post-conflict society.

BACKGROUND

Multi-lifespan Information System Design

Our work is situated within multi-lifespan information system design [6]. A newly articulated research initiative in the HCI community, multi-lifespan information system design focuses on the design and deployment of information systems to support long-term solutions to significant societal problems as those solutions unfold over time. Multi-lifespan system design begins when some person or group of individuals take up the long-term design challenge; the end is not prescriptive. To distinguish between the multi-lifespan information system (that can be expected to span longer time periods such as 100 years) and the different generations (typically with respect to some historical event or stage in life) of human beings who will interact with that system, we use the term multi-generational to refer to people. For this research we focused on two key aspects: (1) information system design within contexts recovering from recent widespread cyclical violence, in this case the aftermath of the 1994 genocide in Rwanda; and (2) multi-generational perspectives on information system design, specifically, from those who lived through the Rwandan genocide and from Rwandan youth born after the genocide.

International Justice and Rwanda

To contextualize our research, Rwanda is a country recovering from decades old cycles of violence, including the 1994 genocide in which approximately 800,000 Rwandans were massacred by their neighbors, relatives, political leaders, and clergy in just 100 days [17]. In response the United Nations Security Council, with the initial cooperation of the Rwandan government, established an innovative international criminal tribunal the ICTR. The mandate of the tribunal is to prosecute those who organized and masterminded the genocide and to aid reconciliation in Rwanda [4]. The ICTR is now completing its work. Understanding how justice has been carried out is fundamental to the processes of peace-building and reconciliation, thus the information heritage of the ICTR is integral to its mandate to aid reconciliation in Rwanda.

Domestically, the social, political and technological environments in Rwanda are undergoing rapid change. In 2008 the Rwandan Parliament passed a law modeled after

Germany's Holocaust denial legislation that criminalizes 'genocide ideology', including denial of the Rwandan genocide. Contravention of the 2008 law is punishable by up to 25 years in prison. NGOs have drawn attention to the potential for the law to be used to limit political opposition. The law has wide-ranging consequences for open and democratic political discourse and public conversations surrounding the genocide [15]. Rwanda's technological infrastructure is also morphing: Radio and cell phones are still the predominate modes of communication. That said fiber optic cable is being laid throughout the country and expected to bring broadband access to a large number of Rwandans at some point in the future.

Testbed: Voices from the Rwanda Tribunal

In 2008, some of the authors conducted 49 video interviews with personnel from the ICTR [13, 14]. This collection is independent of the Rwandan government, the ICTR, and the United Nations. Known as the *Voices from the Rwanda Tribunal*, in these interviews judges, prosecutors, defense council, investigators, interpreters, and others from the tribunal, speak to the people of Rwanda, to the international justice community, and to the public at large about their experiences with and reflections about the ICTR. Interviewees speak to a wide range of issues including the experiences of witnesses, challenges for prosecuting genocide, the role of the tribunal in reconciliation, and the emotional toll on tribunal personnel. All of the unsealed material from the collection has been released on the internet under a Creative Commons license to support appropriation and reuse.

RESEARCH QUESTIONS

As stated above, with this research our overarching goal is to investigate multi-generational perspectives in the design of multi-lifespan information systems, particularly in support of long-term peace-building and international justice in a post-conflict society. We do so in the particular context of Rwanda with a multi-lifespan information system design for the Voices from the Rwanda Tribunal interview collection. Our specific research questions entail:

1. What challenges (if any) do different generations of Rwandans (adults and youth) identify for realizing such a multi-lifespan information system?
2. What potential positive outcomes (if any) do different generations of Rwandans envision for such a multi-lifespan information system?
3. What are the similarities and differences in the perspectives of different generations of Rwandans about the envisioned challenges and potentials for such a multi-lifespan information system?
4. Accounting both for community and generation, which aspects of Rwandans' experience living in a post-conflict society enter into their considerations?

5. What issues including value tensions do Rwandans anticipate for the appropriation of such a multi-lifespan information system?

RESEARCHER STANCE

Our project originated with researchers at universities in the United States and Canada; and was developed further with Rwandan practitioners specializing in peace-building and healing communities. As with the collection of the testbed interviews, this work is independent of the Rwandan government, the ICTR, and the United Nations. The United States and Canadian members of our team are comprised of HCI researchers and designers; law, human rights, and conflict resolution scholars and practitioners; technologists; and videographers. In addition to domain area expertise, these team members bring familiarity with a multi-lifespan information system design framing and the Voices from the Rwanda Tribunal project. Several of these project team members have worked previously in Rwanda and elsewhere in Central and East Africa. The Rwandan members of our team are comprised of counselors and interpreters experienced in post-conflict healing. They bring expertise in working with survivors and perpetrators of widespread violence and recovery from trauma, particularly in the Rwandan context. Our Rwandan partner organization is Healing and Rebuilding Our Communities [HROC], a Quaker based organization. HROC regularly runs workshops in Rwanda, Burundi, and elsewhere in the Great Lakes Region that bring together perpetrators and survivors to rebuild their communities. The research reported here while situated with respect to community, place, participant composition, and receptiveness within the HROC workshop structure was independent of the HROC regular trauma healing and reconciliation workshops.

