

DISSERTATIONS IN
**FORESTRY AND
NATURAL SCIENCES**

MINNA KAMPPURI

*Theoretical and
methodological challenges
of cross-cultural
interaction design*

PUBLICATIONS OF THE UNIVERSITY OF EASTERN FINLAND
Dissertations in Forestry and Natural Sciences



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No 29

Academic Dissertation

To be presented by permission of the Faculty of Science and Forestry for public
examination in Temple of Challenge, Science Park at the University of Eastern
Finland, Joensuu, on May 18, 2011,
at 12 o'clock noon.

School of Computing

Kopijyvä

Joensuu, 2011

Editor: Prof. Pertti Pasanen, PhD Sinikka Parkkinen, Prof. Kai Peiponen

Distribution:

University of Eastern Finland Library / Sales of publications

P.O. Box 107, FI-80101 Joensuu, Finland

tel. +358-50-3058396

<http://www.uef.fi/kirjasto>

ISBN: 978-952-61-0406-5 (printed)

ISSNL: 1798-5668

ISSN: 1798-5668

ISBN: 978-952-61-0407-2 (pdf)

ISSNL: 1798-5668

ISSN: 1798-5676

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ABSTRACT

Cultural diversity has become a significant challenge in human-computer interaction (HCI) and in the design of interactive technology. During the design process, a designer needs to consider how culture affects the ways in which people view, adopt and use technology. Furthermore, cultural issues affect also the design process itself, because design theories and methods are based on particular cultural assumptions that do not hold in every design context. This thesis discusses the specific challenges of cross-cultural design and to what extent the current approaches in cross-cultural HCI have considered them. A new design approach that borrows from worth-centred design and ethnographic research tradition is suggested to address the identified challenges of cross-cultural design. A case study about mobile phones in the life of Tanzanian university students serves as an example of how the approach can support design by highlighting user values and general patterns of technology ownership and use in the local context, as well as providing methodological guidance throughout a design project.

Universal Decimal Classification: 004.5, 304.2, 316.72

Library of Congress Subject Headings: Cell phones; Cross-cultural studies; Cultural pluralism; Culture; Design; Ethnology; Human-computer interaction; Human-machine systems; Tanzanian students; User interfaces (Computer systems)

Preface

I thank my advisors Markku Tukiainen and Jari Kupiainen for their advice and patience, and the reviewers of my thesis, Torkil Clemmensen and Gilbert Cockton for their comments. I have enjoyed many discussions with the colleagues at the Department of Computing, University of Eastern Finland; especially I want to mention Roman Bednarik and Matti Tedre, with whom I have had the pleasure to publish, and who have given me comments and encouragement throughout the thesis process.

The fieldwork in Tanzania would not have been possible without the support of the staff members of Tumaini University, Iringa University College. I am grateful for their help. I also want to thank all the students who took part in my research and HCI course at IUCo during the fieldwork, and Family Kemppainen, Eija-Riitta and Daktari Leena for their hospitality and interesting discussions about life in Tanzania.

I gratefully acknowledge the financial support that I have received while working on this thesis from the Department of Computing, University of Eastern Finland; the Emil Aaltonen Foundation; and the Ella and Georg Ehrnrooth Foundation.

Finally, I owe a special debt to Antsu, without whom I may never have finished this thesis.

Joensuu April 16, 2011

Minna Kamppuri

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1 Introduction

This dissertation is about interaction design. More specifically, it is about designing interactive technology in the settings in which cultural diversity as manifested in users, artefacts, contexts, designers and design methods makes the design process especially challenging. Above all, it is about understanding the challenges arising in such design settings, and the implications they have for the methodology of interaction design in today's global, pluralistic and technology-infused world.

1.1 CULTURE IN THE FIELD OF COMPUTING

For a long time, "culture" simply did not belong to the vocabulary of a computer scientist. At the beginning of computing as a discipline, neither computers nor computer users raised discussion about cultural matters. The first computers were developed and used by a limited group of experts for limited purposes, and due to the major technical challenges, the priority was given to technical rather than human concerns in the development.

As computing evolved and diversified, the first differences that were called cultural rose inside the discipline itself. Wegner (1970) described the technological, mathematical and scientific views on computing as "three computer cultures". Programming languages were seen as including particular views on computers, people and learning, so the disputes between the proponents of different programming languages such as Fortran or Algol were sometimes described as clashes between "cultures" (Solomon, 1976). On the other hand, as soon as the developers and users of computers started to diverge into two groups of people, cultural differences at one level or another began to influence the design of technology, too. Early female software engineers, for example, found out that some male directors refused to use an innovative text editing device be-

cause it reminded them of typing, which the directors considered as women's work (Gürer, 2002).

Although cultural issues have been given little attention in the history of computing, the current diversity in the forms, purposes and users of information and communication technology (ICT) has made computing more receptive to culture as a research topic. This is true especially in those areas of computing – software engineering and human-computer interaction (HCI) – that aim at matching technological innovation with human needs, and thus lie halfway between technical and human sciences. In case of HCI, for example, organisational culture has been of interest since the end of the 1980s, and even culture at a national level is now regularly included in its journal papers¹, conferences² and future visions³. At the same time culture has earned several mentions in the latest update of the Computer Science Curriculum by the leading quarters of the field (ACM and IEEE Society) (ACM, 2008). Hence it can be argued that culture has become a legitimate research topic in computing.

One of the most significant reasons for the growing interest in cultural issues in software engineering and HCI is globalisation that has had an extensive effect on the ICT industry. Many ICT related services and parts of the software development have been transferred to countries where the cost of development is currently low, making the management of multicultural teams and multiple locations a part of everyday life in ICT projects. In computing, these challenges have been studied as a part of software engineering under the title of *global software development* (GSD). Furthermore, the users of ICT are now culturally more diverse than ever, and the temptation of the global markets has motivated the development of *internationalisation* and *localisation*, both of which are sometimes

¹In the review of five leading publication forums in HCI it was found out that between 1998 and 2004 the share of papers considering culture at a national level was 1.3%, about four times greater than in 1990-1997 (Kamppuri, 2008).

²Examples of HCI conferences dedicated to cultural issues include International Workshop on Internationalisation of Products and Systems (IWIPS) and International Conference on Internationalization, Design and Global Development.

³See, for example, Harper et al. (2008).

referred to as *software globalisation*. Internationalisation and localisation are development processes that have been used in software engineering to adapt products for use and sale across many countries⁴.

Internationalisation and localisation are mostly concerned with software architecture issues, reducing culture to something that can be parameterised and isolated in code. A wider point of view on culture in interaction design is more frequently taken in what could be called *cross-cultural human-computer interaction*. From a cross-cultural HCI point of view, the challenge is how to design in a variety of cultural contexts for users who come from different corners of the world with a wide variety of values, skills and preferences. In this sense cross-cultural HCI partly overlaps the interests of *universal usability* (also *inclusive design* or *design for all*). The basic motivation behind universal usability is to design technology that can accommodate many different types of users, devices, and conditions of use, and that can bridge the gap between what users know and what they need to know to benefit from technology (Shneiderman, 2000). In the wide research agenda of universal usability, culture is only one of the many forms of human variety; in addition, universal usability has a special emphasis on designing technology that can be used by as many people as possible.

During the past few years, a new research area related to cross-cultural HCI has been identified. *Human-computer interaction for development* (HCI4D) is concerned with how differences in culture and infrastructure, for example, affect the design of ICT in the developing countries (Chetty and Grinter, 2007). In this thesis, HCI4D is seen as a part of a wider research area of cross-cultural HCI. Although many of the challenges in cross-cultural technology development have become especially salient in the context of developing countries, the challenges discussed in this thesis are seen as resulting from differences that are not restricted to those between industrialised and developing countries.

The above mentioned research areas are all related to design

⁴For a definition of internationalisation and localisation, see 2.2.1.

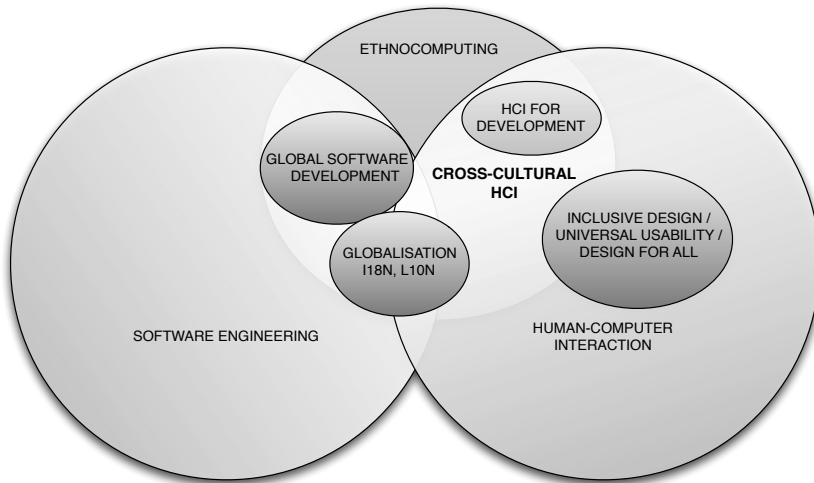


Figure 1.1: Cross-cultural human-computer interaction and related research areas.

and development of technology, but they are not the only areas in computing that can be considered from a cultural standpoint, as shown by a recently introduced research area, *ethnocomputing* (Tedre et al., 2006). Ethnocomputing belongs to the same family of ethnosciences with ethnolinguistics and ethnomathematics, and it covers not only the cultural aspects of software engineering and design, but also topics which are often considered to be void of cultural influences, such as programming and theory of computing. A summary of the relationships between cross-cultural HCI and other related research areas in computing is shown in Figure 1.1.

1.2 CROSS-CULTURAL DESIGN

In this thesis, I use the concept of *cross-cultural design* to emphasise that I am particularly concerned with the cultural aspects that affect the process and methods of *interaction design* – the design of products and systems that include computer technology and require some kind of interaction between them and their users. As such,

cross-cultural design belongs to cross-cultural HCI in the same way as interaction design can be seen as a part of human-computer interaction⁵.

When discussing cross-cultural design, researchers in human-computer interaction usually refer to culture at a national level. Although some other levels such as ethnicity or “Eastern vs. Western world” are sometimes considered as the main source of cultural differences, the differences at lower levels alone, such as between organisations, are rarely discussed in terms of cross-cultural design. Yet there are many levels of culture, and it can be argued that *any* design setting is more or less cross-cultural, apart from those cases in which designers are designing for themselves.

Nevertheless, in interaction design the challenges at cross-national level are somewhat different compared to the settings in which cultures are crossed inside one country or society only – which, for the sake of clarity, are called intracultural design settings in this thesis. Most of interaction design to date has taken place in the settings in which designers and users represent different occupations and organisations. In fact, the first major gap between users and designers due to the differences in skills, preferences and areas of expertise was one of the main motivations for forming the field of HCI in the first place (Grudin, 1990), and the importance of finding a “common ground” between users and designers in the design process despite their differences is well recognised in contemporary HCI⁶. But organisational or occupational culture covers only a part of an individual’s later life, whereas culture at a national or ethnic level has much more wider and longstanding, albeit often subconscious, influence on people (Hofstede and Hofstede, 2005). Living in the same society means that to a certain degree people are exposed to similar cultural influences and share knowledge about the

⁵There is also an alternative view in which human-computer interaction in its more traditional and restricted form is situated inside a larger, multi-disciplinary field of interaction design; see, for example, Winograd (1996) and Sharp et al. (2006).

⁶See, for example, Müller (2002).

wider context such as infrastructure, history, politics and communication. In a cross-cultural design situation, designers and users often have no such advantage.

In most cases, cross-cultural design is used to refer to a situation in which a foreign designer meets local users and a local context, but there are other types design settings that could also be considered as cross-cultural. Designers could be designing for a group of users who live in the same society with them, but who nevertheless have a different cultural background and lead a very different everyday life. Such design settings could be common especially in multi-ethnic societies. On the other hand, cross-cultural design can also refer to a situation in which the designers and the users do share the larger cultural context, but in which the design methods are “foreign” (Oyugi et al., 2008). In such a case, cultural differences between users and designers are not the problem, but there can still be a mismatch between cultural assumptions of the design theories and methods, and the local design context.

1.3 RATIONALE

As ICT and the development of it become increasingly globalised, more and more designers face the challenge of designing technology for users and settings that are foreign to them, and/or using design methods that are foreign to that particular setting. Thus the need for addressing cultural matters in interaction design has been recognised in HCI. Since the end of the 1990s studies of cross-cultural HCI have become more common, and many kinds of methods have been proposed for cross-cultural design (Kamppuri, 2008). Still, to date the research has been sparse, and there is a shortage of good quality papers on the topic especially in the journals of HCI.

Several shortcomings can be identified in the existing methods of cross-cultural design. First of all, the methods are biased in that they have been dominated by the quantitative research tradition in HCI (Clemmensen and Röse, 2010), and especially by one particular type of cultural model, that of cultural dimensions (Kamppuri et al.,

2006a). Second, in many studies culture is taken for granted: there is little reflection on culture as a phenomenon, how cross-cultural design differs from intracultural design, or what kind of assumptions about culture the chosen methods entail (Kamppuri and Tukiainen, 2004a). Third, the main emphasis of cross-cultural design has been on the effect of culture on the products to be designed, and only recently more researchers have started to pay attention to the fact that the effect of culture extends also to the design process, the designers themselves and the concepts, theories and methods they are using (Clemmensen et al., 2009; Frandsen-Thorlacius et al., 2009; Vatrapu and Pérez-Quinones, 2006; Winschiers and Fendler, 2007).

In this thesis, I present an alternative approach to cross-cultural design. The approach starts from the characteristics of culture, and the issues that make cross-cultural design especially challenging compared to intracultural design. As such, it aims at increasing the awareness and understanding of culture among interaction designers, and providing support where it is especially needed during a cross-cultural design process.

1.4 RESEARCH QUESTIONS

The main theme of this dissertation is the theory and methodology of cross-cultural design. More precisely, the research questions are as follows:

- Q1. How is culture seen and approached in cross-cultural human-computer interaction?
- Q2. What are the specific challenges of cross-cultural design that make it different from intracultural design?
- Q3. What kind of design approach could support designers in facing the specific challenges involved in cross-cultural design?

1.5 RESEARCH PROCESS AND METHODS

The research process behind this dissertation was motivated by discontentment with the restrictions of technical approaches to cross-cultural design, such as the localisation model presented in Kamppuri (2002) and Kamppuri and Tukiainen (2004b). Literature reviews of cross-cultural HCI studies⁷ revealed that little cultural theory was used in the research, and the studies in which it was used were dominated by cross-cultural psychology, especially cultural dimensions. The reviews motivated envisioning an alternative path for cross-cultural design, and searching for cultural theory and methodology that could support it.

The first ideas about the characteristics of cross-cultural design were inspired by the historical framework of HCI by Grudin (1990)⁸. Positioning cross-cultural design in Grudin's framework highlighted such issues as extending time scope in design and considering the level of society as a design context. In addition, some recent developments in HCI such as user experience (McCarthy and Wright, 2004) and the importance of value and worth (Cockton, 2004, 2006) seemed to further increase the importance of culture in HCI. Finally, the experiences gained during the fieldwork in Tanzania directed my attention to the role of a designer and many other situational factors in a cross-cultural design setting.

Cultural theory for this thesis was drawn from many sources. In cognitive anthropology, I found Strauss and Quinn's (1997) theory of culture as opposite tendencies an interesting way of going beyond a myriad of definitions. In cultural psychology, I was especially impressed with the cultural-historical approach to activity theory by Cole (1998), in which he reflects on the role of culture in human life and highlights the problems of cross-cultural studies in mainstream psychology. However, in the end anthropology and ethnography became the main sources for cultural theory and methodology in the thesis.

⁷Kamppuri and Tukiainen (2004a), Kamppuri et al. (2006b); Kamppuri (2008)

⁸See Kamppuri et al. (2006b) and Kamppuri et al. (2006c).

There were many reasons for choosing anthropology. I was looking for theory and methodology that would recognise the significance of culture in human life and place it in its theories accordingly. The contributions of cognitive science and mainstream psychology to the study of culture have been described as modest (Cole, 1998; Hutchins, 1995), whereas anthropology has dedicated an entire century of research around the study of culture and cultures. In addition, I found it surprising that even though anthropology has been regarded as one of the background sciences of HCI as early as in Grudin (1990), so far it has played only a minor role in the research of cross-cultural HCI (Kamppuri et al., 2006a; Kamppuri, 2008).

Anthropology and ethnographical research accommodate many issues that would have been problematic with the current first and second wave theories of HCI. The holistic viewpoint, the aim of understanding people with different value systems in a very different environment, and extensive fieldwork make it possible to study the value and use of technology in a larger context at the level that is useful for interaction design. Furthermore, anthropology offers a good amount of critical discussion on the concept of culture, and on reflexivity that is required in the study of other cultures – both topics that are highly relevant for cross-cultural design, but have been largely missing from HCI due to its theoretical roots.

The discussion about culture in HCI research and a preliminary outline for the requirements of cross-cultural design were presented in Kamppuri (2008), which also guided the six months of fieldwork in Iringa, Southern Tanzania in 2008-2009. The main goal of the fieldwork was to experience design related work in a cross-cultural setting, and test and refine the preliminary ideas about cross-cultural design. Tanzania proved to be a good testing ground in this case; as argued by Heeks (2002), a design setting in which the “gaps” between users and designers are extreme enough makes it easier to identify and understand what exactly happens during the design process.

The fieldwork included two case studies that informed the re-

search for this thesis. In the main case study I studied how Tanzanian university students value and use mobile phone. From the research point of view, the purpose of the case study was to gain experience about cross-cultural design as a foreign designer in Tanzania by applying into practice the principles of the design approach that had been outlined during the theoretical part of the research. The design context of the main case study and the techniques used during the study are described in detail in Chapter 5, and the results concerning the worth and use of mobile phones are reported in Chapter 6.

During the fieldwork, there was also another case study that had a smaller, yet significant role in this thesis. It was related to my work as a part-time lecturer at a local university, where I taught an introductory HCI and user-centred design course to Tanzanian IT students. Besides lectures and exercises, the course included a website design project in which the students designed a prototype for a college website using user-centred design techniques. They made contextual inquiries with students from every faculty to find out about the use of the existing website, and about students' needs and preferences for a new website. The views of the staff members were heard in a focus group meeting. In the analysis phase, IT students created user personas, scenarios and an affinity diagram, which were subsequently used to come up with requirements for the website. Finally two groups of students designed their own versions of a website, which were presented to others as paper prototypes in the final meeting of the project. The plan was that the students would then continue with the actual implementation of the website after the term break under the guidance of another teacher.

Throughout the website project I recorded in my research diary observations about how the ideas and techniques of user-centred design worked in the project. I also interviewed briefly each group of students about the inquiry process after they had completed their contextual inquiries. I collected all the artefacts that were created during the project such as inquiry and focus group recordings and transcriptions, requirements documents, user personas, scenarios,

an affinity diagram and paper prototypes. A written permission was acquired from the students of the course for using the material produced for the research purposes. The website project and its results are not described in detail in this thesis. I do, however, occasionally refer to the observations made during the project when discussing the methodological challenges of cross-cultural design.

1.6 CONSTRAINTS AND LIMITATIONS

In this thesis, I take the focus of cross-cultural design on international design settings as justified, and have restricted the discussion accordingly. By this I do not wish to imply that during the actual design process a designer would not need to consider subcultural differences – quite the opposite.

A user-centred design process in interaction design is a long and iterative one, including many stages from finding out the user needs to design and evaluation. This thesis focuses on the early activities of the design process, some of which are so early that they could be considered as preceding the actual design process in the current models of user-centred design (see, for example, ISO/IEC (1999)). It is argued here that early attention to cultural matters and the wider context is required in cross-cultural design projects both for understanding the users and guiding the overall design process. Nevertheless, cross-cultural challenges are not limited to the beginning of the design process. There are many concerns of cross-cultural nature related to issues such as evaluation that are recognised but not discussed in this thesis.

The main argument in this dissertation is that all the basic elements of design, from the design process and methods to the product that is being designed, have a cultural basis. The same applies to this thesis. Although I have made a conscious effort to consider the effects of ethnocentrism⁹ on my work, it is culturally biased. Identification of the challenges that a designer meets in a cross-cultural design setting, for example, are affected by particular kinds

⁹For the definition of ethnocentrism, see 3.3.1.

of cultural encounters: in my case, a Finnish researcher working in Tanzania, and in the case of most of the cross-cultural design studies in HCI, Western designers designing interactive technology for Asian or African users. Those encounters reflect the current situation in the global ICT development; over time, there will be other kinds of design settings, and other viewpoints may become more pronounced.

1.7 THESIS STRUCTURE

The thesis can be divided into three parts. First, Chapter 2 is a background chapter that describes how the importance of culture has increased in HCI, and how the various research traditions of the field have affected cross-cultural HCI studies. The second part consists of two chapters that lay the theoretical foundations for a new approach to cross-cultural design. In Chapter 3, I discuss the characteristics of culture and the challenges of cross-cultural design, and in Chapter 4 I present the principles of a new design approach that is specifically tailored towards the needs of cross-cultural design. In terms of research questions, the research question Q1 is discussed in Chapters 2 and 3, the research question Q2 in Chapter 3, and one answer to the research question Q3 is outlined in Chapter 4.

The answer to the research question Q3 is further developed in the third part of the thesis which demonstrates how the approach suggested in Chapter 4 can be put into practice and how it can support the design process. The both chapters describe a case study about mobile phones in the life of Tanzanian university students. Chapter 5 describes the techniques used in the study and gives account of Iringa, Tanzania as a design context. Chapter 6 describes the positive and negative value of mobile phones as seen by Tanzanian students, and how Tanzanian context of use on one hand, and the diversity inside Tanzania on the other, affect the patterns of mobile phone ownership and use.

The thesis ends with the concluding Chapter 7 that draws to-

Introduction

gether the main points of the previous chapters and discusses the possibilities for further research.

2 *Design and culture in human-computer interaction*

Knowing the history often helps in understanding the present, and the field of human-computer interaction is no exception. The concepts, theories and methods of HCI have developed and diversified over the decades, following the changes in computer technology and the role of computers in human life. The history of HCI can be described as three “waves” (Bødker, 2006; Kaptelinin et al., 2003) that were preceded by the “pre-history” of HCI (Cockton, 2004). The waves co-exist in contemporary HCI, and have their own ideas of design and culture.

2.1 DESIGN IN HUMAN-COMPUTER INTERACTION

When the first digital, fully electronic computers were developed in the 1940s, little attention was given to the concerns related to human-computer interaction. The early computers were giant calculators that were used mainly for scientific purposes, and their users were a rather homogeneous group, consisting mainly of Western engineers, mathematicians and data processing professionals. The gap between the developers and the users was small, because the programmers were often also the users of computers (Grudin, 1990).

The first computers were huge, expensive, and fragile, requiring constant maintenance (Gray, 2001). Consequently, the major concerns in the development of computers were the robustness and performance of the machines. The interaction between users and computers took place through machine language and batch processing, and efforts towards improving the interaction between users and computers were limited to arranging switches and la-

bels in order to reduce user errors and improve efficiency (Grudin, 1990). Some guidelines for user interface design were presented, but they were based more on common sense than research (Cockton, 2004).

However, the fast technical development during the first decades of computer technology revolutionised the interaction between users and computers by creating new possibilities for human-computer interaction. Computer systems became smaller, more efficient and interactive, and many novel interaction devices such as a display, mouse and keyboard were invented (Grudin, 1990). Together with word-processing, spreadsheets and graphical applications, they transformed computers into tools that could be used by a larger user group in a variety of application areas such as business and industry. The first major gap between the developers and users, who were no longer computer experts, made usability a much more significant problem in software development than it had been before (Cockton, 2004). This contributed to the rise of HCI as a research field.

2.1.1 First wave: usability engineering

Human-computer interaction as a research field was formed at the beginning of the 1980s. From the very beginning, user-centredness was one of the core ideas of HCI. Researchers recognised that in software development, there was a need to “look at the user in a different light... [in which] the centre of a system is a user”¹ The reason why users were regarded so important was tied to the field’s focus on business applications. The computer was seen as “a major tool for increasing productivity” (Demers, 1981), and any part of the design that disturbed the interaction between a user and a computer could pose a serious threat to that productivity.

The concept of usability was central in the first wave of HCI. Brian Shackel, one of the early pioneers in HCI, defined *usability* as “the capability (of a system) to be used by humans easily (to a

¹Nicholls (1979) as quoted in Shackel (1991/2009).

specified level of subjective assessment such as comfort, confidence, and satisfaction) and effectively (to a specified level of performance such as time and errors in carrying out operations) by the specified range of users, given specified user support, to fulfil the specified range of tasks, within the specified range of environmental scenarios" (Shackel, 1984). In a later and perhaps the most well-known operational definition of usability by Nielsen (1993), the emphasis was laid on performance with the categories of efficiency, learnability, memorability, and number of user errors, whereas all the subjective factors were covered by one category of user satisfaction, which got much less attention. Also Shackel's (1991/2009) idea of user satisfaction was rather narrow, referring merely to the need of keeping the level of user tiredness, discomfort, frustration and personal effort at acceptable levels. Both Shackel's and Nielsen's views on usability reflected the focus of HCI on the mandatory use of computers in a work context.

The theoretical and methodological background for the first wave HCI came from ergonomics, cognitive psychology and cognitive science (Grudin, 1990; Cockton, 2004). Theories of human perception and motor skills were used to inform the design of interaction devices and applications, and later when the technology allowed for more advanced user interfaces, the researchers became interested in the theories of higher cognitive functions such as learning and problem solving (Ibid.).

From its background sciences the first wave HCI also adopted its methodology that was influenced by natural sciences and experimental research (Grudin, 1990). Human-computer interaction was studied in laboratory settings using quantitative measures and statistical analysis. In software development, the scientific experiments used in HCI were considered too heavy and expensive, and were thus replaced by somewhat lighter and less rigorous version of experimenting: *usability testing*. Usability testing was accompanied by "discount methods" such as *heuristic evaluation* (Nielsen, 1993), a form of expert evaluation based on general design guidelines.

Apart from emphasising the user concerns in software develop-

ment, the early HCI conformed to the prevailing ideas of software development in software engineering. Software development was seen as an engineering process, in which a good quality product could be achieved by following a well-defined process from the requirements to the implementation of the system, and in which co-operation between developers and users was limited to the beginning and the end of the process (Denning and Dargan, 1996).

The first wave HCI introduced usability into this process in the form of *usability engineering*, which was characterised by a confined problem space with a clear focus, as well as formal and measurable usability criteria against which the product was evaluated, using either usability testing or expert evaluations (Sharp et al., 2006). It was argued that all aspects of usability could be transformed into usability goals that could be measured like any other requirement of a system. This included even subjective goals such as user satisfaction, because “attitude criteria” could be defined “with same precision and operational form as performance criteria” (Shackel, 1991/2009).

2.1.2 Second wave: user-centred design

The second wave of human-computer interaction started to gain foothold from the late 1980s. The inventions of World Wide Web, email, groupware and mobile technology expanded the possible uses of computer systems from information processing to everyday communication. They also raised questions about how computer systems could be used to mediate human-human interaction, and support not only individual users, but groups and organisations with individuals with different tasks and backgrounds (Grudin, 1990).

New research interests in HCI made the limitations of the first wave evident. The first wave focused on individual cognition in isolation, which made it insufficient for studying groups working on a collection of applications. In addition, testing in usability laboratories and general usability guidelines downplayed the signifi-

cance of context in human-computer interaction. As DePaula (2003) puts it, from the second wave point of view the first-wave HCI was studying “a single mind interacting with an isolated technology in a social, cultural, and historical vacuum”.

Theoretical grounding for the second wave HCI was sought from organisational psychology, social psychology and anthropology (Grudin, 1990). The most significant theoretical approaches in the second wave became *situated action* (Suchman, 1987), *phenomenology* (Winograd and Flores, 1987) and *activity theory* (Bødker, 1991), and later also *distributed cognition* (Hutchins, 1995). What was typical to all the approaches was that they emphasised the importance of studying the context in human-computer interaction, claiming that design of usable systems required observing what people do and how they do it in the real context of use. Furthermore, their unit of analysis extended beyond individual cognition.

The second wave HCI questioned the engineering model of software development; instead, it was influenced by the ideas of design from the arts. Winograd (1996), for example, argued that user-oriented technology development was closer to the “human openness” of architecture and graphic design than to the “hardedged formulaic engineering design”. By describing the development of technology as a design process, some of the researchers in the second wave wanted to detach from the idea of technology development as a problem-solving exercise, and emphasise the creative aspects of the process.

The methods of usability engineering in the first-wave HCI had not offered much support for understanding or fixing the found usability problems, which were also often discovered so late in the development process that making the required changes was no more feasible (Cockton, 2004). The prevailing design approach of the second-wave HCI, *user-centred design* aimed at addressing these problems by focusing on the context of use, involving users throughout the design process and founding the process on iteration. Several design methods such as *participatory design* (Greenbaum and Kyng, 1991) and later *contextual design* (Beyer and Holtzblatt,

1998) were developed to implement the ideas of user-centred design in practice.

2.1.3 Third wave: designing for user experience, creating worth

In the new millennium, HCI researchers and practitioners live in the world in which the technological possibilities are greater than ever, but those possibilities come with great challenges. When HCI faces the challenges, it is facing a task no less than redefining each of its basic elements: humans, computers and interaction (Sellen et al., 2009).

Computer users have never been a more diverse group of people than they are today. Due to globalisation, ICT that once was a privilege of the Western, industrialised countries is now used by people with a variety of cultural backgrounds, histories, values and needs. Furthermore, the increasing role of ICT in human life encourages designers to find ways in which all the members of the society (including the disabled, homeless, amnesiac and illiterate) can use and benefit from technology.

