Multi-lifespan Design Thinking: Two Methods and a Case Study with the Rwandan Diaspora

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ABSTRACT

In recent years, the HCI community has recognized the need to address long(er) term information system design around on-going societal problems. Yet how to engage stakeholders effectively in multi-lifespan design thinking remains an open challenge. Toward that end, the work reported here extends an established envisioning method by introducing two new design methods, the multi-lifespan timeline and multi-lifespan co-design, with an emphasis on the element of (*long*) time. The new methods aim to stimulate participants' visions of future information systems by: (a) enhancing participants' understanding of longer timeframes (e.g., 100 years), and (b) guiding participants to effectively project themselves long into the future in their design thinking. We explored these multi-lifespan design methods in work with 51 Africans from Rwanda and the Great Lakes region living in the United States to understand the challenges and opportunities they envision for designing future information systems for transitional justice in Rwanda. Contributions are two-fold: (1) methodological innovation, and (2) a case study of multi-lifespan design thinking generated by diaspora members of post-conflict societies.

Author Keywords

Co-design; diaspora perspectives; envisioning; multi-lifespan design; transitional justice; vision-oriented design.

ACM Classification Keywords

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

INTRODUCTION

Wars, conflict and persecution continue to force people to flee their homes and seek safety elsewhere around the globe. While much attention in 2015 has been placed on the

Syrian refugee crisis in Europe, the trend is not new. In 2013, the number of refugees, asylum-seekers and internally displaced people (IDP) worldwide exceeded 50 million people for the first time since World War II. The United Nations High Commissioner for Refugees (UNHCR) reported that an estimated 59.5 million people were forcibly displaced at the end of 2014 as compared to 37.5 million a decade ago [25].

In the research reported here, we worked with 51 Africans from Rwanda and the Great Lakes region who are currently living in the United States. Rwanda is located in the Great Lakes region of East Africa, which also includes Burundi, Democratic Republic of the Congo (DRC), Kenya, Tanzania, and Uganda. Like many post-colonial African nations, Rwanda has suffered decades of ethnic conflicts including the 1994 genocide, which took the lives of more than 800,000 people in just 100 days [27]. According to the UNHCR's historical review of 1980-2014 [25], Rwanda, along with Burundi and DRC, is one of the most steady and prominent source countries of refugees, "implying that war, conflict, or persecution has been occurring either consistently or repeatedly in some of these countries. In other instances, armed conflict may have ended many years ago but refugees may have opted not to return to their country of origin" (p. 16).

Last year, 2014, marked the 20th anniversary of the genocide in Rwanda. The country is continuing its steady, long-term process towards justice, healing, and development. Such effort requires involvement of a full range of actors from all sectors of society—both judicial and non-judicial. It is also the case that information and computer systems hold the potential to play an important role. From that perspective we ask, what unique opportunities exist for the human-computer interaction (HCI) community and what roles might information systems play? Furthermore, as Friedman and Nathan pointed out [6], "In a field known for cutting edge innovation, where devices over 5 years old are regarded as legacy, how do we begin to consider [design] processes and solutions that will likely extend beyond a single human lifespan?" (p. 2243) How to do such multi-lifespan design effectively remains a wide open question.

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Our goals for this research are two-fold: methodological innovation and a case study. Specifically, we aim to: (1) introduce two new methods that stimulate multi-lifespan design thinking and demonstrate their usefulness, and (2) solicit insights in working with diaspora populations from post-conflict societies undergoing transitional justice. As will be come apparent, our two-fold goals are both interdependent and independent. We developed and used the methods situated in a specific multi-lifespan design case study, while at the same time, we present the methods as a tool for longer-term envisioning in general. Giving primacy to the methods, the case study allows us to better explicate the multi-lifespan design framing, to demonstrate the methods' applicability, and to reflect upon and discuss the methods as situated in a multi-lifespan design space.

This paper is organized as follows: First, we explicate the concepts of transitional justice, multi-lifespan design, vision-oriented design, and envisioning. We then describe an established envisioning method and introduce two new design methods, the multi-lifespan timeline and multi-lifespan co-design, with an emphasis on the element of *(long) time*. Next, we report findings from a case study that we conducted with Africans from Rwanda and the Great Lakes region living in the United States. The Voices from the Rwanda Tribunal project [28] provided specific shared content. Based on these findings we share insights for the HCI community on designing multi-lifespan information systems for transitional justice, and stimulating longer-term envisioning more broadly.

BACKGROUND

Transitional Justice and HCI

Transitional justice as a field emerged in the late 1980s, mainly in response to “transitions to democracy” in Latin America and Eastern Europe [10]. Today, transitional justice is more generally understood as a holistic approach to serving justice and achieving reconciliation in societies transforming themselves after a period of systematic and pervasive human rights abuse [23]. Transitional justice may include both judicial and non-judicial mechanisms. The most commonly included mechanisms are as follows:

Criminal prosecutions, which seek to investigate and indict those responsible for human rights violations. For example, in response to the 1994 genocide in Rwanda, the United Nations Security Council established the International Criminal Tribunal for Rwanda (ICTR) with the mandate to prosecute persons responsible for serious violations of international humanitarian law [22]. Those indicted include high-ranking military and government officials, politicians, businessmen, as well as religious, militia, and media leaders who organized and masterminded the genocide [26].

