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Enhancing Cross-Cultural Participation through Creative Visual Exploration

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ABSTRACT
Designers, like artists, fuse learned skills with intuition formed over their past experiences to unfold their creativity. Continuous interactions between the designers, their creations, and their informing and receiving environment lead to alignment and harmonisation. However, we observe that displaced designers in an unfamiliar context can no longer blindly rely on their insights only to create acceptable artefacts. In this paper we depict the journey of a young western designer, who accepted the challenge to co-design a 3D graphics visualisation of a small village in Southern Africa. We have observed that the 3D graphics visualisation has significantly increased participation and facilitated co-creation of meaning at the interface of different cultures rather than just being an end product. Not only do we he have to learn to 'see' what the village elders see but also experience a paradigm shift in design and evaluation methods. Based on personal interrelations and immanent differing principles the interactions among the participants are renegotiated continuously during the design process.

Author Keywords
participatory design, indigenous knowledge, 3D, visualization.

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

EXPLORING NEW TERRITORIES

"Designing usable information technology (IT) across cultures is an art, for it being highly creative and sensitive, situational unique, and contextually self-defined, ideally leading to a synergism of the created artefact with its environment." (Winschiers-Theophilus, 2009a).

Creativity and familiarity

Being designers and developers we share the desire and ability to create. The artefacts we craft feature our own experience, technical and artistic skills, intended purpose, perception and representation of the design context, the environment and participants' input. Creativity, although often attributed to an individual, has been shown to be a socio-cultural activity resulting within relationships (Amabile, 1998 as cited in (Bratteteig &Wagner, 2010)).

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Continuous interactions between the designers, their creations, and their informing and receiving environment lead to alignment and harmonisation over time. In other words, the feedback designers receive within their design space be it from humans or the environment -influences the artefact. Design having been institutionalised in the western world draws on a huge pool of experience and established principles. Co-designing in an environment, which designers and stakeholders are equally familiar with, permits to rely on tacit conventions of choices and methods because of a common habitus (Adams, 2006) and indexicality. However, pointed out in the literature (Puri et. al. 2004, Walker et. al. 2008, Bidwell et. al. 2011) and as will be evident through our story here, this common conceptual platform does not persist when the designers move outside of that sphere.

Prologue

Our meta-metaphorical protagonist starts out our story in a typical Western country. He has just been approached in his entity of being a designer and 3D artist that he might join a project in Southern Africa to work on a system for conserving indigenous knowledge (IK). In fact you could say, that he is very much like a lot of Western-schooled designers who one day might find themselves in a situation where they have to engage in a design process of a new artefact appropriated to a radically different culture and environment. Armed with his trusty toolbox of skills and design methods he approaches the task with confidence and excitement.

This is the story about the paradigm shifts of thinking that this designer had to go through to see the need to see the rural village through the eyes of the local community. It is also about how the anticipated end-product turned out to be a pivotal instrument for communication across cultural barriers; and ultimately how it significantly enhanced participation within the community design project. The whole story traverses through a series of prototypes and participatory design (PD) sessions over the period of one year. But before we delve further into that, we must first set the stage...

The stage

This paper is a reflective discussion of observations and experiences from a longitudinal co-design process with a local community in rural Namibia. The overall project aim is to develop an IK management system, where the rural elders can re-present their knowledge digitally in a way that they consider to be meaningful as a tool to transfer local practices and stories to the urban youth. We currently pursue a 3D representation of the village in which video recorded IK can be re-contextualised virtually. The paper presents an amalgamation of

perspectives, to infuse new thoughts into an established field of PD, without explicitly contrasting it with mainstream theories. We discuss a number of key concepts with regards to cross-cultural participatory design processes that are not prominent in the literature. Throughout the paper we will draw examples from the transformative journey of the first author, a "young Western-trained designer" set out to create a 3D visualization to facilitate the transfer of IK between elders and Namibian urban youth. These personal accounts and reflections hereof have been italicised throughout the text. Towards realizing these concepts it is elaborated how it affected our involvement in the village; specifically how the 3D visualization itself became a medium of communication in participatory design across culture and language. From this account we also wish to raise awareness of potentially troublesome issues and propose a range of questions which every designer committing to work with cultures and communities in Southern Africa should ask themselves.

Embracing an African viewpoint

... with a vision of the world from 'somewhere', thus fully equipped with a partial perspective (Suchman, 2002) our designer attempts to represent a local view assuming that everybody "sees the same", only to discover that the standpoint matters ...