METHODS

Participants

Ethnicity is a delicate matter in Rwanda (e.g., certain ethnic identification violates Rwandan domestic law). In this research, we follow our Rwandan partners and Rwandan cultural norms to refer to survivors and perpetrators (rather than to ethnic groups such as Hutu, Tutsi and Twa). Moreover, even though the language of survivors and perpetrators is permissible and identities of individuals may be known among community members, as outsiders there are limitations to what questions we can ask and of whom. Thus, in this research we are not positioned to collect data and conduct analyses based on ethnicity or to identify specific individuals as either survivors or perpetrators.

We conducted Envisioning Workshops in Rwanda with adults and with youth in three provincial cities. Byumba [BYU] is roughly 1.5 hours northwest of the capital city of Kigali near the border with Uganda. Many people in and near Byumba were directly affected by the genocide since the war started here in 1990. Communities in Byumba depend on agriculture for their livelihood. Kibuye [KIB], roughly 2.5 hours southwest of Kigali, is a small city located on the shore of Lake Kivu and surrounded by rocky

Community	Adult Male	Adult Fem.	Adult Total	Youth Male	Youth Fem.	Youth Total
Byumba	3	16	19	10	6	16
Kibuye	9	7	17*	11	8	21*
Gisenyi	10	4	14	15	7	22
TOTAL	22	27	50*	36	21	59*

Table 1. Number of Participants by Community, Generation and Gender. Note: As indicated by the *, three participants chose not to report gender (1 Kibuye Adult; 2 Kibuye Youth).

hills. Here, too, people depend on agriculture for their livelihood. Gisenyi [GIS], roughly 3 hours to the west of Kigali, shares a border with the Congolese (DRC) city of Goma. In contrast to Byumba and Kibuye, Gisenyi is known as a business community, with people running small businesses in Gisenyi and Goma markets.

Workshop participants were recruited by the HROC Coordinator or HROC Healing Companions, and as appropriate in coordination with each community's local associations, and community and religious leaders. All of the adults had previously participated in at least one HROC trauma healing and reconciliation workshop; youth were children of HROC workshop participants, neighbors of children of HROC workshop participants, or from local youth associations (e.g., for employment opportunities). Each workshop was comprised of approximately 20 individuals, with a mix of men and women, and of individuals known to our HROC research partners to be from both the survivor and the perpetrator communities and their families. One workshop with only adults ([AD], those who had lived through the genocide) and one with only youth ([YO], those who would be at most toddlers or born after the genocide) were conducted in each of the three cities. A total of 109 individuals participated in the six workshops (58 male, 48 female, and 3 no gender reported) (see Table 1 for details).

Envisioning Workshop Development

Given our research aims to understand how two generations of Rwandans would envision future information systems for providing access to video interviews from ICTR personnel as well as obstacles for building such systems, we developed an Envisioning Workshop. We sought a method that would focus participants on ideation and help to manage potentially conflicting viewpoints while allowing for the open-ended expression of a diversity of perspectives and visions (e.g., concerns about collective memory, government control, community experience). In designing the workshop structure, we drew inspiration from and adapted Kensing and Madsen's techniques for generating visions [9] that integrates metaphorical design with a Future Workshop. Long used in participatory design and HCI, Future Workshops typically follow this three-phase structure: critique, fantasy, and implementation. Given our emphasis on having participants envision long-term future systems and potential obstacles for realizing those, we removed the implementation phase.

