# The Challenges of Participatory Design in an Intercultural Context: Designing for Usability in Namibia

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**ABSTRACT**
The need for participation in development projects has been recognised broadly. Thus a great number of successful participatory design practices and principles have evolved mainly in the northern hemisphere. However still too many project initiatives in developing countries collapse although participatory techniques were used. Crossing disciplinary or cultural boundaries implies that one should reconsider established assumptions, concepts and habits that were taken for granted. Thus as much as designed products have to be evaluated in the local context so do design methods, techniques and tools. This paper therefore explores the cultural margins of Information Technology design and the challenges of expanding the boundaries across cultures. A theoretical framework supported by a Namibian case study foster the necessity of an acculturated design in context if striving to develop usable Information Systems.

**Author Keywords**
Usability, cross-cultural design, sustainable development, cultural appropriation.

**ACM Classification Keywords**
D.2.9 [Software Engineering]: Management: Software process models; H.5.2 [Information Interfaces and Presentation]: User Interfaces – *Evaluation/methodology, User-centred design*;

## INTRODUCTION

Worldwide researchers and practitioners have recognized that good systems can not be built by software developers with only limited input from the users [16] and insufficient knowledge about the context [10]. However the understanding and implementation of participation in ICT projects in developing countries does not always seem to be obvious

Misinterpretation of participatory development can be exemplified by the following extract of a consultant report on the development of an Education Management System in Namibia [15]:

"One of the goals of the Ministry was the 'democratic participation' of everybody involved in education, and this implied that the stakeholders had to be *informed…..not asking* the users about their information needs was the correct method". The author explains that previous direct enquires by consultants did not lead to expected outcome so further user involvement was considered dispensable and replaced with a document analysis.

Furthermore a recent investigation in software development practices in Namibia shows that local developers claim to use methodologies, which involves users and guarantees frequent communication with them. While at the same time developers report about inadequate client participation in the development process, manifested in lack of interest from the user side, lack of communication, and unavailability of the client [14].

Puri et. Al [12] argues that participatory design and the implementation of ICT in developing countries bring in new challenges to fostering and nurturing participation. Participatory design as well as ICT development itself has evolved in western societies. However their practicability has not been proven in the African context. Being aware of the mutual dependency of culture and ICT development opens new horizons for the appropriation of ICT design in developing countries.

## THE CULTURE OF SYSTEM DESIGN

Areas of cultural conflicts identified by cross-cultural psychologists such as values, perceptions and perspectives, and communication codes play an important role in participatory interventions.

### The Intrinsic Values of Information Technology Concepts and Methods

Information Technology mirrors the culture and worldviews of its creators. Luis Hestres [5] explicated evidences of American culture, characterized by individuality, low-context communications, competition and cooperation, business, tight time management, and high work ethic within the features (functionality and interface) of Microsoft Outlook. ICT Concepts and methods itself are defined in relation to the underlying societal value system

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thus impart those values to the product. For example Human Computer Interaction, which is concerned with usability evaluation, is rooted in the modernist or enlightenment tradition which values rationalism, information and efficiency over pleasure, collaboration, creation and community [9]. Thus usability is described in characteristics such as time to learn, speed of performance, rate of user errors, retention over time and subjective satisfaction [13]. Industry-recognized methods for evaluating a system's usability (such as GOMS) tend to focus solely on efficient and accurate performance [1]. Standard usability evaluation therefore encompasses a twofold bias. Firstly through the definition of usability according to western standards and secondly through methods which aim to test an already biased objective [18]. The understanding of non-functional requirements and quality criteria, such as usability, are never negotiated within the design context but rather taken for granted; - although being in contradiction with for example African values of community, experience and timelessness-.

### Perceptions and Pperspectives

Furthermore problematic is the role of the developer being the facilitator or change agent simultaneously, as experienced in critical design ethnography or participatory action research. No developer can ever completely escape their own culturally influenced identity and be totally objective in understanding and modeling the stakeholders' reality. Floyd [3] reasons that modeling uses de-contextualization followed by embedding as re-contextualization. For a specific purpose, important is divided from non-important (abstraction), the important operational represented (modeled), and the model implemented. The result of modeling represents a subjective artificial world, which is dependent on the judgment of the modeler of what is perceived to be important. According to findings in developmental psychology, the maturing of individual perception systems requires cultural contexts. Perception may be seen as an active interpretation process [8]. Thus software designers recreate reality according to their background, experiences, knowledge, interests, intentions and emotional interrelations with reality [17]. Moreover can developers hold on to a monopoly on conceptual models and symbolic representations, were the perspective of the user is swallowed by the developer's [2]. Thus although developers seemingly involve users, they unwittingly overwrite design decisions.