At the frontier of knowledge

Technology design intrinsically perpetuates the designers situated knowledge through the dominance of designers and their choice of modelling and communication (see Figure 1). The spheres of influence of participants in the design process literally colours the outcome, as depicted in the integrated cultural flow diagram (Winschiers-Theophilus, 2009a).

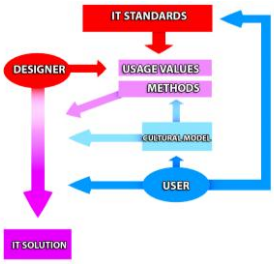

Figure 1 – Integrated cultural model

We have to acknowledge that only if the users gain sufficient authority to determine the research and design agenda can we talk of a truly participatory design (Winschiers-Theophilus, 2009b). As long as we continue to frame design from a Western perspective we can possibly not do justice to neither IK representation nor to their holders (Bidwell et al. 2010, Christopher et al. 2008). Cochran et al. (2008) point out the importance of considering indigenous communities ways of knowing in the development of methods: "Researchers working with indigenous communities must continue to resolve conflict between the values of the academic setting and those of the community." We therefore attempt to exploit the designers' ingenuity within a local epistemology.

The Afro-centric perspective

Sensitivity to epistemologies located in Southern Africa involves appreciating that worldviews and practices in rural communities are situated within the philosophy of 'Ubuntu, where "a person is a person through other people." (Bidwell, 2010). The emphasis lies on a deeply rooted consciousness of a connectedness of all implying a holistic approach. Based on these fundamentals, an intellectual movement led by Asante (Asante, 1988), promotes an Afrocentric paradigm with major consequences for research and design methods. Mkabela (2005), an African scholar, claims that the success of an African centric research project depends on a holistic relationship between researchers and community members. This goes beyond the mere design interactions but establishes multiple bonds, accountabilities and interdependencies: "The Afro centric method suggests cultural and social immersion as opposed to scientific distance as the best approach to understand African phenomena. Such a mode of consciousness addresses a fundamental reordering of our understanding of the relationship between self and other and indeed between self and the world, in a manner where such an ordering not only includes connectedness, but necessitates letting go of the focus on self (Heshusius, 1994)."(Mkabela, 2005) Described as 'being participated' by Winschiers-Theophilus et al. (2010) we acknowledge the facets of interconnectedness of all and do not attempt to 'objectify' the design but rather endeavour to embrace all view points within the interactions and the design. Mkabela points out that only holistic relationships between designers and community members promotes feelings of local ownership that motivates community members "to invest time and energy, to help shape the nature and quality of the research process as opposed to being merely involved in research" (Mkabela, 2005). Community based design in Africa means recognising connectedness of all, and holistic approach, and total immersion of the designer into the community. Yet it must also be remembered that even Southern Africa in its whole is a very mixed landscape of cultures spanning from rural local to urban international.

Design community in action

...he felt he had entered an on-going process with long standing interactions and relationships with the local design community. How would he find his role...?

Since 2008, we have maintained research collaboration with a rural community in East Namibia, which involved regular research visits to the village. The focus has always been on ensuring a truly participatory approach as negotiated within the context. Valuable lessons have been learned through this time and manifested in our participatory design methods (Winschiers-Theophilus, 2010). Thus a premise to any further interactions within the project is the acknowledgement of the community's conceptualisation of the world including our own role and position as part of an integrated design community. We have learned from a community with long traditions of participatory techniques to "be participated" rather than facilitating the process (Winschiers-Theophilus et. al. 2010). As the rural dwellers become increasingly familiar with technologies they are becoming co-designers and co-researchers rather than subjects of investigations or solely

evaluators of prototypes. With this shift in roles and responsibilities we experience challenges reflected in the terminology, such as distinguishing the researchers originating from the village from the external ones. If we proceed to use the terms "designers" versus "community members" or "participants" we continuously replicate the common image and power relations. Thus for the purpose of these discussions we will refer to "local designers" as active collaborators originating from the village as opposed to "external designers".

Among the local designers, four elders from the village have been particularly committed to the project and have been active players in most encounters over the years. They have expressed at multiple occasions their gratefulness for being part of the project and being able to spread their IK while at the same time becoming technology literate. Participation of other community members has often been depending on their availability at the time of our visits. One of our fellow researchers originating from the village has been our host and facilitator for the duration of the project. In the following we will refer to him as host facilitator. Over the years a number of external researchers and designers have joined or accompanied the project and thereby influenced the direction of the research and design in their own way. At the frontier, established conventions are questioned afresh and shared procedures have to be negotiated continuously. While they bring a supplementary perspective and new design ideas, they also have to assimilate the local design space with its immanent characteristics, principles and customs.