Today's technology, on the other hand, has blurred the distinction between private and public spheres (Bødker, 2006) and become a part of almost every aspect of people's everyday life, from work to play, from learning to entertainment, from spirituality to sexuality. In addition, new technologies increasingly emerge not as isolated technical solutions, but as webs of technology (Ibid.).

New forms of computer technology are transforming the way people interact with computers. ICT is breaking free from the familiar setting of a desktop, graphical user interface, mouse and keyboard that dominated the computer use for decades. One can now carry computer technology in a pocket, wear it (*wearable computing*), find it embedded anywhere into the human-built environment (*pervasive* and *ubiquitous technology*), or control it with a variety of physical objects like cubes or tea cups (*tangible technology*). Using eye-tracking or gesture detection as an input method is only the beginning of the story. The days of interface stability are over, and

one of the basic assumptions of HCI – that interaction between humans and computers is conscious and visible, and can be designed for – may not hold anymore as interfaces diversify or disappear altogether (Harper et al., 2008).

The usability of new interaction devices needs to be evaluated, requiring a lot of first-wave HCI work. But theories of human cognition and usability are no longer enough: to understand the diverse and complex ways and situations in which computer technology is nowadays used, researchers and designers need to look into many other aspects that matter in interaction. There is now a question of *user experience* that covers not only the cognitive aspects, but the whole spectrum of sensations and feelings that are experienced in interaction.

In ICT business user experience has become a buzzword. It is often represented as a mere technical challenge that can be designed and offered to the passive customers. In HCI, user experience has taken more profound meanings: it is about understanding the felt life, emotional response and the sensual quality in interaction, something that the designers can only design *for* as they cannot have a total control over factors that affect the overall experience (McCarthy and Wright, 2004). The need to understand user experience has emphasised the importance of many new research areas in HCI, such as trust (Fogg and Tseng, 1999), aesthetics (Tractinsky, 1997), and emotional aspects of interaction (Norman, 2004).

Yet it has already been argued that designers should not stop at user experience. Instead, worth and values are becoming the main themes in third-wave HCI (Harper et al., 2008; Sellen et al., 2009). In the world of ample technological possibilities, the emphasis shifts from what can be achieved with technology to what *should* be achieved with it (Harper et al., 2008; Tedre, 2008): what is the value that ICT can bring to its users and to the humankind? Gilbert Cockton, who has written extensively about value and worth in HCI², argues that by focusing on value in interaction design, one can filter out those contextual and usability problems that do not

²See, for example, Cockton (2004, 2006, 2008a, 2009a).

endanger the overall goal of the design, which is delivering worth to the users. The way Cockton sees worth-centred design as differing from earlier design approaches in HCI can be summarised as follows:

- Interaction design should start neither from technology nor users, but from both: technology (raw material) and worth (design purpose).
- Such things as fit to context, quality in use, usability or user experience are not the ultimate design goals; they are only means to the end, which is worth. *Worth* can be defined as a positive balance of benefits over the costs to the system beneficiaries.
- The design must be based on representations that describe the intended worth of a hypothetical system – how the designers think the system could benefit users.
- During the development, the representations of intended worth change through communication and evaluation with the beneficiaries into achievable and achieved worth. The evaluation is an important part of the design process, but it should consider worth instead of measuring only some predefined variables such as usability.

The development of methods and techniques for putting the ideas of worth-centred design into practice is still in early phases, although some representation techniques such as worth/aversion maps and worth delivery scenarios have been proposed (Cockton, 2007, 2009b). What is evident, however, is that HCI is already going through the third wave in its history, and in order to face the new challenges interaction design, too, needs to be renewed.

2.2 CROSS-CULTURAL HUMAN-COMPUTER INTERACTION

If the different waves are viewed as forming the chronological history of human-computer interaction, one can say that cultural con-

cerns did not play a significant part during the first two waves of HCI. At the time when the first wave ruled the field, cultural issues were not particularly visible in the background sciences of HCI. Mainstream psychology gave culture only a marginal role in its theories (Cole, 1998), whereas cognitive science concentrated on studying human cognition at an individual level (Hutchins, 1995). While the theoretical background of the second-wave HCI was more open to studying the effects of culture in human-computer interaction, the focus was on cognition and usability in a work context, and when culture was discussed, it was usually discussed at the level of organisations only.

The different waves of HCI, however, are not only historical eras but research traditions that co-exist in contemporary HCI (Grudin, 1990), and have a major influence on how research and design are seen and practised in the field today³. Cross-cultural HCI is no exception, as will be seen in the following account that describes how the waves as research traditions have shaped the cross-cultural research in HCI.

2.2.1 A technical approach to cross-cultural design

Some studies in cross-cultural HCI can be compared to the “prehistoric” studies of human-computer interaction in that they approach their topic from a very technical point of view. In such studies culture becomes something that can be mechanically removed from a product and replaced with the content that is assumedly culture-free, or if the product is localised, with culture-specific content. The following extract from a review of internationalisation and localisation literature demonstrates well the technical view of culture in HCI:

Internationalization is the process of extracting the domestic, cultural context from a package. The end goal is to end up with a sort of generic product with an appendix

³See, for example, the papers by Harrison et al. (2007) and Barkhuus and Rode (2007) about how the first wave still affects the research in HCI.

or attachment that contains all the culturally specific items. In other words, it is the separation of product elements into culturally-dependent and culturally-independent parts (...) Localization takes a generic product and adds features and elements to fit the target culture and market. (Carey, 1998)

Although some of the papers discussing internationalisation and localisation are more tuned towards the interests of HCI, their main interest often lies in finding the most convenient ways of making the development and maintenance of international software more efficient rather than considering usability or user experience. In Carey's (1998) review, for example, the need for localisation is justified by "more sales and the ability to charge more", whereas much less attention is given to the possible worth (or the lack of it) that localisation could bring to users.

Internationalisation and localisation research has been criticised for focusing on the surface level issues, that is, on the elements of user interface (De Angeli et al., 2004). In Carey's review, too, the main emphasis is on the translation of text and modification of user interface elements. The cross-cultural checklist presented in one of the earliest and much cited papers in cross-cultural HCI (Russo and Boor, 1993) is mostly concerned with user interface issues such as text, data formats, images, symbols, colours and flow of information, although it also mentions product functionality.

Cross-cultural checklists or guidelines for designing user interfaces for international use are common techniques in technically oriented approaches. They are typically practical rules of thumb that guide the developers how to internationalise their products and how to prepare for technical problems that may take place during localisation. Very often they become a long lists of "don'ts": Microsoft (2010), for example, suggests that for easy localisability the user interface should be void of culture-specific examples, flesh or body parts, gestures, maps, flags or any references to gender, religion or ethnicity.

Some researchers have attempted to form user interface guidelines for localisation by studying the existing interfaces. Barber and

Badre (1998) inspected hundreds of websites in order to find *cultural markers*, which they defined as design elements that are prevalent and thus assumedly preferred in a particular genre and country. Another similar content driven approach has been proposed by French et al. (2002); (also in Smith et al. (2004)). They discuss user interface elements as *cultural attractors* that can be used to create a “look and feel” that matches the cultural expectations of the users. They argue that in Indian finance-related websites, for instance, such cultural attractors are colours red and saffron that signify prosperity, and an image of Gandhi which is used to rise patriotic feelings (Smith et al., 2004).

2.2.2 First wave approach: culture as a variable

The experimental research tradition of the first wave has had a long-standing influence on HCI as a research field (Harrison et al., 2007), and it is also strongly present in many studies of cross-cultural HCI. In general, the first wave HCI has inspired two different ways of approaching culture in cross-cultural HCI: studying it through cross-cultural experiments, and using statistical cultural models called cultural dimensions.

Cross-cultural experiments

In cross-cultural psychology, culture is often treated as a characteristic that is common to all people in a specific society. In its experiments, culture becomes one of the variables along with other human characteristics such as age, occupation or gender. Only a sample of the population is studied, and although it is recognised that these samples should be representative of the population, out of convenience the samples are often comprised of university students (Matsumoto and Juang, 2004). The results of the experiments, however, are generalised to the whole population, which is often seen as all the people living in a particular country (Ibid.).

Experimental studies in cross-cultural HCI follow the tradition of cross-cultural psychology. In the studies researchers make hy-

potheses about how the cultural background of subjects affects their cognitive abilities and preferences related to technology. The hypotheses are often based on the existing theories of cross-cultural psychology. The hypotheses are then tested in an experimental setting that involves comparisons between two or more cultural groups.

A paper by Choong and Salvendy (1998) is an example of such a study. On the basis of cross-cultural comparison studies about the differences in cognitive skills of American and Chinese populations, they formulated a hypothesis that with icon-driven computer systems, American users would perform better with alphanumeric icons compared to pictorial icons, whereas Chinese users would do exactly the opposite. They then conducted an experiment about the recognition of icons with American and Chinese engineering undergraduates. The results of the experiment showed that their hypothesis was correct, and the researchers conclude their paper with a design recommendation of using icons that combine both pictorial and alphanumeric elements, or when this is not possible, using pictorial icons for Chinese users.

Other examples of similar studies in cross-cultural HCI include another study by Choong and Salvendy (1999) about the effects of knowledge representation and interface structure on user performance of American and Chinese users, and the studies by Sears et al. (2000) and Noiwan and Norcio (2006) about the effect of graphical enhancements in the user interface on the perceived usability and attention. There are also studies in which the topic of study is more characteristic of the second wave HCI, but it is nevertheless approached in an experimental manner. Isbister et al. (2000), for example, evaluated how well their interface agent could support cross-cultural human-human interaction between American and Japanese students, whereas El-Shinnawy and Vinze (1997) studied the impact of technology and culture on group decision making with Singaporean and American users.

A lighter form of experiments, usability testing, has also been advocated in cross-cultural design. Del Galdo and Nielsen (1996)

recommend that every localised version of a system should be considered as a new product that requires usability testing in the target country. On the other hand, there have been efforts for developing usability testing methods that are meant especially for cross-cultural design situations. One such method focuses on revealing to what extent users with different cultural backgrounds interpret the elements of user interface in a similar way (Bourges-Waldegg and Scrivener, 1998, 2000).

Questionnaires and cultural dimensions

Questionnaires have been the most used technique in cross-cultural HCI (Kamppuri et al., 2006a; Clemmensen and Röse, 2010). With questionnaires, it is possible to collect a large amount of information from a large group of people in relatively short time, which makes it tempting for studies in which the researchers want to make conclusions about culture at a national level. Questionnaires as the main technique in cross-cultural HCI have been used, among others, by Lee et al. (2003), who studied the adoption of smart cards in Singapore and Australia, and Efendioglu and Yip (2004) who discussed the rise of e-commerce in China.

Furthermore, there is a particular type of ready-made cultural model based on questionnaires that has dominated cross-cultural HCI from the very beginning: cultural dimensions. One reason for why cultural dimensions have gained such a strong ground in information systems (Ford et al., 2003) and HCI is probably their popularity in business and management. By transforming culture into numbers and graphs, cultural dimensions also offer an instant access to culture in a form that first-wave HCI researchers and designers are likely to feel most comfortable with.

Cultural dimensions are cultural models that are based on statistical analysis of large-scale questionnaire studies across countries. In cross-cultural psychology, such studies are sometimes called *ecological-level studies* (Matsumoto and Juang, 2004), because even though the data are usually collected from individuals, in the subsequent anal-

ysis a country is used as the unit of analysis. In ecological-level studies big sample sizes are important, which explains why questionnaires have been favoured as a data collection technique.

Many researchers such as Hall (1976) as well as Trompenaars and Hampden-Turner (1997) have presented their own cultural dimensions, but measuring by cited works and definitions of culture, Geert Hofstede has been by far the most quoted cultural theorist in cross-cultural HCI (Kamppuri et al., 2006a; Kamppuri, 2008). His most well-known works are the popular book “Cultures and Organizations: Software of the Mind” (Hofstede and Hofstede, 2005), and a somewhat more scholarly work of “Culture’s Consequences: International Differences in Work-Related Values” (Hofstede, 1984), in which the data and analysis behind his cultural model are explained in more detail.

According to Hofstede, his cultural dimensions describe *cultural values* which he defines as general tendencies to prefer one state of the affairs over the other. These values form the implicit core of culture, which is assumed to be much more stable compared to the outer, observable layers of culture that Hofstede calls *practices*.

The data for Hofstede’s cultural dimensions were collected in the 1970s from IBM employees in forty countries, with the aid of questionnaires that consisted of multiple choice questions related to the work settings. Hofstede analysed the data by calculating mean scores or percentages for each country and question, and using factor analysis to group the questions. In this way, he came up with four dimensions that he named as power distance, individuality, masculinity and uncertainty avoidance, which were later accompanied by the fifth dimension of long-term orientation⁴ (see Table 2.1). Hofstede then transformed the averages to get index values from 0 to 100 for each country in each dimension. The individual country scores are thus not absolute, but based on the differences between countries. Figure 2.1 shows an example of the results for Finland and Tanzania (as a part of East Africa).

⁴Long-term orientation originated from Chinese Value Survey by Michael Harris Bond.

Table 2.1: Hofstede's (2005) five cultural dimensions.

Dimension	Meaning
Power distance	The degree to which the weaker members of institutions and organisations expect the power to be unequally distributed and accept it.
Individuality	The degree to which there are loose ties between individuals instead of a strong feeling of belonging to an in-group.
Masculinity	The degree to which gender roles are clearly distinct and men are supposed to be assertive, tough and focused on material success.
Uncertainty avoidance	The degree to which ambiguous or unknown is seen as a threat in a society.
Long-term orientation	The degree to which virtues related to future rewards are appreciated.

In cross-cultural HCI, cultural dimensions have been used in many different ways. Like other theories and models of cross-cultural psychology, they have been used as a source of hypotheses for the experiments in human-computer interaction as in El-Shinnawy and Vinze (1997). In other studies such as Choi et al. (2005) and Yeo (2001) Hofstede's cultural dimensions have been used mainly for post-hoc analysis to explain the findings of user research or usability testing.

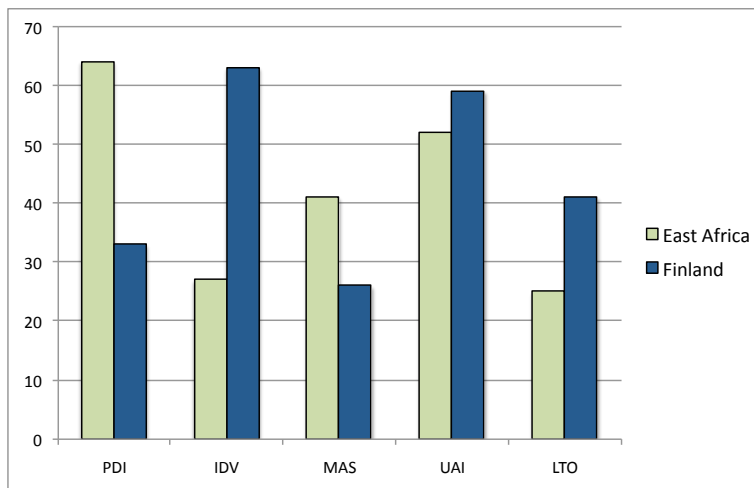


Figure 2.1: Scores of East Africa and Finland for five cultural dimensions. (In Hofstede's model, Tanzania is analysed as a part of East Africa, which covers Ethiopia, Kenya, Tanzania and Zambia.) PDI = power distance, IDV = individuality, MAS = masculinity, UAI = uncertainty avoidance, LTO = long-term orientation. The numerical data for the graph has been obtained from Hofstede and Hofstede (2005) and Hofstede (2009).

There have been two major attempts at establishing design methods on the basis of the cultural dimensions of Hofstede. The idea of direct connections between cultural dimensions and user interface elements was introduced to HCI community by Marcus and West Gould (2000) and Marcus (2002). They suggested that user interfaces reflect the cultural dimensions so that in the countries with high masculinity, for example, navigation style of user interfaces would support studying and control, whereas in less mascu-

line countries the attention of a user would be sought with poetry and visual aesthetics. Although their idea about using cultural dimensions as a source of design guidelines is often mentioned in the literature of cross-cultural HCI, the design implications of cultural dimensions presented in the papers mentioned above are hypothetical, and lack empirical validation.

Smith et al. (2004) have further developed the idea of using cultural dimensions in interface design. In their method called *cultural fingerprints* both countries and websites have profiles based on cultural dimensions, and the profiles can be compared to see how closely they match. Although their method is more advanced, it also entails an unwarranted leap from Hofstede's cultural dimensions to design elements, because the website profiles are based on scores of experts given on the basis of Marcus' ideas. On the other hand, Smith et al. (2004) report that their method is meant for illustrating cultural differences and for discussing the cultural features of a particular website with the stakeholders rather than directly informing the design.

2.2.3 Second wave approach: culture as a context

Although the first-wave HCI has been prevalent in cross-cultural HCI, there are also studies that more clearly represent the second wave of HCI, not only in their research topics but in their ideas of culture and selection of methods.

Honold (2000), for example, argues that activity theory is useful for considering cultural influences in HCI. In her definition of culture, Honold mentions several aspects that are emphasised in the background theories of the second wave, such as different scopes of cultural models and culture being both a structure and a process. Following her theoretical grounding, she also sees culture not as a mere user characteristic, but as a context in which user lives. Consequently, when studying cultural influences on user requirements in India, Honold used a mixture of contextual design techniques including interviews and observations in situ. Another study in

which similar techniques were used is De Angeli et al. (2004), who studied the use of ATMs in India. In their paper, they mention the risk of ethnocentrism in cross-cultural design and also point out the diversity of the Indian society, which makes it difficult to make country-level generalisations.

In case of the systems related to healthcare, there are some reports on the projects that have used the ideas of participatory design in the developing countries. Duveskog et al. (2009), for example, designed an educational, interactive digital platform for Tanzanian school children together with the local pupils as a part of HIV counselling project. Some other researchers have compared participatory design projects across countries. Puri et al. (2004) present three case studies from South Africa, India and Mozambique, whereas Elovaara et al. (2006) discuss their experiences about the differences in ideas and ways of participation in Sweden and Tanzania.

Activity theory and participatory design have not been the only sources for theory and methods in second-wave studies of cross-cultural design. A study by Bitton et al. (2004) offers an example of how art and media research can be used in the development of methods for cross-cultural design. They developed an audio-photographic tool that users can use by themselves to record commented clips of everyday life which can later be shown to designers and other project members. Their idea was to allow the viewers to experience the users' everyday life directly, without involving third party intermediaries. The tool was tested with encouraging results in three countries including Mali.

In surprisingly many studies semiotics or semantics is mentioned as the main source of theory⁵, even though it is not always made clear what the implications of the theory are for cross-cultural design. Two studies that fit well in the second wave tradition of cross-cultural design are de Souza et al. (2004) and Sacher et al. (2001). The former refer to Umberto Eco and Charles Peirce in their

⁵In the review of cross-cultural HCI papers by Kamppuri (2008), one out of five papers fell into this category.

analysis of online groups and how the rules of groups contradict the ideals of Brazilian users, whereas the latter argue for a culture-centric approach to design based on *ethnographic semantics* (Agar, 1994).

2.2.4 Towards the third wave in cross-cultural HCI

The third wave in HCI has only begun, so it is too early to say anything definitive about what cross-cultural HCI in the third wave will be like. Nevertheless, there are several themes that are already emerging.

Worth, values and user experience are major topics in the third-wave HCI, and affect thus also cross-cultural HCI. Cross-cultural HCI is already familiar with cultural values as described by cultural dimensions, but how the values and worth will be defined in the future and what will be the prevailing theories and methods used for studying them in cross-cultural design remain open questions.

In third-wave HCI, researchers are not only interested in the ways culture affects interaction between users and technology, but in methods and theories as cultural products, and in the effects of culture on the design process. The universality of some fundamental concepts of HCI such as usability has already been questioned (Winschiers and Fendler, 2007; Frandsen-Thorlacius et al., 2009). Besides the studies of participatory design in different cultural contexts mentioned in the previous section, there are several studies that have discussed how the suitability of usability testing techniques varies from one culture to another (Yeo, 2001; Evers, 2002; Clemmensen and Shi, 2008; Clemmensen et al., 2009).

The basic themes of cross-cultural studies based on different research traditions in HCI are summarised in Figure 2.2. As with HCI in general, research traditions of cross-cultural design co-exist and have their own roles in HCI, so they should not be seen as separate levels or being in order of preference. Instead, the figure is presented to give an overview of the wide variety of ideas, theories and methods that one can come across in cross-cultural HCI.

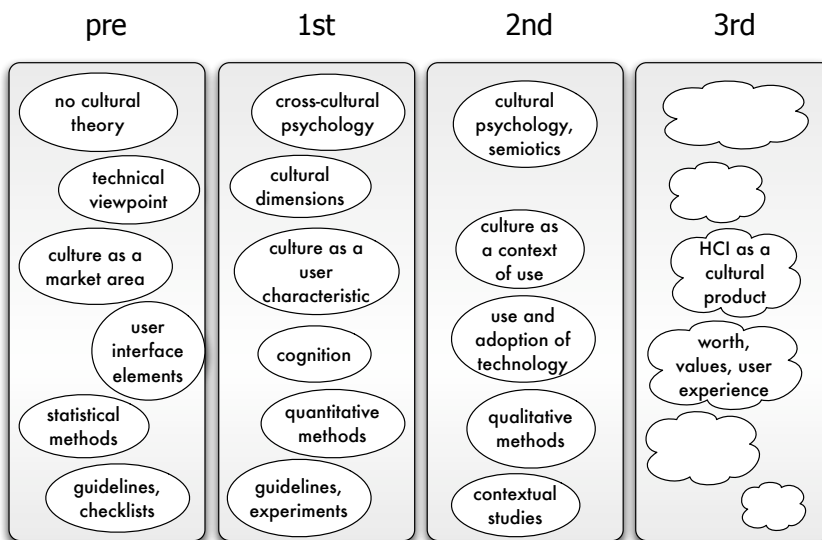


Figure 2.2: Research traditions in cross-cultural HCI.

3 *Cross-cultural design*

The previous chapter gave an overview of how culture has been approached in cross-cultural HCI. In this chapter, I explore in more detail the concept of culture and what cross-cultural design is and how it differs from intracultural design. Several examples from the current theories and methods of cross-cultural design in HCI are given to illustrate their ideas of culture and point out some of their shortcomings when it comes to supporting cross-cultural design.

3.1 DEFINITION OF CROSS-CULTURAL DESIGN

In this thesis, I use the term cross-cultural design. By choosing that term, I do not wish to imply a cross-cultural comparison, or to make any difference between cross-cultural and cultural¹. Instead, I use the term cross-cultural as a synonym for intercultural and thus as an opposite of intracultural². Cross-cultural design, then, can be defined as interaction design that takes places in a cross-cultural setting.

There are many kinds of design settings that could be called cross-cultural, because cultural meanings and forms can be found at many levels of society and beyond it. Yet when HCI researchers are talking about cross-cultural design or using other related concepts such as cultural usability or cross-cultural HCI, they usually refer to situations which involve cultural differences at a national level. Even though some other levels such as ethnicity can sometimes replace the national level in the discussions, the design settings that include only differences at lower levels of culture such as

¹In psychology, some researchers such as Cole (1998) have used the terms cross-cultural and cultural to describe the fundamental differences in the ways the discipline has approached culture.

²Gudykunst and Kim (2003), while themselves using the term intercultural, report that cross-cultural is commonly used in the same meaning.

between organisations are not usually called cross-cultural.

In this thesis, too, the concept of cross-cultural design is reserved for those design settings in which more than one national culture is involved. This does not, however, mean that there would not be cultural diversity below the national level, or that it would not be important to consider such subcultural differences during design.

The concept of cross-cultural design suggests the presence of cultural difference in one form or another in a design setting. There are several elements in a design setting which can be affected by greater cultural difference. These are users, designers, contexts of use and design, and theories and methods used during the design process.

In the most typical cross-cultural design setting that has been discussed in HCI literature a foreign designer designs for the local users in their local context. On the other hand, also a design setting in which the designers and the users represent the same national culture and share the wider context can be called cross-cultural, if there are significant cultural differences between the design theories and methods, and the context in which they are used (Oyugi et al., 2008). In this case, the “foreign” element is the theories and methods of interaction design, which are products of research and development in mainly Western, industrialised world, and as such can be seen as being culturally closer to some contexts than others. In this thesis, the emphasis is on the first-mentioned design setting, although some of the observations that are made about the cultural assumptions behind theories and methods also apply to the latter one.

Figure 3.1 shows the two cross-cultural design settings mentioned above, which also correspond to the design settings of the fieldwork described in Chapter 1.5. The setting A corresponds to the case in which I as a foreign designer studied mobile phone use among Tanzanian students in Iringa, whereas the setting B corresponds to the website design project in which Tanzanian IT students designed a website prototype for a local college using user-centred

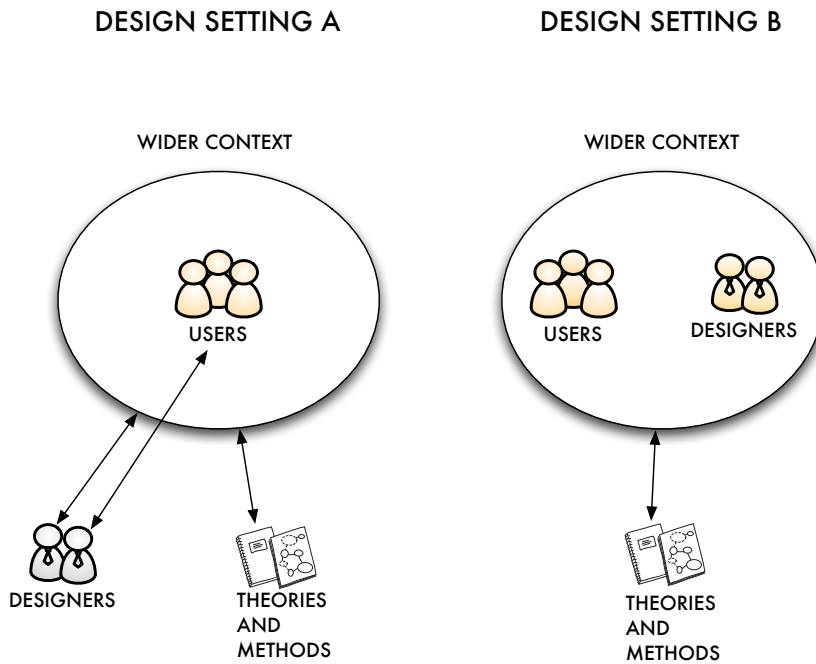


Figure 3.1: Two different cross-cultural design settings, in which the arrows show the most significant cultural differences. In setting A, foreign designers are designing for the local users using theories and methods that have been developed in other contexts. In setting B, local designers are designing for local users, but there are significant cultural differences between the wider context of use / design, and the theories and methods that are being used.

design techniques.

Besides the two design settings shown in Figure 3.1, one can come up with many other settings that could be more or less cross-cultural. The difference between intracultural and cross-cultural design thus appears to be a matter of degree rather than a dichotomy. The design settings similar to the setting B in Figure 3.1, for example, become more similar to intracultural design when the cultural differences between the theories and methods, and the context are small. On the other hand, in some cases the challenges of intracultural design are closer to those of cross-cultural design. Designing for an ethnic minority or the blind, for example, may require that a designer studies and interacts with users who lead very different lives compared to the majority of people in the society, and have their own language and ways of communication. Consequently, the designer may experience many of the same challenges as his or her colleagues who are working in international design projects.

3.2 CHARACTERISTICS OF CULTURE

A deeper enquiry into cross-cultural design must start by considering culture as a phenomenon and a concept. Although culture as a topic occurs frequently in both everyday and academic discussions, there is no generally agreed definition of it. Even in anthropology a myriad of definitions have been presented, and at times the arguments about the concept of culture have gone as far as suggesting that the whole concept should be abandoned due to its misuse and historical baggage (Abu-Lughod, 1991). Yet the arguments over definitions do not change the fact that human beings rely on their ability to learn, maintain and recreate patterns and agreements that can be observed in human thinking, behaviour and artefacts, including technology and the ways in which it is valued, adopted and used.

In the studies of cross-cultural HCI, the definition of culture has been given little consideration, when defined at all (Kamppuri et al., 2006a). It could be argued that HCI researchers should not

concern themselves with defining culture, considering that even cultural psychologists and anthropologists have failed to reach an agreement about the matter. Admittedly, it is unlikely that one ultimate definition for culture could be found in HCI. Nevertheless, the theories and methods that are used in cross-cultural design include many assumptions about culture, and researchers and designers should be aware of those assumptions in order to evaluate the suitability of theories and methods for their purposes.

3.2.1 Individual, cultural and universal

In a review of the existing ideas of culture in cross-cultural HCI (Kamppuri, 2008), it was found out that in most studies culture has been described as being shared by all the members of a particular group, and as learned, passed on from one generation to another. Culture as a learned group characteristic makes it different from individual traits, and from universal traits of human race, a distinction which is also made by Hofstede (1984).

Yet the distinctions are not that clear. Hannerz (1996), for example, has discussed cultural and other human characteristics in terms of all the six combinations of inherited vs. learned and cultural, universal and individual. The two areas that are missing from Hofstede's idea of culture are what is inherited at a group level, and what is learnt at universal level. The first-mentioned is naturally a sensitive topic, but not without relevance even in human-computer interaction in which anthropometric data, for example, has been used for designing technical devices for different populations. When it comes to culture, however, the universal and learned is more interesting.

According to Hofstede, his cultural dimensions describe "solutions to universal problems", that is, the kinds of problems that people face everywhere in the world. Thus, unless Hofstede assumes that these universal problems are somehow pre-programmed into human brain, he is in fact saying that all the people in the world learn to know these problems during their life, while developing

culture-specific ways to deal with them. Hannerz (1996), on the other hand, points out that in the current times of intensified long-distance interactions and large scale cultural diffusion, universal and learned can include both skills and mundane habits such as literacy and washing with soap, and one might soon feel tempted to add using mobile phones into the list as well.