Truth-seeking, which seeks to generate an authoritative record on key periods of abuse, often led by official state bodies (e.g., commissions) that make recommendations to remedy such abuse and prevent its recurrence. For example, in 1999 the government of Rwanda established the National

Unity and Reconciliation Commission (NURC). As part of its missions, NURC has published a number of studies investigating the causes of conflicts in Rwanda and how to mitigate and resolve those conflicts.

Memorialization efforts, which seek to preserve public memory of victims and raise moral consciousness about past abuse. One such example is the Genocide Archive of Rwanda [8]. The archive holds a physical collection of genocide-related media (e.g. photos, objects, print publications) as well as a collection of digital resources (e.g., audio recordings, video recordings, interactive maps).

Institutional reform, aimed at democratizing and transforming the military, police, judiciary and related state institutions from instruments of repression and corruption into instruments of public service and integrity. During the 1994 genocide, many judicial staff had been killed and much of the judicial infrastructure destroyed in Rwanda. In their efforts to rebuild justice systems, the Rwandan government introduced a number of major institutional reforms, both materially and politically, including independence of the judiciary from the executive branch in 2004 [9].

While transitional justice may be a relatively new concept for the HCI community, a number of projects have engaged with conflict and post-conflict societies undergoing transitional justice processes. Some of the work pertains to *criminal prosecution* as can be found in the WITNESS' Video as Evidence program [29], which aims to leverage citizen media as “evidence in a courtroom of law” on charges of human rights violations. Some pertains to *truth-seeking* as can be found in Smyth and colleagues' exploratory work [19] on a mobile kiosk to enable Liberian citizens from remote provinces to participate from their regions in truth and reconciliation processes. Other work pertains to *memorialization efforts* as can be found in Durrant and colleagues' work [5] on “sensitive archive materials” that are emotive and visceral, and contextualized within a “politically and ethnically contested history,” in particular, the 1994 genocide in Rwanda. Yet other work pertains to *transitional justice writ large*, as can be found in the Voices from the Rwanda Tribunal project [28] on multi-lifespan design to support long-term solutions in post-genocide Rwanda. The Syria Justice and Accountability Centre [20] provides another example; this organization seeks to collect and preserve widespread documentation of human rights violations in Syria, ensuring that the documentation is comprehensive and authentic, for use in future transitional justice processes.

Our study adds to this line of research with an explicit emphasis on supporting transitional justice. In particular, we bring together the transitional justice domain and multi-lifespan design approach [6], arguing that transitional justice after long cyclical violence often takes place over many decades and healing from genocidal trauma is achieved slowly through multiple generations.

Multi-lifespan Design, Vision-oriented Design, and Envisioning

Multi-lifespan design focuses on the design and deployment of information systems to support long-term solutions to significant societal problems that are unlikely to be solved within a single human lifespan [6]. In their launching of the multi-lifespan design research initiative, Friedman and Nathan pointed to a fundamental disconnect between mainstream design thinking and engaging information system design in support of these classes of longer-term, complex problems. Friedman and Nathan further identified three multi-lifespan design challenges including the challenge of (i) shifting conditions, (ii) passing the baton across generations, and (iii) morale. In this paper, we focus on the challenge of *shifting conditions*. By definition, transitional justice is situated amidst waves of social change – politically, culturally, and materially. While a detailed analysis of the present situation is often conceived as a key to solving problems in the HCI literature, the constantly morphing social conditions underlying transitional justice make it very difficult for designers and stakeholders to construct a clear understanding of the present situation.

In response, we draw in spirit on vision-oriented design to inform the process of designing multi-lifespan information systems for transitional justice in Rwanda. Vision-oriented design emerged as an alternative to, and in criticism of, rationalistic design methods. As Bratteteig and Stolterman said, “the purpose of the design is not just the designed artefact itself, but changes in the range of possibilities of action in the social organization that will use the artefact” ([4], p. 292). Hence, vision-oriented design advocates that creating visions for possible future situations should be explicitly supported in the design process in contrast to focusing on an analysis of current problems.

We also note that *envisioning* is significantly addressed through scholarship in ubiquitous computing. For example, Reeves viewed envisioning as a distinctive type of future-oriented design thinking that is widely employed in HCI [17]. One key characteristic entails taking into account implications for both society and technology. Reeves further argued that envisioning should be an informed projection from existing (and historical) technology *trends*, criticizing the “ahistoricity” of ubicomp’s typical envisioning. Another key characteristic of envisioning entails fictional representations that do not require forecast feasibility. Reeves problematized a common tendency to conflate fiction and forecast as such conflation often leads to a false sense of broken promises. Although developed from a different domain, context, and purpose, Reeves’ work and our own share many similar insights. While Reeves provides a theoretical framework for envisioning, our attention is on developing specific methods.