The design space: Erindi-roukambe[1]

Erindi-roukambe is a small village located in the Kalahari Desert in the East of Namibia. At first sight, we observe that the people in the village, have evident colonial adaptations from Victorian times, such as the clothes, but yet they remain tightly bound to indigenous traditions. E.g. the women wear Victorian inspired dresses, but also headwear symbolizing cow horns (see Figure 2).

Figure 2 - Traditional headwear and Victorian inspired dress.

Cattle are a sign of wealth and constitute the primary necessity for food and income. The village consists of about 20 homesteads with smaller houses where the majority are made of metal sheets and cow dung (see Figure 3). These houses provide a well-tempered space for up to 10 family members and burning cooking fires are found outside each house. The homesteads are all distantly scattered around a diesel driven pump, which supplies people and livestock with water and serves as the gathering point for the village males and their cattle. Thick acacias grow within and outside of the village, providing a place of shade from the burning sun.

This village, like the vast majority of geographically remote communities in Namibia, is not in close proximity of formal educational institutes, medical infrastructures, and other services reserved for the urban dwellers. The communities function as small semi-self-sustaining eco-systems with a strong tradition of living of and with the nature surrounding them. For centuries the mode of teaching and learning in Southern African rural areas has been facilitated through in-situ oral knowledge sharing and practical learning by actively being part of chores, hard labour and rituals in the local communities. Mediated by village elders sitting around the fire, the youths have attentively listened to these wise men without speaking up unless asked to. This, to the communities, valuable knowledge, gained and assimilated in groups through many decades, is a foundation for the coming generations' survival, values and cultural identity not only limited to historic reflections and tales of the past, but to prepare the youth for challenges and difficulties in their respective future.

Figure 3 - village houses.

Nowadays, as in many other rising nations, youths are, unlike in the past, going to schools following a modern and global curriculum. This means, that they leave their villages to travel far away to live and study in larger cities. While assimilating algebra and gaining textual and digital literacy for a modern and internationalized society, the life continues in the villages where the youths miss out on IK. The knowledge paradox is evident, and with a lack of local knowledge and experience, it is interrupting centuries of sustainable and holistic living. In Namibia, a majority of urban migrants return to their villages in the rural areas, regularly on short visits and permanently after many years of living in the cities. However as the generation of village elders is diminishing, IK is slowly disappearing, as it has not been maintained outside of the interactive spheres created by the knowledgeable elders.

... it was evident to the designer that the main driver of this design process had to be the recording and maintenance of this body of knowledge, and that somehow a suitable artefact had to be created...

The design artefact

Conceptual considerations

In order to preserve and convey IK between community groups separated by age and location, this research project aims to develop an IK management system, which villagers (especially elders) can use intuitively to manage IK digitally. A major concern and design challenge is the fundamental difference between the African IK systems and the western knowledge system governing designers

[1] Means "Horse Pan" in Otjiherero. It received its name due to a large quantity of wild horses in the area

and technology. Subsequently, it is important to investigate under what conditions this corpus of knowledge can be mediated and represented for city living youths with a minimal loss of IK content and meaning. Previous work in the project has shown the inadequacy of text-based interfaces to facilitate knowledge management. Based on ethnographical field observations and reflections a number of design options, including speech output, picture-based input and tangible prototypes were explored (Kapuire & Blake, 2011).While having succeeded in partially mapping local communication practices, the challenge of organising multiple video and audio recordings of IK in a locally sensible manner remained unresolved.

*...Enter our young designer and his 3D visualization skills: Having recently completed a visualization project on teaching European children about African ecology (*Rodil et al. 2011c*). In his mind this spatial organising of audio-visual content begged for a rich and immersive visualization - something with high realism where everybody can recognize places and objects in the village...*

Re-Contextualising Indigenous Knowledge in 3D

In late 2010, we adopted a concept to turn the village into a simulated 3D model in which local video recordings were embedded. Though the indigenous communities' ways of sharing knowledge mainly is through oral traditions, we decided for an interface to organise the many videos spatially, based on prior work (Bidwell et. al. 2010). The original motive was to investigate whether the prototype could serve as a shared platform for knowledge transfer between elders and youths, urban and rural, as well as bridge technological and conceptual gaps. The main IK, which youths should assimilate through personal interaction in the local environment, was now in form of videos recorded of and by village elders, where they explain and share knowledge about herb lore, husbandry etc. The initial concept was oriented around creating a part of the actual village as a virtual 3D village with homesteads, burning fires, swaying trees and people. We explored the possibilities embodied in creating a virtual village like sharing details about the location and environment where the IK was collected as multimedia. Essentially, the visualization approach allows the possibility to create context for content. We believe that the place and environment around the filmed IK has a great importance for a nuanced understanding and assimilation of the knowledge embodied in the clips, thus it was decided to recreate the scenarios around the video clips with 3D graphics.