The boundaries between the areas discussed above are fuzzy. Thus, although even anthropologists are nowadays willing to admit that human biology sets some kind of limits to cultural variability, cultural and biological development are so intertwined with one another that it is not always possible to separate their roles in shaping human characteristics (Cole, 1998). Hannerz (1996) as well as Strauss and Quinn (1997) point out that the same applies to the boundary between individual and cultural. In today's world, there are more possibilities than ever for individual constructions, and many individuals can be seen as being at the crossroads of numerous "subcultures" (Strauss and Quinn, 1997). In other words, there is no strict boundary between self and the domain of culture (Hannerz, 1996).

3.2.2 From a list to process

In HCI, culture is often described as above all a mental phenomenon that affects human behaviour and artefacts (Kamppuri, 2008). This could be expected, considering the major role of cognitive psychology and cognitive science in the history of HCI, and the popularity of Hofstede (1984) in the field. Hofstede has emphasised culture as a mental phenomenon by presenting values as the core of culture that his cultural dimensions are describing, and positioning social and material aspects of culture on the outer layers of culture. Many researchers in psychology and cognitive anthropology, too, tend to focus on what happens inside the head, using concepts such as cultural schemes or cultural models, which are mental patterns humans use to interpret situations and guide their actions. Even in anthropology culture is most of the time studied as ideas and

modes of thought, although the relationship between them and the visible forms of culture has also been of interest (Hannerz, 1992).

On the other hand, many researchers across the fields have argued that when describing culture, one should transcend the traditional division between internal mind and external environment. Cole (1998), for example, has argued that researchers should see culture as artefacts that are both material and conceptual, mediating a group's historical experience in the present. Strauss and Quinn (1997) discuss the idea of internal knowledge that is modified by the environment, and which in turn modifies the environment. In a similar vein, Hannerz (1992) has described culture as being both meanings in the mind and public meaningful forms that have ongoing interrelations. The idea of such cultural process is presented in Figure 3.2.

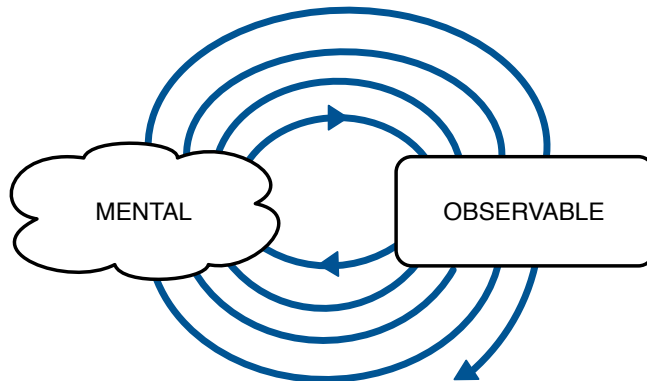


Figure 3.2: Culture as a dynamic process during which mental representations and observable actions and artefacts transform each other.

Concentrating on cultural process gives a more dynamic view on culture, as culture is no longer a mere collection of items such as values, beliefs, customs, rituals, art and tools. Indeed, it has been argued that such lists contain only residua from ongoing cultural process (Hutchins, 1995). Metaphorically speaking, culture can be

compared to running water: it is a river that may look still and permanent from a distance, but which gets its durability from change (Hannerz, 1992); or it is like “crossing streams that are continuously on the move” (Fornäs, 1995).

3.2.3 Cultural change

Considering culture as a process questions the stability of its manifestations both at the level of an individual and a society. An individual is born into a cultural world and learns its meanings, often subconsciously, and many of the meanings that are acquired early in the childhood can be strong and surprisingly stable (Hofstede, 1984). At the same time, the acquired meanings do not prevent an individual from modifying them or acquiring new ones (Strauss and Quinn, 1997). Furthermore, culture is not simply passed on to the next generations as it is. The next generation can adopt certain ideas without questioning them, whereas other cultural elements undergo many transformations through interactions between individuals and their environment (Ibid.). As new issues become relevant and defined, old ones can be taken for granted or forgotten.

Hofstede (1984), too, discusses the possibility of cultural change brought by age and the differences between generations. Yet he also claims that despite the fact that the studies behind his cultural dimensions were carried out in the turn of the 1960s and 1970s, the differences in dimensions between the countries are still valid and confirmed by later studies (Hofstede and Hofstede, 2005). How can it be explained that despite all the changes in the world during the past four decades, the cultural values would still be the same?

Hofstede argues that cultural change pertains to the visible parts of the culture, but not so much to cultural values. In fact, he presents the change of cultural values as so slow that it seems to approach the pace of biological evolution: national values “should be considered given facts, as hard as a country’s geographical position or its weather.”³ (Hofstede and Hofstede, 2005, pg. 13). Only under

³A statement that was apparently made before the effects of global warming

particular circumstances like when a revolution or other equally dramatic societal shift takes place can there be faster changes in cultural values. Alternatively, if the values do change, they do it in parallel ways across the countries so that the relative positions of cultures remain intact (Hofstede and Hofstede, 2005, pg. 28). There is thus a “remarkable stability of differences in cultural patterns among human groups” (Hofstede and Hofstede, 2005, pg. 5).

Hofstede’s arguments, however, are founded on a problematic metaphor of culture. Being on the surface is not necessarily related to continuous change: some visible parts of culture can be stable, and invisible ones in a running state, although the changes in values are not so obvious and easily observable as the changes in artefacts and behaviour (Fornäs, 1995). Moreover, researchers should not value cultural phenomena on the basis of their stability, as sometimes clearly visible changes can be as significant for people as enduring traditions (Ibid.). On the other hand, if there has not been notable change in cultural dimensions for four decades, one feels inclined to ask whether the stability of cultural values or parallel universal change in them are the only possible explanations for this. Could it be, for example, that the changes have taken place in other values than those described by cultural dimensions, or that cultural dimensions as a measuring instrument just do not catch the change even when it happens?

In cross-cultural design, the idea of culture as meanings or values that are resistant to change is not particularly useful. When culture is seen as stable characteristics that can be likened to those of universal human nature, it becomes a mould into which technology needs to be fitted (Hoft, 2003). At the same time cultural processes, in which the visible and the invisible, observable and mental aspects of culture interact and transform each other, are ignored. This is especially problematic in cross-cultural design, considering that interaction designers work at the heart of technological and cultural change, and would need to understand the various ways in which cultural meanings and meaningful forms shape and are shaped by

became a matter of public concern.

each other.

3.2.4 Shared and coherent culture

Being shared is often thought as one of the characteristic features of culture, but it is another assumption that should be taken with caution. Today, there are many levels and a lot of specialisation in the societies, which can give room to numerous subcultures (Hannerz, 1992). Many factors such as ethnic background, religion, social class and profession can unite but also differentiate people inside one society, creating opportunities for diversity.

In the cultural dimensions, however, such diversity has been lost. The main data for Hofstede's dimensions were collected from employees who worked in the marketing and service departments of IBM across the world (Hofstede, 1984). Yet cultural dimensions claim to describe differences between national cultures, not between IBM workers in different countries. This seems to entail that the distribution of cultural values in any subgroup such as IBM employees would be similar to the distribution of cultural values at the national level. In other words, cultural values would not be affected by such factors as age, occupation, urban vs. rural environment, or social class.

Such assumptions would be at odds with the findings of contemporary sociology and anthropology, and indeed even Hofstede himself is not quite comfortable with the idea of completely shared values. He has admitted that the degree of cultural integration varies from one society to another (Hofstede, 1984, pg. 21); it is affected, among other factors, by the prevalence of the national educational system (Hannerz, 1996) and the presence of ethnic groups (Hofstede and Hofstede, 2005, pg. 135)⁴.

The way Hofstede deals with this is to claim that his samples represented the middle-class, and were carefully matched by occupation, age and sex, and therefore if there were any differences

⁴One striking deficiency on ethnic terms in Hofstede's study is the sample of South Africa, which included only white people.

between the sample and other subgroups in the society, it would not be a problem because the differences would be the *same* in all the countries (Hofstede and Hofstede, 2005). This view, however, requires making two additional assumptions: not only would the samples of IBM employees have to represent equally well the middle-class in all the countries as different as Finland and Tanzania, but the extent and the patterns in which age, gender and other similar factors affect cultural values would have to be universal.

Cultural theorists have discussed cultural variability also in terms of coherency and thematicity. Although some central cultural themes can occur across a variety of contexts, there are many others that can be restricted to very specific settings, and different, even contradictory themes can co-exist inside one society (Strauss and Quinn, 1997). Again, instead of considering this type of variability, Hofstede and Hofstede (2005) emphasise the coherence of culture by discussing at length abundant, albeit selective, examples of how cultural dimensions permeate through the society, from education and business to family life and works of art.

Indeed, applying cultural dimensions to cross-cultural design of technology presupposes that they are thematical. Cultural dimensions are not based on data about people and technology, so arguing that they nevertheless affect the ways technology is valued and used means that cultural dimensions must be reflected in many areas of life besides the one from which the original data was drawn. While Hofstede cannot be held responsible for all the ways in which his cultural dimensions have been used, he does encourage the practical application of his cultural model in a variety of disciplines such as organisational management and public policy, and the examples he gives further strengthen the impression that cultural dimensions could be relevant in the relationship between people and technology, too. Although the issue has not been widely studied in HCI, there is already some evidence that suggests that not all the dimensions affect the use of technology, and the effect may be different from one country to another: Smith et al. (2004), for example, observed that power distance seems to affect the Inter-

net use in China whereas collectivity and uncertainty avoidance do not.

When designing for users in another country, there is always a risk of stereotyping (Bourges-Waldegg and Scrivener, 1998; De Angeli et al., 2004). Cultural dimensions are not a remedy for this. If anything, they encourage designers to make generalisations not only across users and contexts in a country, but across several countries. First of all, the units of analysis that Hofstede uses are very uneven: whereas Western countries have been analysed as individual units or in case of Belgium, Canada and Switzerland, even as two language areas, African and Arab countries are treated in a very different way. Tanzania, for example, is lumped together with Ethiopia, Kenya, and Zambia as “East Africa”, and a unit called “Arabic-speaking countries” includes no less than seven different countries⁵. It is clear that the units have not been chosen on the basis of the country characteristics; instead, they followed from the needs of the statistical analysis alone (Hofstede and Hofstede, 2005).

Second, Hofstede uses cultural dimensions to hypothesise about national cultures in all the countries that have scored high or low on a particular dimension. The designers and researchers in HCI who use cultural dimensions may thus be tempted to make unwarranted overgeneralisations across several countries. Choi et al. (2005), for example, studied mobile phone preferences in three countries, and suggest that because they used cultural dimensions, their results could be applied to many other countries that have similar scores in Hofstede’s model.

3.2.5 Culture as a motivational force

As discussed above, change, partiality and controversy are as characteristic of culture as durability, coherence and agreement. The ways cultural meanings are manifested in artefacts and behaviour are thus far from straightforward. Culture is constantly under

⁵The countries in question are Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia, and United Arab Emirates.

change, but it is not easy to say what exactly is going on at any given moment. There are competing cultural themes, and people differ in when and how culture motivates them (Strauss and Quinn, 1997). In addition, even though culture plays a major part in how people feel and behave, there are also many other factors that affect human behaviour: there are inherited and learned individual characteristics, natural environment, universal characteristics of human race, and situational factors involved. Culture cannot explain everything.

Hofstede, too, agrees that culture is not the only factor that contributes to how people behave. Thus cultural dimensions only describe “what reactions are likely and understandable” (Hofstede and Hofstede, 2005, pg. 3). On the other hand, he also seems to believe that culture indeed has some straightforward consequences. He favours deterministic metaphors such as “mental programs”, “mental software” or “collective programming of the mind” when referring to culture, and claims that the cultural dimensions affect “human thinking, organizations, and institutions in predictable ways” (Hofstede, 1984, pg. 11).

The problem with cultural dimensions is that they are very abstract. Conclusions about what people value or do based on cultural dimensions alone can be vague at best, and misleading at worst. Knowing that two countries have a high power distance, for example, tells us nothing about the variety of ways in which power distance can be manifested and expressed in them (Ratner and Hui, 2003). The abstractness of cultural dimensions has led some HCI researchers such as De Angeli et al. (2004) to object their use for guiding design decisions.

The hypotheses made about the use of technology based on cultural dimensions have produced controversial results⁶, and even though it has been claimed that this could be due to erroneous research arrangements (Ford et al., 2005), the evidence for the predictive power of cultural dimensions in cross-cultural design is still missing. If the most useful way of using cultural dimensions in

⁶See, for example, El-Shinnawy and Vinze (1997) and Griffith (1998).

cross-cultural design is indeed the post-hoc discussions as suggested by De Angeli et al. (2004) and Quaet-Faslem (2005), their value would lie more in being a tool for representation and communication in a project group than in guiding the design decisions.

3.2.6 Culture as a resource

In cross-cultural design culture has often been portrayed as a harmful restriction that is a mere burden on the users and a nuisance for the designers. Hoft (2003) has criticised the rigid idea of culture in internationalisation and localisation, which use what Sacher et al. (2001) call a “deficit approach”: focusing on the differences between source and target cultures, and regarding the found differences as deficiencies and problems. In user-centred design, too, culture is sometimes discussed with a rather negative tone. Beyer and Holtzblatt (1998, pg. 108), for example, describe some failed design projects by saying that

“In each of these cases, there was nothing wrong with the system delivered. It was designed and built well and solved a real problem. There was no technical roadblock to its use at all. In each case, what prevented the systems success was the culture of its proposed users.”⁷

Is it really the culture of the users that prevents the success of the system, rather than design that did not consider the culture of the users? Instead of seeing culture as the starting point for the design process, its role is reduced to a restriction that makes life more difficult for both the users and designers; the users feel culture “as a weight or pressure influencing actions”, while the cultural model of contextual design only shows those influences that are “especially harmful” (Beyer and Holtzblatt, 1998, pg. 110-112).

⁷Note though that Beyer and Holtzblatt (1998) discuss culture at an organisational level.

Some of the theoretical approaches that are more characteristic of the second-wave HCI have presented culture in a very different light. Cole (1998) and Hutchins (1995), for example, both describe cultural process as a fundamental part of human life. Unlike in case of any other species, human development takes place not only through biological but cultural evolution, which has enabled much faster and more flexible adaptation to the environment (Cole, 1998). Without cultural process, humans could not function as humans: as Geertz (1973) puts it, a cultureless human would not be so much an “intrinsically talented, though unfilled ape”, but a “wholly mindless and consequently unworkable monstrosity”.

In cross-cultural design, both Hoft (2003) and Sacher et al. (2001) have argued for a more positive role for culture in the design process. The latter suggest that designers should view culture as a tool for connecting to the life of the users. Learning about the culture of users can help designers understand better why the users do what they do, what they value and why. From this point of view, culture could become a design resource rather than a design restriction.

The challenges of cross-cultural design can also benefit the field of HCI as a whole. In a similar way that cross-cultural studies have advanced the mainstream psychology, studies of cross-cultural design can also advance the current understanding of human-computer interaction and the design process. Cultural differences between users, designers and the contexts of use and design highlight the cultural assumptions behind the current theories and methods in HCI, offering new insights into the goals and techniques of interaction design.

3.3 CHALLENGES OF CROSS-CULTURAL DESIGN

Although intracultural and cross-cultural design can be seen as variations of the same process, there are some characteristics that make cross-cultural design especially challenging. In this section I discuss some of those characteristics and illustrate them with examples from the literature of cross-cultural design.

3.3.1 Value, worth and ethnocentrism

The third-wave HCI has emphasised that interaction design should start with value, although there are some uncertainty about what kind of value should that be. In their vision for human-computer interaction, Harper et al. (2008) discuss about designing technology that both reflects the values people hold and provides opportunities for expressing them. They define values as ideas that people have about what is desirable in a given situation, context or society, and which guides their judgements and actions. Such values, they argue, should be discussed in the context of new technological developments and their consequences.

Previously, values have been discussed in HCI mainly in two different meanings (Cockton, 2006). First, value in commercial terms has been understood as something that can be added to consumer products to convince the customers that what they get is worth their money. Second, there is a design approach called *value-sensitive design* (Friedman, 1996) which emphasises moral and public values as well as ethical issues in interaction design. Cockton (2004), however, talks about *value* in singular, taking it as a broad term that includes but is not restricted to the two above mentioned ways in which values have been discussed in HCI.

To avoid further confusion with the the concept of value, Cockton (2006) replaces it with that of *worth*. He defines worth as something that people value and in which they are thus motivated to invest money, time, energy and commitment. Worth depends on the users, situation and context: there is no “product quality” insofar as that refers to intrinsic, universal value in technology (Cockton, 2006). Harper et al. (2008), too, emphasise that people value different things in different contexts.

User-centred design methods typically produce a number of descriptive accounts and models of information flows and physical environment of use. Yet it has been argued that design cannot be based on such accounts, because merely knowing “what is” cannot tell the designers “what should be” – no normative claims can be

made on the basis of descriptive accounts⁸. Consequently, worth-centred design of Cockton (2006) aims at understanding what kind of value the designers can bring to the life of the users and other stakeholders with the means of a socio-digital system. Design as a process requires making choices, and every design choice unavoidably favours some particular aspects of use while discriminating against others. If designers want to design technology that corresponds to the needs of its users, they need to know what the users value.

The values and worth should play a major role in cross-cultural design, too. Cockton's idea of worth can be used to diverge from the idea of culture as a mould in cross-cultural design, because it makes the relationship between the context and design more dynamic. To design something that is worthwhile to the users does not necessarily mean a perfect fit between the context of use and the design. A design can fit the context well without bringing much worth to its users; on the other hand, if the design outcomes bring enough value, they may outweigh the cost of any contextual misfits (Cockton, 2006). Furthermore, Cockton talks about creating worth through design and negotiating value throughout the design process. This includes the possibility of coming up with new, creative designs that can be worthwhile in unforeseeable ways.

Values have a cultural base, although many of the values are learned so early in life that people are not aware of them, and can thus easily mistake their learned values as "facts" or "truths" (Hofstede, 1984; Strauss and Quinn, 1997). As people grow up, they learn to appreciate certain things and disapprove others, and make interpretations and judgements accordingly. This leads to ethnocentric thinking.

Ethnocentrism is a term that was first introduced by Sumner (1906, pg. 13). He defined it as a "view of things in which one's own group is the center of everything, and all others are scaled and rated with reference to it". Such a view is often accompa-

⁸In philosophy, this idea is known as Hume's Law or Hume's Guillotine after David Hume. See also Cockton (2004, 2006).

nied by feelings of pride and superiority (Ibid.). In cross-cultural design, ethnocentrism on the part of the designers can have disastrous consequences, because the designers may fail to recognise and empathise with users' values.

Matsumoto and Juang (2004) argue that ethnocentrism is a fundamental characteristic of human thinking, and thus cannot be avoided; the only way to deal with it is to be aware of its effects on one's own thinking. In cross-cultural design, this means that designers must keep in mind that each person's interpretations of the reality are coloured and distorted by his or her cultural assumptions, and that designers themselves are certainly no exceptions. A designer needs to be constantly on the watch for emotional reactions and moral judgements that are likely to arise during cross-cultural design, and examine them critically instead of making hasty interpretations. It is a skill that needs to be practised like any other design skill.

How about the cultural values of Hofstede? Hofstede's (2005) cultural dimensions describe cultural preferences related to five assumedly universal problem areas in life: social inequality, the relationship between the individual and the group, masculinity and femininity, dealing with uncertainty and ambiguity, and orientation to time. In the world filled with value, however, they represent only a handful of very broadly defined values that have been chosen for their universal appearance in Hofstede's research. In addition, it is not clear to what extent and how the values represented by cultural dimensions are manifested in the relationship between users and technology. Consequently, they fall short of providing the kind of guidance that is needed in worth-centred design.

Finding out worthwhile design goals requires paying specific attention to values and worth: discussing them with users, representing them, and evaluating the design against them. Unlike tasks and artefacts, values are not directly observable, and yet the current user-centred design methods do not pay enough attention to how to make them explicit. In case of contextual design, for example, Beyer and Holtzblatt (1998) say that cultural context including values is

revealed in the language people use, but on the other hand their cultural models are supposed to speak “the words people think but don’t say” (Beyer and Holtzblatt, 1998, pg. 112). There is no special effort for highlighting the values; it seems that they are supposed to uncover themselves somehow during the course of design. This is a risky assumption, and even more so in a cross-cultural design setting in which designers need to actively guard against making ethnocentric interpretations.

3.3.2 Wider context of use

As described in Chapter 2, there has been a continuous expansion of focus in design throughout the history of HCI, first from machines to tasks and immediate context of use, and then to the level of organisation (Grudin, 1990). The fact that usability and user experience depend greatly on the context of use is well-known in HCI, the importance of context being one of the main themes in the second-wave HCI. In the third-wave HCI there are calls for going even further, for considering wider contexts such as socio-digital systems as a part of a society (Kamppuri et al., 2006c; Harper et al., 2008). According to Sellen et al. (2009), HCI needs to see users as individuals who have “desires and concerns and who function within a social, economic, and political ecology”.

Both in intracultural and cross-cultural design settings, designers need to learn about the immediate context of use, as well as about some other contexts beyond it such as the organisation in which the system is used. Nevertheless, what designers know about the wider context varies. In intracultural design designers have experience about how the society in which they are designing in works. Although two persons who live in the same society may have been exposed to different subcultural influences depending on their religion, occupation or social class, living in the same society means that to a certain degree they have shared similar experiences and knowledge about the wider context such as infrastructure, history, politics and communication genres. In cross-cultural design,

the wider context may be as strange to designers as the details of the immediate context of use. This affects the designer's ability to make design decisions that take into consideration the wider context of use.

Organisational culture covers only a part of an individual's adult life, whereas cultural meanings that are learned early in life have often more thorough and longstanding influence on people (Hofstede and Hofstede, 2005; Strauss and Quinn, 1997). As people learn about their everyday life and national culture mainly through unconscious effort, they may not realise what a vast amount of knowledge it contains. Although it is impossible for foreign designers to gain equally extensive knowledge during one cross-cultural design project, even some limited knowledge of the wider context of use is helpful. Being familiar with things like local laws, policies, environment, infrastructure, politics, and business practices help designers understand better why users value what they do, and why they behave in particular ways. In addition, designers can achieve a more realistic understanding of what could be achieved by their designs.

Not knowing the wider context can quickly lead to misunderstandings during the design process. Honold (2000) gives an example of foreign designers who were designing washing machines for the households in Mumbai, India. The designers found out that user preferences included washing machines with wheels, short washing programs, machines made of plastic rather than steel, and visibility of water consumption. Still, the designers initially misinterpreted or failed to see the reasons behind the user preferences. Only after the designers learned about the local physical and cultural context could they understand how such issues as the typical composition and size of a family, relations with the relatives, hot, humid and dusty climate, cultural rules concerning the scheduling of housework, and power and water supply affected what the users valued in the washing machines. For an Indian designer, many of the reasons behind the user preferences could have been self-evident, requiring no further justification.

The wider context of use needs to be conveyed along with the re-

quirements and feature lists in the design project. Without the cultural context, user needs quickly become distorted or are dropped altogether, as happened in the case of German engineers who were designing automation software for their American colleagues (Beu et al., 2000). German engineers gave very low priority to the calls of the American engineers for such features as “beginner’s mode”. What the German engineers did not realise, however, was that the reality of working life for engineers was very different in USA compared to Germany. Higher staff turnover, shorter project cycles and the lack of formal training at work places all made it crucial to invest in the learnability of the software.

3.3.3 Wider context of design

Knowing the wider context in cross-cultural design is useful for understanding users and requirements, but also when planning and implementing a design project. The extent to which the context of use is also the context of design varies from one cross-cultural design project to another, but as a rule any user-centred design project calls for studying the context of use, and being in contact with users at several points during the design project. Furthermore, designers usually need to co-operate with the officials and partners of the project in the target country.

It is also worth noticing that cultural differences between designers and the context of design can have an effect on a design project even when the designers do not leave their home office. Some of the practical arrangements and communication with the project stakeholders may take place through Internet, phone or fax, which brings designers in touch with some aspects of the wider context in the target country. Being familiar with the local values and practices is then even more important, because the limited possibilities for communication and observation make it harder to monitor how things are progressing, or to solve any problems that may arise.

The contextual factors that affect the design project are mostly

the same as those affecting the use of technology. The physical environment can shape the design project by restricting the available options for technology, communication and mobility. In addition, designers work as a part of larger network of actors and institutions such as companies, organisations and government agencies in a particular country, whose values and practices affect also designers. Being familiar with the wider context can save a considerable amount of time and effort with practical arrangements; it can provide answers to questions like whose support is crucial for the success of the project, how to get access to users, and how to motivate users to participate.

Which contextual factors are the most crucial to note depend both on the designer and the design context. Table 3.1 includes some examples of contextual factors and their effects on design projects⁹.

One of the key principles in user-centred design is user involvement, which requires communication between users and designers, often throughout the design process. Many of the techniques in user-centred design such as contextual inquiry or low-tech prototyping have been designed to facilitate communication in situations in which the knowledge of a user and that of a designer can differ. But as the studies in cross-cultural psychology have shown, cross-cultural communication involves many characteristics that are not typical of intracultural communication (Matsumoto and Juang, 2004).

One obvious difference between cross-cultural and intracultural communication is the language. In intracultural design, users and designers may have difficulties in understanding some concepts that are specific to a certain area of expertise, but in general they are likely to have a common (often native) language in which both of them are very fluent. In cross-cultural design, either designers

⁹Examples have been drawn from the experiences during the fieldwork in Tanzania as well as from several papers about cross-cultural design projects such as Foucault et al. (2004), Braa et al. (2004), Chetty and Grinter (2007) and Anokwa et al. (2009).

Table 3.1: Examples of contextual factors and their effects on a design project.

Issue	Effects on design projects
Climate and nature	Humidity, heat, frost, dust and light can affect the performance of both people and technical devices; risk of natural phenomena such as flooding, earthquakes or hurricanes.
Transportation infrastructure	How long it takes to travel from one place to another: condition of roads and railways, traffic load, traffic rules and the degree to which they are followed, availability and reliability of public transport.
Communication and electricity infrastructure	What kinds of technical tools and communication media are available during the project; availability, quality and reliability of electricity and networks.
Supplies	Availability and quality of local supplies, reliability of deliveries from abroad, custom procedures.
Health and safety	Health risks such as diseases and crime.
Legal and political system	How the local laws and government policies affect the design process; the stability of political situation, local agendas.
Management and business conventions	What are the local ways of managing and doing business; e.g. ways to form good relations, most appropriate communication channels, how to motivate people to co-operate.

or users or both often have to communicate using a foreign language in which they may not be able to express themselves as well as they wish. If designers and users have no common language, a third party, an interpreter needs to be involved. Although this gives users and designers a chance to express themselves better, the role of an interpreter becomes critical, because designers and users are wholly dependent on his or her ability and willingness to convey the messages as accurately as possible. If the interpreter is not entirely fluent in both of the languages used, is not a professional interpreter, is not familiar with the application area, or does not understand the variety of details that can be relevant in interaction design, the communication is likely to suffer from omissions and misunderstandings. Interpreting in situ also doubles the time required for communication.

Language is easy to notice, but there are many other more subtle differences involved in cross-cultural communication. In intracultural communication, people can assume that they share a certain amount of knowledge about the physical and social reality that can be used for interpreting what is said. People also share knowledge about the appropriate ways of communication. In cross-cultural communication, the differences in knowledge between participants are more pronounced. To take one example, there are historically and culturally specific *communicative genres* that set the expectations for what should be said and done in particular situations (Günther and Luckmann, 2001). Different cultures have developed communicative genres for different situations, and even when genres exist in two cultures for the same type of situation, their elements and the ways of use can be different. In cross-cultural communication participants may thus have conflicting ideas of how to appropriately perform acts such as expressing disagreement, reacting to compliments or demonstrating their skills in a particular situation (Ibid.).

In intracultural communication, people notice more easily differences in knowledge, interpret subtle clues about the social position of the persons and modify their ways of communication accordingly. If people make mistakes, they can usually resort to

appropriate “repair procedures” (Günther and Luckmann, 2001). Again, cross-cultural communication tends to be more awkward and rigid in this sense, because it is more difficult to know when and how the communication style should be adapted, and how to correct one’s mistakes. Common problems in cross-cultural communication situations include underestimating a foreigner’s knowledge about local issues which can be interpreted by the other party as “talking down”, and stereotyping that can lead to exaggerations at the level of style and genre (Ibid.).

The problems of expressing oneself with a foreign language and the mismatches between talkers’ background knowledge, non-verbal behaviour and other cultural rules concerning communication can lead to misinterpretations and general feeling of uncertainty about the intended messages (Matsumoto and Juang, 2004). The ambiguousness and extra effort required in the communication situation can irritate the participants, and the violations of cultural expectations during the communication situation tend to invoke negative interpretations about the other party. The communication situations that take place during cross-cultural design are thus marked by a higher risk of tension and conflict.

3.3.4 Theories and methods as cultural products

Due to the globalisation of ICT, interaction designers more and more often find themselves designing technology for people and contexts that are strikingly different from the traditional users and development contexts of ICT. To date, most of the design theories and methods in HCI have been developed in the industrialised West and at the time when ICT was mainly used as a tool for increasing efficiency at work. Increased diversity in users, contexts of use and purposes of use has, however, highlighted the cultural assumptions behind the theories and methods of HCI, encouraging the designers and researchers to question the universality of them.

