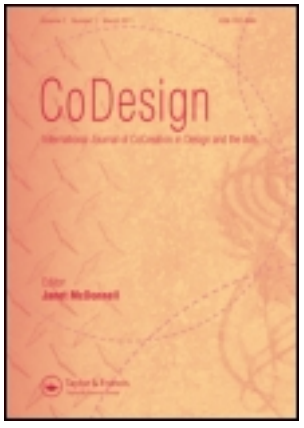

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Altering participation through interactions and reflections in design

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Altering participation through interactions and reflections in design

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In this paper, we illustrate through a set of examples how our own conceptualisation of participatory design (PD) and associated tools and techniques transforms within the design process itself. Co-designing with African rural communities has brought to light our many assumptions and intentions underlying commonly used methods and principles of PD. While genuinely striving for user involvement these same methods can hinder a truly participatory approach to design. We have learned much through our encounters and continuous reflections in various projects with southern African rural communities and seek to share our experiences in one particular, current project which led us to interrogate and revise our existing conceptions of PD. We also aim to infuse the evolution of PD with insights from Africa and cross-cultural design so that PD can better serve diversity globally.

Keywords: community participation; rural interaction design; African context; community-based; sustainable development; cross-cultural design; indigenous knowledge; local appropriation; action research; dialogical methods

Participatory design in context

Participatory design (PD) has evolved over many years, grounded in different socio-political circumstances with the recognition of the ultimate benefits of stakeholders' involvement. However, the nature and extent of each person's participation have only been loosely defined and leave much room for interpretation. Therefore, here we explore some of the underlying assumptions and expectations of participatory interactions from different perspectives within the context of our design project. Our purpose is two-fold: first, we seek to learn from our current southern African rural communities by interrogating and revising our existing conceptions of PD. Secondly, we aim to infuse the evolution of PD with insights from Africa and cross-cultural design so that PD can better serve diversity, globally.

Since 2008 we have been investigating and developing a community-based indigenous knowledge management system in two rural pilot villages in Namibia to explore and create an appropriate methodology and design outcome. The idea arose in recognising the importance and value of indigenous knowledge to sustainable

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development in different areas including, for instance, health, agriculture and animal husbandry. A well-known example is the information about Hoodia, a cactus species found in Namibia, which the San communities use to suppress appetite during their hunting journeys. This product has meanwhile been commercialised, with its market expanding as far as the USA. In rural areas one can find many more unexplored customs of this nature; however, such knowledge and its application is fading away. In rural southern Africa local knowledge has been shared across generations in stories, songs, dances, concrete artefacts and the actions performed in undertaking tasks; however, modernism and rural-to-urban migration have both devalued and interfered with the information transfer processes that construct this knowledge. Wise elders in villages can no longer directly share their knowledge with younger people who have migrated, albeit often temporarily, to towns, and when migrants visit or return they sometimes encounter difficulties in undertaking the practices required of everyday rural life. Often, urban migrants are no longer accustomed with traditions of food conservation without electrical appliances and medical treatment using only local plants. Therefore, we are interested in digital ways to preserve and disseminate, within the locale, applicable indigenous knowledge.

Our major design challenge lies in translating the local indigenous knowledge system into an appropriate technological knowledge representation despite the fundamental epistemological differences. Paradigms inherent in mainstream information and communication technologies (ICTs) are based on urban, Western values, logics and literacies directly implemented in internal structures such us information architectures, databases, meta-data and knowledge representations. User interfaces and functionalities, such as text-based and keyword searches, further depict a Western perspective on knowledge, based on concepts such as objects, particularity and abstraction. In contrast, African indigenous knowledge systems are characterised by holistic and highly contextualised approaches with an emphasis on interconnectedness, with communication channels based on performance and orality.[1] Thus, the attempt to simply represent African indigenous knowledge by means of databases and standard meta-data will necessarily lead to partiality and loss of valuable knowledge, besides a possible irretrievability of contextually relevant information by local users owing to the different organisation and categorisation. Our particular focus of design is therefore based on a deeper awareness of the differences in knowledge systems and the attempt to embrace indigenous knowledge into a new technological paradigm. At the same time, we are conscious of the fact that as Western educated designers and outsiders to an African indigenous knowledge system we will never fully comprehend the knowledge system. Thus, local people's participation is indispensable to ensure an adequate representation of their knowledge. Yet producing such participation brings with it various challenges such as the conceptual gulf between indigenous knowledge and ICT, language barriers, understanding and respecting the roles and agendas of the people involved and types of interactions, supporting trust and acceptance, and managing and controlling dynamic processes (Winschiers-Theophilus *et al.* 2010).

Participation across cultures

Puri *et al.* (2004) provide strong empirical justification for appreciating the contextual nature of PD by comparing case studies in designing health information systems in South Africa, Mozambique and India. They conclude that, 'there is no

single algorithmic best practice regarding participatory design in information systems which is applicable to all situations'. Walker *et al*. (2008) further doubt that techniques devised for the developed world are appropriate in the developing world, and Winschiers (2006) demonstrated that common PD methods based on Western communication structures, such as future workshops and brainstorming, are incompatible with Namibian user groups' social habits.