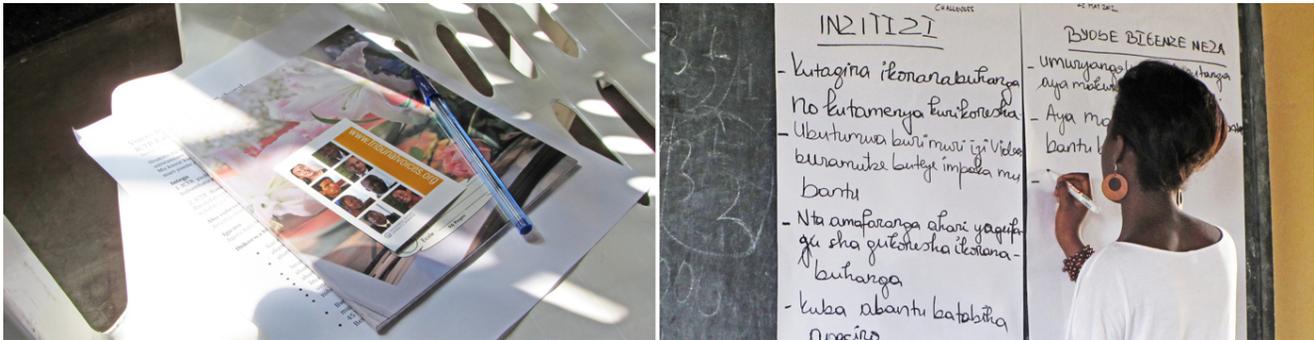


Figure 1. (a) A chair with materials for each participant; (b) Rwandan interpreter writing ideas in Kinyarwanda.

We began development of the Envisioning Workshop in the United States with input from our Rwandan partners and informed by our prior positive experiences conducting Future Workshops with local participants in Central Africa and elsewhere. As with others who have conducted HCI work in developing countries [11, 16], from the beginning we were aware of the challenges of integrating interpreters into the workshop flow; cultural cues for encouraging participation of both men and women; managing different levels of literacy; education and familiarity with information technology; and creating an atmosphere in which participants would feel safe to speak openly.

Pilot Workshop: Adapting the Envisioning Workshop to the Rwandan Context. To fine-tune the workshop to the Rwandan context, upon arriving in Rwanda, we piloted the Envisioning Workshop with participants and interpreters in Kigali. Based on that experience, we made adjustments to the workshop flow and organization as follows: (1) the metaphor generation component produced a good deal of confusion among participants (perhaps because the notion of a metaphor did not readily translate from English to Kinyarwanda), thus we removed this component from the workshop; (2) to clarify why envisioning activities are useful and why it would be helpful to identify potential challenges for a future project, we introduced the example of a project to bring clean water to a village and the types of challenges that might need to be overcome to design a successful water system (e.g., flooding during the rainy season, animals dirtying the water); (3) given cultural patterns in Rwandan society around respectful turn-taking, listening, and allowing someone “the time to have their say” we decided not to limit the amount of time a participant could speak (in contrast to the 60-second time limit suggested by Kensing and Madsen [9]); and (4) because we could not know in advance if all participants would be literate and to sidestep any embarrassment should that be the case, rather than having each participant record his or her idea, we had one of the interpreters record the idea in Kinyarwanda on a large piece of poster paper.

Envisioning Workshop Structure and Rhythm

Physical Setup. Prior to participants entering the workshop room, we arranged chairs in a U-shape, opening to the wall where we would be projecting video interview clips. On

each seat, we placed a small notebook where participants could record personal notes, pen, factsheet about the ICTR (in Kinyarwanda), and project business card (see Fig. 1a).

Introductions and Pre-Envisioning Workshop Activities. Our Rwandan partner from HROC introduced the workshop goals to explore visions around the meaningful long-term use of the Voices from the Rwanda Tribunal materials. Next, he briefly introduced the workshop leader who, in turn, introduced the team members. Then each participant introduced him or herself and shared what he or she expected from the workshop. Self-introductions often included informational questions about the tribunal, expressions of discontent with the tribunal, and personal reflections on the genocide.

After the introductions, we provided some background on the ICTR. To introduce participants to the Voices from the Rwanda Tribunal collection, participants watched three clips from the collection – one on the experience of a witness (Amoussouga, Spokesperson for the Tribunal, 2:46 min), one on communal wrongdoing (Ndongo-Keller, Chief of Language Services, 2:09 min), and one on the tensions between prosecution and reconciliation (Odora, Chief of Appeals, 2:08 min). For each, participants shared their views on the clip’s message and relevance (if any). Given space limitations, the data collected from these pre-envisioning workshop activities will be reported elsewhere.

Envisioning Workshop. The Envisioning Workshop comprised two phases. Prior to Phase 1, we first introduced the idea of envisioning activities and why it could be useful to identify challenges and potential outcomes of a future system. To do so, we used the locally relevant example of a project to bring clean water to a village that we had developed during the pilot workshop. We then explained the process in which participants would offer suggestions and the interpreters would record them in Kinyarwanda on large poster paper so that everyone could see. All suggestions were recorded; justifications were not required; and critiques were not allowed.

Phase 1 – Envisioning Challenges: As a group, participants were asked to envision challenges for designing an information system for the Voices from the Rwanda Tribunal collection:

Help me understand what could go wrong if we design our system around these interviews. How could there be challenges or problems? Let me start by telling you of one problem we are aware of already: We only have a small number of clips that are translated into Kinyarwanda. So a challenge is: what if the people in Rwanda who only speak Kinyarwanda can't understand the clips? What other challenges do you see?