Concepts of usability and participation

The critical discussion about the extent to which the concepts of HCI are culture-specific has already begun. Even usability, which is one of the fundamental concepts in the first-wave HCI, has not escaped a closer scrutiny as several studies have investigated the effect of culture on perceived usability. The preliminary results from Winschiers and Fendler (2007) suggest that instead of the more traditional usability attributes of efficiency and error rates, Namibian ICT users are more concerned with safety, flexibility and easefulness. In another study Frandsen-Thorlacius et al. (2009) compared the usability views of Chinese and Danish users, and found out that whereas Danish users appreciate effectiveness and lack of frustration, Chinese users place more importance on visual appearance, satisfaction and fun. The user frustration due to poor usability has been reported to be a significant problem at work in the USA (Lazar et al., 2006), but a similar study by El-Qirem et al. (2007) found out that in Jordan, very few users got frustrated over computer problems that occurred at work.

Findings such as those above expose the cultural basis of usability as a concept that reflects the particular circumstances in which it was created. Although HCI has recognised that the relative importance of usability attributes depends on the context of use, even in a work context the importance of attributes can differ from one culture to another so much that some of the traditional usability attributes do not matter, while other, alternative aspects of use become more significant. The observations about cultural differences in the meaning of usability support Cockton's (2006) call for not using general, pre-defined evaluation criteria in interaction design.

The second-wave HCI is based on the idea of user-centredness in design, and of its methods participatory design in particular has advocated the active user participation throughout the design process as a key to successful design projects. The requirement for participation stems from the strong ideals of the cultural context in which participatory design was developed: Scandinavian workers'

union and industrial democracy that aimed at empowering lower-level workers by giving them a more active role in the development of systems they had to use (Greenbaum and Kyng, 1991). Later, when participatory design spread to other countries such as USA, the political aspects of participatory design became de-emphasised, and it was used more pragmatically as one way of avoiding project failures in ICT development (Byrne and Alexander, 2006). Nevertheless, the original ideas about the need for grass-root participation and how it can be achieved are still reflected in the principles and techniques of participatory design.

The values behind participatory design, however, are not universal. Participatory design and industrial democracy behind it can be seen as attempts to reduce power distance. Such ambitions are likely to be more acceptable in the societies in which the power distance is already smaller, whereas in countries with high power distance there is a chance of strong resistance from several quarters (Hofstede, 1984). A telling account of the challenges involved in a design setting with a high power distance is offered by Braa et al. (2004), who, encouraged by previous successes in several countries, were daring enough to initiate a participatory health system project in Cuba. Their project was called to a halt, partly because of changes in the political situation but also because the officials of authoritarian and centralised health system in Cuba preferred a top-down approach to development, and did not share the designers' desire for grass-root involvement.

Even when participation in itself is considered as a good thing, there can be many ways of participating. Byrne and Alexander (2006) argue that the classifications of different kinds of participation in participatory design tend to be judgmental, because they imply that it is always possible, desirable and necessary to achieve the most intensive forms of participation. Yet in some design settings it may be impossible to create participation that would correspond to the ideals of participatory design. Rigid hierarchical structures and strong bureaucracy in a country can efficiently prevent any participatory initiatives that start from the grass-root level.

In that case, regardless of how paradoxical it may sound, “imposed participation” pushed by a powerful leader may be required (Hofstede, 1984). Puri et al. (2004), for example, experienced this in India, where they found out that the push for the participatory design process needed to come from above, from government officials.

Design and evaluation techniques

Usability testing with a thinking aloud technique is probably the method that has been studied the most in cross-cultural design settings. In their theoretical study, Clemmensen et al. (2009) use Nisbett’s (2003) theory of cognitive differences between Westerners and Asians to discuss the potential effects of them on the use of thinking-aloud technique in usability evaluation. They conclude, among other things, that thinking aloud could affect the task performance more negatively in case of Asian users, and that Western users express themselves more directly whereas Asian users aim at maintaining social harmony during communication. Related empirical study (Shi, 2008) about usability testing in China found out that the latter was true in case of Chinese evaluators but not so much in case of users. The authors attributed this to the users’ education and experience about similar evaluation situations.

An empirical study in which usability tests were carried out with users from three countries found out that testing worked best with English users but not so well with Indian and Kenyan users (Oyugi et al., 2008). The fact that using an evaluator from the same country as the users did not change the situation suggests that the problem was indeed in the cultural distance between the method and the users rather than between the evaluator and the users. The authors conclude that the type of communication between users and evaluators that is expected to take place during a usability test may not consider the effects of high power distance in Kenya and India.

Contextual design (Beyer and Holtzblatt, 1998) is one good example of a user-centred design method that includes many cul-

tural assumptions related to communication. It presents one process with fixed design activities and with only limited variations which are merely “rapid” versions of the method in which the process is shortened by leaving out some of the activities (Holtzblatt et al., 2005). The main technique for studying users and the context of use is contextual inquiry, an interviewing and observation session that takes place in the context of use. In order to balance the uneven relationship between a user and a designer, who may be conceived as a technical expert by the user, the designer is supposed to assume a role of an apprentice who is learning from the user.

From a cross-cultural point of view, a contextual inquiry is not always an appropriate technique for studying users and the context of use. It presumes that users feel comfortable and are willing to give a truthful account of their actions during a relatively short, one-to-one session. In addition, the relationship model of “master and apprentice” it promotes is not always preferable or even possible. In some countries people prefer to retain and even emphasise the status difference, so there may be contexts in which acting against this expectation could perhaps give a negative impression of the designer, cause confusion or make the user withdraw from the situation.

Another culture-dependent rule in contextual inquiry is that the designer should turn down user requests for technical help during the inquiry session. In some cultures, however, there can be a strong social pressure towards helping other people when one is perceived as being able to do so, in which case refusal can break the cultural expectations and be interpreted as an insult of the worst kind. In the class discussions with Tanzanian students, for example, it became clear that they felt somewhat uncomfortable with this particular rule of contextual inquiry, and found it difficult that such requests should be denied.

The design techniques of participatory design also make assumptions about how people communicate. The techniques may work well across many design contexts in the countries such as Swe-

den, where participation is often politically grounded and highly regulated (Elovaara et al., 2006), and where people can express their opinion and debate openly. But that is not always the case. In Cuba, for example, people are used to voice their opinions and criticism in ways that are more indirect, slow and based on informal networks, but such participatory techniques may not be supported by participation design (Braa et al., 2004).

The strength of participatory design is that as a flexible approach that has yielded a wide variety of design techniques, it is open for new techniques that consider the special requirements of different design settings. Sometimes local traditions can be better sources for design techniques than design books. India, for example, has its own tradition of user-centred design that goes back to the 1970s when “barefoot designers” designed products to improve people’s everyday life (De Angeli et al., 2004). In the villages of South Africa, Puri et al. (2004) made use of traditional communication channels such as community meetings, and local ways of expression including songs, dance and poetry in their design project.

The problem with generalisation

The researchers in HCI have started to question the universal applicability of design and evaluation techniques, so in the future one can expect to see more studies similar to Evers (2002). She compared three techniques in four countries and found out, among other things, that Japanese users were more comfortable with interviews than questionnaires or think-aloud, and that American users were the ones that could deal best with think-aloud technique.

While such studies are important considering the need for heightening the awareness of cultural assumptions in HCI, they suffer from the same problem as many studies about the effects of culture on the use of ICT: overgeneralisation. Treating national culture as a single variable that determines whether a particular technique will work or not is not particularly helpful, because it does not take into account the cultural variety inside a country and the situational

factors. In Malaysia, for example, power distance may make people cautious about giving direct criticism during usability evaluation, but if the users know the evaluator beforehand and are experienced users, they feel more comfortable with voicing their opinions (Yeo, 2001). Experience with ICT may also have been one factor in the website design project in Tanzania, in which the student-designers attributed the unwillingness of some users to give their opinions about a website to the lack of technical experience. In Cuba, Braa et al. (2004) noticed that although the grass-root participation was not characteristic of the country in general, participation turned out to be more active in the remote areas of the country that had developed some autonomy due to the long and slow connections to the central offices in Havana.

Some researchers in HCI have suggested that although cultural dimensions may be too abstract for predicting the ways in which ICT is used, the dimensions could be used when appropriating usability methods to a local context. Winschiers and Fendler (2007) give an example from Namibia which in Hofstede's terms is classified as being rather collectivist and having high power distance. On the basis of these characteristics the authors argue that in Namibia, group usability evaluations should be preferred over individual ones, and that interviewers and interviewees should come from the same ethnic group to level out the power distance. These guidelines match with their practical experiences about doing user research in Namibia (Winschiers and Fendler, 2007).

Cultural dimensions represent aspects of culture that are likely to affect the suitability of design techniques. Power distance, for example, has been considered as a possible explanation for cultural differences in several studies (Vatrapu and Pérez-Quinones, 2006; Winschiers and Fendler, 2007; Oyugi et al., 2008). But if cultural dimensions are used to inform the choice of design techniques, their abstractness leads to the problem discussed above: cultural dimensions hide the variety inside a country, and the resulting country-level guidance may lead a designer astray.

Let us consider, for example, how Hofstede's cultural dimen-

sions depict the differences between Finnish and Tanzanian culture. According to Hofstede, in collective societies such as Tanzania, students hesitate to speak up in larger groups if the teacher is not present, especially if the group includes out-group members. Combined with the assumed effect of power distance, this could explain why in a Tanzanian university, a Head of Department can find individual interviews with the students problematic, whereas foreign visiting researchers can observe exactly the opposite: in a group students are shy to voice their opinions, whereas criticism is more openly given in individual interviews.

Nevertheless, it is equally easy to find examples from both Finland and Tanzania that do not fit the expectations set by cultural dimensions. According to Hofstede and Hofstede (2005, pg. 88) in individual cultures such as Finland silence is typically considered as abnormal, and social conversations are compulsory. Yet any foreign designer who relies on this while communicating with Finnish users will be surprised, because there is in fact the opposite tendency. Not only does the preference for silence constitute a significant part of Finnish communication and identity (Carbaugh et al., 2006), but it is one of the very characteristics of Finnish culture that draws the attention of many foreign visitors.

Hofstede also claims that in collective societies such as Tanzania people typically avoid confrontations and conflicts. My observations during the fieldwork in Tanzania showed that this was indeed often true. On the other hand, there were also many situations in which it was not. The local newspaper frequently reported about vehement group protests, even against protestors' superiors such as teachers or local authorities. At the university the students openly criticised the work of their peers in the class; for example, during seminars students sometimes got into heated debates that would be highly unusual among Finnish students, never mind how individually oriented they may be.

Although Tanzania's score in masculinity is higher in Hofstede's model than that of Finland's, the difference is much smaller compared to power distance and individuality, and when Hofstede and

Hofstede (2005, pg. 129) divide countries between masculine and feminine, they label both Finland and Tanzania as feminine countries. Still, designers who arrive in Tanzania can find out that there are very different expectations considering male and female roles in Tanzania, and those expectations shape both design projects and the ways technology is used. Again, relying on cultural dimensions when choosing or adapting design methods would be very misleading.

4 An ethnographic approach to cross-cultural design

In this chapter I outline an alternative approach to cross-cultural design that aims at addressing the theoretical and methodological challenges recognised in the previous chapter. The chapter ends with a brief description of how the approach can be fitted into user-centred design process.

4.1 ABOUT “ETHNOGRAPHIC” AND “APPROACH”

There are several reasons why the approach described in this chapter is called “approach” instead of “method”. By being an approach it forbids the idea of one fixed method that could be followed in cross-cultural design, and not only allows, but calls for designing the design process and adjusting it as necessary during the project. As such it follows both Cockton (2009a) who argues that development frameworks should not rigidly direct design activities, and ethnographic tradition in which research is seen as a dynamic process that includes many unexpected twists and turns (Brewer, 2000). In comparison to user-centred design methods, the approach is more similar to participatory design with its general principles and a wide variety of different design techniques, than contextual design with a well-defined design process and fixed techniques.

The requirement for flexible development stems from the view that no technique or method used in interaction design is neutral, but is always affected by the targets of the study, the researcher and the research setting. From this point of view, cases in which a design technique works in different ways from one design setting to another cease to be anomalies, and become a part of everyday life that designers must deal with. When design methods are consid-

ered as cultural products that are based on particular assumptions about how people behave, it makes sense that there cannot be “one-method-fits-all” type of design methods in cross-cultural design.

The second reason for choosing the term “approach” is that the approach is more than particular design activities. It is also about adopting a particular mindset towards people, culture, technology and research. It encourages designers to think about the characteristics of culture and the ways it manifests itself in the world, in users and technology, as well as in designers and the fundamental ideas of their discipline. As such it differs from those studies, methods and approaches in HCI that have been called “ethnographic” mainly on the basis that they are “in situ, qualitative, or open ended” (Dourish, 2006). This approach is ethnographic in a much wider sense of the word.

In HCI, “ethnographic” has been defined loosely. Often ethnographic studies in HCI draw from ethnomethodology and grounded analysis, which are based on quite different assumptions than ethnography in anthropology (Pollner and Emerson, 2001). Some methods that have been called ethnographic in HCI have downplayed the very aspects that are hold dear in ethnography. For example, whereas in anthropology intensive and extended fieldwork is seen as essential (Atkinson et al., 2001), in HCI the main emphasis has been on developing “quick and dirty” methods in which the time required for fieldwork and analysis is drastically cut down. One example is Millen’s (2000) *rapid ethnography* that suggests several ways for saving time (or “time deepening strategies”), such as narrowing the research focus before entering the field. In fact, some techniques that have been called ethnographic in HCI such as contextual inquiry and *cultural probes* (Gaver et al., 1999) differ so much from ethnographic research that they could be described as rejections rather than as variants of ethnography (Dourish, 2006).

Many designers who get involved in cross-cultural design may find themselves in a design setting that reminds them of a field of a classic anthropologist (see, for example, Chetty and Grinter (2007)). Both designers and anthropologists need to find ways to

make sense of people and their everyday life in a setting in which the researchers are more or less strangers. They both need to observe, question, learn and understand what people say and how they behave and why, and find ways to communicate their experience to people who have never visited the field. Many of their challenges such as how to handle the fieldwork, how to guard for ethnocentric thinking and how to represent culture are the same¹. Thus the anthropological discussions about the concept of culture and methodology can be very valuable when considering the challenges and needs of cross-cultural design.

There are also significant differences between the work of a designer and an anthropologist. One of them is that whereas in anthropology there is a strong tradition of ethnographers remaining neutral and not committing themselves on the phenomena they are studying, designers have no such option: they must interfere in people's life because their designs will unavoidably favour some aspects of life while discouraging others. The designers cannot avoid making value-laden decisions. In anthropology, the goal of the research has traditionally been advancing the knowledge about humankind. The work of interaction designers, on the other hand, is closer to what Brewer (2000) calls *practical ethnography* in which the success of the research is measured against the extent to which the research advances the life of those studied.

While the approach described in this chapter does not claim to be truly faithful to ethnographic research as it is practised in anthropology, the approach has borrowed a great deal from it. The critical discussion that has taken place in anthropology about the concept of culture has contributed to the ideas of culture and how they can affect design process. The ethnographic study of mobile phone use in Jamaica by Horst and Miller (2006) has served as a

¹Observed similarities can also be disturbing ones, such as in Suchman's (2002) provocative comparison of the designers in the midst of the 21st century capitalism and the anthropologists of the colonial times: today, the people studied are consumers, whose needs and wishes designers are supposed to collect and report to big and powerful corporations, who can then use the information for their own purposes.

practical example of how technology can be approached in anthropology. The idea of trying to understand why people do what they do – or like Geertz (1984) puts it, “to figure out what the devil they think they are up to” – is in the heart of ethnographic endeavour, but also in the interests of the worth-centred, cross-cultural design discussed in this chapter. The approach also advocates many elements such as extensive fieldwork and reflexive research that are fundamental in ethnographic research. In addition, although the goal of the approach is to inform cross-cultural design process, not to contribute to anthropological theory, it does not exclude the use of pre-existing or resulting ethnographies for inspiring the design in ways that go beyond straightforward design implications (see, for example, Dourish (2007)).

4.2 CULTURE

As discussed in Chapter 3, the prevailing ideas of culture in cross-cultural design stress the stability, coherence and sharedness of culture, while the global world of ICT in which interaction designers work today is characterised by change, heterogeneity and diversity. The ideas of culture do matter in interaction design, because they affect, among other things, what kind of design techniques are used and how the results are presented.

Country-level generalisations such as cultural dimensions enforce the idea of one national culture and give designers no access to cultural variety from which the supposed national averages have been drawn. What they overlook is that both sharedness and thematicity have also their opposite tendencies: that cultural values need not to be, and indeed often are not the same across all the subgroups and contexts in a society. In interaction design, the abstract and decontextualised cultural dimensions can contribute to stereotyping and overgeneralisations across the user base.

An alternative, more balanced way of defining culture is to view it as a process that has opposite tendencies (Figure 4.1). Cultural meanings spread and create similarity; at the same time, they do so

through never-ending cycle of transformations from meanings to meaningful forms and back to meanings, during which they tend to diversify. In the modern world, there are many forces that affect culture beyond national boundaries; yet the local everyday context continues to have a strong presence in the life of people (Hannerz, 1996). There is similarity, but not without controversy; there is motivational power, but not without competing motivators.

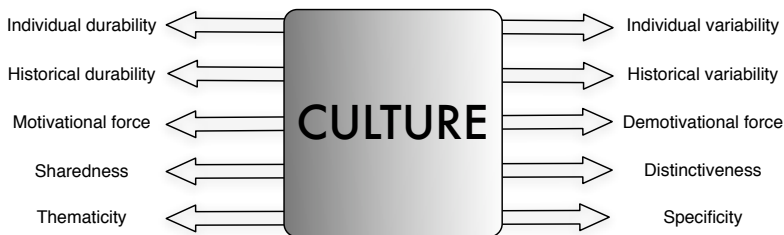


Figure 4.1: The opposite tendencies of culture, based on Strauss and Quinn (1997).

For designers of cross-cultural design this means that such things as cultural coherence or stability should never be taken for granted, but as topics of investigation (Hannerz, 1996). Instead of relying on simplified models of national culture, designers must study users and the context of use in ways that bring out the dynamic and controversial nature of culture. They must, for example, pay attention to the different levels of culture and how those interact with each other. Timeless, overgeneralising and stereotypic descriptions should be avoided in favour of accounts that highlight also subcultural difference and include a wider timeframe that extends both to the past and to the foreseeable future.

Furthermore, researchers and designers can benefit from taking a more positive view on culture in interaction design. Cross-cultural design is challenging, but it is not necessarily about designers having “the same responsibilities with more constraints” as described by Anokwa et al. (2009). Each design context has its own possibilities and constraints from the design point of view; it is the

job of the designer to find out what they are, and make a full use of the possibilities while finding ways to live with the restrictions.

4.3 PROJECT PLANNING

If there was only one piece of advice that could be given for cross-cultural design, reserving enough time for design projects could well be the one. In the tight schedules of ICT development, the time reserved for design activities in one project can be weeks rather than months or years, but cross-cultural design projects in particular would benefit from longer timespan. Although designers in cross-cultural design projects may never have as much time as ethnographers in anthropology – in anthropological studies, a year of fieldwork is often considered as the minimum – the challenges of cross-cultural design are such that dealing with them requires more time compared to intracultural design.

Time is required, for example, for using several design techniques while in the field. As there is often uncertainty about which design techniques will work best in the design context, the use of several techniques is a precaution in case some of the techniques produce poor results. In addition, the validity of the study increases if the designer can use several different techniques to cross-check the information and interpretations made.

Living abroad and trying to make sense of a foreign design setting can be a demanding and a stressful task for a designer. Even simple tasks and communication situations can suddenly take a lot of time and require extra effort. If the time spent in the field can be counted in days or weeks, it is possible that the designer spends the whole time under a more or less severe “culture shock” that decreases his or her possibilities to empathise with the users and understand them. Furthermore, in a cross-cultural setting the quality of data collection is typically at its worst at the beginning of the fieldwork, when the researcher is not yet familiar with the context, and the interaction with the people studied is superficial and prone to misunderstandings (Davies, 1999). Thus short periods of field-

work (or “smash-and-grab ethnographies” as Brewer (2000) calls them) are particularly ill-fitted for cross-cultural design.

When the design context is unknown, it is difficult to make realistic plans for the design activities. The accounts of cross-cultural design projects are filled with unexpected turns and failures, implying that flexibility is one of the key issues when making the plans. Some of the risks related to the contextual factors discussed in Chapter 3 can be considered beforehand and alternative ways of action can be planned. On the other hand, the extent to which practical arrangements can be done beforehand depends also on the design context: in some cases, long-term planning may not be a preferred practice in the design context and may thus not supported by the local stakeholders.

Learning about the wider context of use and design is a time-consuming task that should be started even before entering the field. Often at least some kind of material about the target country or certain regions of it are available: travel guides, historical accounts, ethnographies or official statistics. Photographs give a general idea of what the local environments looks like, and documentary films usually include interviews of local people and glimpses of their everyday life. Local newspapers, some of which may also be available in Internet, can present a wide variety of issues that are topical in the society.

One useful way of learning about the wider context is to talk to people who have lived in the country, either natives or people who have spent some years there. They can raise issues of the wider context that are likely to strike the researcher as unexpected and difficult to deal with. As with literal sources, a designer should regard these accounts with caution, because they are always partial and biased in one way or another. One should also keep in mind cultural change and variability which may affect the applicability of the accounts to the context of use and design.

Foucault et al. (2004) give an example of what kind of background work can be done before entering the field. They used a “culture capsule” to help their design team get a sense of China

and Chinese culture at the time when travelling to China was restricted due to SARS. They built a room that mimicked a Chinese home and put up there all the material from their background research. The culture capsule served as an inspiration and as a way of distancing the designers from their own cultural background and assumptions, as well as a showcase for the project to other stakeholders and visitors.

4.4 VALUES AND WIDER CONTEXTS OF USE AND DESIGN

In worth-centred design, the overall goal in interaction design is not new technology, or even usability or user experience, but creating worth for users and other stakeholders. Such design ends cannot be defined beforehand, because they vary from one project to another (Cockton, 2009a). On the other hand, in reality technical development is not solely controlled by what users need or value, and in many development projects some decisions concerning technology have usually been made from the very beginning of the project. Designers thus need to start from both means and ends in parallel, by being sensitive to what people value and what the available technology has to offer (Cockton, 2008a,b).

In cross-cultural design, the emphasis on value and worth is especially important. Designers and developers have their own ideas of what kind of value technology can offer to its users in particular situations. Those ideas are affected by their individual preferences, skills and experiences, but also by their cultural background. The cultural ideas of what is good, important or worthwhile, and what is undesirable, insignificant or useless differ from one culture to another, and even though they do not on their own determine what an individual can value, they set a kind of general benchmark against which things are valued in a particular society. Designers who come from another society with different value systems may find it difficult to understand why local users appreciate something that from designers' point of view has no significance, or why users have an aversion to the ideas that designers themselves find very useful.

Value is intangible, and due to often unconscious nature of cultural values there is always a risk that disagreements between designers and users about the potential value of technological systems remain unquestioned in a project until it is too late. In anthropology, the importance of not making personal value judgements about what is observed is emphasised (Fetterman, 1998), and the research techniques are geared towards questioning aspects that can be taken for granted (van Veggel, 2005). By making biases explicit, one can better guard against them, so that should be one of the goals especially in the early phases of a design project. How exactly it is best done depends on users and the cultural context, but designers need to put effort on finding techniques that reveal what is valued, and allow negotiating value with users and other stakeholders.

In case of cross-cultural design, both what people value and technological possibilities must be seen in the wider context of use. In ethnographic research, Fetterman (1998) talks about *contextualisation* or putting observations into a larger perspective. In order to explain why people feel and behave in the ways they do, a researcher needs to avoid quick judgements and look for the reasons in the background. In cross-cultural design, a lot of the background information can be missing if the cultural distance between designers and the context of use is large. In this case contextualisation requires much more effort than in intracultural design.

Wider context of use should also be understood in terms of time. Knowing the historical background helps in understanding better the current situation and the reasons behind it. In design, it also helps in extending the timescope into the other direction. Designing sustainable systems and considering culture as a process rather than as a static mould both require one to consider what is likely to happen over a longer period of time. Although predicting the future is never easy, it is easier when one sees how things have changed during the past years or decades instead of seeing only the current situation.

The third area on which a designer should focus at the begin-

ning of the design project is the wider context of design. This includes recognising how the local context will affect the overall design process and interaction with the users. Observations about how the details of the physical, technical and social environment affect the design project should be recorded as they are useful in steering the later stages of the design project.

In cross-cultural design, language that is used to communicate with the users is one of the major concerns in the design context. In addition, as discussed in Chapter 3, the challenges of cross-cultural communication are not restricted to language. Learning about different communication channels, styles and patterns with users and other stakeholders in the early phases of the design project benefits the subsequent design activities and helps in finding the most appropriate design techniques to use.

4.5 IN THE FIELD

What makes ethnography different from other types of research that use similar techniques is its insistence on studying people in everyday contexts in which the ethnographer is closely involved (Hammersley and Atkinson, 1995; Brewer, 2000). Thus in an ethnographic approach to cross-cultural design, fieldwork is of essence.

Although different kind of distance techniques such as culture capsules can be used, they are rather supplements to than replacements for the fieldwork in the context of use. Meeting users in person and getting first hand experience is necessary so that a designer can familiarise himself or herself with the wider contexts of use and design, but also for other reasons. Design is not just about collecting data; it is also about being able to empathise with the users and imagining what the life is and could be for them, and especially in case of cross-cultural design, it can be hard to experience such things without becoming personally involved.

4.5.1 Reflexivity

The ethnographic approach to cross-cultural design acknowledges that the data collected for a design project is not objective. The kind of data that are produced depends on the techniques used, which are based on particular assumptions about the world. Furthermore, in the field a designer has a particular role that affects the interaction with users. How that role is perceived by users may depend on gender, age, social class, ethnicity and personality.

The non-objective nature of data is particularly clear in case of ethnographic research in which the researcher takes part in the activities studied (Brewer, 2000), but it is an issue even in more controlled settings².

The idea of data as a product that is created by complex interactions between researchers, those studied and the research setting is especially relevant for cross-cultural field studies in which the differences between cultural assumptions are potentially greater, and the researchers have limited possibilities to control the design settings. What is required in the design process is *reflexivity*: being explicit about how the research is done and recognising the designer's role in it.

Reflexivity is a major factor that makes ethnographic interviewing and observing different from the types of interviewing and observing that are common in interaction design. In ethnographic interviewing an interview is seen as a process during which both interviewer and interviewee together develop understanding and which is affected by both the relationship between the interviewer and the interviewee and the context of the interview (Davies, 1999). But even those techniques and data that are often considered as objective and universal include historical, cultural and political biases. Official statistics follow the interests of the government and institutions (Davies, 1999). In addition, statistical data are often presented and interpreted assuming that they are unproblematic, although

²See, for example, the study by Molich et al. (2004) about how little overlap there is between usability problems found by different usability teams.

numerous interpretations have been made throughout the process of collecting and analysing the data, and the analysis itself can break many assumptions behind the statistical methods (Gorard, 2003).

Reflexivity does not need to be about paying attention only to the effects that are considered as negative from the design point of view. Differences in gender, age, and social status between users and designers can also have positive effects on research. Sometimes the people studied can experience interacting with the researcher of high social status as empowering and enlightening (Davies, 1999). In cross-cultural design, Anokwa et al. (2009) and Sambasivan et al. (2009) have experienced that both equal and asymmetric relations between users and designers can turn out to be useful during the design process.

In anthropology, the use of interpreters in ethnographic research is discouraged; instead, learning the local language is considered as essential (Davies, 1999). Indeed, there are many good reasons for it. Language provides insights into how people think and interact with each other (Sacher et al., 2001). As such, language can be a path to understanding the cultural reality of the users. In addition, being able to communicate with the local people with their own language can change the relationship between them and the researcher (Davies, 1999). Although in cross-cultural design projects, there is rarely enough time for a designer to master a new language, even a rudimentary knowledge of the local language can get a positive response from the local people and help the designer to form better relationships with them.

If there is no common language between users and designers, local interpreters and translators are often used. In such cases, communication in the field becomes even more complicated, because the relationship between users and the interpreter as well as between the interpreter and the designer affect the communication. Interpretation and translation, on the other hand, are never neutral processes. It is not possible to translate from one language to another without some change in meanings, and the translator's own

ideas and values affect the translation process (Davies, 1999). Translators and interpreters, if used in a design project, should thus be chosen carefully.

4.5.2 Ethical issues

Consideration of ethical issues should be a part of all research activities. In cross-cultural design, however, there can be situations in which conventional, generally accepted research ethics are hard to follow or contradict those of users. Designers should thus be prepared to negotiate and justify their decisions concerning the details of the research process.

Designer should be aware of what are locally regarded as sensitive issues. A classical example is a foreign researcher who unwittingly upsets local people by asking questions that are regarded as intrusive in the local context. However, things can work also the other way round. A researcher who thinks about polite ways of asking about, for example, one's marital status or religion, may find out that these topics can be among the first things that are asked in the local conversations between people who do not know each other. On that account, not being aware of what can be approached in a straightforward manner can also lead to a lost opportunity.

The conventional research ethics in social science require that people participating in a study should be asked for their consent after being fully informed about the nature and consequences of the research (Byrne and Alexander, 2006). The problem is that researchers and designers themselves cannot always be sure of what the consequences of a design project will be, so one should be careful about what is promised to the users and other stakeholders of the project (Chetty and Grinter, 2007; Anokwa et al., 2009).

It should be considered carefully how and in which kind of situation the informed consent should be acquired. The ideas of privacy and what is private information vary. The users may not always be worried about their identity being revealed – sometimes they may even want it to be revealed, if they feel that it could affect

their life in a positive way. In some cases, the situation in which the informed consent is acquired can be such that participants do not really have a choice to say no (Byrne and Alexander, 2006). Although the informed consent should be obtained without undue influence (Davies, 1999), sometimes the pressure from above can be a locally accepted and expected way of ensuring participation and thus be in conflict with research ethics. The official forms used by educational institutions and companies can be long and filled with legal jargon, and depending on the context of design, users may or may not feel comfortable with signing such forms, especially if there has not been enough time for developing a trusting relationship with the researcher.