Societies in different parts of the world differ in their understandings of participation. However, often the values that shape and the tacit and explicit rules that guide participation are not obvious to, or appreciated by, outsiders of a community of practice. For example, in a hierarchical society lower ranking members are not expected to publicly and openly express opinions, although they are not formally prohibited from doing so. This might seem unjust and counterproductive to participation, when participation is associated with egalitarianism or democracy.

The challenges of participation in cross-cultural design contexts are particularly evident in designing and implementing ICTs for socio-economic development. Puri *et al*. (2004) argue that PD and implementing ICT in developing countries bring new challenges to fostering and nurturing participation. In southern Africa, we notice differences between developers' and users' approach to participation based on different senses of self, individuality and community; different literacies, such as oral and print based; and different knowledge skills, such as technological and situational. Thus, PD approaches need to account not only for diversity between individual people and groups but also for variations in the culture and dynamics of different communities. Considering these variations enables us to review PD concepts and methods appropriate to specific development contexts while simultaneously creating shared meanings for participation in design endeavours.

Tacchi and Watkins (2007) propose that local participation must involve an interpretive approach to understand the socio-economic, cultural and political context that shapes the behaviour and actions of system users. We ascribe to the view that user involvement in cross-cultural contexts should include an appropriation of the design process itself (Winschiers-Theophilus 2009) and that we can achieve true participation only by negotiation situated within the design context itself. This extends the PD process and yields an entirely new set of challenges and open questions about issues, such as the change in the role of participants, developers and facilitators.

Power relations

Brereton and Buur (2008, p. 112) observe that:

> new formats of participation can be characterised by their sensitivity towards new types of network relations among people, the diverse motivations of people to participate, the subtle balance of values and benefits involved in collaborative endeavours, and the inherent relations between participants.

Besides the various power relations established by a local village and personal and functional power relations arising within design activities, on which we will elaborate later, there are fundamental and inescapable power relations between knowledge systems (Bidwell *et al*. 2011a, b), which affect design decisions. The systems we use to organise knowledge, such as chronologies, taxonomies, cartographies and authorship, are produced in particular socio-cultural discourses (e.g. Green 2008) which

themselves are entwined with particular values and constructs of community. For instance, written literacy entwines with values such as 'freedom to information', 'efficiency' and 'individualism' (Bidwell *et al.*, 2011a, b). That is, values inherent in Western readings of participation can displace other knowledge traditions with a direct impact on ICT design. Often we unwittingly adopt a compensatory attitude by considering differences as 'deficiencies' to be remedied. For instance, in designing for an 'illiteracy' of some sort we decentre those logics and skills that we are illiterate in ourselves. For instance, commentary on what oral users do not do, cognitively (Sherwani *et al.* 2009) decentres what people achieve verbally; and this deficiency approach to written illiteracy stems from a, now refuted, view that writing itself enables detachment and objectivity (Finnegan 2007) without accounting for relations between verbal explanations and schooling practices (Hull and Schultz 2001). Systems that neglect core processes in transmission can erode special cognitive skills; for instance, Western schooling hinders the otherwise superior performance of certain groups of Australian Aboriginal children on visual spatial memory tasks (Kearins 1978). Such neglect undermines the efficacy of a design; for example, the design of an Australian GPS-based system which aimed to perpetuate traditional knowledge on fire did not support the nuances of information transfer when an elder shares his knowledge while 'walking country' (Bidwell *et al.* 2008). When a local community emphasises oral information transfer, 'all information is social and traceable to a person' (Sherwani *et al.* 2009) and we have found, in southern Africa, that this trace shapes people's perspective on the reliability and relevancy of information. For instance, when we first implemented a system to address bush encroachment in Namibia we used a sophisticated reasoning shell and displayed the logic paths of decisions proposed to users, but found that none of the farmers was interested in this logical reasoning; instead, they wanted information about people they knew who had followed the proposed decision (Winschiers-Theophilus *et al.* 2008).

Thus, ironically, the processes of PD can potentially contribute to devaluing the particular logics of a certain community. Consider the logics involved in narratives. Oral cultures often use storytelling to transfer information, and PD often uses storytelling methods. However, methods in PD rest on particular conceptions of storytelling, story structures, forms and conventions that emerged within Western media traditions, text-based culture and 'secondary' orality, e.g. univocal voice, chronology and linearity (Bidwell *et al.* 2010, 2011a). Our views of where a story 'comes from' and who is permitted to voice it are also cultural; for instance, a Western constructivist view, that authors control narrative and listeners determine meaning, is in stark contrast to cultures where stories are 'owned' by ancestors or the land. Internationalising interfaces with local language or culturally sensitive icons may make software accessible to those excluded by textual illiteracy; but, to design applications suited to strong oral traditions, we must go beyond re-purposing Western styles of recording (Bidwell *et al.* 2010, 2011b). To achieve this we need to appreciate storytelling in a way that does not implicitly impoverish the voice of the 'other' and derive techniques that account for relationships between participation and oral interactions.