Phase 2 – Envisioning Potentials: When no further challenges were offered, the ideation shifted to envisioning potentials. While the prompt for envisioning challenges was targeted toward identifying specific problems, the prompt for envisioning potentials was somewhat more open-ended. As a group, participants were asked to envision what an ideal information system might be like:

Now let's imagine we design this system and everything about it is perfect. Everything goes very smoothly. What is that system like?

Whenever there was a lull in the idea generation, the workshop leader prompted participants for further ideas. The prompting continued until no further ideas emerged or time ran out. The envisioning workshop sessions varied in length from 20-50 minutes (M=32 min). Audio recordings were made of each session.

Role of Interpreters. Two interpreters from Rwanda (one male and one female) provided interpretation throughout the envisioning workshop. During the workshop, while one interpreter spoke out loud translations of participants' spoken Kinyarwanda into English and the workshop leader's spoken English into Kinyarwanda; the second translator recorded participants' ideas in Kinyarwanda on large poster paper taped to the wall (see Fig. 1b).

Translation and Coding

While in Rwanda, all of the data collected during the envisioning activities was translated from Kinyarwanda into English by one of the workshop interpreters. Specifically, the interpreter listened to an audio recording of the envisioning workshop and translated the participants' full spoken contributions. Then, the other interpreter reviewed each translation for accuracy. In the translations, particular attention was paid to conveying the nuance of expression in Kinyarwanda (for example, the Kinyarwanda word "ibyaha" can mean either "sins" or "crimes" in English). At the same time, to retain participants' phrasing and expression, the interpreters were instructed to refrain from overly smoothing the English translations. For accuracy, the translations of the audio data were used in the analyses.

A coding system was developed from participants' responses to the envisioned challenges and envisioned potentials as follows: (1) first, three researchers independently read through all of the data to generate an initial set of coding categories and assign responses to categories; (2) next using a consensus model, researchers iteratively synthesized categories and arrived at agreement; and (3) then all three researchers made another independent pass through all of the data and any lingering disagreements were resolved. Table 2 contains the coding categories,

category definitions, and example responses for the envisioned challenges; and Table 3 those for the envisioned potentials. Each workshop was coded for the presence or absence of a comment in each of the categories. A category was only coded once per workshop (that is if more than one person contributed a comment in the same category, the category was simply coded once as present in the workshop) (see Tables 4 and 5). If a participant's contribution contained comments relevant to more than one category, all relevant categories were coded. In a few instances, participants contributed comments that we could not understand or that fell outside the scope of the activity (e.g., during the envisioning challenges session, suggestions for specific solutions); for purposes of these analyses, such contributions were coded as "Uncodable."

RESULTS

Overall, the Envisioning Workshop format (as informed by the pilot workshop) meshed well with local cultural practices: participants appeared engaged, offered diverse perspectives, understood the value of surfacing potential obstacles, and expressed strong reasons for wanting access to the video materials well into the future. Moreover the focus on design ideation (as opposed to open-ended political discussion) along with the workshop structure that allowed each person to speak without being challenged and to have his or her idea represented in writing managed the diverse and potentially conflicting views smoothly.

To examine the ideas participants generated in the Envisioning Workshops we first characterize the kind of responses that were generated (i.e., category). Then because the workshops were fairly organic in nature and the workshop method allowed, albeit in limited ways, for different group dynamics to emerge, we provide a community-centric analysis of the data. After having done so, we revisit the data from a generational perspective.

Envisioned Challenges and Envisioned Potentials

Envisioned Challenges. As shown in Table 2, participants' envisioned challenges for a successful information system design for the Voices from the Rwanda Tribunal collection were grouped into nine overarching categories. Perhaps unsurprisingly, the first two categories of envisioned challenges refer to limited access to technology (C1) and to limited infrastructure (C2), with the latter not only including the internet but also energy, venue (e.g., "a collection center"), and financial resources.

Complementing challenges from access to technology and infrastructure were challenges that arose from a lack of knowledge or access to information (C3). Here participants raised issues tied to basic literacy, digital literacy, and translation (i.e., into Kinyarwanda). Issues with translation concerned access to the video interviews as well as concern about mistranslation and potential manipulation. Further, translation emerged as an important factor for digital literacy more generally (e.g., "If you don't know English then you will not use internet"). The concerns around