The use of rewards to encourage participation is another delicate issue. In ethnographic tradition, the involvement of informants is supposed to take place through establishing a rapport with them, whereas financial compensation to informants is often not encouraged, as there is a risk of distorting the research and getting unmotivated participants. On the other hand, not giving any kind of compensation to the participants can also be an ethical issue, especially in case of marginal groups or developing countries. Byrne and Alexander (2006), for example, discuss women in low-income villages, who often suffer from time poverty as they have to work from dawn till dusk to take care of their family. Expecting such persons to take part in the research project without providing anything that would ease their daily workload could be unreasonable, especially as the designers seldom can guarantee that the design efforts will have any definite positive effect on participants' daily life in the future.

When compensation is given, its form and quantity should be carefully considered to avoid bad feelings among the stakeholders and other local people. Local ideas and practices of gift giving influence how the compensation is interpreted, so the researcher should make sure that the compensation is considered as fair and appropriate. The researchers should definitely avoid encouraging them to participate by using material rewards if the designer knows

or the participants themselves feel that it could be harmful for them (Davies, 1999).

Another area in which some ethical issues are likely to arise is dealing with local authorities and organisations. In different societies different rules are applied, and sometimes the difference between official rules and practice can be great. In some contexts bending the rules according to the situational factors is common and perhaps the only way of proceeding with certain matters. To what extent that creates an ethical problem is an issue that needs to be considered by the designers as well as negotiated between the stakeholders.

4.5.3 Design techniques

As design techniques, too, are cultural products that suit better some contexts than others, design techniques should be selected considering the characteristics of and relationships between users, designers, the context of design and the technology to be developed. Considering the challenges of cross-cultural design, however, there are some general principles that can guide the selection of design techniques.

Anthropologists typically use methods that are open, nonstandard and improvisatory (van Veggel, 2005). The need for more open attitude towards such methods has also been recognised in HCI, which has been dominated by quantitative research tradition for years. Cockton (2009a), for example, has argued for using also more informal techniques such as autobiographical reflection. In cross-cultural design, one needs to be open to many kinds of design techniques, critically consider the usefulness of standard design techniques in a particular design context, and be prepared for modifying the techniques to increase their suitability. In the early phases of a design project, it is particularly important not to set the research focus too early, before a designer has developed and tested his or her understanding of the context of use and design.

In ethnographic research, *triangulation* of methods and tech-

niques is used to increase the validity of the results (Fetterman, 1998). Comparing data that has been created through the use of different techniques as well as from different sources improves the quality and accuracy of the findings. Contradictions requiring a closer investigation may be observed, which can reveal tensions between the ideals and behaviour of the users or subcultural differences. Alternatively, they can either confirm or challenge the earlier interpretations made by the researcher. The use of several techniques is also a precaution in cases in which the designer cannot be certain about how well a particular design technique will work in the given context.

The fieldwork produces always partial viewpoints, but through triangulation a designer can get more than one of them and thus develop a deeper understanding about the reality as experienced by the users. In order to maximise the benefits of using several techniques, designers should consider what kind of information techniques can produce and what would be the most beneficial ways of combining and scheduling the techniques so that they can be used to inform each other.

As there should be a focus on values and worth from very early on in the design process, at least some of the first techniques chosen should be able to make user values explicit and allow the designers to question their own assumptions about what is worthwhile. Participatory observation, the prevailing method in ethnographic research which combines observation and informal interviewing, is one possible way to start: it is open-ended and flexible enough for allowing both exploratory research and deeper inquiry into topics of interest. Later on surveys and questionnaires can be used to get an idea of how widespread particular phenomena are and what kind of differences exist inside a user group. As developing a good questionnaire form for people who come from a different society and culture requires a lot of work and some exposure to the local context (Davies, 1999), surveys and questionnaires should always be preceded by other research activities to help a researcher get a general idea of what is going on in the field, what kind of ques-

tions should be asked and what is the local vocabulary related to the subject area.

When interesting themes have been found, semi-structured and recorded interviews in which the interviewer has a list of themes but in which the conversation is still allowed to flow into different directions depending on the interests and experiences of the interviewee can be used. As in ethnographic tradition, the interview situation should not be considered as a series of questions and answers but as a process during which both the interviewer and the interviewee develop their understandings of the topics discussed (Davies, 1999). Tape recording is beneficial as it allows going back to the interview data in the later phases of the project, when a designer is in a better position for interpreting what users really mean and which information is the most important.

4.6 ANALYSIS AND REPRESENTATIONS

The fieldwork accounts in the development of ICT have often been considered as unproblematic accounts that more or less resemble the reality. In the other extreme would be postmodern ethnographies that are not concerned with the truth but aim only at a particular effect. Most ethnographical work is somewhere between those two extremes. Brewer (2000), for example, argues that ethnographers can make authoritative accounts as long as they recognise their limits and give the readers enough information so that they can evaluate themselves the claims made.

Conveying what one has experienced and learned is important in cross-cultural design projects, in which designers need to communicate the physical and cultural reality of users to other project members who may never have visited the site. In anthropology, the idea of conveying culture to a foreign audience "as it is" does not make sense. The problem of representation can be compared to the problem of adequacy versus acceptability in translation: a translator can either follow the source text as closely as possible or aim at transferring the relationship between the text and the readers,

but rarely both. Each language has its own meanings that are not directly translatable, so a translator may have to go far from the original text in order to achieve the same effect in other language and with other readers. In anthropology, an ethnographer is also a kind of translator who is making strange into familiar, translating a foreign culture to the reader (Anderson, 1994). Thus ethnography is never about simply reporting observations (Dourish, 2006).

Bitton et al. (2004) argue that the benefit of their audiovisual documenting tool is that it gives users a possibility to produce "raw" or "minimally-mediated" experience for the audience. From ethnographic point of view, one can question whether creating an unmediated relationship between users and developers in different place and time is beneficial, or even possible at all. Are recordings of everyday life made by users themselves somehow more authentic or informative than those made by the researchers? Cultural accounts are always selective, biased and filled with meanings, regardless of who makes them. In design projects, there is thus a choice between letting other project members not familiar with the users' culture to interpret the material made by the users who do not know them, or letting a third party who is familiar with both contexts to act as a mediator or "cultural broker" (Anderson, 1994). In which case is the risk of cultural misunderstandings greater?

Cockton has introduced different kinds of graphical representations that can be used to present, discuss and evaluate intended and achieved worth during design projects. These include *worth/aversion maps* (W/AMs) that make explicit the potential worth and means that are used to achieve it, as well as possible negative outcomes (Cockton, 2007). These can be complemented with *worth delivery scenarios* that envisage how the design will be used and how the user experience evolves into a worthwhile ending (Cockton, 2009b).

In cross-cultural design, designers and other project members may find it difficult to appreciate what the users value, especially when it differs drastically from what the designers themselves value. In order to make the user values more understandable for all the project members, it is important to make explicit also the wider

context of use and the justifications behind the values. For this purpose, a *value map* is introduced in this thesis. Value maps are meant to be used in early phases of a design project. Thus, unlike W/AMs, value maps do not include the features to be designed and their connections to worth. Instead, they show existing positive and negative outcomes as experienced by users and relate them to the relevant contextual factors. As such, a value map can provide an account of the wider context of use and work as a reminder for designers and other project members about why particular issues matter to the users. An example of such a map is shown in Chapter 6 (Figure 6.3).

Brewer (2000) has given guidelines for reporting ethnographic research. Although the goals of the design accounts are different from those of ethnographies in anthropology, some of the guidelines are relevant also for a designer who is writing an account about what was learned in the field. According to Brewer (2000), a researcher should, for example

- specify the topic and the parts of topic that are addressed
- describe background, experience and commitments of the researcher
- specify the setting and the ground on which generalisations are made
- describe the details of the fieldwork including the access to the field, the relationship with the people studied and any constraints that affected the study
- show complexity of the data and discuss alternative explanations
- provide enough data for evaluating the validity of interpretations made

4.7 INTEGRATING THE APPROACH WITH USER-CENTRED DESIGN PROCESS

In order to steer user-centred design more towards values and worth, Harper et al. (2008) propose a new stage of *understanding* that would precede the four main stages in user-centred design process (ISO, 2010). The proposed stage differs from the initial planning stage that is mentioned in the official user-centred design standard. According to Harper et al. (2008), the goal of the new stage is to specify what kind of value will be of interest in the project, and the people and the environment that are in the focus of the project. This can be accomplished through discussions with users, developers and other stakeholders, and reflection and conceptual analysis that can draw from a variety of disciplines including philosophy, art, cultural studies and design (Ibid.).

The emphasis on values and worth extends also to other stages in the design process (Harper et al., 2008). In the study stage designers would investigate at more detailed level how value is created through different kinds of interaction, considering not only the details of interaction but how higher level values are manifested in the everyday life of users. During the stages of design and build designers create and implement ideas that aim at supporting, amplifying or, in some cases, contradicting certain human values. In the evaluation stage, designers need ways to evaluate what kind of value their designs bring to the stakeholders, also in the long-run.

The ethnographic approach to cross-cultural design is compatible with the modified version of the user-centred design process suggested in Harper et al. (2008). The emphasis on values and worth, and the requirement for studying interaction as a part of wider context draw attention to those areas which are most likely to cause misunderstandings and problems in cross-cultural design. In addition, the new, initial stage of understanding encourages designers to keep the focus broad enough at the beginning of the design project, and restrict it in the later phases in an informed manner.

Nevertheless, the challenges of cross-cultural design require also some additional work during the phase of understanding (see Figure 4.2). In cross-cultural design, during the stage of understanding designers should not specify only the wider context of use but the wider context of design. This includes determining what kind of limitations and possibilities for design the context provides, what kind of user participation is desirable and which design methods and techniques should be used. Sometimes this type of information may be available from other recent, similar projects, but sometimes designers need to start from scratch. In any case, more time should be reserved for the first stage in cross-cultural design, because cultural differences make a designer's work more demanding and the risk of unexpected events is greater. In addition, the experiences and information gained during the first stage are likely to save a notable amount of time and effort in the later stages of the project.

The first stage is particularly important in cross-cultural design, and its outputs feed to all the other stages of the design process. The design goals are defined on the basis of what users value, and in the evaluation phase those design goals are compared to achieved worth. Context of use helps the designers and other project members to understand and remember why users value what they do, even when there is a large cultural distance between users and developers. Value maps can be used to represent user values and contextual factors behind them. Information about the context of design will be useful when choosing the techniques for co-designing, prototyping and evaluating with users. Furthermore, it can steer the overall project planning.

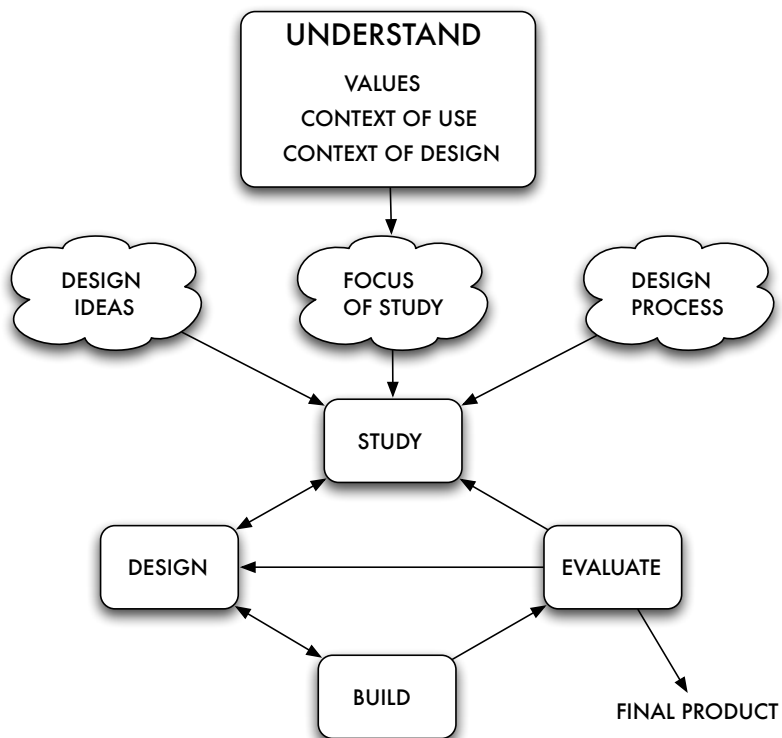


Figure 4.2: An example of how the ethnographic approach to cross-cultural design can be integrated with user-centred design process.

5 Iringa, Tanzania: the study and the design context

The ethnographic approach described in the previous chapter was the basis for a study that took place in Iringa, Tanzania. The study was about mobile phones in the life of local university students, and although the study itself was not a part of any particular design project, its overall aim was to provide a useful starting point for designing mobile phone technology for Tanzanian students. As such, the outputs of the study are similar to those that would be expected from the stage of understanding in the modified version of user centred design process (see Figure 4.2).

In this chapter, I discuss Iringa, Tanzania as a design context. In addition, I describe the details of the study including the techniques used in the field and the analysis of data.

5.1 DESIGN CONTEXT

As suggested in Chapter 4, the research during the stage of understanding should not focus only on the context of use, but also on the context of design. By making explicit contextual factors that affect the design process and user research, the stage can support designers in planning further design activities and foreseeing potential problems that might occur during the design process. In this section, I discuss some contextual factors that affected the fieldwork in Iringa, Tanzania.

5.1.1 Environmental and technical context

Tanzania is a large country with an area of almost one million square kilometres, including islands of Mafia, Pemba and Zanzibar (CIA, 2009). It is, however, a large country also in the sense that

moving from one place to another takes a considerable amount of time. The distances and time and effort involved in travelling must be considered when planning the schedule of a design project, especially when research is made in several places in the country.

The condition of the road network in Tanzania varies greatly, and in some places it depends on the weather conditions. Only about 6% of the roads are paved (NBS, 2009). Private cars are used by few; most of the people use public transport that tends to be very crowded. There are buses that commute daily between main towns, and *dala-dalas*, mini-buses that drive shorter routes. Vehicles are often in a bad condition, and despite the harsh roads, careless driving is common. Consequently, break-downs, long delays, cancellations and accidents are frequently experienced with the public transport. In fact, the traffic can be seen as one of the real risks in Tanzania, the fatality rate on the roads being thirty to forty times bigger compared to the countries with the safest traffic (Rugonzibwa, 2009).

A somewhat safer although not necessarily more reliable transport on some routes is offered by two railways, which run from Dar es Salaam to Northwest Tanzania and Southwest to Zambia. Travelling long distances by a train or a bus can take for days. Sometimes flying is a more convenient if much more expensive option. There are three international airports (in Dar es Salaam, Kilimanjaro and the island of Zanzibar). In most cases, however, flying will involve light aircrafts that land on one of the numerous small and unpaved airports in the country.

Tanzania is close to the equator, so days and nights are about the same length throughout the year. This means that every twelve hours of daylight is followed about twelve hours of darkness. In most areas in Tanzania the darkness can be very intense, as there is little outdoor lighting even in those areas where electricity is available. It can also restrict travelling, because considering the lack of street lighting and a number of local vehicles and people who are on the move on the roads without any light source, driving after dark cannot be recommended. Walking alone after dark can also be

a somewhat risky even in relatively small towns like Iringa.

Iringa is in Southern Tanzania, about five hundred kilometers from the city of Dar es Salaam and the coast of Indian Ocean. The town is located on the mountains, 1600 meters above the sea level. The location of the town makes its weather rather pleasant, with a lot of sunshine but without heavy humidity that prevails in Dar es Salaam. The rainy season, “long rains”, starts usually around March and lasts for three months.

The town has over 100000 inhabitants, but they are spread over a large area, so the town centre gives a feeling of a much smaller country town, which is further enhanced by an occasional cow grazing on the roadside not too far from the city centre. The market in the heart of the town is abundant with tomatoes, red onions, green peppers and bananas, the products of small-scale farming that is the most common means of livelihood in the surrounding Iringa region. Along the rough and dusty streets, there are a considerable number of small shops and stalls selling a wide variety of commodities, from electric appliances, newspapers and stationery to groceries, fabrics and baskets, usually at negotiable prices. The surroundings of the town are dominated by school buildings and churches of numerous denominations, many of which are branches of Islam or Christianity, the two major religions in Tanzania in addition to indigenous beliefs.

Two major public health concerns in Tanzania are malaria and HIV/AIDS. These diseases have many serious societal and economic effects: they increase the number of deaths and orphans, and contribute to absence and low productivity at workplaces (THMIS, 2008). The proportion of HIV positives in Tanzania is about six percent, although the figures vary across the country, being as high as 15.7% in Iringa region (THMIS, 2008). From a visitor’s point of view, malaria is a considerable risk, because mosquito bites are difficult to avoid completely, and prophylactic medication does not provide 100% protection. Although for a visitor getting tested and finding medical treatment for malaria can be in fact much easier in Tanzania than in the countries with less practical experience with

the disease, becoming seriously ill is something that can bring a design project practically to a halt for quite some time. Again, this should be considered when making a schedule for design activities.

When it comes to the basic infrastructure, the availability of electricity and running water are restricted: only about 14% of Tanzanian people have access to electricity (ENERGIA, 2010). In places like Iringa town, where electricity and running water are available, disruptions can be common. In case of electricity, there is also a problem with fluctuating voltage, which is harmful for electronic appliances. Other environmental factors that affect the use of technological devices include intense sunlight, and dust that can collect inside appliances.

Landline phones have never been common in Tanzania, the fixed lines being available mainly in urban areas. On the other hand, the number of mobile phones has quickly increased, and they are commonly used also in rural areas. In the countryside, however, there are many factors that often restrict the use of mobile phone. The lack of mobile network and / or electricity in many villages means that in order to actually use the phone or charge its battery, the user may have to travel several kilometres. In Iringa town, using a mobile phone is easier, although there can be problems with the quality of the mobile phone network.

Compared to mobile phones, computers are much less popular in Tanzania. Due to the high cost of both computers and Internet connections, the main access point to Internet for many Tanzanians is an Internet cafe (Furuholt and Kristiansen, 2007). In addition, colleges and universities offer Internet access to their students, although the access may be restricted. There are no guarantee that the Internet connection is working at any given time, and due to its unreliability and slowness the use of Internet while in the field can turn out to be challenging. Computer viruses are also a common problem.

In design projects, many kinds of technical devices are often needed. Although one can find a surprisingly large variety of electronic devices and other supplies in towns like Iringa, finding them

can take some time, and there are often problems with the quality, the items breaking down shortly after purchasing. Ordering items from abroad is one option, but not for the impatient; parcels to and from abroad can take anything from a week to six months to arrive, if they do not get lost altogether. For the purchases of greater value, the custom procedures tend to be complicated and can take from weeks to months. It is thus a good idea to think well beforehand what is needed during the project.

There are several public and private institutions that give higher education in Tanzania. One of the colleges in Iringa is Iringa University College (IUCo) of Tumaini University. Tumaini University is a private university with four colleges which was founded by the Evangelical Lutheran Church of Tanzania. IUCo has been running since 1994, and there are five faculties that offer a variety of study possibilities from certificates and diplomas to Bachelor's and Master's degrees. The teaching language is English. There are about one hundred staff members and three thousand students. In addition, the college has continuous teacher and student exchange with several universities in USA and Europe, including the University of Eastern Finland.

IUCo's campus is located a ten to fifteen minutes drive from the town centre. There are several buildings that contain classrooms, offices of the staff, computer laboratories and a library. The campus has accommodation for about five hundred students. A building called Science Park is the home of BSc program in information technology that started in 2007. The computer science department in the University of Eastern Finland has been involved in the design and teaching of the IT program. The first students in the new program graduated in October, 2010.

IUCo attracts students from all parts of Tanzania and also from neighbouring countries such as Kenya, Zambia and Uganda (Tumaini University, 2007). Although it is a Christian university, there are also teachers and students from other denominations. The study fees vary from one program to another, but in 2007, the total cost including both the study fees and indirect costs such as ac-

commodation, food and transport was estimated to be nearly ten million Tanzanian shillings (TZS)¹ during a three-year first-degree program (Tumaini University, 2007).

5.1.2 Socio-cultural context

Besides the technical and environmental context, there are many cultural ideas and practices that affect design projects in Tanzania. The following observations are largely based on my experiences during the fieldwork in Iringa town. Although many of issues recognised are not unique to Iringa, generalisations across Tanzania should be made with care, as there is a lot of cultural diversity in Tanzania.

In ethnography, it has been argued that all social research is more or less political because it is always affected by the values of the researchers, and thus the researchers should be openly ideological and strive for change (Hammersley and Atkinson, 1995). In Tanzania, such an attitude is common in all activities. The societal impact of one's actions is frequently discussed in various contexts from the webpages of the corporations to the thesis plans of the local undergraduate students – an element that is largely missing from the corresponding Finnish contexts. The concern for societal issues became evident also in the interviews with the local students in Iringa, in which some of the students expressed rather strong opinions about the societal impact of mobile phones in Tanzania.

The possibility of personal and political agendas is something that needs to be considered when co-operating with the local stakeholders. In case of user-centred design projects, for example, it is usually assumed that a designer concentrates on understanding users and giving voice to their concerns, and refrains, as much as possible, from influencing them even when the users' opinions differ from those of a designer. During the fieldwork, however, I noticed that such assumptions may not always hold. One example is an observation session carried out by a local student about

¹About 6000 EUR with 1/1/2007 exchange rate (OANDA, 2010).

mobile phone use in a local bar in Iringa. It revealed interesting ways in which mobile phones are used, but also conveyed the observer's strong disapproval towards loudly ringing mobile phones, and linked showing off mobile phones and men's calls to "external ladies" to the use of alcohol.

The effect of personal or political agendas was also seen in the contextual inquiries of the website project in which local student-designers interviewed local student-users. The interviewers were not shy of directing the discussion into topics that they personally felt to be important, seeking support from the interviewee for their cause. One interviewer, for example, wanted to know if the interviewee did not find the university logo that included a cross as "very segregating". In another case, a group of interviewers felt strongly against the practice in which the exam results of the students are available through the university website through an ID number that is given to each student. In their interviews, they brought up the privacy issue but were clearly not content with the answers of students for whom the security risk was not an issue; one user, for example, felt that other people had their ways of finding out one's results, and if people misused her ID number, it would be their problem. Despite not receiving wide support from the users even after some pushing in the interviews, the privacy requirement turned up in subsequent data analysis, whereas the opposite views were not included.

The examples above illustrate in part why the problems of cross-cultural design cannot be solved by simply using the local designers. There is no guarantee that interaction with users will be unproblematic when local researchers are used. If designers follow a design technique literally, it might not suit the local context and ways of communication; if they modify it to the local style, some of the central ideas behind the technique may be lost. If all the members of a design project are not aware of what is happening, they can mistake the results of the research for something that they are not.

Everyday life in Tanzania is marked by hierarchical structures in

families, organisations and society. Being male, older and successful in life tends to raise one's position in the hierarchy, and there is a clear power distance between teachers and students, parents and children, and bosses and subordinates. At university, for example, the power distance may inhibit individual students from voicing their opinions in front of their teachers.

Hierarchical systems can affect design process in many ways. Often a formal approval from above must be obtained, or is at least beneficial for the research activities. It can also be expected by the participants: in the website project, for example, the students who were making contextual inquiries reported that it was difficult to motivate their fellow students to participate, and wished to have an official statement that showed that their project had been initiated and approved at a higher level of the university. On the other hand, as people in high positions are accustomed to emphasising and using their power, it can be hard to convince them that opinions at the end-user level should be heard, and that user participation is not equal to letting the users dictate what will be done². While the support from the higher levels is often crucial for success, there is always a risk of unexpected and sudden decisions from above (either at organisation or government level) that one simply needs to accept and adapt the plans of the project accordingly.

The effect of power relations becomes evident also in user research situations. While emphasising one's wealth, education and status may impress people and help in forming connections, in user research the perceived status difference may make the interaction with the users more formal and less informative from the research point of view. If a designer is perceived as a foreign expert it can be difficult to avoid the effect of power distance, especially if there is no chance of establishing a longer relationship with the users. Another way of levelling the perceived power distance is using group interviews instead of one-to-one situations.

²It is good to note, though, that even in the countries that are regarded as having lower power distance such as Finland convincing the management level about the benefits of user participation is not always easy.

Even though open disagreement with those in higher positions is often avoided in Tanzania, there are many other ways of resistance that can be used. I heard about many cases in which school children rebelled against their parents by doing things in secret, or subordinates used a passive resistance by only pretending to do as they were told. Sometimes discontentment can grow little by little, spreading among people until it erupts into a massive group protest. As the early signs of disagreement and conflict can be subtle, they are easily ignored by an outsider until the situation gets serious.

In Tanzania, collectivity and social networks play a very significant role in life. The main responsibility for looking after individuals is not on the state but on the family and relatives. They provide the main support network that a person can rely on in the times of sickness, financial problems or other difficulties. There are also other kind of networks that consist of friends, colleagues and acquaintances. When in need, a large network provides many possibilities for help and support, but there is also a responsibility to offer help which may be requested from several directions on the same basis.

The importance of social networks affects research and design process in many ways. The support from the right persons or the possibility for extending the network can be effective incentives for participation. On the other hand, in a closely-knit social network the effect of individual events is much wider: problems that occur within the network of family, friends or co-workers can take priority over other plans, resulting in missed or cancelled meetings, or closed offices. Again, in order to handle the changes, flexibility in the project schedule is required.

When it comes to decision making, in Tanzania one can observe what Hampden-Turner et al. (2000) have called *particularism*. In particularism, unique circumstances and exceptions rather than universality of rules dominate decision making in a way that can be interpreted as inconsistent or unfair by a visitor who is used to more universalist decision making. The specific circumstances

are often related to the social networks and hierarchies that are conceived as important in Tanzania. Relatives and those in high positions or who are associated with people in high positions, may be excused and given privileges. Getting good contacts can thus be much more efficient way of dealing with issues than relying on general rules or individual diligence. Being associated with esteemed persons or institutions can solve many practical problems and speed up bureaucratic processes which can sometimes proceed at very slow pace otherwise.

Although in the terms of East Africa, Tanzania is less corrupt than its neighbouring countries, bribes are used for accessing or speeding up services, evading regulations, avoiding legal punishments and advancing one's career or business (EABI, 2009). Even if one does not wish to be involved in bribery, one needs to be prepared for handling situations in which it might be expected.

At university, I noticed a particular feature in communication that is related to the social networks. Whereas in Finland, official and less personal communication channels such as e-mail lists, noticeboards, websites or Intranet pages are commonly used for communication inside or between organisations, in Tanzania information is often communicated in more personal and informal way, from one person to another. This means that unless one is an intense part of the network, there is a risk of missing some important information. Being up to date about what is happening, on the other hand, is very important, because any plans can change suddenly and on a short notice (or without a notice at all).

While careful planning is needed and has been highly recommended for technology projects in the developing countries (Brewer et al., 2006), in Tanzania a designer can experience certain obstacles to it. Often there is a general resistance to deal with the things in the long run so that the issues are postponed until there is an absolute necessity to settle them. This resistance can be observed in many areas of life, from visa arrangements to the payment of school fees. Considering the research project, it can make it difficult to smooth the start of the project with pre-arrangements. In some situations

trying to sort out things beforehand may not just fail but even make things worse. Consequently, a designer should consider about taking advantage of any spontaneous opportunities that arise. In case of arranged, recorded interviews, for example, many researchers at IUCo found out that arranging such interviews could take a considerable amount of time and lead to many missed appointments. On the other hand, there were much more possibilities for informal and spontaneous interaction with the students on the campus than there would be in Finland, for example.

Perhaps related to dealing with issues as they arise and the desire to avoid conflicts, there is also a tendency of postponing the reports about any problems or disappointing news. In such circumstances, monitoring the progress of the project can be challenging, because in case of problems, the topic may be avoided until the last minute or until there is better news to be told.

The traditional roles of males and females are quite distinct in Tanzania. A man is considered as the breadwinner and the head of the house with greater liberties, whereas the role of a woman is to look after children and the home. Although things are changing – for example, lately over a third of first year entrants at universities have been female (NBS, 2009) – the different expectations concerning males and females can affect people's behaviour in many situations. In communication situations males are often the ones who are addressed and seen as decision makers, whereas females may be more or less politely passed. Although females in general have to struggle more for credibility, I experienced that being female could also become an advantage when doing user research: unlike male professionals, female researchers were less likely to be perceived as threatening by the students, which decreased the negative effects of power distance on interaction with the users.

5.2 STUDY

This section describes the case study about mobile phones among the university students at Iringa University College, Tumaini Uni-

versity.

5.2.1 Overview of the research process

I arrived in the field with several ideas of possible techniques but without an exact plan. Even the exact study topic took its final form only after a few weeks in a field, when the strong presence of mobile phones among Tanzanian students caught my attention as an interesting phenomenon with a lot of design potential.

I had agreed to take a position as a volunteering lecturer at IUCo during my fieldwork. The job was to teach an introductory course about HCI and interaction design to the second year IT students. Although teaching took a considerable amount of time and energy, it also provided me a legitimated access to the field, and gave a possibility to observe and discuss with students the concepts and methods of user-centred design in Tanzanian context. I was also able to link some of the exercises in the course such as a diary study and a storyboard session to my research topic.

My role in the field in relation to the local students varied. To those students who took part in my HCI course, I was a foreigner but also a teacher, and although my appearance and behaviour broke many of the local expectations for a teacher, the interaction with the students tended to have an air of certain formality. For other students whom I did not teach, my role was more of a foreign postgraduate student doing research for her dissertation. Contrary to my expectations, this role seemed to make interaction with students somewhat more relaxed and easier.

In research, method triangulation was used, in which several techniques informed and supported each other. I wanted data that would give statistical evidence about the distribution of particular patterns of mobile phone use and ownership, but also in-depth descriptions of individual cases that would help understand better the details behind the patterns, and improve the validity of the interpretations made. The possibility to use data that were obtained from several sources with several techniques either backed up the

interpretations, or showed controversies that required closer inspection.