PRIOR WORK

In our previous work with local Rwandans [30], we developed an envisioning method (called the Envisioning Workshop) to generate visions for multi-lifespan

information systems. The method was inspired by and adapted from Kensing and Madsen’s techniques for generating visions [12] that integrate Future Workshops [11] and metaphorical design. In a similar vein, our Envisioning Workshops aimed to bring together participants with potentially conflicting viewpoints (e.g., survivors and perpetrators of the 1994 genocide in Rwanda) to engage in a collaborative process of creating multi-lifespan visions.

In summer 2012, we conducted six Envisioning Workshops with 109 Rwandan adults and youth in three provincial cities in Rwanda [30]. Overall, the Envisioning Workshops meshed well with local cultural practices in Rwanda and successfully generated visions for building information systems for transitional justice. At the same time, we experienced some limitations with the Envisioning Workshop method. First, the delineation between multi-lifespan visions (e.g., 100 years) and references to any possible future in general (e.g., 5 years) was rather thin. The future means many different things and people experience time differently. In particular, people with post-traumatic stress disorder (PTSD) are often reported to experience “sense of foreshortened future” ([1], p. 468). The ability to think with a long time horizon that reaches beyond a single human lifespan is key to multi-lifespan design. But were participants thinking sufficiently long-term during the workshops? In general, we felt the need to more explicitly communicate the longer time scale of import for multi-lifespan design methods. Second, we observed that participants’ visions were insightful, and yet, tended to be abstract and broad. According to Bratteteig and Stolterman [4], “Design can be understood as a process that includes activities concerned with three levels of abstraction. At the most abstract level we find a *vision*, at a more concrete level an *operative image*, and at the most concrete level we find the *design specification*. ...The creation of visions, operative images, and specification intermingle, and the three levels inform and delimit each other” (p. 294, emphasis in the original). Likewise, we felt the need to strike a better balance among longer-term visions and more concrete levels of design thinking. The limitations of method identified in the previous study are part of the motivation for our current work.

RESEARCHER STANCE

The Voices from the Rwanda Tribunal project originated in 2008 with researchers at universities in the United States [7, 13]. Over time, many others have participated in this ongoing project including individuals from Canada, Iran, Korea, New Zealand as well as Rwanda. For this particular research, two of the authors previously conducted Envisioning Workshops in Rwanda [30]. The Rwandan members of our team are comprised of a counselor and a journalist who are currently living in the United States.

DATA COLLECTION CONTEXT

To explore the new multi-lifespan methods and understand

the perspectives of diaspora members from post-conflict societies, we conducted workshops with Africans from Rwanda and the Great Lakes region living in the United States. The locations were chosen and workshop participants recruited by our partner organization Global Solidarity Corporation (GSC). GSC is a US-based NGO that facilitates humanitarian interventions in the developing world with a particular focus on Africa. As appropriate, we coordinated with each community's leaders and local associations. We worked in three states with large communities of Rwandans: Indiana (IN), Maine (ME) and Texas (TX). Each workshop was comprised of approximately 15-20 individuals, including a mix of men and women from the survivor and perpetrator communities. As shown in Table 1, a total of 51 individuals participated (31 male, 17 female, and 3 no gender reported).

In planning this research, we learned from our Rwandan team members that some Rwandans living in the United States would not identify themselves as Rwandan but would rather call themselves Congolese or Burundi. Thus we decided to invite diaspora members from the broader African Great Lakes region. We focused on recruiting young adults from ages 21-30, who would be at most children or toddlers during the 1994 Rwandan genocide. However, self-reported demographics revealed that a few participants were younger or older than the targeted age group (ages 20-58, IN M=32.6, ME M=25.4, TX M=27.5).

METHODS

In each community, participants engaged in a six-hour workshop: the morning was dedicated to introductions and pre-Envisioning Workshop activities, and the afternoon to the Envisioning Workshop. English was the working language. In a few occasions where participants preferred to speak in Kinyarwanda or French, a workshop interpreter provided a real-time interpretation.

Pre-Envisioning Workshop Activities

Introductions and Informed Consent. After brief introductions, we obtained oral consent to avoid documenting participants' personal information. We informed participants of places where we might share the information acquired in this study (e.g., conference, website). We did not take photographs of participants and we only made audio recordings if we were confident that participants had understood the risks and felt comfortable.

Video Clips. As in [30], we used the Voices from the Rwanda Tribunal collection [28] as a testbed for exploring multi-lifespan information systems for transitional justice in Rwanda. Participants watched the same three video clips used in the previous study – one on the experience of a witness (Amoussouga, Tribunal Spokesperson, 2:46 min) [2], one on communal wrongdoing (Ndongo-Keller, Chief of Language Services, 2:08 min) [14], and one on the tensions between prosecution and reconciliation (Obote Odora, Chief of Appeals, 2:08 min) [16]. In addition, participants watched a fourth clip on the issues of crime and

Com- munity	Gender			Nationality			Total
	Female	Male	NR	Rwanda	Great Lakes	NR	
Indiana	7	10	0	9	6	1	17*
Maine	7	11	1	5	9	5	19
Texas	3	10	2	4	7	4	15
TOTAL	17	31	3	18	21	10	51

Table 1. Number of Participants by Community, Gender, and Nationality. Note: NR = not reported. *In Indiana, one participant reported another nationality (1 US citizen).

ethnicity (Taku, Defense Counsel, 1:02 min) [21].