Much has been said about the 'tyranny of participation' in development contexts (Cooke and Kothari 2001); and we find that some critiques reconcile with assumptions that cause PD to fail in Africa. In strictly adhering to sets of PD methods we may incorrectly assume that participants share a common understanding of participation and participant roles, underestimate the complexity of our

encounters, and disregard local values and socio-cultural habits guiding interaction protocols. Underpinning such problems are fundamental tensions around relationships between democracy, empowerment and participation. Democracy is an explicit goal in the development agenda and, with few exceptions (e.g. Beck *et al*. 2004), is associated with particular communication protocols and methods to enable the successful local uptake, ownership and domestication of ICTs. Thus, conflicts arise relating to power relations between culturally specific systems of participation.

Towards consensus

Reasoning in indigenist frameworks, which recognise relationships between what participation means and knowledge practices (Martin 2003, Smith 1999), motivates us to draw upon local epistemologies. Applying such sensitivity to communities in southern Africa requires appreciating that discourse is deeply rooted in a paradigm of 'connectedness of all', expressed in the aphorism: 'a person is a person through other people'.[2] This paradigm is based on an African (Bantu) philosophy, identified by the term *Ubuntu*,[3] which variously means, 'humanity', 'humanness' or even 'humaneness'. Mbiti, one of the first African philosophers recognised through written media, never used the term Ubuntu itself, but explains that the cardinal point in understanding the African view of humanity requires recognising: 'I am, because we are; and since we are, therefore I am' (Mbiti 1990, p. 106). Thus, Ubuntu is itself a critical discourse that constructs personhood through collectivism and, usually, recognises relationships with ancestors within collectivism. As Mbiti puts it:

> In traditional life, the individual does not and cannot exist alone except corporately. He owes his existence to other people, including those of past generations and his contemporaries. He is simply part of the whole. The community must therefore make, create or produce the individual; for the individual depends on the corporate group (Mbiti 1990).

Storytellings, building of consensus and community meetings to make decisions are key features in traditional rural African communities. In Francophone Africa the term *palaver* is used for this institution. The Congolese theologian Bénézet Bujo (2009) refers to it as the 'efficient institutionalizing of communicative action'.

> In seeking a solution for a problem, they share experiences, refer to the entire history of the clan community, and consider the interests of both the living and the dead. The procedure can be time consuming as it is carried on until consensus is achieved (Bujo 2009, p. 122).

Here we focus on two major implications for PD interactions: the role of each participant (community members and developers); and the methodological consequences.

'Participation' in discussions and activities is a long-established and easily observed practice in rural villages in Africa, and needs to inform design methods rather than those common in PD. Rather than an emphasis on facilitating joint design activity which brings individuals together, we need to shift to guiding an existing group towards a design output. This, again, raises questions about the appropriate role of the design practitioner or researcher, who is external to the local community, in relation to the group during design interactions. After all, following the Ubuntu principle would suggest: 'I am not just a researcher/developer but part of

a wider collective, which encompasses the users, and together we derive a communal existence and within that communal existence, I am'. Thus, designers in rural computing contexts must accept the dynamics and expanded roles that evolve through lengthy processes of social grounding (Merkel *et al.* 2004). Accordingly, as we conform to community ethics, we may have to violate our own predefined role.

> With participatory design becoming a mainstream 'method', the importance of the balance between workers and management has been downplayed in exchange for an all-encompassing involvement of any kind of user. [...] participatory design methods are employed to establish collaboration between developers and the potential users of the manufacturer's products or services. 'Users' in this sense are not organised in unions, and there is no structural (employment) relation between manufacturers and users. There has been a shift towards seeing consensus as an ideal. Participatory designers tend to understand themselves not as part of a conflict, but instead as neutral facilitators of a process where different perspectives should meet each other harmoniously. Although the majority of participatory design methods tend to encourage equal sharing of perspectives and building of consensus, there are exceptions (Buur and Larsen 2010, p. 123).

Paradoxically, this striving for consensus, using particular methods, hinders consensus building in design activities involving people who are more experienced with, and rehearse a commitment to, consensus building. This leads us to consider what talking means, as a true participatory method, and draw on how Bohm (2007) cogently differentiates discussion and dialogue. Dialogue involves a mutual non-judgemental approach by all participants and does not aim to convince others of the rightness of one's opinion or to merge individual pre-factored ideas, but rather aims to jointly create something new by talking.

Action Research as means for mutual learning in participatory design

PD remains problematic until participants acquire sufficient ICT literacy (Maunder *et al.* 2007) as much as until developers or facilitators acquire sufficient contextual comprehension. One role of designers in participatory community computing is therefore to facilitate the process of learning about ICT (Merkel *et al.* 2004). Different approaches, reported in the literature, aim to alleviate the conceptual gap between developers and users. Walker *et al.* (2008) suggest, 'train local people to take on design roles and self-report their progress with the technology as participant ethnography'. Inherent in such a process is that 'local knowledge must be explicitly acknowledged, and activities constructed in way that give local stakeholders time and space to safely explore options and make choices in time of change, so that they can gradually, if they so choose, alter their practices to incorporate outside knowledge' (Walker *et al.* 2008, p. 2709).