Figure 4 depicts a running IK video being spawned as a floating 2D plane with sound. The ambition is not to visualize IK per se but to provide a meaningful interpretation enhanced through meta-data by visualizing place, people and actions in scenarios.

Figure 4 - instantiated 2D plane with IK video showing how to slaughter a goat.

VISUALISATION TO ENHANCE PARTICIPATION ACROSS CULTURES

A 'Random Walk' design process[2]

Considering the overall design process we have substantially deviated from a standard progression of prototypes evolving towards a final product. The process is neither evolutionary nor iterative but what we describe as unpredictable 'zigzag' with the idea of going to the far end and then steps all the way back opening up the issues and then back covering them and jumping to the next high end. Coherency was upheld as the results of a session would always inform and determine the nature and content of the next session. In this case we started with a high-fidelity prototype [3D village simulation] in December 2010 as designed by the externals and introduced it to the internals. In this session we realised that basic assumptions regarding recognition and representation in 3D were wrong and needed further investigations. Hence, in the following session in August 2011, we literally went back to the drawing board with the community members to guide further design decisions and determine focal points, complemented by a slight adaptation of the first high fidelity prototype [Camera adapted] and its evaluation (Jensen et al. 2012). We then constructed an experimental system [House Recognition] in November 2011 to verify our interpretation of drawing board observations and collected data followed by a second high-fidelity prototype [3D Homestead Creator] in December 2011.In the following section we elaborate on the method of interaction, outcomes, purpose and the value of the interactions in regard to cross-cultural participation.

High-fidelity prototype [3D village simulation]

...He had worked on the first version of the prototype without ever setting foot in the village. Pictures and descriptions from other researchers had been his only eyes. Now it was time to go to Africa and take the prototype out in the bush to evaluate it with the locals...

Two years into the project, having had numerous technology probes and participatory sessions we introduced the high-fidelity 3D visualisation prototype to the community as a design idea to classify IK. The demonstration and discussion session around this prototype provided unexpected and very interesting results on several levels (Rodil et al. 2011a, Rodil et al. 2011b).

For the first time community members thoroughly criticised the technology demonstrated and had specific

[2] A mathematical term covering a process, which is unpredictable. Used here to reflect a nonlinear design process.

design ideas on how to change and improve. The elders discussed at a very detailed level for example one of the virtual models of trees placed inside the kraal (enclosure), which they found to be too crooked and underlined it with, that no wild trees grow inside the kraal. This implicitly demonstrated the focus of attention and the differences in priorities and observations between the community members and the external designer. While the latter has not attempted to differentiate trees, he instead focused on creating man-made objects, people and animals. Thus the discussion around the 3D visualisation illuminated the perspectives and focus of attention of the community versus the designer. Another faux pas by the designer, which yet triggered a new discussion, were the errors in the scenario design. The elders pointed out, when discussing the branding of cows scenario, that the people were not branding the cows, hence they were positioned like if they were milking the cows. This indicated their eye for detail, and it also illuminated our flaws in portraying an important part of their local customs and failure in representing their world view. We just had to realise that "They do not see what we see and how we see", which has major consequences for the success of the system in terms of representation and recognition.

Although the prototype was designed for high recognition rates with a focus on graphical resemblance of objects in the village and their geospatial positioning, the villagers did not immediately relate the representation to their own environment. Shuttered by this observation we asked ourselves a number of fundamental questions, such as: In which way does the villagers' perception of the world influence their recognition of representations? This further led to a decision to investigate what should be represented and how to ensure recognition.

...having spent countless hours meticulously re-creating the parts village in 3D, it somehow hurt to discover that they did not "see" it in the same way he did...

Back to the drawing board

Drawing Sessions

We conducted individual "think-aloud" drawing sessions with a number of village elders and youths. They were asked to draw various objects from their local environment. Specifically, we asked them to draw common animals as well as their own homesteads from two different points of view. We emphasized the free nature of the exercise and that we would not give attention to drawing experience and skill. They were told to draw as they remembered from memory and imagination.

The drawing process and dialogue during the drawing sessions provided valuable insights into differences in perspectives. It induced discussions on objects of importance to their homesteads, the placement and arrangement in relation to each other and the view point.