Envisioning Workshop: Methods and Rationale

The Envisioning Workshop was comprised of three distinct multi-lifespan design methods: timeline, envisioning (from the previous study), and co-design. Here we provide a brief description and rationale for each.

Multi-lifespan Timeline

How long is 100 years? What things might happen in the next 100 years—societally and technically? The purpose of the multi-lifespan timeline was to help participants in an early stage of the Envisioning Workshop to position themselves within a very long-term socio-technical timeframe. With an emphasis on both societal and technological changes (and the interaction between the two), the participants were encouraged to think in terms of time (*when*) as well as quality (*what*) of changes that could occur over a 100-year period. By reviewing what has occurred in the previous 100 years, it was hoped that participants would be better positioned to think about the potential scope for technical innovation and social change, which may well transcend the boundary of a single human lifespan. Specifically, this method allowed participants to position their own lifetime, from birth to roughly when they become 75-years old, within the larger movement of history, spanning 200 years.

Prior to the workshop, we created a large-scale timeline on butcher paper (160" width x 36" height). The current year—2015—was marked at the center point, and 25-year intervals were indicated stretching 100 years into the past and 100 years into the future. Above the timeline axis, we populated the past 100 years with a handful of example social events and technological innovations (e.g., World War I and II, first computer, Rwandan independence, space walk, US Voting Rights Act, Internet, AIDS epidemic, the 1994 genocide in Rwanda, first iPhone). The items were arranged into two rows, one labeled "Society," the other "Technology" (See Figure 1). We also we measured and cut strips of blue tape to represent 75 years on the timeline, one for each participant.

At the start of the workshop, we taped the timeline to a wall. Each participant was asked to take a strip of blue tape to mark her or his lifespan on the timeline. Once everyone placed their blue tapes—their lifespans—on the timeline, we reflected as a group on some key events and

Figure 1. Example of a Multi-lifespan Timeline. Blue lines represent participants' personal lifespans (from birth to 75-years old).

technologies from the past 100 years. Next, participants were asked to brainstorm ideas for the future of society and technology: *what* might happen and *when* might it happen. Suggestions were recorded by the workshop facilitators on sticky notes and placed on the timeline so all could see. We tried to avoid “factual forecasting,” but rather to focus on creative visions. All ideas were welcome, justifications were not required, and critiques were not allowed.

Multi-lifespan Envisioning

With multi-lifespan envisioning, participants turned to consider the broad challenges and potentials specifically for information systems for transitional justice in Rwanda. The multi-lifespan envisioning comprised three phases: (1) envisioning information systems, (2) envisioning challenges, and (3) envisioning potentials. In Phase 1 we asked participants to brainstorm ideas about what an information system would be like or could do in order to support the transitional justice process in Rwanda. In Phase 2, we asked participants to consider challenges for realizing an information system. Finally, in Phase 3, we asked participants to imagine an ideal information system as participants would like it to be. Workshop facilitators recorded participants' ideas on large poster paper taped to the wall so that everyone could see. As with the multi-lifespan timeline, all suggestions were recorded, justifications not required, and critiques not allowed.

Multi-lifespan Co-design

Multi-lifespan co-design moves participants from more abstract visions to a concrete instantiation of an information system while still emphasizing multi-lifespan visions. Specifically, in this case study participants were asked to focus on 20 years from now, which corresponds to roughly

one generation in the future. Participants were provided with creative materials such as spec sheets (cf., [31], see Figure 2), large paper, and colored pens. Working in groups of 3-4, participants generated sketches and stories about an information system for transitional justice that would be used in year 2035 – selecting a specific clip, imagining an audience, purpose, and context. The design prompt follows:

Co-design Activity: Design 2035

We have spent the day today discussing the Voices from the Rwanda Tribunal collection and envisioning the future. In this activity, we would like you to envision the future 20 years from now. Your challenge is to design an information system that will be used 20 years in the future. You can design your system for whomever you want.

A. In groups of four, please do the following:

1. With your group, choose one clip from the four interviews you saw today. Decide who you are designing for—your audience. Discuss with your group why this clip is meaningful. Fill out this information on the spec sheet.
2. Start by generating a lot (maybe five) of ideas. Then pick one to focus on. On your large sheet of paper, work together as a group to create your design. Consider what other information your design might be combined with.
3. Envision your design in use. Complete all the questions on your design spec sheet, then, as a group, write a story that describes someone using your design 20 years from now. Consider where that person is, what the world will be like in 20 years, why the person is using your design, etc.

B. Come together in the larger group

You will have 3 minutes to share your design with the larger group. Quickly explain who your audience is, then describe your design and tell your story.