An important focus in PD interactions is the mutual learning of developers and users and, through this, creating shared meanings about the possibilities of ICT and the development priorities. Blake and Tucker (2006) described their initial thoughts on an approach that merged methods from the fields of human–computer interaction, PD and prototyping under the umbrella of Action Research. Iterations of design, intervention and reflection enable a user group to learn about ICTs, their possibilities and malleability, while developers learn about social usage context (Blake 2010). Brereton and Buur (2008) found that developing and modifying prototypes, as catalysts, in response to many informal discussions, observations and actual use, was most effective to understand future use. Thus, designers and

facilitators become technology interventionists, with the purpose of seeding new ideas in the community of practice and jointly reflecting upon usage. The phases of joint interventions followed by reflections are one step towards a better understanding of the design process itself.

We frame our design process following a critical action research approach (Blake 2006), to introduce technology and design concepts. Together, these positions mean that we undertake a process of reflecting on our current understanding of users and our relationship with them and then introduce appropriate tools for data gathering and interpretation and design conceptualisation.

Participatory community project

We first introduce the project context and the challenges encountered in the participatory interventions within our project. We then reflect on a number of methodological issues that arose.

Our design team consists of people of the Herero tribe who reside in two villages in the east of Namibia, academic researchers and students. Researchers include a Herero-Namibian who has a home at one of the research sites and, thus, acts as the main interface between rural residents and researchers. A second locally based researcher, of European origin, has resided in Namibia for 16 years with a research focus on cross-cultural evaluation and appropriation of PD methods. The external researchers who joined the project in 2009 include: a South African professor grounded in critical action research with over a decade of ICT projects with African (indigenous) communities; an Australian interaction design researcher specialising in rurally situated ICT and with experience in working with indigenous groups in Australia and life in an African village; and a European professor with skills in encultured conversational agent technology and cross-cultural project experiences in Japan; more recently, a senior academic European in the field of ubiquitous computing has joined the research team, adding yet another perspective. Several local and overseas students are directly and indirectly involved in specific project parts. External academic partners in Germany and South Africa supervise students who implement different prototypes as specified by us and tested in the field.

Relationships, roles and agendas

The academic researchers living in Namibia conceived the original research and development idea of an indigenous knowledge management system and were, variously, supported by external researchers who joined the project at different times. As the project unfolded distinct and volatile motives for participating emerged among the researchers and the community members. Equally influential to the PD process and outcome are the different roles taken on by the individual participants during each encounter.

We chose the community described here because one of the researchers grew up in that village and regularly returns and participates in all rural activities. He migrated to Windhoek, Namibia's capital city, aged 12 years but many of his close relatives remained in the village. The researcher (Figure 1) has his own distinctive personal relationships with each member of the community based on his gender, age, family position and shared history. His kinship facilitates trust building and only specific community members' commitment towards the project.

In accordance with our research purpose and local protocol, explained to us by the researcher originating from the village, our main point of contact is an elder who most villagers perceive to be the most trustworthy and knowledgeable. He is the one from whom we gained initial consent for the project to be carried out in the village, who we involve in or inform about all research activities, and who helps in soliciting other local residents' involvement. The non-local researchers established relationships and trust with this elder over several two- to three-day visits and longer stays, always introducing any new-coming researchers first to him. The elder's increasing comfort with the project activities can be clearly seen in video recordings, where he was rather hesitant to begin with but has become a most eloquent narrator today in our and the cameras' presence (Figure 2).

All conversations are conducted in Otjiherero and the researcher originating from the village translates if appropriate, without disturbing the flow of interaction. Since this researcher is involved in planning the purpose, objectives and activities for each trip and local communication protocols he needs no guidance during the interactions. However, a strong dependency on his skills as facilitator, his own agenda and his relationships with the individual villagers has influenced the interactions and choice of participating community members (Figure 3). Only over

Figure 1. Researcher with elders.

Figure 2. Elder increasingly comfortable in front of the camera.

Figure 3. Researchers and community member.

frequent and longer visits did the individual researchers build up individual relationships with different villagers, thereby slowly shifting the access to information, although still constrained by language barriers.

In the capital, the external researchers are highly influential in terms of project processes and planning owing to their research seniority. However, rurally the researcher who originates from the village is the main actor. Those of us who are younger and/or female take on the host societies' customarily more docile roles, independent of professional positions in the capital or cultural background.

Our sensitivity to our hosts' customs reinforces the position of the locally originating researcher and allows him to influence interactions with local residents during design activities. The researcher has two natural positions within the research and the rural community and assumes a distinct third role at the interface of the interactions. He needed to delicately balance participatory activities because, as a relative youngster among the village elders, he is expected to be an active listener only but not an interrogator or initiator of actions. Equally, we need to inform the elder about our planned participatory sessions and ensure that he fully comprehends their purpose and technique before other residents. Thus, during our first research visit, we explained the purpose of the entire project and obtained the elders' commitment to active involvement, undertaking recordings with him to get a feel for the process and exploring approaches such as interviewing and free storytelling.