One could question the validity of such sessions considering the low exposure of participants to drawing exercises in the absence of paper and pens in the village, but at no point were drawing skills evaluated. Equally the power of visual expression within an oral focused society has been reconfirmed in the drawings. Thus we argue that as a medium of communication between the internals and externals not sharing the same language, visualisation broke the barriers and necessity to communicate through intermediates and translations, which is more prone to misinterpretations and misrepresentations.

'Pictionary;Session

In order to further explore representations and recognition of concepts common to a group we adapted the well-known 'Pictionary' game to the circumstances. In this setup we chose a list of words extracted from previously recorded stories told in the village. Then we assembled first a group of elders, later youths, asked for a volunteer among them to draw. The drawing person was told one word which (s)he then started drawing on a big A2 sheet until any of the surrounding people would guess it. All participants apparently enjoyed the session, even though some elders first felt a bit uneasy when drawing. In terms of representation we could see some overlaps between the two groups. In terms of recognition groups struggled with by us considered easily representable objects, such as "arm" while both groups easily guessed terms such as "story telling" which both groups similarly represented with a fire and people around or "mourning" (church, people, coffin). The purpose of the 'Pictionary' session was to inform further prototype designs for interface objects and scenarios, especially. The visual game attracted and kept the villagers engaged for much longer time then previous design sessions. And although we were only observers we extracted valuable design directions. Figure 5 depicts the design-through-drawing sessions.

Figure 5 - Left: girl drawing in Pictionary, Centre: Homestead drawn in the individual drawing sessions, Right: Elders playing Pictionary.

...he thought it would all make sense if they just saw it in the right perspective...

Camera adapted prototype evaluation

In an attempt to verify much criticised camera perspectives in the first prototype, the second version was now changed to allow changing the camera perspective. We discussed back and forth with the elders on how things change based on perspective, and the discussions were underpinned with live switching between different cameras in the visualization. This served as being important for concretizing the changing elevation of a virtual camera in a virtual world. We also reassumed our dialogue around fidelity and detail, and the answers from the year before were reflected while showing the prototype. The overarching results showed that they preferred a first person view due to the ability to move close to objects and watch them, but yet they also shared

our idea about better spatial overview through an elevated camera perspective (Jensen et al. 2012). The previous results about detail and colour on e.g. cows were confirmed and nuanced. Thus the session with the adapted hi-fi prototype facilitated the clarification on previously observed and discussed differences of world views and focus of attention, thereby co-constructing a new representation of the world. Figure 6 is showing the dialogue around a car battery powered prototype.

Figure 6 - the picture shows village elders and facilitators discussing camera perspectives in the prototype.

House recognition application

The focus of this session was to establish the recognition rate of matching 3D visualisations with different camera angles and colours to a photo. We developed an application in Android running on a Motorola Xoom Tablet. The physical environment with sun, sand and low battery life made the change from a laptop appealing, but also the fact that the vast majority of users are not textually literate does not fit well with an interaction device, which consists of 50% of the space occupied by 'useless' buttons. The tablet solution features beside higher battery power and a closed shell, a much more frictionless and less intimidating interface – if designed appropriately. The prototype featured a range of 3D models of houses which were modelled and textured based on image references captured from the previous excursion. The virtual objects were created by one of the designers with the focus on having realistic texture properties while being low-polygonal to minimize use of processing power.

The interface attempted to be as intuitive as possible, avoiding ambiguous icons of Western traits such as arrows etc. It was structured as large coloured boxes with images of the individual houses overlaid (see Figure 7). The prototype has close relations to a Western game, where you match images as pairs. Here the users were pairing pictures of real houses with virtual houses, by tapping onto the house of choice. For the first time, we opted to do the technology probe sessions individually, as we wanted to explore the interaction with the device at the same time as obtaining statistical data on the recognition rates.

Figure 7- GUI in tablet prototype about viewing perspective and recognition of virtual houses.

All participants could interact with the tablet after few minutes of demonstration. The vast majority of participants appreciated the surprisingly fun and 'easy' tablet, and stated several times that they did not find it as hard as they thought. An older woman said to us:" If this is how to use computers, then I have no problems" (she has never used a computer before). This is a strong indicator/appeal to keep investigating the tablet as a device to develop for. In order for us to share our vision and develop it together, we need some kind of common ground. If we introduce a piece of software, which restricts creativity and dialogue due to its nature, we might miss a great opportunity.

And once more we could confirm the overly eager participation of the villagers and the lively discussion on the 3D representation. In terms of recognising the owners of the houses, we realised that not everybody remembers everybody else's house, even though the village seems very small to us.