ENVISIONED CHALLENGES	Description and Examples
C1. Technology Access	An appeal to difficulties gaining access to technology including references to (C1.1) <i>unelaborated</i> (e.g., “People who need this information the most are those that are in the countryside. And technology is not available there.”[KIB, YO]); and (C1.2) <i>specific technological devices</i> (e.g., “We have phones but we cannot use this system with our phones.”[KIB, AD]).
C2. Infrastructure Access	An appeal to difficulties gaining access to societal infrastructure, including references to (C2.1) <i>energy</i> (e.g., “Some people may have computers but they don’t have electricity.”[KIB, YO]); (C2.2) <i>internet</i> (e.g., “If you have a very very slow internet it doesn’t allow you to see the pictures or motions.”[KIB, YO]); (C2.3) <i>venue</i> (e.g., “Lack of collection center.”[BYU, YO]); and (C2.4) <i>financial resources</i> (e.g., “If you have no money, there is no action.”[GIS, AD]).
C3. Information Access	An appeal to difficulties gaining access to information, including (C3.1) <i>basic literacy</i> “Some people don’t know how to read.”[KIB, YO]; (C3.2) <i>digital literacy</i> (e.g., “If we use internet, not many people know how to use it.”[GIS, YO]; and (C3.3) <i>translation issues</i> (e.g., “Videos might be translated but sometimes they change their original meaning.”[KIB, AD]).
C4. Dissemination	An appeal to issues that might inhibit individuals’ dissemination of the materials, including references to (C4.1) <i>training</i> (e.g., “There should be people who understand this message who can transmit it to others. Some people should be trained about this.”[KIB, AD]); (C4.2) <i>with whom to share</i> (e.g., “There should be teams in charge of identifying the categories of people that this information should be taken to.”[BYU, YO]); and (C4.3) <i>willingness to share</i> (e.g., “They know information, they know a lot of things, but they refuse to pass this information to others.”[GIS, YO]).
C5. Fear and Trauma	An appeal to (C5.1) <i>fear to share</i> (e.g., “Somebody might have information but he may be afraid to give information to others.”[GIS, YO]); and (C5.2) <i>trauma to watch</i> (e.g., “If the victims get re-traumatized because of the video.”[BYU, AD]).
C6. Government Control	An appeal to contingencies on government sanction, regulations, policies, understandings, or practices (e.g., “Democracy in Rwanda, freedom of speech is not there. So there is no democracy.”[GIS, YO]).
C7. Common Understanding	An appeal to the need for common understanding (e.g., “Having common understanding. Then all the people should understand the same way.”[GIS, AD]).
C8. Indifference	An appeal to the lack of relevance, caring, or interest in the information (e.g., “If people don’t care about the materials because they don’t benefit from them.”[BYU, YO]).
C9. Uncodable	Responses that do not identify directly potential challenges, such as suggestions for positive courses of action, solutions, etc. (e.g., “Maybe we can plan to take this information to prison.”[KIB, AD]).

Table 2. Coding Categories, Definitions and Examples for the Envisioned Challenges

English and the issues of translation reveal a fundamental challenge arising from the cultural dominance of English on the internet and with information technology.

Another set of challenges concerned barriers to successful dissemination of the materials (C4). In line with the widespread post-conflict cultural norm of trainings (known as “Ingando” re-education camps) required by the Rwandan government for most if not all sectors of Rwandan society [15], participants expressed the need and desire for training about the collection materials. In particular, participants requested a certificate to provide them with the authority to pass information about the video interviews to others. Participants also identified not knowing with whom to share this information as another barrier. A third barrier concerned people who for one reason or another would not want to share information. Taken together, the barriers to dissemination raise interesting issues around creating a sense of ownership for and reuse of the information,

particularly in reference to the underlying role of government (see also C6).

Reflecting the aftermath (even after nearly 20 years) of widespread violence and genocide, another set of challenges tapped into participants’ concerns for people’s fears and prior traumas (C5). Interestingly, participants identified fear from other individuals or from government (e.g., “People can be afraid of sharing these things because they are afraid of politics. We have seen people getting arrested because of giving information linked with politics”) but, by and large, not from exposure to the materials themselves. The one exception occurred in one workshop, where a participant expressed concern for re-traumatization of the victim (e.g., “If the victims get re-traumatized because of the video”). Of note, all challenges that discussed fear of sharing (C5), tied that fear to a potential unwillingness to share that information (C4).