<p>1. Which clip did you choose? FIRST CLIP ON JUSTICE</p> <p>2. Who is the audience for your design? Where is your audience located? VICTIMS OF SEXUAL ABUSE, YOUNG ADULTS IN THE RURAL VILLAGES</p> <p>3. It's 2035. Design your system. Draw it on your large poster paper.</p> <p>4. Write a story describing your design in use, 20 years from now.</p> <p>Maria a 47 year old lady was raped 27 years ago while she was a young lady. She tried to live with the pain and struggled through her young life. She came to know Sexual Abuse Counselling Network 15 years ago and she made a decision to forgive her violator and has since married with a one child and husband. Today she is one of the biggest voices of our Network advocating for a world free of Sexual Violence.</p>	<p>5. Why did you choose this clip? Because after I think 2035 there will be victim's and perpetrators of sexual violence abuse and the victim's will require guidance and counselling in order to live a normal lifestyle.</p> <p>6. What other information would be combined with your design?</p> <p>a) <u>finding education on sexual literacy.</u></p> <p>b) <u>pay medical bills for victims and families</u></p> <p>c) <u>pay lawyer fees.</u></p> <p>d) _____</p> <p>7. Are there any downsides to your design? - lack of internet access, good infrastructure. - lack of enough public address system</p> <p>8. Is there anything else you want us to know about your design? we think it will work to help for good.</p>
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Co-design Activity Spec Sheet: DESIGN 2035

Team: JUSTICE Date: 06/27/15

Figure 2. Example of a Multi-lifespan Co-design Spec. Sheet.

Coding

For accuracy, transcriptions of audio data were used in the analyses. A coding system was developed from participants' responses to the multi-lifespan timeline and envisioning activities as follows: (1) first, three researchers independently read through all of the data to assign categories; (2) next, using a consensus model, researchers iteratively discussed the codes and arrived at agreement; and (3) for the remaining non-consensus items, all three researchers made a final independent pass through to assign categories. When there was disagreement, the three coders were always split two to one; we went with the majority.

FINDINGS

Multi-lifespan Timeline

Recall that the multi-lifespan timeline method was designed to help participants understand both the time (*when*) and quality (*what*) of changes that could occur over a very long period of time. Overall, participants generated 45 ideas across the three locations (IN=11, ME=18, TX=16). We found no significant differences among the three locations in terms of the years (the medians: IN=2040, ME=2048, TX=2043; Kruskal-Wallis test, $p=0.520$) as well as the content of the items (Fisher's exact test, $p=0.620$). Hence we collapsed data from the three locations to conduct holistic analyses (N=45) with careful attention to both the

time (e.g., year) and quality (e.g., content) aspects of the visions. Representative quotes are included in parentheses.

Time. Perhaps not surprisingly, most of the items were clustered towards the nearer future, in particular, between 2016 and 2065 (76%) with decreasing numbers of items as time moves further into the future (see Figure 3). While it may be easier for participants to imagine the nearer future, in all three workshops participants also generated some interesting visions for the longer-term future that went well beyond their own lifespans ("In like 300, 4-500 years... It will be de-extinction. Bringing back dinosaurs and all the extinct animals").

Quality. The multi-lifespan timeline method emphasizes both societal and technological change (and the interaction between the two) over time. Accordingly, we sorted items into three categories: society, technology, and both. Participants envisioned societal changes (44%) including aspects of POLITICS ("In 2040, Africa we have more power to veto"), ECONOMY ("I think in hundred years, all the world will have one currency"), ENVIRONMENTAL ISSUES ("Depending on our attitude toward environment, ...there might be also some shortage of natural resource, or desertification in some place"), and UNIVERSAL FREEDOM ("Gender, inter-racial... More freedom. All becoming whatever you want"). Technological changes (31%)

Figure 3. Timeline Distribution of Years.

spanned a wide range of fields including COMPUTATION (“[In] ten years, paper computers”), MEDICINE (“Cure all cancers by 2020”), BIOLOGY (“In 2045 there’s gonna be another virus”), ARCHITECTURE (“2040, all building will be flexible so even when there is an earthquake they will just move”), TRANSPORTATION (“There will be like air bus. You don’t need to go on the road. Just fly”), MILITARY (“Chemical weapons and very sophisticated weapons”), and SPACE (“I think 2065... people are going to move, going to live in another planet”). Some participants (24%) embedded their ideas for a new technology in the context of a future society, which we categorized as “both” (“Around 2065, it’s gonna be a lot of unemployment ’cause [unintelligible] what we call new technology. Robots are working nowadays in the industry”).

Multi-lifespan Envisioning

Having placed themselves in a long(er)-term socio-technical timeframe through the multi-lifespan timeline activity, participants next engaged with broad ideas for information systems to support transitional justice in Rwanda through a multi-lifespan envisioning activity. The activity comprised three phases: (1) envisioned information systems, (2) envisioned challenges, and (3) envisioned potentials. For each phase, we present the coding categories derived from that data (see Tables 2, 3, and 4, respectively), highlighting some interesting aspects, in particular those related to transitional justice.

Information Systems: What could the system be?