3D Homestead Creator

A new prototype (Homestead Creator) was developed as a direct product from design ideas out of the previously described sessions. We wanted to investigate the importance of perspective, importance of detail, type, colour and placement of objects. The overarching intention with the prototype was to create a medium for the villagers to design scenarios for the recorded IK without us being present. To transfer this idea, we chose to add to the drawing exercises and ask them to design their own homesteads with the limited array of objects available (see Figure 8). Thus the elders could choose objects, such as houses, trees, animals, fences and pots and place as they liked on the plane to reconstruct their own homestead.

Figure 8 - the animal models available in the Homestead Creator

The application facilitated a dialogue in which deeply conceptual misperceptions were illuminated. For example, the dumping well (as seen on Figure 9) was implemented as an interface metaphor to delete, instead of the commonly used dustbin symbol. Then previously placed objects could be dragged into the dumping well if they were supposed to be deleted. It was designed from being inspired by Heukelman's work on cultural icons (Heukelman & Obono, 2009) and the way garbage is disposed at the homestead of the local researcher.

The village elders reacted with some repulsion to the idea of "throwing away a house, or a chair" or anything, for that matter, which could be "reused. They said they would rather rebuild the object or dissemble and repurpose its pieces to construct something else, but they would never ever want to delete it. And, indeed, when we observed community practices we noticed that they did not throw away "broken" or unusable objects but keep

them somewhere to re-use later for a different purpose. Thus, a more adequate implementation might be a site for storing for removed objects that villagers could pick through later for whatever alternative use.

Figure 9 - a spatial overview of the being-created virtual homestead

After the formal discussions ended, the elders continued designing their homesteads in smaller groups or on individual basis - something we did not expect. At one point one of the elders and one of the young boys were co-designing the Elder's house (see Figure 10), and the connectedness around the system was obvious. This illuminates our important role -of only facilitating the process of knowledge transfer and creating artefacts, which bridges the gap between elders and youths.

Figure 10 – Left: elder and youth are co-designing. Right: 3 elders are co-designing.

Visualisation for co-creating meaning

The introduction of 3D visualisation and drawing as a communication across cultures and language barriers has proven to be enhancing participation. Elders and youth have shown great interest in the project and technology.

We believe that through the introduction of the visualisation we can identify community priorities within a dialogue. More importantly, fundamental conceptual issues appeared and initiated a discussion which would not have occurred without the visualisation as a trigger. It was also evident that going through a series of (dis)proofs of concept not only embodied the opportunity to concretize the dialogue about something abstract, but as previous example illustrates also influenced our design thinking, and nuanced our understanding on the environment we wish to design for and with the people inhabiting it.

What matters? And to who?

An important pillar of continuing the research with visualizations is to ensure and critique fidelity and detail of the graphics. Through dialogues around something specific (prototypes), a bigger picture is forming, and when receiving critique on visual parameters such as size of tails of the virtual animals (Rodil et al., 2011b) it is evident that the villagers not only perceive it as designed, but also share their much deeper knowledge on these, to us, seemingly insignificant parameters. Thus in this project the prototype has become the tool of facilitating participation enhancement and at the same time a joint meaning making across cultures.

Designer's adaptation to facilitation

Over the years we have experimented with a number of different ways of facilitating interactions in regard to bridging language barriers, communication habits and defined roles within the conversations. Most dialogues were facilitated by the host researcher in the local language, who was briefed by the external researchers on the purpose and expectations. A translation of the recorded interactions would then be available to the external designers a few days later.

Loss of control

The first prototype was evaluated on youths and elders (see Figure 11), and from a dominant role in the development, we had full control. When the actual evaluations with the community were conducted, our roles changed completely. We are used to conduct our own experiments and discussions around prototypes, but to facilitate the in situ sessions, we found it crucial to engage a local as host researcher, who is skilled in semi-structured interviews, local language and being from the community he has a place in the hierarchy, to lead the discussions around the virtual village prototype. We were instructed not to interfere while discussing with the elders and our roles were suddenly reduced to holding cameras.

We feel confident with this approach since translating from Otjiherero to English and vice versa might be a bias to our results and the fact that we had no experience interacting with these complicated group hierarchies and customs, made the approach the only proper solution for sharing the design with the community.

Figure 11 - Village elders, women and 'walkers' discuss the 1st. 3D visualisation prototype

Another local researcher translated bits and pieces, which allowed a small insight into how the elders responded, but the full picture was first available a couple of days later after an impartial translator translated the videos from the discussions.

...the whole setup left the designer with quite a strange emotion of losing control and not knowing how the prototype was perceived, yet he had to trust his local collaborators' skills in reflecting his vision in a new domain...