ENVISIONED POTENTIALS	Description and Examples
P1. Actionable Tasks	A reference to actionable tasks that would result in increased access to the materials, including references to (P1.1) <i>media products and media use</i> (e.g., “If you want to share ideas you send text on the cell phone.”[GIS, AD]); (P1.2) <i>venue</i> (e.g., “There should be clubs where people meet and somebody to explain to them what this is.”[GIS, AD]); (P1.3) <i>translation</i> (e.g., “All of them will be translated so that when you follow it you will understand.”[GIS, YO]); (P1.4) <i>training</i> (e.g., “Given certificate of approval of training for this message and encouraging people, so if someone came and asked ‘why are you spreading this message?’ they can say they are trained to do this.”[BYU, AD]); and (P1.5) <i>dissemination</i> (e.g., “Giving the information to as many people as possible.”[GIS, YO]).
P2. Knowledge and Understanding	A reference to knowledge and understanding of (P2.1) <i>unelaborated</i> (“The second thing is that even the people in the villages who don’t know how to read and write, they don’t use internets and cellphones, but they can still understand.”[GIS, YO]); (P2.2) <i>courts</i> (e.g., “People may have information about ICTR and Gacaca.”[BYU, YO]); (P2.3) <i>unspecified history</i> (e.g., “People will know the truth about what happened.”[KIB, YO]); (P2.4) <i>genocide history</i> (e.g., “Those who deny genocide may know what happened in Rwanda.”[BYU, YO]); and (P2.5) <i>humanity</i> (e.g., “Those who watched will know humankind.”[KIB, YO]).
P3. Community	A reference to reabsorbing people into the community, including references to (P3.1) <i>fellowship</i> (e.g., “The Rwandans would understand that they should respect themselves.”[KIB, YO]); and a political or civic agenda for (P3.2) <i>unity and reconciliation</i> (e.g., “We will increase unity and reconciliation.”[KIB, AD]).
P4. Building the Future Society	A reference to building society and a more positive future (e.g., “There will be development and prosperity because there is no conflict.”[KIB, AD]).
P5. Justice	A reference to justice and fairness in terms of systems, society and individual practices (e.g., “Justice will work better because it will see that many people understand what is happening.”[GIS, AD]).
P6. Uncodable	Responses that do not identify directly potential outcomes, such as questions, and inspirations (e.g., “We can achieve a goal. Because if you don’t have [any] challenges, everything goes well. Then you achieve your goal.”[GIS, AD]).

Table 3. Coding Categories, Definitions and Examples for the Envisioned Potentials

Concern about government sanction, regulations, policies, understandings, or practices comprised another set of barriers for successful information sharing (C6). Participants highlighted the need for government approval of the project. Traces of this concern could also be seen in the challenges for dissemination and fear described above.

Participants also articulated challenges arising from tensions when the society lacks a single common understanding about the genocide and related events (C7). They recognized a lack of consensus could have implications for a threat to personal safety (e.g., “We should agree that people don’t understand things in the same way. You can ask yourself how people will receive this message and you may have concern about your safety after delivering that message”).

A lack of relevance, caring or interest in the information constitutes another challenge (C8). Even if all of the other challenges are met, government authorization obtained and so forth, the system may not succeed if people cannot find and create meanings, values or benefits.

Envisioned Potentials. Having categorized the types of envisioned challenges for an information system design for the Voices from the Rwanda Tribunal, we turn now to the

envisioned potentials should such a design be successful. As shown in Table 3, participants’ envisioned potentials comprised six overarching categories.

Specifically and complementing the envisioned challenges, participants envisioned some actionable tasks to improve the information system (P1). Actionable tasks included ideas for media products and media use to increase access to technology (P1.1; cf. C1) as well as suggestions for venues (P1.2; cf. C2.3). Participants also envisioned a complete translation of the materials (P1.3; cf. C3.3); training and certification programs (P1.4; cf. C4.1); and wide dissemination of the materials (P1.5; cf. C4) as indicators of a successful information system.

Further envisioned potentials for a successful information system emphasized societal benefits. Participants envisioned a positive impact on people’s knowledge and understanding (P2) about, for example, the courts (e.g., ICTR, Gacaca), history, genocide, and humanity.

Participants also envisioned the potential for the system to contribute to a sense of community (P3), reflecting the cultural value of fellowship and kinship among Rwandans (e.g., “For us, Rwandans love one another according to the history. I think if everything goes well, it will increase our

ENVISIONED CHALLENGES	BYUMBA		KIBUYE		GISENYI	
	AD	YO	AD	YO	AD	YO
C1. Technology Access						
C1.1 Unelaborated						
C1.2 Technological Devices						
C2. Infrastructure Access						
C2.1 Energy						
C2.2 Internet						
C2.3 Venue						
C2.4 Financial Resource						
C3. Information Access						
C3.1 Basic Literacy						
C3.2 Digital Literacy						
C3.3 Translation						
C4. Dissemination						
C4.1 Training						
C4.2 With Whom to Share						
C4.3 Willingness to Share						
C5. Fear and Trauma						
C5.1 Fear to Share						
C5.2 Trauma to Watch						
C6. Government Control						
C7. Common Understanding						
C8. Indifference						
C9. Uncodable						

Table 4. Envisioned Challenges by Community and Generation [AD = adults; YO = youth]

love to one another”). In line with the widespread political agenda for unity and reconciliation after the genocide [15], participants also referred to unity and reconciliation as a communal goal (P3.2). Embedded in these ideas is the commitment to reabsorbing people into the community, considered critical by many Rwandans for healing society.