### Implicit Communication Codes

An approximation of common reality may be obtained through merging the various viewpoints of stakeholders involved. However, the formation of viewpoints as a cross-cultural judgment faces inherent difficulties, which are attempted to be resolved by means of communication. In the field of software engineering multiple methods have been formulated to facilitate communication between stakeholders and developers. Yet as they are all based on western communication codes their validity in a multicultural context has not been established. Among others differences in the organization of discourses and expression of intention have to be considered in the selection of means of communication. For example, software engineering textbooks say: "use prototyping as requirement engineering method if the requirements are not clearly understood". However in the Namibian context, a historically based, oppressive colonial system, with an authoritarian and hierarchical social order contributing a great deal to a submissive uncritical attitude; presented with a prototype to clarify requirements Namibian stakeholders mostly acknowledge the prototype as designed by the developer team. Successful methods in oppressive situations, like future workshops equally fail. The phases of Future Workshops are organised according to a western discourse structure with criticism of the current situation followed by future visions and ending with means of implementation. In an African context, where development is more pragmatic the workshop structure should be: inventory rather than criticism; usage of existing items rather than future visions which seems utopian for people dealing with solving daily problems. [17]

It is then pertaining to system engineers' competency to determine stakeholders' intention and communication competency and to accordingly develop and apply culturally valid communication techniques to guarantee real participatory design.

### Modeling the Users' Culture

In the context of internationalisation of software, a number of researchers and developers have relied on Hofstede's [6] cultural dimensions to guide their user interface design. Hofstede categorizes societies in five dimensions, namely power distance, uncertainty avoidance, masculinity vs. feminity, individualism vs. collectivism and time orientation. Based on this western biased categorisation system designers directly deduced design principles taking the different dimensions into account [7]. However Ford and Gelderblom [4] could not establish any significant correlation of usability of the websites and representative users from the different cultural dimensions. Thus the mere modelling of the users' culture to deduce design principles rather than intervention within the context seems doubtful.

## CULTURE-DRIVEN FRAMEWORK OF SOFTWARE DESIGN

Each software development project unfolds within a unique cultural context and therefore can only be successful with true participation of the users. Considering the challenges of cross-cultural participatory design the author has developed a generic, culture-driven framework for software design in a non-western context, in which cultural variances are determined within the specific development context [17]. At the centre of the process stands a dialogical design which implies the involvement of the users in the definition of the context/problem, the ICT concepts as well as the

methods themselves, thus an appropriation of the design process by the users. To perform such a design process developers and users need to acquire additional skills and knowledge as depicted in figure 1. Biased and inadequate design decisions caused by cultural misinterpretations, as described earlier, can now be avoided.

## CASE STUDY: INFORMATION SYSTEM FOR RARE SPECIES MANAGEMENT

The following case study illustrates that methods have to be evaluated within the design process and adopted to the context.

The Namibian Ministry of Environment and Tourism aims to improve the management of populations of rare and or high value mammal species. In the past the Ministry staff relied on specially compiled paper-based species- and management reports to make informed decisions. To guarantee wider accessibility and up-dated information the Ministry opted for an electronic system. The end-users will be Chief Wardens and Conservation Scientists whose main tasks are the technical support of biodiversity conservation and wildlife population management. All end-users are both content-consumers and content-providers. [11]

After a transboundary workshop with representatives from Namibia and Botswana, the developer implemented a web-based prototype reorganizing the paper reports as hypertext. The information was structured by species categorized into logical units of 'habitat', 'range', 'abundance', 'economics' and 'background' which seemed intuitive to the developer. The project management approved the prototype without requesting changes.

However as no user was involved up to this stage of development the usability of the final product was doubtful. The developer agreed to run a usability testing session and invited 14 selected users from the Ministry of Environment and Tourism. The session was organized in form of a one day workshop rather than individual testing sessions to emulate African community processes of decision making.

Prior to the workshop, fourteen Human Computer Interaction students enrolled for the Bachelor of Information Technology at the Polytechnic of Namibia were trained in usability testing and workshop techniques to assist in the design, implementation, running and analysis of the workshop. This showed to be very valuable; one, within the workshop users felt at ease communicating in their native languages; two the interpretation of user behavior could be done by people from the same cultural background. The workshop consisted of a number of different phases around the concept of usability. The introductory activity ensured that all participants understood their active role in the redesign of the prototype.