As I was carrying out research in Tanzania for the first time, and there was not much information available about the suitability of user research techniques in that particular context, the use of many techniques was also a safety measure that decreased the dependence on any single method that could fail to produce useful results. The diary study, for example, turned out not to be a reliable source for quantitative data, but this was compensated by a questionnaire study, the design of which was supported by the usage issues learned from the diary study and initial observations. In the questionnaire, the part with Likert-scale questions did not turn out to be very useful, but the questionnaire as a whole revealed many interesting patterns that were discussed in the subsequent interviews. Combining the different techniques in a cyclic way required a lot of flexibility in the research plan and in the use of techniques, as well as starting the initial data analysis while still in the field; yet I found it very worthwhile.

I had considered some method options before my arrival to Iringa, but the final selection, timing and adaptation of techniques was a dynamic process that took place throughout the research. The schedule of the students and many unexpected events frequently affected my plans, giving another good reason for the flexible approach. Table 5.1 shows the design techniques used, their timing and the data collected.

5.2.2 Techniques and analysis

In this section, I describe all the user research techniques used during the field study and my observations about how the techniques worked in the research context.

Observation, newspapers and website review

Most of the observation related to my research was informal and continued throughout the fieldwork period. I recorded regularly in

Table 5.1: Research activities and data.

Activity	Time	Data
Observation	Ongoing throughout the research	73 entries in the research diary; notes from four formal observation sessions
Newspapers	Several times per week 21.9.2008 - 19.1.2009.	About 150 clips in the scrapbook
Diary study	9.10.- 21.10.2008	15 student diaries about mobile phone use
Questionnaire	23.10.2008 - 24.1.2009	118 returned forms
Storyboards	13.11.2008	4 storyboards
Interviews	6.1. - 29.1.2009	493 min of recordings and notes from one un-recorded interview
Website review	3.-11.3.2009	Notes from the review of operator websites
Other	Ongoing throughout the research	Photographs and artefacts related to mobile phones

my research diary any potentially interesting details that I heard or saw in town or at the university, along with my own comments and feelings. These observations were sometimes complemented with photographs. In addition, I experimented with formal observations by writing notes during hour-length intense observation sessions in places such as the university library and an Internet cafe. One formal observation about mobile phone use in public was carried out for me by a local student.

During the fieldwork, I followed the local newspapers to familiarise myself with current issues in Tanzania. Several newspapers in English were sold in Iringa, and I kept reading them all to counteract the bias of each particular newspaper. In addition, I collected advertisements and pieces of news that were related to mobile phones or ICT in general into my scrapbook that contained also examples of local mobile phone related artefacts such as air-time vouchers and SIM cards. After fieldwork, I occasionally returned to Tanzanian news that were available through Internet.

In order to learn about mobile phone operators in Tanzania, I reviewed the websites of the six mobile phone operators that were operating in Tanzania at the time. Due to the frequent problems with Internet connections while in the field, the review was made after I had returned back to Finland. During the reviews I made notes about such things as the services, coverage, marketing strategies and images used in the websites.

I found both the newspapers and websites important sources of information. Furthermore, these were also resources that were in most part available even after I had left the field.

Diary study

The diary study was one of the assignments in the HCI course I was teaching. During one lecture, I presented the idea of a diary as one data collection technique used in establishing the system requirements. Then I gave the students a task of keeping a diary of either their mobile phone use or Internet use for six days. For

this purpose I had prepared for them little notebooks that included a couple of short questions (such as age and the length of use) and a list of what should be recorded for each entry: date and time, activity, length, content, people involved, place, any problems that occurred, and the benefit gained. The meanings of these were described in more detail in the lecture. After one week, the students returned the notebooks to me. Twenty-two diaries were returned, out of which eighteen described mobile phone use. For three of them I did not get a permit to use for research purposes, so the final number of diaries in my data was fifteen.

In the literature of HCI, diary studies are sometimes presented as producing data that can be analysed quantitatively, and the researchers may go to great lengths to ensure that users record the entries as faithfully as possible. In this case, however, the number of entries did not reflect the real use. In many of the diaries, only one event per day was reported, although my observations on the campus and the results of a pilot questionnaire suggested much more active use of mobile phones. The entries were also sometimes very brief statements such as “17.10.2008 My fellow IT student beeped me” which did not include all the details that had been asked for in the instructions. Missing information may have followed from misunderstanding the task, or it could have been also intentional: students wanting to complete the assignment with as little effort as possible. With hindsight, one brief meeting in half way of the week could have motivated the students more and cleared some of the misunderstandings related to the instructions.

It should also be pointed out that the idea of keeping a diary is not universal, so the participants are not necessarily familiar with any related practices. In my case, the students who took part in the diary study had been introduced to the diary concept only a year earlier when they had to keep a study diary as a part of the exercises in one course.

Despite the fact that the diaries did not produce any data that could have been analysed quantitatively, I found them useful in many other ways. The diary was one of the very few techniques

that did not require so much effort from my part, and even though the reports in the diaries have to be considered more as stories than factual accounts of mobile phone use, they were nevertheless stories created by the users, reflecting the local reality of mobile phone use. In the early stages of the research, some of the entries in the diaries gave me the first hints about locally important distinctions, concepts and usage patterns related to mobile phones.

Storyboards

Another activity during the HCI course that I used as a material for my research was storyboarding. I introduced storyboards to the students in the lecture, after which there was a groupwork session. In order to show how storyboards could be used to illustrate and develop design ideas, I gave each group of students a task of coming up with an idea for a new mobile service in Tanzania and presenting their idea to the rest of the class with the aid of a storyboard. Figure 5.1 shows one example of a storyboard that the students created during the session.

The storyboard session lasted for two hours, and raised lively discussion as the students commented openly each other's presentations. The students' presentations reflected the reality they were living in, and the issues that they saw as problematic in Tanzanian society, whether it was the spread of HIV or the difficulties in getting more airtime or the battery charged in rural areas. Storyboards gave the students a possibility to freely come up with and present their own ideas related to mobile phone development. In addition, with storyboards the perspective could be extended from "what is" to "what could be".

Although storyboards raised vivid discussions, it was not so easy for all the groups to brainstorm and express their ideas through them. Considering that the participants were IT students at university, the problems with envisioning technical solutions could have been even more substantial in case of participants with less education or less exposure to ICT. In cross-cultural participatory design

projects with school children, for example, it has been found out that traditional storyboards are too open-ended to support generation and development of design ideas (Moraveji et al., 2007).

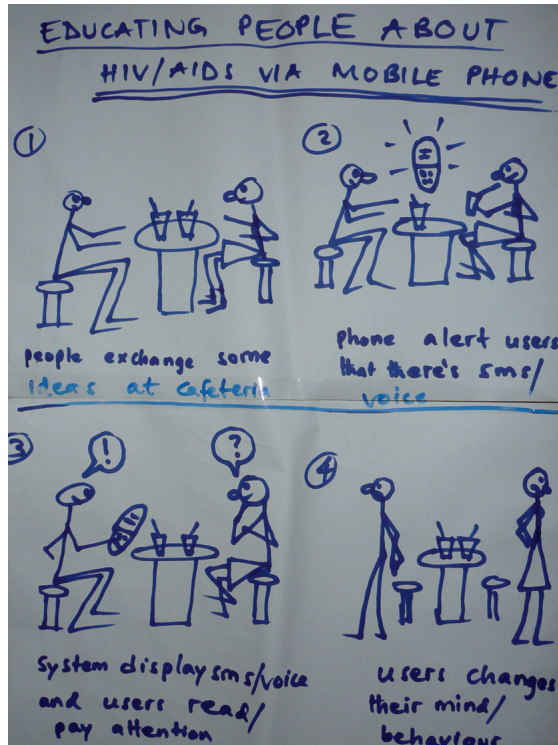


Figure 5.1: Using mobile phones in the battle against HIV. A storyboard made by the students.

Interviews

Towards the end of the fieldwork I arranged interviews with ten mobile phone users out of which eight were current students of Tumauni University, IUCo, and two had already finished their studies and were in working life. I recruited the interviewees in several ways. Four of them I knew beforehand; two were students in HCI course and with two others I had been in regular contact during

my stay in Iringa. The remaining six students were recruited from the group of students who took part in the questionnaire and who had given a permission to contact them for subsequent interviews. In the first round I sent an e-mail invitation to seventeen students, both males and females from different faculties. In the e-mail I introduced myself and explained briefly what kind of research I was doing and why. I gave them the place and possible dates for the interview and asked them to choose dates and times that would suit them. I also mentioned that any student taking part in the interviews would be given a gift of airtime worth 2000 TSH - a sum that was roughly equal to the price of one to two student lunches at IUCo.

Ten students contacted me after my e-mail, though some of the responses came too late. One of my mails was returned because the e-mail address I had was incorrect. There were no answers from female students and from one particular department. At that time, it was pointed out to me that the students in general used email much less than IT students I had observed, so in the second round I decided to use mobile phone, which I had previously judged as too personal channel of communication for such purpose. I sent five SMS invitations to female students, and this time all of them replied and several interviews were arranged.

In all, I contacted 22 students by email or SMS. Thirteen students replied back to me: with eleven students we agreed about interviews, whereas remaining two wished to be interviewed at times that were already taken. Out of eleven agreed interviews, however, only six actually took place: in the rest of the cases, the interviewee failed to turn up for the reasons that remained unknown.

It was difficult to find a peaceful spot from the university for interviewing. In the end, most of the interviews took place in the office that the Head of IT department kindly loaned for the purpose. One interview was made in the house I was living in while in Iringa, whereas another one was conducted during a car trip from Iringa to Dar es Salaam. The length of the interviews varied from about half an hour to hour and a half. Before doing the qualitative analysis, I

transcribed all the recorded nine interviews in verbatim and wrote up the notes from one remaining interview.

At the beginning of each interview session I introduced myself and explained the purpose of the interview and asked the permission for recording. The interviews were rather informal and open-ended. I had prepared beforehand a list of topics that I wanted to discuss, but I did not go through the topics one by one, and I allowed also the interviewees to lead the conversation into other directions. Each interview was thus slightly different.

I had heard that the local interviewees had sometimes been suspicious about signing long documents including the details of informed consent. For the research permission, I thus used a very short form that stated in a few clear sentences what it was about. In addition, although I explained the purpose of the interviews in the invitation and at the beginning of the interviews, I did not ask for the written permission from the interviewees until the end of the interview sessions.

I arranged individual interviews, although I was prepared to switch to group interviews if individual interviews would turn out to be problematic. Somewhat contrary to my expectations, the individual interviews seemed to work reasonably well. There were several factors that made the power relations less of an issue than what they could have been; as a foreign female who had been frequently seen at the university and whose outer image and behaviour perhaps lacked many details that were locally interpreted as signs of power and success, I found that in many cases the students felt quite confident to discuss their opinions and experiences with me.

The variation in interview situations seemed to have more to do with the personalities of the interviewees and their command of English than with the one-to-one interview setting. In some cases, language was a more restricting factor in the interviews than I had expected. Despite the fact that in Tanzania the official teaching language from the secondary school is English, the students are used to communicating with each other in Swahili; one of the interviewees, for example, commented to me after an hour of interview that

it was the longest time he had ever held a conversation in English.

Despite the challenges involved in conducting the interviews, they turned out to be very useful. They allowed getting deeper insights into issues raised by earlier techniques and supported the interpretation of the questionnaire results but also revealed many themes in mobile phone use that had not become evident through other techniques.

Questionnaire

Together with a colleague of mine who was working as the head of IT at IUCo at the time, I planned and ran a questionnaire study among the IUCo students. We considered many ways of carrying out the questionnaire study. The original idea was to use the student records of the university in order to achieve a representative sample, but unfortunately it turned out that no up-to-date information was available. Our second plan was to arrange a competition that the students could take part in by filling in and returning our questionnaire forms. We were going to distribute the questionnaire through the local student union, but also this plan failed because the student union representatives did not see it worthwhile enough for the students. Our third plan was to arrange a similar competition, but advertise the competition on the notice boards of the university and deliver forms via the receptionist. This approach, however, was not encouraged by the university management.

Finally we opted for the fourth plan that was recommended to us by a local teacher and business man: we co-operated with one teacher from each faculty who distributed the questionnaires to their students. We kept the competition to encourage the participation further, so all the students that returned the questionnaire were asked to give their name and contact details on a separate sheet of paper to take part in a draw in which there were three prizes. The draw was made after all the questionnaire forms and name lists were returned back to us, after which we contacted the winners and announced them on the notice board of IUCo. In ad-

dition, each teacher who helped us by distributing the forms was given a small gift of airtime.

A total of 160 questionnaires were distributed to all programs in each of the five faculties of the university. The number of forms distributed was proportioned to the number of students in each program and faculty, and the teachers were asked to include students of both sexes and from different stages of the program.

We developed the questionnaire form, which went through several versions until a pre-test version was given to one class of students. The pre-test questionnaire was returned by 17 students, after which we analysed the forms focusing on any signs of potential misunderstandings such as missing or erroneous answers. On the basis of the results we revised the questionnaire further. The final questionnaire³ was five pages long and included the following six sections:

1. General information
2. Access to phone
3. Technical information
4. Mobile phone use
5. Cost of mobile phone
6. Opinions on mobile phone use

At the beginning of the questionnaire form we explained briefly the purpose of the questionnaire and the way results would be collected and used. As students at university level, the respondents were used to answering questions on paper, but we also attached to the questionnaire a separate piece of paper that explained the different question types and gave instructions for answering them. Most of the questions were in the form of multiple-choice questions in which the respondent was asked to choose one option. In some

³The questionnaire form can be found in Appendix A.

cases more than one option could be chosen, which was mentioned in the question. The questionnaire included also several parts in which the respondents were offered a possibility to complete their answers or make comments.

The number of returned questionnaires was 118, giving the response rate of 74%; however, due to the way in which data was collected, it is not known how many students who were offered a questionnaire form possibly refused to take it. All the respondents were students at the Tumaini University, IUCO and all except two reported that they were Tanzanian. The two cases were removed from the final sample, so the size of the final sample to be analysed was 116.

In the sample, 65% were male and 35% were female (the sex of three respondents was not given). The exact data about the gender ratio of the students at the time was not available from the university, but according to Tedre and Chachage (2008), the female ratio in IUCo was 48% in 2007. If the ratio was similar a year later, females were under-represented in our sample. The sample also differed from the students of IUCo in another way, because the proportion of third year students in the sample was much higher than first or second year students. On the other hand, the low number of Masters level students reflected the real situation in IUCo, and the difference in the distribution between faculties of IUCo students and respondents was not statistically significant.

The age of the respondents varied from 20 to 48 years so that majority of them were in their twenties: the median age was 25 years. For the purposes of the statistical analysis, the respondents were divided into three groups (G1, G2, G3) based on their age (Table 5.2).

Data analysis

The initial data analysis started while I was still in the field. In the case of questionnaires, for example, I went through the data and prepared a coding book defining how the answers should be coded

Table 5.2: Distribution of the sample into three age groups used in the analysis.

Group	Frequency	Percent	Valid percent
G1 (<=23)	37	32%	34%
G2 (24-26)	40	34%	36%
G3 (>=27)	33	28%	30%
Missing	6	5%	-
Total	116	100%	100%

into a spreadsheet. The cases of incomplete or erroneous answers (such as two options chosen when only one was asked) were solved so that when it was possible to conclude what the respondent had meant, the answer was coded accordingly, and otherwise the answer was coded as missing. For example, some of the respondents had described the length of the mobile phone ownership both in years and months (“3 years, 36 months”), in which cases only the time in years was recorded. In two-part answers where the first part was missing, it could be sometimes deduced from the second part (for example, when a respondent had specified the number of times beside the field “weekly” without ticking the box in front of it). A few respondents had given a range instead of a single number (such as “6-8 times”). In those cases the midpoint of the given range was recorded as their answer.

The questions measuring frequency of use caused some trouble, because many respondents had chosen one of the main options (never, monthly, weekly, daily) but had not filled in the number of times. I ended up analysing these questions in two different ways, as categories only and with exact numbers. I also re-coded some of the answers that would have been otherwise misleading, so that answers like “weekly, 14 times” became re-coded as “daily, 2 times”.

The sixth section of the questionnaire about opinions regarding mobile phone use turned out to be problematic, because there were a lot of missing or unclear answers. The students might have been

unfamiliar with the evaluation of statements with a Likert-scale. On the other hand, it was also the last section in a relatively long questionnaire, so some of the omissions and mistakes may have resulted from the students hurrying or becoming tired with the questionnaire. Due to the frequency of missing answers, the section was left out from the final analysis. There were also some other individual questions that turned out to be ambiguous⁴ and were thus excluded from the final data set.

After all the data had been input into a Microsoft Excel sheet, I checked that they corresponded to the answers given in the original questionnaire forms. Then the data was imported to Statistical Package for the Social Sciences (SPSS) for statistical analysis.

The initial statistical analysis suggested that most of the continuous data did not meet the assumption of normal distribution. As there were also many categorical variables in the study, non-parametric techniques such as Chi-square, Spearman's Rank Order Correlation, Kruskal-Wallis Test and Mann-Whitney U Test were used for the analysis. In cases where the data could not be presented in the form that would have fulfilled the requirements of Chi-square Test for Independence, Fisher's Exact Test was used instead. The limit for the statistically significant results was set at the level of 0.95.

The statistical analysis revealed the prevalence of particular patterns of mobile phone ownership and use. In addition, it pointed out some age and gender related differences, the explanations for which were searched from the qualitative data.

In the qualitative analysis, text was divided into extracts and along with some photographs tagged with very general, multiple labels such as "Benefits of mobile phones" or "Infrastructure". In this task I used an application called Together⁵, which can handle text, images, movies, pdf-files and web pages, and allows tagging them with multiple labels. After tagging, all the extracts that in-

⁴For example, some of the respondents seemed to interpret our question about landline phones as being about the phone use in general.

⁵<http://reinventedsoftware.com/together/>

cluded a particular label were exported into files under a folder that was named with the label. These folders were then imported into another program called Scrivener⁶. Scrivener is a writing tool which includes one section for writing and another section in which source material can be easily modified and grouped into hierarchical structures. In Scrivener, I took each topic folder in turn and started the analysis from the data, forming first small groups around common ideas (such as “People can see right away from your phone if you are from a rich family” and “If a person loses an expensive phone, he will get frustrated because replacing it with a cheaper phone will bring his status down.”) and combining them later into larger themes (for example, “You are as wealthy as your phone”). The analysis focused on finding themes that would describe the values related to the ways mobile phones were seen and used by the local students.

⁶<http://www.literatureandlatte.com/scrivener.html>

6 *Mobile phones in the life of Tanzanian university students*

In this chapter, I present the results of the case study about mobile phones in Tanzania. I start by discussing mobile phones as a part of wider context in Tanzania, and then move on to describe how mobile phones are valued and used among the local university students. Finally, I give some examples of how the study could inform subsequent design activities.

6.1 **MOBILE PHONES IN TANZANIA**

What strikes a first-time visitor to Tanzania is the strong presence of mobile phones. Advertisements of mobile phone operators dominate the landscape from the large billboards in Dar es Salaam to the most remote road banks in the countryside. There are buildings that have been fully painted with the identifying bright colours of mobile phone operators, shop walls plastered with their slogans, and mobile phone towers that populate the landscape like a herd of steel giraffes. A foreign visitor cannot be but amazed by the pace and intensity with which mobile phones have been adopted in the developing country that is regularly placed amongst the poorest countries in the world¹.

The official statistics further strengthen the impression that the development in the mobile phone sector in Tanzania has indeed been fast. Tanzania Communications Regulatory Authority (TCRA) is an independent authority which licences and regulates postal and

¹In terms of its per capita income which was estimated to be 1300 USD in 2008, Tanzania is amongst the bottom ten percent of the world (CIA, 2009).

broadcasting services and electronic communication in Tanzania. In June 2009, it reported that the number of mobile phone subscriptions in Tanzania was about 15 millions, giving the official mobile phone penetration rate of 36%. At the same time, the number of landline phones or fixed lines had remained very low (see Figure 6.1).

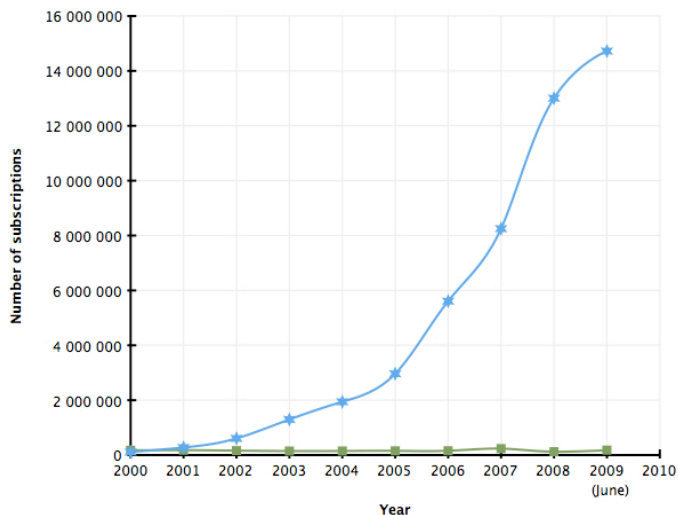


Figure 6.1: The number of mobile phone subscriptions (the upper graph with stars) and landline phone subscriptions (the lower graph with squares) in Tanzania 2000-2009. Based on data published by TCRA (2009).

Among the students of Tumaini University, IUCo, the mobile phone ownership is even higher compared to the national statistics, possibly even approaching the point of saturation. All the students who took part in the questionnaire study owned a mobile phone, and the same has been reported in an earlier questionnaire study of 61 students about the use of ICT at IUCo (Tedre and Chachage, 2008). The students' own evaluation of how many students at IUCo have mobile phones varied from "most" to "ninety-nine percent" or "all" – indeed, it seemed that it was rather the case of *not* having a mobile phone that was considered more of an exception.

The use of mobile phones in Tanzania is not limited to the most educated and the well-off. Mobile phones are commonly used in rural villages, even where there is no electricity and sometimes also no mobile phone network available. A study of mobile phone use in rural villages of Iringa (Mpogole et al., 2008), for example, found out that most of the users live far from electrical power, which means that getting a battery of a mobile phone charged can require several hours of travelling and waiting. Still, many of the users kept using their mobile phone despite the fact that the cost of use and maintenance could total as much as 30% of their official monthly income, which meant that they often had to compromise in other areas of life such as education, clothing or food to make mobile phone use possible.

Mobile phone studies in the developing countries have presented many inspiring success stories about how poor people have used mobile phones to benefit financially². One could find such examples also in Iringa: a local shop owner can inform her customers through mobile phone when goods become available (Mpogole et al., 2008), and a taxi driver who previously had to be contacted by his customers in person or through messengers is now taking orders for deliveries of all kind through calls and text messages that come as far as from Dar es Salaam. But some researchers such as Mpogole et al. (2008) argue that for many users in the developing countries a mobile phone is actually something that takes users' resources away from "activities that could improve their livelihood" and thus rather draws people into poverty than out of it. Such a sentiment is not unusual in Tanzania, where the excess use of mobile phone for entertainment purposes is often frowned upon, as well as the use of mobile phones when one cannot really afford it – "Somebody may have no food to eat but they have got a phone to communicate!".

From a design point of view, it is interesting to try to understand why Tanzanians want to use mobile phones even when it is a

²See, for example, the studies about how the fishermen in India (Jensen, 2007) and in Tanzania (Myhr and Nordstrom, 2007) have benefited from the use of mobile phones.

significant financial strain on them and they have to sacrifice other things in life in order to do so. For some, it may be a tool that opens new business opportunities or improves the existing ones, but for a majority of users that does not seem to be the case. But if Tanzanian users are not making money with mobile phones, does it mean that they are just wasting it? Hardly so, as Tanzanian people see mobile phones as adding many kinds of value to their life, and that value cannot be measured on financial terms alone.

Understanding why mobile phones have become so important for many Tanzanians requires some background knowledge about Tanzanian culture and society. In particular, it requires developing an understanding of what matters in everyday life in Tanzania, and how the possibilities offered by mobile phone technology have been adapted to serve the interests of local users. For designers, it can reveal many opportunities for future development as well as concerns that need to be handled to minimise those aspects of technology that the users experience as having negative impact on their life.

6.2 CONTEXT OF USE

6.2.1 Communication technology

In the developing countries, the possibilities for long-distance two-way communication have been few compared to the industrialised countries which have much longer history of using such technology. In Tanzania, for example, the sparsity of fixed telephone lines made in many cases the postal system the main form of long-distance communication.

Landline telephones

Landline telephones in Tanzania have offered communication opportunities only for a limited number of people. Telecom network in Tanzania before mobile phones was small, focusing around urban areas. In 1985 when telephone density was as low as 1.72% in

Dar es Salaam and 0.91% in other urban areas, the same figure for the whole country was only 0.22% (Kiula, 1994). Consequently, a majority of people who lived in the countryside had to travel long distances in order to make or receive calls.

Where the fixed lines were available, the cost was another issue. The required payment for connection and post-paid plans made landline phones suitable mainly for offices and wealthy users. But even in those cases getting connected could be a long process that included a lot of letter-writing. Between 1984 and 1993, for example, the number of customers waiting for a fixed line more than doubled (Kiula, 1994) and at the end of the last century the figure was 150000, the real demand being estimated as high as 400000 (Luhanga, 1999). The reasons for failing to answer to the demand have been attributed to the population growth and inadequate investments in the telecommunications sector (Kiula, 1994).

On top of other problems, the landline phone network in Tanzania has been unreliable, suffering from faulty equipment, inadequate capacity, incorrect billing and poor maintenance service (Kiula, 1994; Luhanga, 1999; Mtenzi et al., 2008). One estimation of the fault rate stated that on average only about 70 percent of fixed lines were working at any time (Luhanga, 1999).

TTCL and Zantel are the only companies that provide landline telephone services in Tanzania, TTCL throughout the country and Zantel mainly in the islands of Zanzibar and Pemba (Mtenzi et al., 2008). The role of landline phones has remained small, being currently only about one percent of the total number of telephone subscriptions in Tanzania. The number of fixed lines has not, however, decreased either during the past ten years. Prepaid deals are today available also for fixed lines, and at least in some areas a fixed line may be a more reliable solution for Internet connection than a wireless one.

Compared to landline phones, getting a mobile phone is cheaper and much more easier in Tanzania. Mobile phones are sold in many places from shops to stalls and by street hawkers, and getting a pre-paid SIM card is as easy as buying a bunch of bananas from

the market. Even though use of mobile phone in rural areas can be costly and inconvenient, fixed lines are not a real option: it may not matter if it takes several hours to get a battery of a mobile phone charged, if the alternative is to travel several hours every time one wants to make a call. And unlike a fixed line, a mobile phone means that one can reach his or her social network by pressing a few buttons, even when there is no money to make calls.

Postal system

Tanzania Posts Corporation is owned by the government and has been given the license by the Tanzania Communication Regulatory Authority (TCRA) for operating the public postal system in the country, on the condition that they provide postal services wherever they are needed. This goal, however, has not been reached in more remote areas and is difficult to match with the law that requires the Posts Corporation to be financially profitable (Tirabassi, 2006). In order to cover less profitable rural centres, the Posts Corporation has given the postal services to agents which can be franchise holders operating most of the services, or persons such as traders or teachers who have agreed to run some limited postal services (Ibid.). Altogether there are about 400 postal outlets in Tanzania (ITNewsAfrica, 2008). There are also many private courier operators working in the country.

Currently there is no addressing system in Tanzania, so the mail is delivered to post office boxes. TCRA is working on a new addressing and postcode system (ITNewsAfrica, 2008), but considering the large scale of the project, many other current projects³ and the development history – ID cards in Tanzania have been under development for four decades (ThisDay, 2008) – the new addressing system is unlikely to be available in near future.

Since many Tanzanian students live far away from their family and are able to visit their homes only a few times a year, writing let-

³Related projects in Tanzania include developing an ID card system and a national register of mobile phone users.

ters used to be the main method of communicating with their family, relatives and friends back home. Due to the long distances and inefficiency of postal services in Tanzania, communication through letters has been unreliable and slow. For many students it is the letter writing rather than fixed lines that mobile phones are compared against, which makes the benefits of mobile phones even more evident.

Sending the letter it, it was taking a very long time to get the feedback, yeah, the post office was working, until now they are working but it took a very long time. For example, from Arusha to Dar es Salaam it could take three to four days the letter to go maybe from Arusha to Dar es Salaam and then, if somebody replies maybe another four days so hardly week or more. (female)

Now because even up to time I can use the phone to talk to my mum, and my family, while here in the college. But previously, I sit down and write a letter, then through the post office, then reaching them would take four to, four weeks, reach in the village. But now it is just a minute, hello hello, just chatting if I have a problem, I phone them direct (...) for instance, we are approaching the end of the semester, and one week, the coming week is the end of the school fees, I have not yet paid, so I writing the letter towards my parents asking please send me the school fee, and when it reaches them, the examination will be [over]. (male)

Internet

First connection to the global Internet in Tanzania was established in 1995 by CyberTwigga via the SITA network that was used mainly for flight bookings (Sheriff, 2007). After the regulations in the field were loosened, the number of licensed Internet Service Providers increased, being 62 in June 2009 (TCRA, 2009).

For a long time, Tanzania was connected to the Internet via a satellite connection only, which kept the price of the connections high. In June 2009, the first undersea cable by Seacom connected

East Africa to Internet, and three other marine cables (The East African Marine System, The Eastern Africa Submarine Cable System and Lion) are expected during 2010 (Mwiti, 2009). The launch of the first undersea cable was described as the day when “technology finally arrived in Africa” as it was hoped to change the economy of Africa and make “e-everything” possible (Ibid.). Speeds of the connections should now go up and the prices should fall, but the real impact remains to be seen. There are some doubts about how much the new cables will actually benefit the majority of Tanzanians who live in rural areas, because the inland network is currently still in a planning stage (Kamndaya and Kinyori, 2009; Mjasiri, 2009). Other challenges include the lack of both computer literacy and online government services (Kiishweko and Kagaruki, 2009).