Closely tied to the ideals about community were those that spoke to rebuilding society, both in Rwanda and beyond. Participants viewed that successful information sharing from the Voices of the Rwanda Tribunal could help enable a more positive future for Rwanda and for the world (P4).

Improved justice and fairness was articulated as another potential societal impact (P5). In particular, participants envisioned that information about the tribunal would act as a deterrent to violence and other offences (e.g., “Crimes will be reduced”; “People may be afraid of offending humankind”) and bring the international community together to address widespread systematic violence (e.g., “All countries may stand to fight against genocide”).

Community-Centric Analyses

While the workshop structure was consistent across the communities, as to be expected when engaged in deeply rooted community-based research, the three communities we worked in were different from each other and the dynamics of each of the workshops differed as well. In this section, we report on some of those unique characteristics.

ENVISIONED POTENTIALS	BYUMBA		KIBUYE		GISENYI	
	AD	YO	AD	YO	AD	YO
P1. Actionable Tasks						
P1.1 Media Products and Media Use						
P1.2 Venue						
P1.3 Translation						
P1.4 Training						
P1.5 Dissemination						
P2. Knowledge and Understanding						
P2.1 Unelaborated						
P2.2 Courts						
P2.3 Unelaborated History						
P2.4 Genocide History						
P2.5 Humanity						
P3. Community						
P3.1 Unity and Reconciliation						
P3.2 Fellowship						
P4. Building the Future Society						
P5. Justice						
P6. Uncodable						

Table 5. Envisioned Potentials by Community and Generation [AD = adults; YO = youth]

Byumba. In Byumba, the perspectives of the adults and youth had very little in common. In terms of envisioned challenges, the only challenge raised by both generations was indifference (C8). In terms of envisioned potentials, there were no categories in common. Byumba adults spoke only to actionable tasks (P1) and did not extend beyond that to other topics; while youth engaged a broader set of potentials (P2, P3, and P5). The brevity of Byumba adults’ considerations may be due to that workshop’s particular dynamic in which a heated discussion ensued on why some acquitted persons would refuse to come back to Rwanda; and consumed much of the workshop time.

Kibuye. The Kibuye workshops demonstrated a strong sense of a community. For example, virtually all of the envisioned potentials examples for community (P3) and building the future society (P4) emerged from the Kibuye workshops, both adults and youth. We also observed a strong Christian fellowship among the Kibuye adults: for that workshop, a community leader participating in the workshop led everyone in an opening and closing prayer. We also note somewhat shared generational perspectives between adults and youth on envisioned challenges and even greater convergence on envisioned potentials.

Gisenyi. Recall that among the three workshop cities, Gisenyi was the most developed with a commercial atmosphere. In that context, it is interesting that Gisenyi youth did not identify access to technology (C1) or access to infrastructure (C2) as an envisioned challenge; while Gisenyi adults did so. As with the Kibuye adults and youth, there were moderately shared perspectives about the envisioned challenges and greater convergence on envisioned potentials.

Generational Perspectives

In this section, we turn our attention to a more complete comparison of adult and youth perspectives. Across generations and communities, participants voiced a consistent concern with two types of envisioned challenges, those tied to information access (C3; 3 adult, 2 youth) and those to successful dissemination of the materials (C4; 2 adult, 3 youth). In terms of envisioned potentials, adults and youth consistently voiced societal benefits tied to justice (P5; 2 adult, 2 youth).

We also examined perceptual gaps between the adults and the youth to identify potential underlying generational tensions. Such an analysis may also hint at the direction in which Rwandan society (at least in the communities we worked within) is evolving. Perhaps unsurprisingly, all of the adult workshops identified challenges tied to access to technology while such access appeared to be less of a concern for youth (C1; 3 adult, 1 youth). The adults also spoke explicitly to potential harms from government sanctions and policies (C6; 2 adult, 1 youth) while the youth alluded to such concerns implicitly through their discussion of fears (C5.1; no adult, 2 youth) and unwillingness to share information (C4.3; 1 adult, 2 youth). In terms of envisioned potentials, suggestions for a wide range of actionable tasks emerged from the adult workshops (P1; 2 adult, 1 youth), which echoes the widespread concern among the adults for access to technology. On the other hand, many youth noted the educational aspect of the materials (P2; 1 adult, 3 youth), perhaps reflecting the youths' position in society as students and active learners.

DISCUSSION

Based on these findings, we next present two issues for multi-lifespan system appropriation in the context of the Voices from the Rwanda Tribunal testbed: *conditions for knowledge transfer* and *public discourse and diverse cultural values*. Finally, we reflect on our methods.