We included other residents in discussing the project only on our second visit. Our discussions included knowledge dissemination and intellectual property rights, and we found that the majority of villagers could not relate to the concept of economic benefits of knowledge. On the contrary, they felt flattered to be consulted and re-emphasised the importance of their knowledge to their identity and their wish to have it broadcast out in the world. They expressed hopes that recordings of their village life and practices would raise the awareness of government, and other bodies, to their need for facilities such as water and electricity. In terms of immediate economic benefits, we compensate residents for their direct availability in project activities monetarily or with food hampers. More than a dozen community members have always been readily available for project activities and over time we have established a rigorous participant payment system based on a number of local and international considerations. Currently, we are uncertain about residents'

understanding of their active role in the design of the system. For some villagers our activities introduced them to cameras, cell phones, laptops and tablets or computer applications for the first time. However, trapped within our own conceptualisation of ICT solutions and a lack of deep familiarity with the local knowledge system, we are aware that we cannot design for the community but that only a real PD will lead to a useful and usable system.

Oscillations of process control

During our repeated research visits, we became profoundly aware that we could not impose planned project activities but must adapt to villagers' daily schedules and recognise that villagers are busy most of the day. Often we spend a lot of time waiting for participants to be available, unsure about whether planned activities, often constrained by daylight hours, will happen; initially, this contributed to some anxiety within the research team. However, we learned to accept that events must be determined by local participants and to appreciate that villagers' socially oriented activities, which may seem leisurely to an efficiency-oriented academic researcher are a vital and purposeful part of community practice. During each visit we oscillate between different participatory activities. Sometimes researchers participated in activities initiated by residents, either because they are a 'natural' part of village life or because they aim to guide the researchers; other times residents participated in researchers' activities, such as contextual interviews, using technology probes and reflecting on their outcomes, and evaluating prototypes.

We now consider the locally driven and researcher-driven activities equally important to the PD exercise. On the one hand, knowledge on community practices led us to understand better the adequacy of design methods and decisions and, on the other, participating in locally driven activities creates equal grounds for participation. Involvement in user-driven joint activities starts to tackle power relations that, as often reported, can cause users to feel intimidated and anxious (Sherwani *et al*. 2009) and, simultaneously, calls into question the priorities that researchers set in their goals for limiting *valuable* fieldwork time to activities that they see as directly related to design outcomes. The speed at which we achieve overall project outcomes seems slow and this, at times, causes frustrations for both academic researchers and local participants. The latter expect a finalised system while researchers suspend their own design ideas in an attempt to avoid pre-empting local design suggestions. The entire endeavour becomes a difficult act of balancing participant backgrounds and expectations in relation to the process, outcome and role within the project.

Participatory design interventions and reflections

Our commitment to empowering local residents in co-design required identifying techniques to enhance design thinking among participants while being truly participatory. We, the research team, had numerous discussions regarding the best methods to employ.

Participatory community group meetings

From our second visit, our activities were dominated by conversations with groups, a long-established method for villagers to exchange information, elaborate problems

and make decisions. Usually, several elders and some youngsters sit in a circle and elders dominate the discussion (Figure 4). Discussions centred around the value of preserving and sharing indigenous knowledge and the importance of recording only trustworthy narrators for information veracity and validation (Bidwell *et al*. 2011a, b). People's remarks revealed gaps in their knowledge and their interest in developing their knowledge. We also prompted discussing intellectual property rights and privacy in relation to information dissemination. The researcher who originated from the village preferred group discussions because he felt this was closest to the normal local communication practice. Sometimes, we prompted discussions by replaying previous recordings of elders and, contrary to some of our expectations, residents engaged in a meta-discussion on their own knowledge system. Various implicit and explicit design ideas were produced during the many group discussions we observed. Our contribution to the dialogue was minimal, mostly due to the language barrier, and we avoided quick and sloppy translation which, we believe, can lead to misunderstandings, and asking inappropriately timed questions. Instead, we recorded all discussions for *post situ* translation and analysis.

Technology probes

To reduce our role in recording knowledge and increase opportunities for locally prompted narratives about knowledge, we gave some villagers flip-cameras and cell phones to record their knowledge. A number of villagers recorded everyday rural activities, including hand-milking cows, packing tobacco and brewing tea on an open fire. Our detailed analysis of their recordings (Bidwell *et al*. 2011a, b) revealed that when villagers recorded each other they often became engaged in the conversation

Figure 4. Elders with community researcher.

that they were recording. Indeed, throughout our work with rural Herero we often notice that engagement between tellers and listeners overrides attending to the recording device; for instance, at the other research site one narrator shifted his focus from the camera in his attention to the setting, his narrative and listeners, while on another occasion a listener failed to record a narrator because he was concentrating on the narrative (Bidwell *et al*. 2011a, b). We uploaded video to a laptop, observed villagers' discussions around it and video-recorded their discussions for *post situ* analysis and translation.

Considering user-generated video, associated with observation and discussions, as a technology probe seems appropriate for the context. Certainly, local residents showed enthusiasm and as they became more familiar their confidence with technology steadily increased. At the same time, the probe results provided material that we could incorporate in evaluating early design ideas *in situ*.