Compared to mobile phone users, the number of Internet users in Tanzania has remained low. The estimated number of users in 2008 was only 520000, 1.2% of Tanzanian population (ITU, 2008). Internet enables many ways of communication such as email, chatting and video calls. In Tanzania, however, there are several factors that have hindered its success. Unlike mobile phones, computers are expensive in Tanzania, and even university students rarely have a computer with an Internet connection at home (Tedre and Chachage, 2008). The local universities have Internet connections, but their capacity is limited, and in case of students, the use of Internet can be restricted to a few hours per week. In Dar es Salaam and in towns like Iringa there are Internet cafés in which people can access Internet without having to invest in hardware and connection. Users pay by time⁴, so slow connections and frequency of viruses which hinder use also increase the cost of it.

However, the mobile phone operators in Tanzania are now offering a possibility to access the Internet through a mobile phone, which is likely to increase the number of Internet users in the future. The questionnaire study of IUCo students revealed that al-

⁴In 2008, a common rate in Iringa was 1000 TZS per hour, about 0,54 EUR with 31/12/2008 exchange rate (OANDA, 2010)

most half of them have a mobile phone with Internet capability, and 77% of those who have it also make use of it. One student, for example, explained that accessing Internet through a mobile phone was especially convenient when there was no free access available at the university, that is, when the network at the university was down, or the student had used his weekly allocation of three hours of Internet time and could not find anyone who would let him use their allocation. Considering that some universities do not offer free access to Internet for the students, the mobile phone can be even more tempting option for accessing Internet.

6.2.2 Dispersion as a challenge for social networking

The distances between different parts of Tanzania are great, regardless of whether they are measured in kilometres or in travelling time. In addition, what is also characteristic of the Tanzanian society is the physical dispersion of its people that started early in the political history of Tanzania. The first president of the United Republic of Tanzania, Julius Kambarage Nyerere, wanted to promote a sense of national affinity by abolishing tribal chiefdoms and making Kiswahili the official language in Tanzania (Swantz, 1996). In order to further enhance his socialist Ujamaa politics in the 1960s and 1970s, he started first voluntary and later forced resettlement of rural households into centralised Ujamaa villages (Ibid.).

Today, many Tanzanian families are scattered all over the country, even abroad. A student's parents may have their relatives in different parts of Tanzania, whereas the siblings go to boarding schools or colleges and universities in different towns, and due to school regulations and long distances may visit home only on rare occasions. It is also not unusual for young children to live with a relative of their parents while the parents work or study elsewhere.

Dispersion is a challenge in Tanzanian life which is characterised by a strong desire to stay connected with family members, relatives and friends, who form a support network that one can rely on when he or she needs information, money or emotional support. In Tan-

zania, the social network thus carries many functions that in countries like Finland would be regarded as the state's responsibility. When many people of the social network live far away, meetings in person become impossible, which makes long-distance communication the only way of keeping in touch. In addition, long-distance communication allows extending social networks beyond one's immediate surroundings, and intensifying communication also with those people who live nearby.

6.2.3 Mobile phone

Tanzania Communications Regulatory Authority (TCRA) issues licences to the mobile phone operators. At the end of 2008, there were six active mobile phone operators in Tanzania. In terms of the number of subscriptions, the leading operator was Vodacom, followed by Zain (formerly Celtel) and Tigo. Together these three operators covered 90% of the whole telephone market in Tanzania (TCRA, 2008). Of the smaller operators, TTCL (Tanzania Telecommunications Company Ltd.) and Zantel offered both mobile and fixed lines, whereas Benson had only a minimal customer base of a few thousand mobile users.



Figure 6.2: A shop wall in the market square of Iringa, featuring advertisements from four mobile phone operators that were operating in the area in 2008.

Vodacom and Zain are most often described as having the widest coverage in Tanzania, as their networks extend to many of the rural villages, too. Vodacom and Zain are also associated with the best quality and some prestige that makes them especially suitable for business communication. On the other hand, Zain in particular is also considered as the most expensive operator, which may explain why the questionnaire results suggested it to be less popular among the students of IUCo than nationally, and more popular amongst the older than younger students⁵.

Tigo, on the other hand, is more popular among the IUCo students than nationally. The operator uses very youthful and trendy advertising that is likely to attract the student population. In addition, it has a reputation of having cheaper rates, and even those users who do not use it as their main operator may take advantage of its offers that allow “free” talk for twelve hours for the price of 1500 TZS (0,82 EUR) or unlimited number of text messages over a limited time for 500 TZS (0,27 EUR). At the time of the research, however, other leading operators were advertising very similar offers; Tigo’s “one shilling per second” campaign, for example, was challenged by Vodacom’s campaign that offered calls for half a shilling per second at night time.

At the end of 2008, Zantel was available in Iringa but its main customer base was in the islands of Zanzibar and Pemba that lie close to Dar es Salaam. In the islands Islam is the prevailing religion, which was also reflected in the website of Zantel with its imagery of men dressed in Arabic style, and women wearing headscarves. The company also offered a special talk offer that was restricted to the residents of the islands only, to “carry them through there Holy month of Ramadhan”. Since then, the operator has renewed its website and seems to now promote its services more keenly for the whole Tanzania.

The state-owned TTCL has been struggling for years (Mande et al., 2008). On the basis of user comments and the website of the operator, it appears unprofessional compared to its competitors

⁵ $\chi^2 = 10.17, p < 0.01$

and fails to attract mobile phone customers. One of the significant reasons for its failure may be that TTCL uses Code-Division Multiple Access (CDMA) technology. Although this cell transmission technology is common in the USA, users of CDMA phone are tied to one operator, whereas GSM users can usually freely change their operator by changing the SIM card in their phone. As will be discussed later, the use of multiple operators is a common practice in Tanzania, so this type of restriction can be a major disadvantage. CDMA technology is also used by Benson that has been operating for several years but without much success.

In general, mobile phone users in Tanzania are aware that mobile phones are a big business in Tanzania, and at least in business and at university level the users have a critical attitude towards the operators. The pricing of the operators is widely considered as too high. In order to live up to the expectations of the public, all the biggest mobile phone operators promote visibly their special offers. In addition, their sponsorships, charity work and development projects are frequently featured in the newspapers and operator websites as examples of how they “give something back” to the society.

Majority of the mobile phone users have prepaid subscriptions, which are cheap and easy to get, and include no monthly fee. The total cost is even lower in case of some users who buy a SIM card but instead of buying a phone, borrow mobile phones from others for using their card whenever they need it. On the other hand, it is also common for a mobile phone owner to use several SIM cards with one phone. This makes it difficult to evaluate the real number of mobile phone users in Tanzania on the basis of the total number of subscriptions alone.

Each operator has several pricing schemes. For example, in 2009 Zain offered three different plans for personal, non-business use: calls at 1 TZS (0,0005 EUR) per second at night time, to one chosen number at any time or to any number at anytime after the first minute. Vodacom had a plan in which a user could call two numbers at 1 TZS per second. In addition, the both operators had differ-

ent kind of promotions. With Vodacom, one could call any number for half a shilling per second, although the discount was “based on the utilisation, location and time of the day”. In addition, with Vodacom, one could also get free airtime with every recharge, and “Tuzo points” that could be used to get free SMSs or discount calls. The prices quoted were usually for in-network calls; the calls between networks could be as high as five times more expensive.

In general, the operator advertising is somewhat confusing. Often it is not clear whether the offer applies to the pre-paid or post-paid customers alone, whether the price quoted is exclusive or inclusive of VAT, and if the rate excludes the calls between different operator networks. In addition, the websites of the operators give sometimes contradictory information about the prices. Due to the complexity of pricing schemes and inadequate information, the comparison of the operators can be very challenging.

6.3 VALUE OF MOBILE PHONE

After a brief introduction to the general background of the mobile phone scene in Tanzania, I turn next to the value of mobile phone as seen by Tanzanian university students at IUCo. In order to get a balanced picture of the value of mobile phone, the attention is given to the perceived benefits of mobile phones, but also to the ways in which students see mobile phones as having negative effects on their life.

6.3.1 Benefits

Efficiency of communication

The students saw the biggest benefit of mobile phones in the ease of communication. Compared to the industrialised countries, the way mobile phones have changed communication in Tanzania is more strongly felt, because the difference between mobile phones and earlier communication possibilities is so dramatic. As fixed lines have been few and far between in Tanzania, mobile phone

use is not just about calling while you are on the move instead of waiting until you get home. Instead, it is about being able to contact someone in seconds instead of writing a letter that can take weeks or get lost altogether, trying to find someone who could take the message for you, or leaving whatever you are doing and travelling yourself.

The big benefit of using mobile phones I can say [it] is easy to get somebody, any place, where he is or she is, yeah that's what I can say because it was very difficult before mobile phones [were] introduced in Tanzania, it was very difficult to get somebody, if there's a certain message, any information. (male)

Yeah, post office was the most efficient thing you could have used, relied upon but that time you couldn't have asked someone "Where are you?" so that they can come, you just go there (...) "Let me see this, if the person is there", but it was somehow, yeah, we used to do it and then it was okay but [it was] difficult. (male)

In a country where distances are long and travelling slow, mobile phones can save a considerable amount of time and effort. Although in many rural areas without electricity charging of mobile phones requires some travelling, it can still be improvement compared to how things used to be. One informant remembered how his father in not so distant past had to travel thirty kilometres from the countryside to Iringa town if he wanted to call his relatives. Another one gave an account of how she, while living in Dar es Salaam, had once heard a rumour that her mother was dead. As there was no other way of finding out whether the rumour was true or not, she had to take a leave from her work and travel all the way to the other side of the country only to find out that her mother was alive and well.

Staying connected to the social network

Based on the students' own estimations of their mobile phone use, they are active users of their mobile phones. Most of the students

call and text daily, and in the questionnaire study the median number of contacts per day (total number of calls and messages made and received) was reported to be as high as 20. On the other hand, many of the contacts tend to be brief ones. Text messages are used for a chatting type of communication, and the content of frequent communication with family and relatives is often described as “just greetings”, “informing about the health of other family members”, or “asking how the studies are going”. Their role can thus be as much about enforcing the relationships in the social network as about conveying information.

With mobile phones, the users can be up to date on what is going on in their social network, which improves the possibilities to look after people in the network even when they are far away. Through a mobile phone, a student can receive information about the welfare of family members and relatives, such as confirmations that someone has arrived safely, or that the delay is due to some problem with transportation. Communication with the social network is also about entertainment, chatting and gossiping, or sending to each other little amusing poems and jokes. With the aid of the mobile phone, students can communicate with a circle of friends even in the presence of parents and teachers, creating a parallel communication arena that provides a less noticeable outlet from a hierarchical communication setting.

From a student’s point of view, one important aspect of staying connected is that the mobile phone allows an instant access to the support network whenever it is needed. Parents and other relatives can be contacted if a student falls sick, examination fees need to be paid, or there is some other urgent need for money. As such, a mobile phone provides a feeling of security:

Even if I got a problem, maybe I got sick, seriously, there’s a phone, can use the phone then and inform them I think that’s the biggest benefit. (male)

Also emotional support is available through a mobile phone. A student can discuss personal issues with friends, and because of

the mobile phone, the network of possible contacts is much larger, including also those long-time friends who are now living in other parts of Tanzania. Whether one needs encouragement and advice in study related matters or in family disputes, they are only one phone call or message away.

Being a part of the network and constantly reachable means that one is also open to opportunities, being it a night out with friends, a free lunch or an opportunity to make business. On the other hand, a mobile phone also makes it possible to extend one's social network by allowing contact with people who otherwise would not be reachable on frequent basis. Good contacts are highly appreciated in Tanzanian society, and regarded as crucial for success in many areas of life such as studies, career or business.

Management of studies

In Tanzania, studying is a collective exercise. Besides participating in the lectures and working on group assignments, the students also study in smaller groups that are called discussion groups. These informal and voluntary gatherings are arranged by the students themselves, and their purpose is to talk about the topics covered in the lectures, and sort out together any questions and problems that have arisen. The times and places of discussion groups vary, so the details are often conveyed to the participants through a mobile phone.

Mobile phones also allow discussing the study related matters with the students at other universities. Students with friends who are taking the same degree at different universities in Tanzania can compare what they have learned, exchange information and help each other to overcome problems. One student reported having sometimes such discussions through a conference call service that allows several callers at the same time, making it a kind of long-distance discussion group.

Mobile phones play a major part in co-ordination of daily studies at university. At IUCo, most of the study related information is

passed from one person to another. Each class, for example, has a class representative (CR), who is contacted by teachers if they have a message to the students, and who then spreads the information around the class. The students keep each other up-to-date about timetable, informing about postponed lectures and exam dates, or reminding about a lecture or discussion group meeting that is about to start. The members of the student union use the mobile phone in a similar way to arrange meetings and events, as well as to advise students in study related matters.

The information about the universities, studying possibilities and study loans is frequently given through a mobile phone. In addition, the students are not the only ones who are taking an advantage of the possibilities of a mobile phone in study related matters. Teachers at the university also use mobile phones for contacting students, announcing cancelled lectures, or even for giving the students an assignment or instructions about what they should do while teacher is away.

Symbolic value

As described above, Tanzanian students see a lot of functional value in a mobile phone. In addition to functional value, however, mobile phones also have value as a status symbol.

At the beginning when mobile phones had only started becoming common in Tanzania, simply having one was enough to gain appreciation. Those who got a mobile phone were considered as rich persons by the community, and got respect merely because they had a mobile phone. Even today, a mobile phone may be associated with a rise in the social class:

Having a phone, really, you are up. Middle class. (male)

But as the number of mobile phones in Tanzania has increased, more and more people are expected to have one, so it is the lack of a mobile phone that is now becoming a sign of poverty, or being "outdated". Even though it is recognised that sometimes people

genuinely do not like mobile phones and do not want to own one, often people are suspected to say so only because in reality, they cannot afford one. There are also stories about people who never use a mobile phone but still carry one with them, for status reasons:

[Never] mind you are calling, you are not calling, but you have the phone. Nobody beeping you, nobody calling you, you have the phone. It is the prestige. (male)

At university, where mobile phones are a common item, it is the look and the features of the mobile phone that count. In Tanzania, a groomed appearance is considered as a sign of success, and among the university staff and students a mobile phone can become an accessory that emphasises one's status. Many students regarded a mobile phone as an important sign that in most cases reveals everything about people and their background. One student gave an example of such interpretation of a very basic Nokia model that was bought from a local mobile phone store:

This is a poor, you see, those consider you directly because of this phone, it can be concluded, it can (show) you as a poor. If you had a very expensive phone, walking, listening to music, taking videos, wow, everybody speak "oh let me see your phone, how much", oh, people appreciate you, yeah. (male)

The look of a mobile phone does matter to many students. One male student described how he used to have a mobile phone that could be used simultaneously with two SIM cards. Despite the fact that he, like many other Tanzanian users, used more than one SIM card, he had given up the phone because he considered its size to be too big. A female user, on the other hand, emphasised how important part the looks played when she bought an expensive phone, the real price of which she did not want to reveal to her mother:

My mum wants [for] me maybe a phone of ten thousand which I can't even carry in my handbag... I [would] feel

ashamed to carry, and many girls they like this bling-bling phone, I can tell you.

The shame that was attached to the cheaper models of mobile phones was so strong that some users were reported to use their phones only when no-one was looking, because they did not want the others to see their phone. One student with a basic mobile phone model had found another way of dealing with the stigma, making fun of it with his friends by pretending that they had the most advanced features in their phones:

Like the person had a phone with a camera, we smile, I just tell you "please, can you transfer some for me, I'm going to switch on the Bluetooth!" (male)

Some of the students at IUCo have expensive mobile phones. Although the temptation to buy a more expensive phone than one can really afford to raise one's status can be great, it brings also the pressure to keep the status in case the phone is stolen – not a rare event in Tanzania – or breaks down. One of the students with a basic phone model explained that this was one of the reasons he did not want to invest on an expensive phone while still a student:

Then to get lost, it's come a problem again, to get the, because when you buy this, this one of fifty thousand, like this ones, you see first of all, the status will come down, yes, you firstly using the phone of three hundred thousand I think automatically you are not going to buy again, the phone of three thousand, three hundred thousand, yes, at the same time, in this level of school yeah, maybe for the people who are studying here, whose parents are big potatoes, you know. (male)

Not all the students appreciated the use of a mobile phone as a status symbol, and felt that people should be proud of what they have instead of buying mobile phones that are more expensive than they could really afford. Still, even the male student who questioned the sensibility of having an expensive mobile phone while at

university, was planning to get “a good phone, something expensive” with many features once he would graduate and get a good job.

6.3.2 Drawbacks

Despite the popularity of mobile phones among Tanzanian university students, there are also many ways in which they see mobile phones as having negative impacts on their life. From a design point of view, the negative impacts are as important to recognise as the positive ones, because the negative value can decrease the worth of otherwise valuable technology. When a designer is aware of undesirable effects, he or she can make a conscious effort to minimise them.

Constant availability

Being always connected to one’s social network is one of the recognised benefits of a mobile phone among Tanzanian students, but it is also one of its greatest drawbacks. As the mobile technology makes it possible to reach people anywhere and at any time, many people in the social networks of the students expect them to be available 24/7. Leaving the phone home for a day or switching it off can thus cause conflicts, as family members and friends who are trying to reach the student can become annoyed and complain about him or her not being reachable:

I get messages, text messages, blaming you for what you have done, as if the phone is theirs! (male)

The pressure for staying connected can come from many directions. Friends can be demanding and expect that their calls are answered and messages replied on any time. One student explained that his father in particular refuses to understand that he cannot keep the mobile phone on at all times, and gives him abuse if he fails to answer when the father tries to contact him. The wives and girlfriends were also described as becoming angry if their calls or

messages are not answered, as they can interpret it as a sign of him not caring, or not answering because he is unfaithful:

Sometimes they can even call you at midnight... you have to pick up the phone and reply, if you don't do that, you'll get a very, very big problem next day. (male)

It is not unusual to receive calls late at night, especially if there is a special call offer going on at that time. People can also contact the students and request them to meet and go somewhere instead of studying. It is also the sheer volume of expected communication that can become a burden: even if one avoids buying daily call offers that allow unlimited amount of calls for a fixed fee, friends and relatives may buy the offers and expect one to chat with them.

A student can rely on his or her social network for support, but as a part of the network, he or she can also receive many requests for financial or other kind of help from siblings and girlfriends, for example. Finding the ways to answer the requests, or dealing with conflicts that may follow when such requests are denied, cause stress to the students and distract their attention away from the studies. It also happens that the students receive disturbing news about arguments or other problems at home that they would rather not hear about at that particular moment, especially when there is an exam coming. With a mobile phone, however, it is difficult to avoid such situations.

Some students keep their mobile phones on at all times, and due to the pressure from the social network, those who do not do so must be prepared for getting complaints. Still, being constantly available can be exhausting, and many users at least sometimes wish to be "free", cut from the network and the requests. One student described how a trip to a national park used to be a refreshing break from being connected – until the mobile phone network was extended to cover the park, too. Another student pointed out that when communication took place through letters, one could choose whether they wanted to open the envelope just before exams. Unlike mobile phones, letters also provided a possibility to ignore possible requests in more subtle ways:

So the time before we had phones, no problem because nobody could just try [to] find you, if he want to find you, he has to write a letter, and he is not sure if the letter has been delivered or not you see, so if you receive a letter, two, three, four, four days without replying, he will never complain, yeah, because he is not sure whether the letter has been delivered or not unless you let him know, and how can you let him know? By writing another letter to him, so if you don't write, the assumption is that the letter has gone somewhere else... but today, they know that the phone is switched off, their text message has been delivered. (male)

In other words, although the inefficiency of the postal system was experienced as problematic by Tanzanian students, they also found value in it, because it helped them shield from the pressure of the social network. A mobile phone in all its efficiency, on the other hand, does not provide its users such a possibility.

Disturbance

The students felt that the way mobile phones are used in Tanzania sometimes deteriorate the quality of face-to-face communication. Although many schools at primary and secondary levels have forbidden the use of mobile phones among the pupils, at university the mobile phones are commonly used both outside the lectures and during them. A student's mobile phone can ring during a lecture, and although most of the students put their phones into vibrating or silent mode, there can be a frequent flux of people going outside the classroom to talk and returning back in, which causes disturbance during the lectures. Although there are some teachers who are more strict and do not allow that, some others are also themselves taking calls and talking in the middle of the lectures, which interrupts the teaching.

You find a lecturer or a student is concentrating on talking with his relatives or his business because they've used this Extreme⁶, so it is time wastage, you know you spend a lot of

⁶Extreme is a talk offer by Tigo.

time concentrating on single things, but you don't understand the other importance of your responsibility when you are at a campus so this is very bad, especially to the students. (male)

Similar kind of behaviour is also common in meetings, where the parallel discussions that the participants have over the phone can draw attention away from the actual topic, and ringing phones and people going back and forth distract the flow of the meeting. Although there is some kind of agreement that a mobile should not be kept on in such occasions, the ideal is often not accomplished in reality. Due to the power distance and possible harmful consequences on their future, students and employees feel that it is not possible to complain if their superiors are behaving in this way, so the only option may be to put up with it.

Illegal and aggressive behaviour

The students associate mobile phones with some criminal activities. The local newspapers have reported cases in which mobile phones have been used in raids to inform the robbers about the suitable time to strike. In addition of being tools of criminal activity, mobile phones are often also the target of it. Poverty and theft are widespread in Tanzania, and as mobile phones are the most valuable thing that people carry with them in Tanzania, they are frequently stolen. In places like *dala-dalas*, there are thieves who can spend a whole day travelling back and forth, looking for mobile phones to steal. Some students felt that a mobile phone can sometimes also be the motive for stealing, when the temptation for getting a mobile phone and using it is so great that it encourages the use of illegal means to get one.

In cases like an unpaid bill or infidelity, mobile phones are often used for conveying threats and intimidating people. Overall, it seems that over the phone it is easier to break the rules regarding what kind of things can be said and to whom, and express one's anger in the ways that may not be possible when meeting in person. One student, for example, described an argument that took

place over the phone after he had refused to send money to his brother:

He just complain, you see “now you feel like you already pass a long life, you don’t remember your own family, yes, you don’t like to help me”, you see a lot of, he told me a lot of things in Swahili, the insult, you know (...) talking face to face, he’d not be able to insult me. (male)

Conflicts in the relationships

The habit of having a relationship with more than one partner is common in Tanzania, where polygamous marriages (a husband with more than one wife) are recognised by the law, and also in the marriages that are officially intended to be monogamous there can be unofficial, “external” partners. Both men and women can have external partners, although men are more open about it, because it is not so damaging to their reputation as it can be for women.

Although the practice of having multiple relationships in Tanzania predates the arrival of mobile phones, mobile phones are seen as enabling and perhaps even encouraging such behaviour. One student described a mobile phone as “one kind of evil in the marriage”. As a more personal and mobile communication device, the mobile phone has made it much easier to initiate and keep up external relationships. People can choose where and when to make a call or send a message, can easily lie about their whereabouts, and can communicate to a particular person without intermediaries. There are thus more possibilities for external relationships.

Perhaps even a greater disadvantage of a mobile phone from the students’ point of view is that besides facilitating external relationships, it can also raise suspicions and leave evidence about such relationships. Both men and women usually try to hide external relationships from their partner to avoid conflicts; in the study by Lary et al. (2004), Tanzanian men and women identified infidelity (whether real or suspected) as the most common trigger for violence in their relationships. In case of mobile phones, however,

there can be many clues about hidden relationships such as suspicious phone calls, text messages or unknown numbers in the address book. When one's partner finds evidence that suggests the existence of another partner, there will be arguments and sometimes fights so serious that they lead to the separation of the family. On the other hand, some particular ways of using mobile phone such as switching it off or not answering it may raise jealousy even in situations in which there are no reason for it.

Both student and newspaper reports suggest that through a mobile phone, some girls and young women can be drawn into relationships that are harmful for them. Guys use mobile phones for picking up girls; once they manage to get the girl's mobile phone number, they can start courting her. Some men have a habit of dating much younger women, even school girls, whom they tempt with gifts such as money. For young girls the consequences of such relationships are dramatic, because if they get pregnant, they are usually expelled from the school, and there is also a high risk of getting HIV. Some parents are cautious about giving a mobile phone to their young daughters, but it is not uncommon for the girls to obtain a phone as a present from someone else and use it in secret.

Cost

The cost is always an issue in Tanzania, where most of the users have low income. In general, the students find using a mobile phone expensive. A mobile phone is, in the words of one male student, like a second wife, a liability that requires money in the similar way as supporting the wife and children.

Whereas some students manage to keep the cost down, many feel a pressure from the social network to invest into airtime even when they could not really afford it. It can be very difficult to avoid the cost of using mobile phone in situations in which one is expected to maintain good relationships with other members of the social network and bear the cost of communication. One student stated that when his parents beep him, they expect him to call back

right away and do not take a lack of airtime as an acceptable reason for not calling. Therefore he has to make sure that he has some airtime on the phone at all times. Another student reported that there are situations in which he ends up using much more airtime than he was going to:

It's costing me, for instance I have decided to talk to my girlfriend, and when my girlfriend maybe say something which is kind of embarrass[ing to] me, I won't feel good, I have to go and add credit, maybe two thousands, or three hundred, three thousands, you add into phone so that you can have conversation, you can clear the problems (...) and after talking then I sit down and I think, oh really how can I survive?
(male)

Whether due to the pressure from the social network or other reasons, for some users the temptation for buying airtime seems to approach somewhat an addiction. Although none of the students identified themselves as having serious problems with airtime spending, they were familiar with such cases:

Something which is in mind, they just [have] image that captured your mind, is phone, yes, to have credit in phone even if a person is staying without even a shillingi in his or her pocket, but only to possess credit in the phone, yes. (male)

It's something that you can't avoid, it's just you fill it and you can stay without it, there the people who can't stay without money in the phone, whenever you have one thousand, you can't keep it, yes he [says] "oh, let's me buy one voucher", even if the phone has in the voucher, you see.
(male)

For some student users, the cost of mobile phone use requires making compromises in other areas of life. Often the compromises are related to food. One male student, for example, described how he goes for cheaper lunches so that he can use the remaining money to buy some airtime. Another student felt that Tanzanian students

do not understand the negative impact of “not feeding yourself well rather than feeding your phone”.

On the other hand, the students felt that money is not the only user resource that a mobile phone is using, because it can also take time from other activities. In case of students, there is a risk that the time spent on mobile phone is away from studying, which may have negative impact on their success in the studies.

Health effects

The users were aware that use of mobile phones involved some kind of radiation that could possibly affect one’s brain or cause cancer, although there did not seem to be not much information available about it. One user reported having ear problems that according to his doctor were related to the mobile phone use. The awareness of possible health effects sometimes affects the use so that a user can, for example, avoid keeping a mobile phone against one ear for longer periods, or use the speaker of the phone to get some distance from it. In general, however, the students were not that worried about the possible health effects, which were considered to be less of a problem compared to the other drawbacks discussed above.

6.3.3 Summary

Considering the many benefits that Tanzanian university students attribute to the mobile phones, it is easier to understand why they and many other Tanzanians would find it hard to manage without a mobile phone, even in situations in which getting a mobile phone and using it can be a heavy financial strain. In Tanzania, the greatest source of financial and emotional support is the social network consisting of family, relatives and friends. Although mobile phones are not seen as generating income as such, the students use mobile phones to rely on the help of their social network. Although the details of this practice were not studied here, it can be compared to what Horst and Miller (2006) call “link-up” among the low-income

users in Jamaica, who use mobile phones to collect and maintain connections who help them make ends meet.

For students who are living far from their home villages or towns, a mobile phone is often the only way to be an active part of that social network, and keep oneself up-to-date of what is happening. At university, the study schedule and other details are under continuous change without public announcements, so in order to receive information about them as well as to participate in discussion groups one needs to be reachable by others. In addition, there is also the issue with status: a mobile phone is considered as a piece of modern technology that people expect someone at university level to have, and which can also be used to gain respect and popularity among one's peers.

Although the wide use of mobile phones among the students of IUCo suggest that the positive aspects outweigh the negative ones, making a mobile phone worth having and using, the drawbacks are as real and persistent as the benefits, and continue to affect the life of the users. The value map in Figure 6.3 gives an overview of the positive and negative value related to mobile phones. It shows also some examples of how the value is related to the local physical and cultural context in Tanzania. On the background of difficult cost control, for example, there are many factors that are related to cultural values and practices regarding one's status and responsibilities, while the restricted financial resources of the users make the problem with cost control especially significant.

6.4 PATTERNS OF OWNERSHIP AND USE

The field study revealed general patterns of mobile phone ownership and use among the students. These patterns reflect in many ways the physical and cultural context in which mobile phones are used. In addition, there are subcultural differences that can be observed both among the students and between the students and other user groups in Tanzania.

6.4.1 Ownership, use, access and sharing

As discussed in Section 6.1, most of the students at IUCo own a mobile phone, and based on the official subscription statistics, over 15 million Tanzanians could already be mobile phone owners. Yet survey data from the same year (2009) indicates that there were only about 6.2 million mobile phone owners in Tanzania (FSDT, 2010). The discrepancy between the figures can be explained by two phenomena that are common in Tanzania: using several SIM cards from different operators, and buying a SIM card but no phone.

Based on the questionnaire study among IUCo students, the mean number of SIM cards they used was 1.7. If the use of several SIM cards was as common in other user groups, 6.2 million mobile phone owners could be using 10.5 million SIM cards. On the other hand, students reported that some users who do not have a mobile phone have nevertheless bought their own SIM card. Such mobile phone users have their own phone number and can charge airtime on their card, but despite being subscribers, they do not have a mobile phone of their own and can thus use their card only when they borrow a phone from someone else. The rest of the 15 million subscriptions could be explained, for example, by teenage users⁷ and SIM cards that have been stolen and discarded.