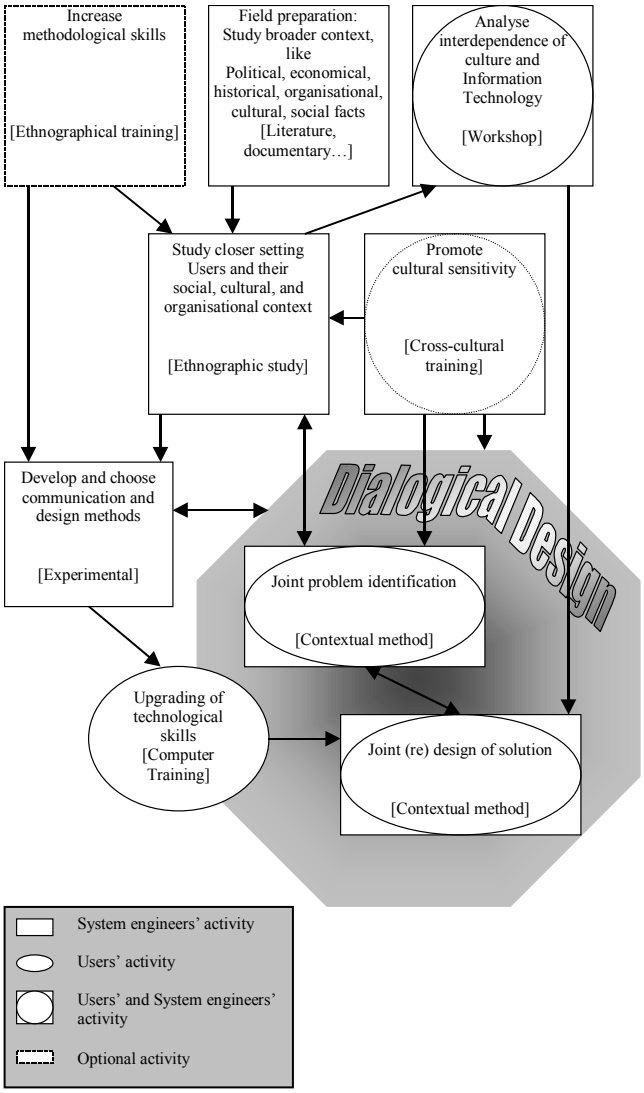


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**Figure 1: Generic culture-driven design framework [17]**

The ice-breaker, as chosen by the HCI students, established the team building as participants did not necessarily know each other. The users' own quality criteria was assessed individually, then discussed in small groups and later presented to the whole group. This established a system independent understanding of what participants would call a "good" system and a "bad" system. More time would have been required to actually establish a full definition of a usable system within the given context as well as adapting the following methods of evaluation. However an indication of priority of enjoyment over speed and accuracy was established. This was confirmed in later testing were no correlation between user satisfaction and efficient and effective task completion was found. A task-oriented prototype evaluation was chosen to determine the usability of the prototype yet proved to be ineffective. User satisfaction mostly had to be judged by the observation and analysis of video recordings rather than the user interviews and questionnaires. As in the latter, the African

communication convention of listener satisfaction surfaced thus the answers did not correspond with the observations. Furthermore interesting was the evaluation tactics of some participants who would first look for known information in order to establish trust into the system. As one participant was requested to judge a relocation of buffalos he discovered that the system had no information on cattle which according to his knowledge represent an important factor in the decision of relocation. Having not found the information the participant refused to use the system to solve any further tasks. Once more this shows that no assumptions on participants' behavior and preferences can be made but have to be determined within the design context.

The workshop demonstrated the necessity to agree on concepts and methods during the design process itself to implement a system which meets the users' expectations.

## CONCLUSION

Successful participatory intervention in the development of Information Systems in Africa has been hindered by cross-cultural matters. It has to be recognised that Participatory design in a cross-cultural context goes beyond the involvement of users in the design of the product but should include an appropriation of the design process itself. An ethnographic analysis of the design context or modelling of users is no longer sufficient but an evaluation of participatory design techniques within the design context is required. Through enhanced cross-cultural and cross-disciplinary dialogue new knowledge can be created at the frontiers enriching rather than standardizing IT design.

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