Contextual interviews

On various occasions we opted for contextual interviews; such as with various individual women as they went about their everyday tasks. Our interviews focused on sharing traditional knowledge through kin networks, current technology access and use, and the value of potential knowledge recording applications to their lives. Some of the women also used the mobile technologies that we provided. We recorded these discussions on video for *post situ* analysis. Some of the women suggested some unique purposes for knowledge recording; such as supporting intimate kin relations and maintaining networks based on cultural norms that are specific, and of great value, to the Herero people. This led to our pursuing a set of new design ideas.

While the women explicitly expressed a number of specific design ideas, we felt a sense of unease which we attribute to our data collection methods. The imbalance between the number of researchers (one filming, one asking questions, one observing and taking notes) and the number of women interviewed (one or two at a time) and the presence of cameras tended to intimidate the women. In most instances the interviewee terminated sessions, saying that she had other responsibilities to take care of. We also felt, with some exceptions where interviews extended across an hour, that the presence of strangers (us) and the *male* village researcher inhibited discussions; however, this did not occur in group discussions, where villagers tended to ignore the presence of researchers while engaged in the conversation. In general, it has been a challenge to engage with the women of the village as they mostly remain in their homes while the men gather at the central water pump as well as at the different places where we conducted our sessions. In later interactions we made an extra effort to visit the women one by one in their homes, where we were, in most cases, welcomed.

Digital prototype evaluation sessions

We developed a first prototype which we hoped would act as a catalyst. Our analysis of local communication structures suggested that we distinguish between the roles of narrator and listener; thus, we organised video clips so that the narrator of the clip indicates for which audience and situation the video clip is meant and the listener specifies the current situation that he or she is in. The system retrieves videos based

on the equivalence between the clip's meta-data and the listener's profile and current needs. The first prototype was developed by German students without any contextual understanding and so the user interface was heavily text based. We evaluated with a group of residents, guided by the elder, and explained the purpose and functionality of both the prototype and the evaluation exercise (Figure 5). Since participants had never touched a computer before their interactions with it were very hesitant and they struggled with concepts of uploading, moving clips between applications, assigning meta-data and entering text, even in their mother tongue.

For the purpose of validating very specific design ideas the prototype evaluation seems adequate. At this stage the local residents' computer literacy and confidence in requesting changes to prototypes were low. This will increase over time as we continuously expose them to different technologies; however, we must limit the use of text. So, for instance, we left a mobile storytelling application at the other research site, which uses only audio and pictures, based on research into orality in another southern African rural community (Bidwell *et al.* 2010).

Thumbnail sorting versus digital video organisation

We ran a number of activities on laptops to explore design possibilities, such as video organisation and retrieval facilities using iTunes. Besides various other important insights, validations and falsifications of early design ideas, we realised that using laptops, at this stage, defocused design exercises that aimed at the conceptualisation of video organisation. Therefore, we reverted to using paper design activities, an idea that we had originally dismissed, at that site. We printed and laminated thumbnails of great number of video recordings made by local residents and researchers at the sites and then asked three participants, who sat around a white A1 piece of paper, to group the thumbnails. Participants discussed the thumbnails among themselves, focusing on thumbnails of recordings made in their village and grouping them. We asked them to sequence them and use a marker pen to indicate the order, and they chose to sequence in terms of their temporal order (Figure 6).

Figure 5. Elders evaluating prototype.

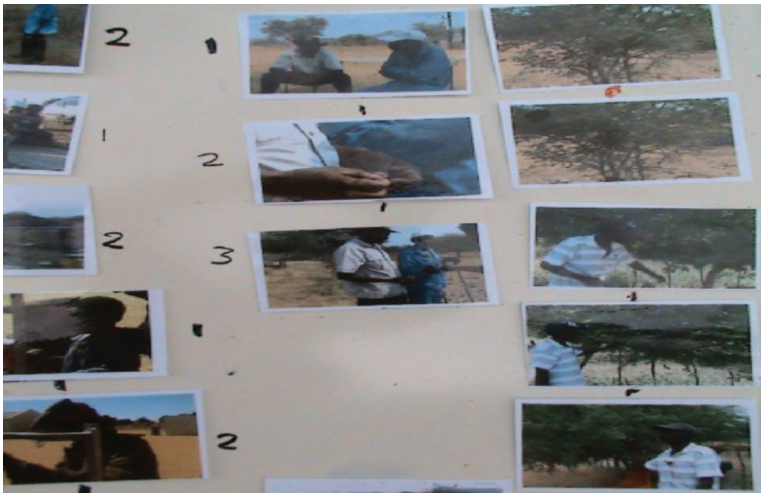

Figure 6. Thumbnail sorting.

While the participants engaged well with the activity, we observed their difficulties in recognising the video and the essence of the topic, which is essential for the correct interlinking. We are also uncertain as to whether the participants really grasped the purpose of the activity. The activity did not lead to a major conceptual breakthrough in potential knowledge representations and architectures.