Interestingly, approximately one-fifth of the participant responses envisioned information systems as integral with VENUE (see EI-1 in Table 2, 19% of responses), typically a central “public” location where people could physically gather to access and share information. In Rwanda, information is often spread via mass gatherings. For example, on the last Saturday of each month, Rwandan citizens engage in nation-wide community service called *Umuganda*, which means ‘coming together in common purpose to achieve an outcome’ [18]. The government often disseminates public announcements during *Umuganda*. Other participants envisioned information systems as a means of TRANSFERRING KNOWLEDGE (EI-2, 13%). Genocide education and training programs are widespread cultural norms in Rwanda including *Ingando* re-education camps [15] and *Itorero* leadership academy

EI-1. Venue	EI-3. Media (e.g., radio, newspaper, flyer, T-shirt)
EI-1.1. Archive	EI-4. Artistic Expression
EI-1.2. Large Public Place (e.g., bus terminal, market, sports event)	EI-5. Non-verbal communication
EI-1.3. Village	EI-6. Dialogue
EI-1.4 Other	EI-7. Networking Activities
EI-2. Transferring Knowledge	EI-8. Freedom
EI-2.1. Educational Program	EI-9. Healing
EI-2.2. Training	EI-10. Memorialization
EI-2.3. Other	EI-11. Leadership
	EI-12. International Perspectives
	EI-99. Other

Table 2. Categories for Envisioned Information Systems.

EC-1. Access	EC-5. Information Destruction
EC-1.1. Infrastructure Access	EC-6. Information Quality
EC-1.2. Information Access	EC-6.1. Legitimation
EC-1.3. Cultural Access	EC-6.2. Distortion
EC-2. Technological Compatibility	EC-7. Politicization
EC-3. Logistics (e.g., time, cost)	EC-8. Legal Ramification
EC-4. Ownership	EC-99. Other

Table 3. Categories for Envisioned Challenges.

EP-1. Building Future Society	EP-5. Genocide Prevention
EP-1.1. Moving Forward	EP-6. Human Values (e.g., justice, respect, peace, human dignity)
EP-1.2. Young Generations	EP-7. Access
EP-1.3. Development	EP-8. Participation
EP-2. Education	EP-9. International Perspectives
EP-3. Truth	EP-99. Other
EP-4. Unity and Reconciliation	

Table 4. Categories for Envisioned Potentials.

[24]. In addition and reflecting some of the core constructs of transitional justice, participants envisioned information systems as contributing to FREEDOM (“Maybe the freedom to express your option [sic] on something”), HEALING (“The healing center”), MEMORIALIZATION (“Memorial sites,” “The reminder of the failure of humanity”), and LEADERSHIP (“Authorities”).

Challenges: What Could Go Wrong?

With their ideas in hand about what information systems for transitional justice might be, participants next turned to envisioning challenges for realizing those ends. As shown in Table 3, participants’ envisioned challenges were grouped into eight overarching categories. Some pertained to pragmatic challenges such as ACCESS (“The interface not being user friendly and not reaching out to people in the rural areas in Africa not knowing how to use it”), TECHNICAL COMPATIBILITY (“How do you keep up with the technology?”), and LOGISTICS (“How long it would take to put all the system together? It might take forever”). Other challenges pertained to information management such as OWNERSHIP (“How can you protect the copyright of this research?”), INFORMATION DESTRUCTION (“It could be another unfortunate war and destroy what has already been built”), and control over INFORMATION QUALITY (“The manipulation of information”). Yet others expressed concerns related to transitional justice such as

Figure 4. Example of a Multi-lifespan Co-design Sketches This drawing shows evidence of multi-lifespan design thinking with societal evolution spanning across the years 2015, 2020, and 2035.

POLITICIZATION (“Retaliation of the information that is put on the system into the communities,” “It could be politicized or divisive”) and LEGAL RAMIFICATION (“The interference of the information with the ongoing cases,” “The growing of mistrust in the Tribunal”).

Potentials: What Would Be the Ideal?

We turn now to the envisioned potentials—that is, the ideal qualities participants imagined for future information systems for transitional justice in Rwanda. As shown in Table 4, participants’ envisioned potentials comprised nine overarching categories. Many participant responses put a strong emphasis on BUILDING FUTURE SOCIETY (“By moving forward, we have a good projection for the future. The past is the past,” “Protecting the young generation from the past”) demonstrating multi-lifespan design thinking. EDUCATION was again emphasized (cf., EI-2). Reflecting some of the core constructs of transitional justice, participants appealed to TRUTH (“In relevance to [unintelligible] bias like double genocide... I hope that this system can have concrete information where genocide of Rwanda cannot be misinterpreted”), UNITY AND RECONCILIATION (“This information system will help the reconciliation process because the new generation I think they’ll learn though the information”), and GENOCIDE PREVENTION (“Fight the genocide ideology”). Participants further pointed out HUMAN VALUES such as justice (“Give satisfaction to the people seeking for justice”) and respect (“Showing the respect everywhere”). Of interest, one participant highlighted rebuilding Rwandan pride:

I’m thinking of the pride of Rwandan citizens. Because like, I think when genocide happened some, some citizens might not want to be Rwandans again or just lost the pride of being a Rwandan. And when they see a system to, like this information system to bring back the peace and trying to build again like a new Rwanda and more improved, they will gain more pride of being just a Rwandan.

Multi-lifespan Co-design

Having engaged with multi-lifespan envisioning broadly, we next provided participants with a structured co-design experience to surface specific ideas, challenges, and potentials that were of importance to them. Participants worked in groups of 3-4 in each of the three locations (IN=4, ME=5, TX=5). We highlight three examples from the multi-lifespan co-design sessions that illustrate key issues around transitional justice in Rwanda. We provide researcher synthesized holistic accounts that explain these three projects in terms of what participants chose to recount about them, staying close to the participants’ verbal descriptions of their designs in the audio recordings and written language on their spec sheets.