Back in charge

We then tried a new approach, were the designers were the facilitators, but with translation help from the host researcher. One of the reasons was the previous experience where we were out of the loop, not able to

evaluate our own design, and dig deeper into the design flaws allowing more detailed feedback.

Thus in the second session the designer took full charge by continuously prompting the evaluators with direct questions such as "*What can you see?*" and "*Is this a cow?*". Answers were immediately translated for the designer to react accordingly. This approach can be an effective method if we want specific detailed feedback on design objects but is a very inconvenient method to receive the "unexpected". Occasionally the host researcher took initiative and discussed intensely with the two groups (elders and youths), and used his intuition and strong cultural knowledge to pursue answers we did not think of. E.g. like the colours of the cows. This combination made it possible for us as designers to actually meet the people, whom we were designing for in a context discussing the system. The results from the first prototype made us uneasy about the actual answers, but during the second run it was evident that we got very interesting and honest feedback.

...sometimes their replies and comments made the whole group laugh, and he had to put aside his pride when they remarked on badly animated cows without the full diversity of colours that Herero cows have...

This kind of feedback is vital to receive for the continuous shaping of the system, but also for the designers, who had different priorities in the development and most importantly to acknowledge and incorporate the elder's expertise. It was also the first time we as designers had the chance to explain and get input on what we were trying to create.The group sessions were promising in providing results, but on the other hand it was difficult to get a clear picture, hence some of the individuals shared more than others, and consensus was quickly formed. Usually it is positive to have agreeing users, but this way of sharing ideas and critique with people sitting a bit away from the prototype in a community, where some votes counts more than others, made us a bit uneasy about the actual response. Not that the way of doing it is incorrect, we tried following customs, but the lack of personal opinion and detailed responses made it difficult to generalize the findings.

Empowering community members to lead and facilitate design dialogue

To evaluate the prototype (House Recognition) we decided to meet the people at the community pump, and from that spot begin to evaluate the tablet. We quickly found a couple of interested males, but our evaluation was suddenly at a halt, when our host researcher told us he had to leave and that he would introduce us to someone who could speak English. Our intrinsic attitudes were clearly annoyance and a feeling of being let down after having pulled a lot of work in the development. The day ended up by being very interesting for our research, and our interaction with the community, but it also made us rethink how we can and should facilitate in the community. By chance, we met Julius at the water pump. He is a permanent resident in the village at the age of 26 and after a short introduction he immediately agreed on helping us investigate the prototype with the villagers. Having no language skills in Otjiherero nor did we feel confident enough to walk around the bush to people's homesteads alone, thus it proved highly important for us to meet this friendly young man. Julius has only received limited schooling, hence we initiated a smaller dialogue on 'how' to facilitate and avoid misleading (and leading) questions. Quickly another problem arose from the dialogue. How are we able to record the discussions, and even more importantly, how are we going to understand the flow, the questions and the pointers made by the villagers, without a shared language? We suddenly feared the risk of yet again being back to the setup one year before, where the flow of information from facilitator to developer was disconnected for several days.

Julius opted for asking a couple of his friends for help, thus we met Mervin and Benjamin and our team grew from 3 to 6. The three young men were briefed under an acacia in the roles of interviewing semi-structurally, how to take relevant notes and to control the setup. E.g. we discussed the importance of testing individuals not being helped by bystanders and that nothing was right or wrong, and that we were very interested in our developmental missteps. From the initiating discussion, when we had smaller breaks or walked in the bush it was (and still is) very important for us to explain the aims and scope of what we are doing to all involved. Not only from an including way of sharing the vision and conducting field studies, but simply because it is a great opportunity to receive feedback.

In the beginning the three young men reluctantly initiated interaction with relatives and people from the village, but after only a handful of sessions with a high frequency of adjusting questions and discussing procedure, we were once again out of the loop. This new approach to discussing design between two parties where the whole setup was completely new to both of them- was highly interesting on various points. E.g. the new facilitators could ease the whole setup with one comment, due to their shared Habitus and humour with the village people (see Figure 12). We, as developers have especially in unfamiliar field test setups, a tendency to stick to the script and scrutinize our field notes with instructions meticulously shaped from our offices –focusing on results.

Figure 12 - Local facilitators discussing the prototype with some of the women in the village.

Here was an example of a natural flowing discussion, and the intuition to lead it was originating in the very same environment. After every session the three facilitators briefed us about their discussions and findings, enabling us to tap into the information flow, while maintaining a

role as cameraman or an extra note writer.