Three-dimensional model mapping

In this activity we explored the potential of designing a three-dimensional (3D) model of the village as an interface to access videos along the represented locations via radiofrequency identification (RFID) tag technology. For this purpose, the design session included observing the way participants represented locations by creating a model followed by placing thumbnail images from videos at appropriate places. In preparing the activity we considered material we might use to create a 3D model, such as realistic toys (plastic or wooden cows, people, trees), clay and natural material (e.g. leaves, cow horns). However, when we discussed this with one of the elders we were advised against using realistic toys because this compromised the sense of seriousness and signalled a patronising approach. Thus, we opted for large sheet of paper, adhesive clay and a set of 50 thumbnail photos, and let the activity unfold naturally. During the activity, first one of the elders took us to four places where herbs grow around one homestead and, without prompting by us, picked the herb at that location while a younger member photographed him and we registered a GPS co-ordinate. We brought the sample foliage back to the homestead and recorded three residents creating a spatial map on the paper by placing the foliage at their relative locations and then selecting and placing thumbnails according to where they thought those clips were filmed.

Currently, we have differing opinions about this activity. Detailed analysis by the researcher who was present during the activity confirmed additional observations that villagers are not generally used to bird's-eye-view maps, so the idea of 3D maps seems inappropriate (Bidwell *et al.* 2011a, b). Participants walked, confidently,

through dense bush straight to locations to collect data points but were much less confident about creating a geospatially accurate aerial view despite the proximity of these locations. They scaled the map around the immediate area of the homestead in which they performed the activity and were reluctant to extend or rescale it to include more of the village. Further, participants easily sorted the thumbnails to isolate those to place on their map but spent more time talking about people and activities in clips than mapping. They seemed to emphasise people's situated activity in a place, rather than abstract and generalise from that.

Data interpretation

We have conducted various different data analysis and interpretation sessions. In one debriefing among researchers we discussed our observations and dialogue with local residents and explored further design ideas and further steps. As all local discussions were in Otjiherero language, translations and interpretations were required for further processing. Various rural-to-urban migrants translated, one of whom, who returns to the village regularly, added additional examples from her own experience in the village and contextual elaboration to assist our understanding, and occasionally added her own design suggestions. We also held joint viewings of recordings with researchers from social sciences for different interpretations.

Our participatory approach integrates a 'multi-sited' approach to ethnography (Marcus 1995). Thus, our account includes ethnography in Windhoek and rurally. In Windhoek we participated in migrated residents' activities and took basic Otjiherero language lessons, in addition to the numerous and extended rural visits (Bidwell *et al.* 2011b).

We have combined different participants' views with different approaches in the process of sense-making. These included researchers and rural and migrants' abstractions, and interpretations informed by Windhoek-based researchers' personal and professional experience in Namibia as well as non-resident researchers in discussion with the non-participant interpreter/translator.

We are in continuous flux in obtaining inside versus outside perspectives employing multiple approaches of sense-making, such as ethnographic studies, insider discussions and researcher discussions. Personal and observed experiences of Ubuntu (e.g. Bidwell 2010) are often threaded within our considerations, which reflect not only the way in which rural residents and rural–urban migrants construct their identity within a community but also the way we do, as researchers and people ourselves. The outsiders among us, particularly those with greater or prolonged immersion, have become most acutely aware of cultural contrasts in the way that interdependences between humans produce a sense of humanity, personhood and identity (e.g. Bidwell *et al.* 2011b). We notice through our project activities the consequences that differing concepts about identity have for design practices and technology use; recognising that detaching our own and participants' experiences of personhood from our practices automatically disrupts any commitment to 'knowing the user'. Yet, with our many design attempts we realise how our own worldview, sense of self and known methods trap us. The importance of rural residents leading the design at large, while we explore specific design ideas for their usefulness and usability, is unequivocal; however, facilitating their lead is inherently beset by its own tensions and imponderables.

Lessons learned

Having lived the experience and analysed the theoretical grounds of PD from different angles, we have uncovered a number of issues for consideration when using PD around the world. We believe that it is essential that further research and discourses are carried out in the following areas in particular.

The unique situational flavour of participation

Each design situation represents a unique context for participation depending on the participants, their viewpoints, their agenda and their role within the process and the design context. We notice major differences in the values of Western and African societies which directly influence PD concepts and practices. For example, most sub-Saharan Africa rural peoples have stronger collectivist values than we notice in urban and developed places and incorporate 'participation' in everyday collaborative activities. Thus, for the researcher facilitation is less about supporting group participation and more about relating the interactions towards design. The scope of the methods varies depending on the user-community's own approaches to participation and requires studying and accounting, in the design process, for the values of the design context. Different approaches can integrate the local concepts of participation, by following either a community-based participatory interaction or an active appropriation method driven by the developer and the users. Mutual learning, a well-established principle in PD, now serves to inform the design process rather than products' design decisions.

The role of participants

In many PD situations, developers assume the roles of facilitators and change agents simultaneously, which is in itself problematic. Moreover, in many PD interactions, developers consciously or unconsciously take over the role of designers, by choosing the methods and later modelling techniques. We are conscious that each participant, developers as well as local residents, influences design outcomes in one way or the other. Therefore, we encourage developers to develop sensitivity to appropriate participatory interactions, both when engaging with local people and when translating insights into system implementations, and an awareness of their own design biases and roles within the design process. Learning from our experiences over years of working with African and other indigenous communities, we realise that a change of role has to take place. In a truthful participation, the nature of participation itself should be negotiated within the context of the project, rather than consciously or unconsciously realised as meta-participators (developers) impose predetermined techniques which subvert local cultural norms.