Holistic Written Accounts of Three Example Designs

Research Connection Port (IN, Amoussouga clip). The Research Connection Port is an information portal that brings together various research projects related to the 1994 genocide in Rwanda. This portal would allow Rwandans, in particular, those who have yet to receive justice to “feel that there is this space for them to have a voice and that they can come forward.” More importantly, the portal would provide Rwandans access to research outcomes:

...there’s been many other researchers. If you’ve ever been in Rwanda, you know it’s research central. There’s so many different universities, students coming in, and no one knows where that research goes. There’s just no tool to access it, ...they hear your stories and you don’t know where it’s going. So we want to bring that together and create a system where researchers can go to, and compile their stories, and kind of share that. ...And also just being sensitive as a researcher to not wanting to let your vision of the research take away from these people’s experience.

The Port would provide both technical and legal measures to protect research participants’ privacy (e.g., blur participants’ faces in the images; informed consent including participants’ legal rights to withdraw their data).

Map of Conflicts (ME, Taku clip). This information design takes the form of a world map that shows a global history of conflicts: what currently is happening in the world (e.g., racism in the US, conflicts in the Middle East), what happened in the past (e.g., the 1994 genocide), and, in turn, projects “the location of the meta-conflict for the next generation where it will be.” In order to prevent future conflicts, the map would provide education and “recommendation[s] for having the generation where there’ll be no racism, white and black, we just live in the community together share everything”:

...we want the entire world free from violence, crimes, and massacres. This will happen by eradicating some prejudices from policymakers. If someone committed a crime has to be responsible to face the consequences, he must be held accountable not to be judged based on where he comes from or the community group is affiliated with. He committed the crime on his behalf not on the name of his group or ethnicity. ...If people stop pointing each other by group and just focus on individual who committed a crime and get punished, ...things will change in a good way.

The participant-designers acknowledged that it will be hard to change a person’s mind but that “it’s a commitment for everybody on the policymakers, for us as individuals.” Their hope is that in 20 years, people would travel without fear: “kids and, even people from those [Middle East] area can come to USA and then they’ll be, feel like home.”

Sexual Abuse Counseling Network (ME, Amoussouga clip, see Figure 2). The Sexual Abuse Counseling Network focuses on artistic methods to heal and support victims of sexual violence. The network would provide various creative programs such as singing, dancing, drawing, and comedy, which allow participants to express their feelings and reconcile emotional conflicts:

Maria is a 47 years old woman, a lady, who was raped 27 years ago when she was a young lady. She tried to live with that pain and struggle through her young life. She came to know Sexual Abuse Counseling Network 15 years ago, and she made a decision to forgive her perpetrators or violators, the people who violated her. And she has since married and has one child and husband. Today she is one of the biggest voices of the Sexual Abuse Counseling Network.

In addition, the network would provide educational programs (such as sexual literacy and karate lessons for self-defense), financial support, and shelters for victims.

Overall Analyses of the Fourteen Co-design Projects
Now we provide analytic details on all 14 projects.

Choice of Video Clip. While all three workshops viewed all four clips, 10 co-design groups (71%) chose to do their co-design work with the Amoussouga clip. The designs, albeit inspired by the same video clip, were highly varied in type and scope, from electronic devices to mobile apps to games to socio-political process of Rwandan unity and reconciliation. The groups’ reasons for choosing this clip were also as diverse as their designs. We do not know the

exact appeal behind the Amoussouga clip—it could be because of the clip’s story-telling value as opposed to more conceptual ideas (philosophical or legal) discussed in the other three clips, or that participants were simply not very taken with the other three clips. What we do see is that a single clip can be the wellspring for a diversity of meanings, visions, and designs.

Value Implications. Given the context of transitional justice in Rwanda, participants’ co-design projects highlighted a number of values related to justice including: accountability, eradicate impunity, human rights, international justice, legal rights, and rule of law. For example, one group engaged with a developmental notion of justice, stating “according to our design, 20 years from now, justice will have more values than now and people are starting to learn more about it, which will help the future generation to know the advantage of it, so the future generation will know the advantage of appearing to the court.” Another frequently expressed value was unity, in particular, with an emphasis on uniting Africa (“United States of Africa”). Moreover, the co-design projects in general reflected strong African cultural values and norms. For example, in line with the widespread post-conflict cultural norm of trainings in Rwanda (cf., EI-2), one project focused entirely on a top-down process of *authorized* training: from authorities to trainers to the people.

Evidence of Multi-lifespan Design Thinking. Of the 14 co-design groups, 10 groups (71%) provided evidence of multi-lifespan thinking either in their stories or drawings. In their stories, 8 groups made statements about what society would be like in the year 2035 (“In 20 years ahead, there might be other issues of fighting/war,” “For the 2035, our wish is that all neighboring Great Lakes region and East African countries will be living in peace with each other”). Interestingly, one group explored a more personal experience of time. The story in Figure 2 illustrates a survivor of rape taking the steps towards healing over a span of 20 years. In their drawings, four groups explicitly indicated time. Figure 4, for example, shows a gradual unfolding of the Rwandan unity and reconciliation process (“Ndi Umunyarwanda”) with clear indication of the years 2015, 2020, and 2035. Yet other evidence was found in descriptions of audience (“We chose it for young people, for young generations, the people who will come after”).