Local versus own protocol

The local community being relatively small and isolated is making our presence the more visible and might have a long term impact, which might either be considered disruptive or beneficial for the community. As designers we have a local accountability and are fully responsible for our actions within the encounters (Suchman, 2002). However at times we find ourselves in what we call a respect paradox. Arguments could be made, that as externals to the community and negotiating terms we are disrespecting the local culture. We however argue that when we are aligning with local protocols which significantly conflict with our own expectations and feeling of righteousness, we are equally disrespecting the people. As Mkabala (Mkabala, 2005) pointed out that "if the research process is to be truly collaborative, conflict is inherent and to be expected in the process, where the researcher and the researched are equal partners and come from different backgrounds. Accordingly, as conflict will arise, there is a need for dispute resolution mechanisms to resolve these conflicts in a fair and equitable way." An important question in participatory design is which protocol to follow in case of conflicting opinions. While such conflicts occur in almost any cross-cultural interaction, they can become very prominent when collective decisions are deeply rooted in basic human feelings such as fairness, justice and decency. Here we draw an example regarding participant payment. Seemingly small things, such as *who* gets to pay the participants can trigger these conflicts. Having spent a full day conducting the experiments with Julius, the young Western designer felt a strong bond and attachment to Julius and what he had done for us. The gesture of paying Julius personally, signified in his mind a meaningful way of saying thanks. However, all payments to participants had throughout the project been handled by the local facilitator, as this was deemed the most appropriate. Furthermore, the local facilitator disagreed on paying Julius more that day (around double). In retrospect, the local researcher's attachment and place in the hierarchy is likely to at least unconsciously have affected his view on this, besides the consideration of the position of Julius in relation to the participating elders and their payment. In our project team there has been tensions and various opinions regarding how to compensate community members monetarily for their participation. While the topic had surfaced during previous field trips, the new situation of a participant morphing into the role of facilitator and spending significantly more time and effort on it warranted, in the authors' belief systems, an increased reward. Moreover the new bond between the designer and Julius introduced an emotional and personal dimension. In the end we negotiated balancing between a Western calculation of participant-payment, based on time taken and type of tasks involved, and a more locally situated protocol which accounts for local authority and a more holistic or general attachment to the entire project rather than a specific activity.

As we continue with the project a number of unresolved conflicts surface. E.g. in the particular case of Julius transforming into the facilitator, it essentially turns the knowledge and power structure upside down; positioning him in the role of the knowledge-holder and protagonist within a community where the distinction between elder and youth prevails, and Julius being considered part of the youth. Local power structures and the workload distribution puts the women in the homesteads, and it was not until late in the process, and with Julius as the facilitator, that we have been able to engage with women. This opens the entire discussion on the relation of gender, power and knowledge in IT design further entangled in the conflicts with local protocols.

OPEN DISCUSSION

...having since returned to his home country after a prolonged stay in Southern Africa, the designer's journey has in many ways come full circle. He felt he had truly explored new territories, and in the end it was a leap of mind and seeing things through the eyes of others...

While we have used the designer metaphorically and as a projection of the mind-set of what we argue is typical of Western designers, in reality he is representative of all designers. No matter how experienced and embedded into cross-cultural participation and community-centred design one designer can be, the paradigm shifts in thinking, continuous negotiations of protocols and transformations of roles in both the design space and the design process are ubiquitous. Sometimes they manifest themselves as paradoxes leading to conflicts. There are no answers, procedures or mechanisms for controlling this. We, as designers, can only be mindful of these issues, incessantly reflect upon their implications and challenge our own position and role in a given process. We hardly believe that the topics and problems covered in this paper are unique to our project. They depict the (often unspoken) realities of establishing and managing participatory design projects in unfamiliar contexts and cultures. Our main aim was to shed light on these aspects, share our experiences and trigger further reflection on questions which re-occur continuously:

1. How can we establish and maintain a common language of community participation?
2. How can we ensure sensitivity towards local knowledge and foster indigenous design frameworks?
3. How can we ensure we do not 'overlook' important aspects of a culture and worldview that we as designers are not familiar with?
4. How will our presence and actions influence the local power structures and social norms. In other words which changes do we induce beside the explicitly intended ones?
5. What is our long term strategy for developing rapport with the community?
6. How can we gradually evolve and continuously negotiate terms, roles and influence of the participants?
7. How can we avoid the risk of false promises while still engaging the interest of the community?

...as he finally realized that it was all a big melting pot:

Where designer, the artefact and the space melt together within the design process, where the object of design becomes the tool for participation and where the designer becomes a part of the community and the community becomes designers.

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