Altering participation

Designing with residents of a rural village in Africa contrasts with designing for organisations or individuals. The former is a well-established group of people linked in many ways which are not necessarily transparent to the outsider. Any interaction takes place within this multi-faceted system. Brereton and Buur (2008) recognise the complexity of the relational network. Inspired by concepts of Ubuntu, we place interactions and interrelations at the core of each encounter and spend much more time on discussions and activities that are not directly relevant to design from a

conventional perspective but are essential for ensuring collaboration. For many years, we have conducted usability evaluations and design sessions with rural communities, always with groups of self-assigned members. This practice has proven very effective as the users have many spontaneous and design informative discussions during the sessions, which would not have occurred in individual settings. If local residents outnumber the researchers and are in their own familiar environment they often take the lead in participatory interactions, including those designed by the researcher team. A continuous deviation of planned activities in terms of timing, process and expected outcomes driven by the community gives the developer team a feeling of 'being participated'. This can feel uncomfortable, at first, as it appears to threaten control of the design process, but then there is a sense of release as the community leads its own process, although in a different way.

Towards comparative evaluation

Monitoring and evaluation are important parts of reflecting on the changes that take place within a community but can be difficult to achieve in ICT for development. Measuring the 'success' of a participatory method is beset with dilemmas in identifying ways to compare processes and outcomes without bias. The literature is awash with reports on the incompatibility of evaluation methods with different cultural settings. For instance, after studying cross-cultural evaluations on three continents, Oyugi *et al*. (2008) concluded that even an evaluator situated in the users' culture cannot compensate for methods that are inappropriate to the context. Winschiers and Fendler (2007) inspected the underlying values and meaning of concepts inherent in usability evaluations and found that Namibian user groups did not prioritise efficacy and user satisfaction in the same way, typifying 'usability'. Indeed, evaluation beyond the participants' perception and expression seems impossible without a common understanding of the concept of 'participation' and its corresponding approaches. A lot of research remains to be done in this field.

Conclusion

We have explored the consequences of differing societal values for appropriate PD concepts and practices within a specific context. We found that 'participation' was an already established priority for people with whom we worked. This has such far-reaching consequences for researchers that we introduced the idea of 'being participated' to show the fluidity of the leadership role. This role can no longer lie with researchers, as our own notion of participation is altered by the interactions.

Developers continue to carry responsibility for the lion's share of a final product, through their own (re-)conceptualisation of 'participation' and their ability to perceive and integrate the target communities' participatory practices. Ideally, the meaning of participation, negotiated within the design context itself, shapes the PD process. The developer's role varies depending on the design context. Most of all, the developer has to be seen as part of the design community. In a setting like ours, where the socio-economic and knowledge systems between developers and users differ profoundly, mutual learning is a prerequisite for truthful participatory interactions. Local people need to acquire sufficient technological knowledge to contribute to the design while, at the same time, developers need to understand the domain and context of application and appropriate communication and interaction

methods. As new researchers have been joining our project continuously, we have observed their initial unease with negotiated and meanwhile established interaction methods. Therefore, one of our planned activities will be to look into the more systematic preparation of new researchers for the field.

Concepts from Ubuntu are broadly shared in many parts of sub-Saharan Africa and participatory practices are normal in African rural life, which suggests that we can generalise some of our lessons more broadly. Working in such communities gives researchers an opportunity for 'being participated' rather than actively facilitating participation. African communities have deeply anchored participatory practices yet often lack technological opportunities. Therefore, the emphasis of developers and researchers should be intervention-driven introduction of technology, thereby enhancing the communities' technological skills and ability to actively contribute to detailed design decisions. In the absence of a valid evaluation framework, continuous reflection phases throughout the design process with all participants involved serve to realign methods and decisions. Having drawn many lessons from a long-term project with one pilot community we are looking at deploying specific methods and techniques to a number of other communities within southern Africa to establish a comparative design and evaluation framework.

Having illuminated the complexity of cross-cultural PD activities in theory and practice, we hope to contribute towards a discourse in re-thinking concepts and methods of PD in the era of globalisation. This is not to say that we move away from the core values of PD, but rather that we seek to develop sensitivity to our unconscious cultural biases. The established long-term relation with the one local African pilot community enabled us to continuously reflect, discuss and reshape our design interactions to such a high level of familiarity by all participants that we can now focus on design decisions towards a more appropriate representation of the local knowledge system.

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Notes

1. Scholarship of African orality includes linguistic and 'extra-linguistic' acts, such as gesture, movement, crafts and performance (Finnegan 2007).
2. In Zulu it is *'umuntu ngumuntu ngabantu'*, in Sotho we have *'Motho ke motho ka batho babang'*, while in Otjiherero it can be rendered as *'omundu omundu okuza movandu varue'*.
3. Related words are found in many African languages, for example, in Swahili it is *'Ujamaa'*, which was adopted by Julius Nyerere of Tanzania for his brand of African socialism. Since it is a powerful and loaded concept it has also been subject to misuse and overuse (Munyaka and Motlhabi 2009).

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