Issues for Multi-lifespan System Appropriation

Conditions for knowledge transfer. Given a multi-generational perspective on design, an interesting question concerns system appropriation and how information and knowledge can be transferred from one generation to the next in a post-conflict society. One strategy frequently discussed during the workshops involved trained and certified agents (see C4.1 and P1.4). Participants emphasized the role of the “trainer” to situate the material well, identify relevant materials, provide good responses to questions, and so forth. While consistent with the Rwandan context where trainings tied to reconciliation and rule of law abound [15], this desire for training also may reflect a widespread pedagogical view in Rwanda and elsewhere in many parts of Africa – one that favors didactic forms of instruction in knowledge transfer [1]. Another motivation behind “official” trainings may be security from government retribution. Recall that concerns about government control were seen as an obstacle to system appropriation (see C6). With official trainings, trainers

would be instructed in what can and cannot be shown and discussed without violating domestic legislation. Training and certificate programs are attractive in that they can improve people's confidence in their understanding of the information and technology; at the same time, didactic training may inhibit people's independent and creative appropriation and reuse of the materials.

Public discourse and diverse cultural values. Working in the domain of international justice, our research seeks to support discourse not only across generations but also across diverse cultural groups from within Rwanda, The Hague, and other international communities. In building such systems, consideration must be given to the ways a system can be appropriated by different cultural groups [7]. In the work reported here, Rwandan participants revealed concerns about barriers to arriving at a common understanding (see C7). Such emphasis may reflect communal processes for arriving at consensus or handling dissenting voices often found in traditional Rwandan society [1]. In contrast, other societies, including interesting aspects of the emerging democracy in Rwandan society, may view the presence of diverse contesting voices as an important indicator of a healthy civic society [5]. Arriving at a common understanding may contribute to a goal of unity and reconciliation (see P3.2); at the same time such consensus may inhibit diverse appropriation and reuse of the materials, which ultimately may underlie long-term peace-building among groups with strongly held views.

Reflections on Method

Given the multi-lifespan orientation of our research and design approach, how (if at all) did a long-term perspective manifest in our methods? A first element can be found in our core framing of the envisioning workshop: we oriented the envisioning questions toward a dreamed future as opposed to current and proximal use of the information system. A second element can be found in our workshop populations: we elicited responses from two generations of Rwandans – those who lived through genocide and those who were born afterwards. This structural element positions us to gain insights on multi-lifespan change by comparing generational perspectives with respect to distance from direct experience of the trauma. A third aspect can be found in the results. Specifically, we saw evidence for participants' own multi-lifespan thinking when they engaged in the long-term implications of the systems as evidenced by (a) the ease with which participants engaged with the envisioning prompts; and (b) references to future generations of Rwandans (e.g., “Children born after genocide may understand what happened”); and to building the future society (P4).

How do we know participants spoke to us with their full hearts and minds? Given the deeply felt emotional and socio-political context of this work and a strong cultural worldview to tell authorities what they want to hear, why, if at all, would we expect participants to have shared their

sincere thoughts and feelings with us, a group of primarily non-Rwandan researchers from western universities? The long and short answer is we cannot know the extent to which they did so. In gauging how successful we were in eliciting both *sincere* and reasonably *complete* responses from participants, we suspect the responses we received were reasonably sincere as participants constructed these themselves. Moreover, a few participants expressed their honest lack of interest in the videos and said one or more of the clips would not be of use to people in their communities. As for completeness, here we are considerably less certain. Many people in Rwanda are quite careful about what they say, particularly when their criticisms might be seen as disrespectful to the Rwandan government or other authorities. Thus we surmise participants may have had thoughts that they chose not to share with us; particularly, issues tied to fear, trauma, and government control may be under-represented.

CONTRIBUTIONS AND FUTURE WORK

With this research we set out to investigate how to account for multi-generational perspectives in the design of multi-lifespan information systems, particularly in support of long-term peace-building and international justice. Within that framing, our contributions are three-fold: We: (1) developed an Envisioning Workshop appropriate to a post-conflict situation and demonstrated its effectiveness for eliciting long-term design ideation; (2) working across two generations of Rwandans, identified six opportunities for a multi-lifespan system for international justice to contribute to meaningful societal changes in a post-conflict society and eight challenges that must be overcome if such a system is to be realized; and (3) provided a "proof-of-concept" for the viability of a multi-lifespan framing for information system design research.

Future work is many-fold and long-term. At a minimum, the message and meaning-making data generated in the pre-envisioning workshops needs to be analyzed from a multi-lifespan perspective. Eventually, further system design and deployment that builds from these results needs to be undertaken, with the Rwandan communities that participated in this research and elsewhere in Rwanda. Global communities such as the international justice community in The Hague and elsewhere need to be engaged. Finally, we hope that others working in post-conflict situations or on significant societal problems that are unlikely to be solved within the timeframe of a single human lifespan will be inspired and encouraged by this research to take up a multi-lifespan approach to their design work. Where healing and societal evolution are at stake, (we believe) time adds a vast element to the design space.

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