DISCUSSION

Based on these findings, we present key insights for designing multi-lifespan information systems for transitional justice. We focus on (a) eliciting multi-lifespan design thinking, and (b) working with diaspora members from conflict and post-conflict societies:

Eliciting Multi-lifespan Design Thinking

Multi-lifespan design thinking refers to a distinctive process of designing with a very long time horizon that reaches beyond a single human lifespan. However, people’s senses of time can be subjective and human lifespans vary across

different communities. Thus Friedman and Nathan asked: “How long a timeframe would be useful to think with?” ([6], p. 2246). With this question in mind, we experimented with several different time scales in our new multi-lifespan design methods. Specifically, in the multi-lifespan timeline, we deployed a 200-year timeline vis-à-vis a single human lifespan of 75 years. In the multi-lifespan co-design, we engaged with a “generation” interval of 20 years. As a group, the methods went a good distance toward eliciting multi-lifespan design thinking. In particular, participants engaged with a wide range of timeframes, from the nearer term to 300-years into the future. Aspects of multi-lifespan thinking pervaded participants’ responses, with nuanced references to future generations writ large, evolving social and political consciousness (e.g., on gender, justice, freedom), infrastructure changes (e.g., global monetary systems, African union), long-term natural time scales (e.g., resource scarcity, desertification), and complexity of the human psyche (e.g., multi-stage recovery from trauma).

That said multi-lifespan thinking was not necessarily easy for participants. We observed that envisioning became more challenging as participants moved further away from the present in their considerations (see Figure 3). We also observed two interesting tactics that participants employed to make sense of longer timeframes. The first entailed *sequencing*. Particularly during the co-design, we saw participants dividing a given timeframe (20 years) into smaller chunks and then creating a sequence of those time segments. For example, in Figure 4 the participants first envisioned 5 years ahead (2020) and from there added another 15 years to arrive at the year 2035. In a similar vein, in the story illustrated in Figure 2, participants looked back 27 years, then envisioned 12 years ahead, and then added another 15 years to conclude in 2035. The second tactic entailed *mirroring*. We observed that looking back on the distant past provided a useful anchor to calibrate looking forward for a similar length of time. For example, with the timeline, a participant referenced Mandela’s imprisonment in 1964 and the 1965 US Voting Rights Act to reason, “Like in 50 years, every man will [unintelligible] to have freedom. ... You check Mandela and black people in America, so in 50 years everybody will have.”

Taken together, these findings point toward potentially fruitful directions for exploring multi-lifespan design methods in future work. In this research, we ordered the methods as follows: timeline, envisioning, co-design. But other orders are possible and could be more productive (or have different strengths). Our intuition tells us that the timeline (or some similar) method with its emphasis on helping participants to position themselves in a longer-time frame is likely still a good candidate for going first. However, whether it might best be followed by abstract envisioning (as we did, with the envisioning method) or by a more specific design activity (as with the co-design method) remains to be explored. We also find the tactics employed by participants to be provocative and wonder if

they could be leveraged to develop additional multi-lifespan design methods. For example, established methods that support sequential thinking such as storyboarding could be explicitly embedded in a longer timeframe. These, of course, are only a few beginning suggestions for what is likely a rich area for future HCI design research.

Diversity and Place of Origin

As Best and colleagues pointed out [3], diaspora communities are internally diverse in terms of (a) time since emigration, and (b) widely dispersed geographic distribution (e.g., special locations designated for refugee resettlement programs vs. metropolitan areas). Additionally, a person’s *place of origin* is also a crucial aspect to internal diversity within a given diaspora community. A person’s place of origin can be expressed at many levels from nationality to regions to neighborhoods to particular communities such as refugee camps. Moreover, place of origin can have strong political implications. Our case study shows that asking a person’s place of origin even as broad as nationality can be a politically sensitive issue for people living in the diaspora, particularly in conflict and post-conflict settings. At the same time, our data indicated that many participants remained connected with the community of their origin—culturally, historically, emotionally, and through family and friends—albeit physically and generationally separated from the place of origin. For example, references to Rwanda’s national transitional justice mechanisms often underlay participants’ dialog and designs, including unity and reconciliation (e.g., *Ndi Umunyarwanda*); the fight against genocide ideology and genocide denial (e.g., Genocide Ideology Law); and cultural norms around public gatherings (e.g., *Umuganda*) and official trainings (e.g., *Itorero*). Yet, each participant’s specific concerns and level of engagement with these transitional justice mechanisms varied widely, in part, depending on that person’s place of origin. As such, researchers need to be sensitive to how participants present themselves in terms of place of origin and associated potential political implications.

CONCLUSION

With this research we introduced two new methods to stimulate multi-lifespan design thinking. We explored these methods with diaspora members from conflict and post-conflict societies in the context of transitional justice. We hope this work will inspire more work in the HCI community on multi-lifespan design, envisioning, and transitional justice.

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