The official subscription statistics in Tanzania, then, have little to do with mobile phone *ownership*. How about the *access* to mobile phones? According to FSDT (2010), in 2009 there were 7.2 million Tanzanians who did not own a phone but used someone else's phone, which would make the total number of Tanzanian mobile phone *users* 13.4 million, quite close to the number given by the official subscription statistics. The access to mobile phones, however, could be much higher. Already in 2005, the perceived access among Tanzanian users was reported to be as high as 97% (Samuel et al., 2005). It should be noted, though, that it was the informants' own

⁷The survey by FSDT (2010) included only Tanzanians that were sixteen years or older, leaving thus out about a half of Tanzanian population. Yet the discussion about the use of mobile phones at schools in Tanzania indicates that at least some of the mobile phone users are under sixteen years of age.

conception about whether they could access a mobile phone in case they wanted or needed to do so, not considering whether they did so in reality or how much time and effort it would require (for example, how long they would have to travel to find a mobile phone / network / electricity that they could use).

As discussed in James and Versteeg (2007), estimating mobile phone ownership, use and access in the developing countries is far from a straightforward task, and Tanzania is no exception. As a summary, one can say that while the official mobile phone statistics do not reflect very well the number of mobile phone owners or the number of people who have an access to mobile phones, they are closer to the number of mobile phone users. Even the group of mobile phone users, however, consists of very different kind of users: people with a mobile phone (or several of them) and people who do not own a phone but use someone else's phone, possibly with their own SIM card.

It should also be pointed out that the official mobile phone penetration rate in Tanzania based on the number of subscriptions is not directly comparable to the corresponding figures in the industrialised countries. On one hand, the relationships between mobile phone ownership, SIM subscriptions and mobile phone use are very variable in Tanzania, which means that the official subscription statistics may give too optimistic idea of the overall situation; on the other hand, considering the age structure of the population in Tanzania⁸, even lower mobile phone penetration rates become more impressive.

Sharing of mobile phones is often considered as a typical feature of mobile phone use in the developing countries that substantially increases the number of people who have an access to mobile phones, making the real number of mobile phone users much greater than the number of mobile phone owners. Indeed, in the questionnaire study over half of the students of IUCo, too, reported that they loan their mobile phone to relatives and friends daily or

⁸In Finland, for example, the share of people under 15 is 16.4%, whereas in Tanzania the figure is 43% (CIA, 2009).

weekly.



Figure 6.4: An advertisement on the front of a local mobile phone shop.

Still, sharing of mobile phones is not an unproblematic phenomenon that would guarantee access to those who do not own a mobile phone themselves. Although sharing of mobile phones is common in Tanzania, it does not take place freely regardless of the circumstances and the relationships between the mobile phone owners and the borrowers. First of all, the frequency of mobile phone thefts in Tanzania and the use of mobile phones for dubious purposes has made some of the mobile phone owners careful about handing their mobile phones to people whom they do not trust. There have been incidents in which a person who has asked to use a mobile phone has run off with the phone, and it also happens that people borrow a phone for doing something that they are not willing to do using their own phone number, leaving the mobile phone owner to suffer the consequences.

Secondly, even though in some contexts Tanzanian users may be willing to share information that may be considered by others as private information (such as the passwords of their email accounts, see Tedre and Chachage (2008)), a mobile phone can be nevertheless considered as a personal device to which others should have no access. The female informants of the study reported that husbands and wives, for example, often do not share a mobile phone. Due to the information contained in a phone that could possibly cause conflicts in the family, especially husbands are often reluctant to loan their phones to the wives, and if they do allow that, it is used under their surveillance and returned back to them after the call has been made or message written.

Thirdly, even when the mobile phone owners know a person and allow him or her to borrow their phone for communicating, the fact that people cannot directly reach each other irritate both the people who are trying to reach someone and those who have to act as intermediaries. One informant explained that when one's friends start calling someone else's phone to inform their friend about something, the owner of the mobile phone gets tired of delivering the messages. Another male user found it a nuisance that his girlfriend's parents did not allow her to have a mobile phone of her own, so he had to contact her through her friends:

It is really giving me hard time when I want to talk to her, and every day, every day [s]he should borrow phone from her fellow, so that she can talk to me, and likewise to me here sometimes calling and someone is receiving the phone "Who's that?", "Please, [it's] Rehema's"⁹ – my girlfriend is Rehema – "Rehema's boyfriend", "Oh please she is not here, call later", you see it is disturbing me. (male)

Finally, much of the mobile phone sharing is taking place between people who have their own mobile phone. At IUCo, nearly a third of the mobile phone users reported using someone else's phone daily or weekly despite the fact that they have a mobile

⁹The name has been changed.

phone of their own. There are varied reasons for borrowing, such as empty battery or no credit left in one's own phone, using a feature (for example, sending pictures or using Internet) that is missing from one's own mobile phone, or an effort to save money (see 6.4.4). Sometimes the users wanted to check an unrecognised number from which they had been beeped, and used it in someone else's phone in order to see if the number was found in the address book. For various reasons one may also want to send a message or call someone without revealing the number from which they are making the contact. Sometimes it can be about surprising or joking with someone, but sometimes also insults and bad language may be involved.

The sharing of mobile phone, then, is not always about extending access to mobile phones. There are users who borrow mobile phones because they have a SIM card but no phone, or have neither, but there are also those who borrow mobile phones for other reasons. In addition, there are cultural issues that regulate who can borrow a mobile phone from whom and when, and what kind of reactions this may raise in the people involved.

6.4.2 Calling, texting and beeping

Most of the users at IUCo reported communicating through their mobile phone using both calling and texting on daily basis. Texting appeared to be slightly more popular than calling: 61% of the students texted more often than they called, and although the mean number of messages was affected by a few very high estimates, also the median number of daily messages sent was higher compared to the calls made¹⁰.

¹⁰In case of sent messages per day, the mean was 16.3 and the median 5; in case of calls made per day, the mean was 4.2 and the median 3. The high mean number of messages is partly explained by nine cases in which the number of daily text messages was estimated to be from 50 to 200. Although the highest figures could be mistakes or overestimations, they are not entirely impossible considering that daily unlimited text message offers were used by some users for a chatting type of communication.



Figure 6.5: A message from a local mobile phone operator to Tanzanian users.

One interesting mode of mobile phone communication that can be considered as significant form of communication as calling and text messages in the developing countries is beeping (Donner, 2008). *Beeping* is a way of communicating with a mobile phone in which someone calls a mobile phone number but hangs up before the recipient has a chance to pick up the phone, leaving the recipient only with the information about a missed call. In Tanzania, too, beeping is common. At IUCo, 90% of the students used beeping. Nearly half of the students reported that they beep, and about three out of four receive beeps on daily basis.

In most cases beeping in Tanzania carries a meaning of a call request: the person who is beeping wants to inform the recipient that he or she has a need to communicate but has not enough air-time in the mobile phone and no possibility to get it. There is thus usually an expectation that the person who receives the beep will

call back. As such beeping is clearly one way of dealing with the use of mobile phone with a low budget by transferring the cost of communication to someone who is assumed to afford it.

The practice of communicating by transferring the cost to others is much encouraged by the local mobile phone operators. They have free text message services such as “please-call-me” and “please-recharge-me” in which one can send a limited number of such messages daily for free in order to get called or to get airtime for communicating. The operators also have a service that can be used to recharge someone else’s SIM card using the airtime in one’s own phone. At the time of the research, Vodacom described this service as a way to send credit to “family members who cannot recharge their accounts themselves, relatives and colleagues living or working in distant areas of the country, loved ones who may need airtime during night hours when shops are closed”. An ad by Tigo put the message more bluntly: “Out of credit? Ask a friend!”.

In a country where poverty is widespread, families live far from each other and social networks are important sources of financial support, beeping and possibility of transferring airtime to other mobile phones channel the costs to those mobile phone users who can better afford it. In this way, mobile phones allow distributing the wealth around the social networks and looking after family members, relatives and friends regardless of where they live. A male user, for example, reported that he transfers airtime to his mother’s or sisters’ phones when they ask for it, and a female user said that she calls back when her children beep, because the children depend on her and may need her help. In general, beeping is accepted when it is used by those supported to contact the people who are supporting them; in such cases users who are beeping are expecting to get called back:

If I don’t have money, and even if I have money, I normally beep if it is my husband...because I know for sure he will call.
(female)

The issue of beeping is somewhat controversial. It is very common and also approved in the cases described above, as well as

when friends or relatives who have urgent matters to communicate have no airtime to call. However, beeping is also frequently used by many users in more opportunistic manner: they beep even if they have airtime for calling, they do not have anything important to say, or the communication is for their own benefit only:

There are some [people] like that, yes.. I call them the selfish people, the ones who won't use their money, they want to use others', yes. (female)

Yeah, they just save money, in expense of another and you just try, it, it may happen that what he wants to tell you, it is for his own benefit, not yours, and he still beeps, so when you call him, telling you of his problems... so sometimes you get mad, "Why did you call to tell me those things?", yeah, you cut off and then he calls. (male)

Opportunistic type of beeping is probably one reason why, despite the popularity of beeping, many of the informants expressed strong negative feelings towards it, considering it as a "bad use of mobile phones". In addition, beeping is often associated with the lack of money and poverty; one student, for example, recalled a speech of a politician about making "Tanzania the nation of people who are *not* beeping".

As the students can get beeped several times per day, they are quite selective about whether or not they call back. Usually they want to be able to recognise the number that the beep comes from, because that affects whether they will call. If the person beeping has close relations to the user, likelihood of the user calling back increases. In a similar vein, if the user knows that the person who is beeping is unlikely to have money to call, or that he or she does not beep without a good reason, the user is more likely to call back to find out what is going on.

Even when when there is a close relationship between a person beeping and the one being beeped, the person who is beeping may have to beep several times in a row to convince the recipient about the importance of the matter before the recipient decides to call

back. Another way of making a more convincing plea is to send one or more “please-call-me” or “please-recharge-me” messages. Unlike beeping which requires some credit on the phone and which can be done unlimited number of times, the number of those free messages is limited to two or three per day, and they can be sent also when there is no credit at all left on the phone; they can thus be considered as the last resort.

Although the main purpose of beeping appears to be the call request, it can have also other uses that Donner (2008) calls *instrumental beeps* and *relational beeps*. The first mentioned beeps are signals that can have various, often pre-agreed meanings. In Tanzania, beeping can have many instrumental meanings, such as “I want to call you through Tigo, please change your SIM card”, “The lecture / discussion group / meeting is about to start, where are you?”, or “Did you read the text message that I sent you?”. Relational beeps, on the other hand, are a way of letting someone know that he or she has been thought of, without necessarily expecting any action on the behalf of the recipient. The recipient has to interpret the meaning of a beep based on who is beeping, when and whether there has been some pre-agreement about doing so. Sometimes confusion can follow as the person receiving the beep interprets incorrectly the intentions of a person beeping.

6.4.3 Use of features and services

Besides calling, texting and beeping, the most frequently used mobile phone features among the students are the alarm clock, calendar, calculator and radio (see Figure 6.6). In terms of utilisation (number of regular users / total number of users that have the feature on their phone), also the flashlight turned out to be very popular. Due to the shortage of electricity and geographically limited national power grid in Tanzania, the roads and streets remain dark after sunset for about eleven hours every day, and indoor lighting, where available, is frequently affected by power cuts. There is thus a real need for using a flashlight whenever there is one available.

Mobile phones in the life of Tanzanian university students

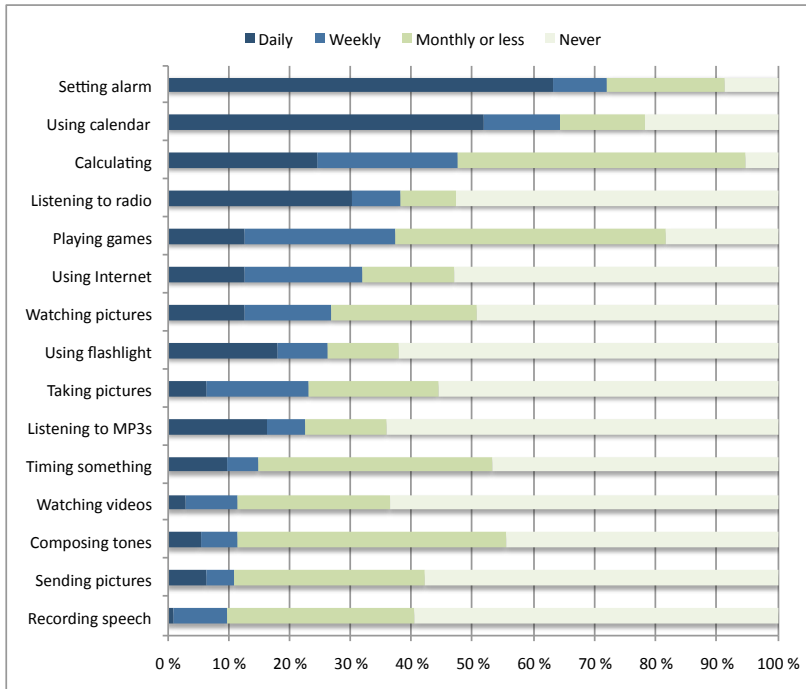


Figure 6.6: Frequency of use across different mobile phone features among the students of IUCo.

Internet was available in less than half of the mobile phones that the students own, but its utilisation percent¹¹ was as high as 77%. The students of IUCo have a restricted free access to Internet at the university, but due to the weekly use quotas and unreliability of the Internet connection as well as the rarity of Internet connections at home, mobile phone is useful in providing an alternative access to Internet.

In Tanzania, there are fewer mobile phone services available and they are used less compared to the neighbouring country of Kenya. The students of IUCo, for example, use regularly only a few mobile

¹¹Utilisation percent was calculated here as the number of real users (people using the feature) divided by the total number of potential users (people who had the feature in their mobile phone).

phone services (Figure 6.7). Most of the services used are related to the management of their pre-paid accounts: checking one's airtime balance, sending or receiving airtime to or from another mobile phone user, and sending or receiving a free "please-call-me" message. The other services such as those that provide news or sport results have some regular users, but most of the students have never used them. In some cases users may benefit from the service in indirect way: an item such as a joke that one user has bought from a service gets circulated among other mobile phone users as a regular text message which becomes much cheaper, even having no extra cost at all if the users have subscribed a daily SMS offer.

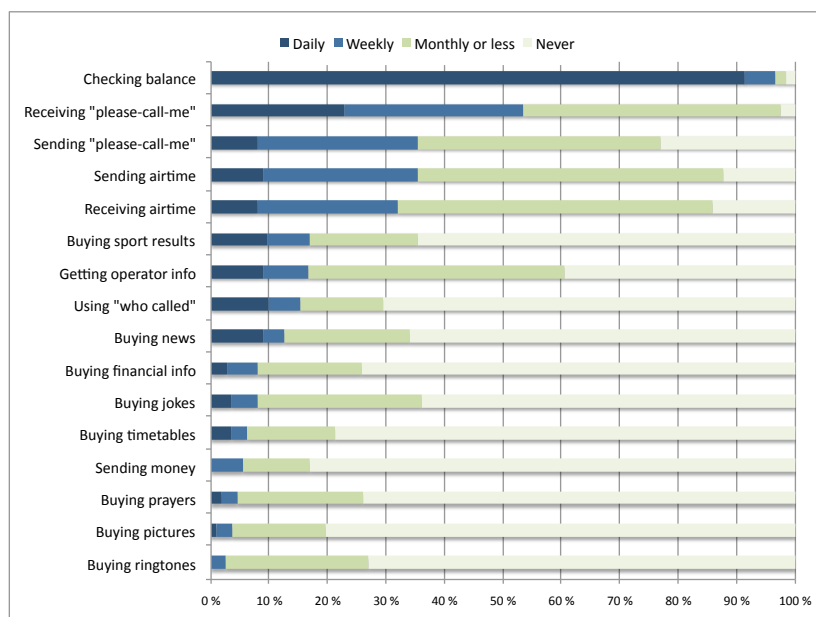


Figure 6.7: Frequency of use across different mobile phone services among the students of IUCo.

At the time of the fieldwork there were two different money transfer services on mobile phones in Tanzania, Vodacom's M-Pesa and Zantel's ZPESA. These services could be used to send money to another person who could then collect the money from a local

service point of the operator. As many as 83% of the IUCo students had never sent money through such a service. Mobile money services, however, have been under quick development in Tanzania, and today, there are already four mobile money transferring systems, which also include more versatile features such as payment of bills.

6.4.4 Using mobile phone with “small coins”

Most of the mobile phone users in Tanzania need to get by with a low income. It is thus not surprising that the users are interested in different ways of cutting down the cost of mobile phone use, although also many Tanzanians with a reasonable income are interested in how they can use the phone while minimising the costs. In the words of one informant, in Tanzania people are after “small coins”, and this is also reflected on the ways in which mobile phones are used among the students.

Effect on the modes of communication

Most students consider texting as a cheaper way of communicating through mobile phones, so text messages are often used to keep the cost down. As calling abroad or between operator networks are particularly expensive, use of text messages instead can save a lot of money, but many students use text messages for other communication too.

On the other hand, some students felt that if the call made is a very short one, it can actually become less expensive than a message. Calls are kept short especially at the times when calling is more expensive, so the communication can be very different from face-to-face communication in Tanzania that is often characterised by lengthy greetings. The person who is making the call plans beforehand what needs to be said and may try to speak fast, resulting in a kind of communication that a columnist in the local newspaper humorously described as “blurting on the cell phone like a hungry parrot”. A local student explained the style of such calls:

“Hey please-do-me this-and-this-and-this”, “Hey where-are-you please-can-I-see-you-at-this-and-this”, yes, not like “hello, how are you doing?” (male)

When the students want to make longer calls, for example when chatting with friends, they often schedule the calls for times when the rates are lower, which is usually on the evenings after 10 p.m. or during weekends.

The popularity of beeping, discussed in 6.4.2, is also motivated by the users’ wish to cut down the expenses of communication. The cost is either transferred to someone who can better afford it or who is seen as being responsible for taking care of it, or beeping is used as a free way of conveying a message that would otherwise require calling or texting.

Choosing operators

The price is an important factor when Tanzanian mobile phone users choose their operator. In the questionnaire, over half of the students of IUCo reported that cheap rates and good offers are among the reasons for choosing a particular operator. Tigo has a reputation of being the cheapest operator to use, and indeed it is more popular among the students than nationally, whereas Zain, which has an image of an expensive operator, is much less popular among the students than nationally.

The only factor that is even more important in operator choice than the price is matching the operator with that of family members and friends: nearly three out four students reported that it mattered in their choice of an operator. Calls between operator networks are more expensive than inside one network, and special call offers usually apply only to the calls inside one particular operator network. Thus matching the same operator is actually also a way to reduce the cost of use, both for the users themselves and the friends who are calling them:

Some of my friends have Tigo so when you call Tigo-to-Tigo, that’ll be cheap some have Vodacom, so you have to call

them with Voda so that it can be cheap, and I'm also thinking having Zain, because my parents are using Zain. (male)

Yeah, most of my friends they have Tigo. And if you are my friend and I found out you have TTCL, or, you have Zain, or Vodacom, I say "Oh! I will keep on flashing you, beeping you, because I don't have enough credit to call you"... but if you are Tigo, "ooh, I will keep in touch with you". (female)

The wish to match the operators of friends and family, and to use offers such as Tigo's Extreme call offer and text message offer has motivated many students to buy SIM cards from several different operators even though in most cases they have only one mobile phone. Sometimes a student uses one SIM card as the main card and the other ones are used only occasionally; other users keep the SIM cards with them at all times and change them frequently to match the operator whose number they are about to call. As described by one user who kept one SIM card in the phone and the other one hidden between the phone and its cover:

If our fingers could show how much, how much we do open, change, change, change! (male)

As SIM cards are relatively inexpensive and easy to get, money-wise it can pay off to get more than one. If one has not a SIM card of an operator whose number he or she needs to contact, there are some other options to communicate and still save money. One can send a text message instead of calling, or borrow a mobile phone from someone who does have the operator's SIM card.

Special offers and batching

The operators have special plans and offers for both calls and text messages, and many students take advantage of them. Zain, for example, has three different plans for personal use, in which a special rate applies at night time, for one phone number at any time, or for all calls after the first minute. The students are especially

familiar with Tigo's Extreme call offer that allows unlimited (Tigo-to-Tigo) calls for a daily fee of 1500 TZS (0.82 EUR). There is also a similar offer for text messaging that allows an unlimited number of text messages for a day. Of the students of IUCo, 58% reported using talk offers daily or weekly. This, however, does not necessarily mean that they would *purchase* an offer every day or week, as sharing of offers with other users is common. One informant described how one phone can circulate in the class once its owner has bought a daily call offer:

But there is a lot of case most of the people find every day they call you, [they know] person who have joined and when you know that one have joined, you find it all the class can use the same mobile phone, calling all the day, from morning up to evening. (female)

Batching of calls and messages is another way of saving in costs. Some students buy call offers during weekends and then call all their friends during one day, spending hours on the phone. Others buy a daily text message offer and send messages to all the people they have failed to respond to or whom they have not contacted for some time. Even those users who do not normally use offers may buy one on special occasions like during holidays when a large number of greetings and messages is sent.

Keeping the airtime balance low

Most of the Tanzanian users are using mobile phones on pre-paid basis, which means that they need to buy airtime vouchers and load airtime on their SIM cards in order to make calls or send messages. A typical way of how this is done is to buy only small vouchers and keep only a small amount of airtime at any time on the SIM card.

This tendency affects the use in many ways. Being unable to call or being cut off in the middle of the call because the airtime has run out is a part of everyday life for Tanzanian mobile phone users. It can also be seen in the use of mobile phone services: the most popular service with 91% of the students using it daily is the free



Figure 6.8: Airtime voucher stalls on the streets of Iringa.

service of checking airtime balance. Some students reported using the service several times per day or after every call so that they can keep track of how much airtime they have left.

Although this way of using mobile phone may seem inconvenient, it is not directly enforced by limited budgets. According to the questionnaire study among the IUCo students, the median amount of airtime used per week is 5000 TZS (2.7 EUR), and the tendency of loading airtime only for a day or so at a time was also observed among those users who used more money on the use of phone. It could be interpreted as a safety measure: mobile phone thefts are common in Tanzania, and any airtime that is on the phone would be an extra loss for the user in such a situation. In Iringa town, it was also sometimes difficult to find airtime vouchers of 5000 or 10000 TZS, although this could be either the reason for or the consequence of people buying mainly smaller vouchers. For many users, however, the main reason for loading only small amounts at the time was related to their wish to restrict the amount of money they spent on the phone:

So I have to buy another credit tomorrow, five hundred, so that's the problem, I don't want to put a lot of money on that phone because at the end of the time, I'll find I have spent a lot, a lot of money on the phone. (female)

I used to recharge my phone with a little amount, a big amount of money so that I can have it for a long time but I came to realise that does not work because when you had it, you just talked, talked, talked, talked, talked. So you got to recharge your phone a lot, sometimes you just one thousand, five thousand and sometimes you will be so tight and you need to make a call, you just go for three hundred. (male)

The users feel that buying airtime little at a time, even though it would take place on daily basis, prevents them from "misusing" the mobile phone and spending too much money on it. On the other hand, it seems to also give them a somewhat deceptive feeling that they are not spending that much, because buying airtime little by little does not feel so bad. The total sum of money spent over a longer period can thus become to many users as an unpleasant surprise. One informant described how her mother, who frequently used the phone for calling both for business and leisure, got very upset when she received information about the total sum of money that she had spent on her mobile phone during a year:

One day they send her a message that "for the year, you have spent", like "seven hundred thousand", just for phone, and she was shocked, "Ni!", [I said:] "Yes, you are shocked?", she said: "I have to decrease!" (female)

Another user reported that although a mobile phone operator offered a service that could be used to find out the total money spent on airtime during the year, not many people wished to use such a service:

There's a program that's in the cellphone you can, you can ask, you can send that kind of command to bring the how much it costed, so most people don't like it because they can [see] that "Aah! Just for a year, three MILLION??? Where did I get that money?!" (...) even myself, I don't like it! (male)

A more extreme way of dealing with the temptation of using too much airtime was used by one male user who sometimes did not buy airtime at all for the phone on a particular week, or switched it off altogether. It was not easy, however, to do so, because people in his social network expected him to keep in contact and to be reachable. According to the student, switching off the phone in particular could actually become expensive, because when one switches the phone back on there will be a lot of complaints, and the user feels obligated to contact people and apologise for having the phone switched off.

6.4.5 Subcultural differences

Although many of the patterns discussed above are tied to the cultural context in which mobile phones are used, and can be seen as shaped by many phenomena that could be considered as generally “Tanzanian”, it is important to avoid making too generalised picture by emphasising also those lines along which Tanzanian people differ from each other as mobile phone users. In this section, three such sources of difference are described: gender, age and urban vs. rural areas.

Gender

In anthropology, technology as technical skills and expertise is seen as one of the most significant ways in which gender is expressed in societies (Bray, 2007). In case of mobile phones, many studies¹² have focused on gender related differences in the ways mobile phones are viewed and used. Being aware of how much distinct gender roles affect everyday life in Tanzania, one can expect gender to make a difference also when it comes to mobile phones.

At IUCo, many of the users have got their first mobile phone before they come to university, typically when entering the high school (Form Five, A-level). In the youngest student group (23

¹²See, for example, Ling (2001) and Lemish and Cohe (2005).

years or younger), the mean age of getting a mobile phone was 17.5 years. Some Tanzanian parents do not want their children to have a mobile phone when they are still at secondary school, because the parents fear that mobile phones may distract the children from their studies. The interviews implied, though, that somewhat different rules may be applied to sons and daughters in the same family, suggesting that the parents were especially cautious about letting their daughters use mobile phones while at secondary school. This may be due to the fact that although there is a norm according to which young people should not be in intimate relationships while they are at (primary or secondary) school (Wight et al., 2006), many young Tanzanians meet in secret, and a mobile phone is a convenient tool for the pupils for keeping in touch and arranging where to meet. The consequences of such relationships can be much more severe for girls than boys: many schools expel girls who have fallen pregnant, while boys who are responsible usually get away with a fine.

The questionnaire, however, did not support the impression that male users would obtain a mobile phone at a younger age than women. There are several possible explanations for this. First of all, it may be that the traditional differences between male and female users are not that obvious among the students of a private university such as IUCo compared to, for example, to rural areas. Secondly, female users can indeed get their first mobile phones around the same age as male users, but perhaps from somewhere else than their parents, or even in secret from their parents. One of the female informants, for example, recalled how her younger sister had secretly got a mobile phone from somewhere, and how her father had got angry and broke the phone when he had found out about it.

According to the traditional gender roles in Tanzania, males are expected to support their family financially whereas women are expected to look after the children and home. In non-marital relationships, too, men are often expected to support their girlfriends by giving them money or gifts (Wight et al., 2006), which today may

include a mobile phone. On the basis of the questionnaire, female students at IUCo were more likely to get their mobile phone as a gift than males¹³: one third of the females reported that their phone was a gift compared to 12% of the male students.

Although there was no significant difference on the amount of airtime spent between male and female students of IUCo, the female students received more often airtime from others than males did¹⁴. The interviews confirmed that in the relationships, men have to bear the cost of communication: whereas the idea of a man beeping his girlfriend or wife is considered as “not good”, a man is supposed to call back whenever his wife or girlfriend beeps his mobile phone:

As long as African life, men [are] responsible always, maybe to take care of the woman, you see, so for me to save the credit in my phone, whenever my girl maybe SMS me, to answer in time, because sometimes it may bring complication or, if she just beep me, call her in time. (male)

The role of a man as the main payer of communication costs could explain why male users are even more frequent users of the service that allows checking airtime balance¹⁵, and why males are more interested than females in good offers and cheap rates when choosing the operator¹⁶. Furthermore, males are also more active users of “who-called” service¹⁷, which may be related to a greater need to find out who has beeped them in order to evaluate whether they need to call back.

Although many studies about mobile phone use in the industrialised countries have found differences between male and female users in the ways mobile phone is used, in cases of feature use or communication mode preferences no such differences were found between male and female students at IUCo. On the other hand,

¹³ $\chi^2 = 5.84, p < 0.05$

¹⁴53% vs. 21% daily or weekly; $\chi^2 = 11.74, p < 0.01$

¹⁵97% vs. 83% daily users; $p < 0.01$

¹⁶67% vs. 40%; $\chi^2 = 6.60, p = 0.01$

¹⁷ $\chi^2 = 5.67, p < 0.05$

this does not mean that the differences could not exist. The questionnaire study surveyed the patterns of use at very general level, whereas the gender differences could have more to do with the details of use such as with whom the students communicate with a mobile phone and what kind of issues are communicated through it.

Age

Older age in Tanzania is associated with more respect, prestige and financial resources. In the oldest student group (27+) almost all the users had bought their mobile phones themselves, whereas in the youngest student group about one third of the users had got their phone as a gift¹⁸. The oldest student group also got less frequently airtime from other people compared to the youngest user group, and borrowed less other users' mobile phones, suggesting that they had more resources for financing their own mobile phone use. On the other hand, there was no statistically significant difference between different age groups when it came to the price of the mobile phone or the amount of airtime spent per week, although the younger users were less likely to pay all of the used airtime by themselves.

There were also some differences between younger and older students in the preferred modes of communication. Texting was more popular among younger than older students. Among the two younger student groups, the ratios between users preferring calling or texting were roughly 1:4 and 1:3, whereas in the oldest user group it was the other way round (3:1). Furthermore, the number of sent and received messages per day correlated negatively with the students' age¹⁹.

The effect of age on texting and calling preferences seemed to also extend outside the university. The students often pointed out that unlike the students themselves, their parents preferred calling

¹⁸ $\chi^2 = 9.76, p < 0.01$

¹⁹ $\rho = -0.51, p < 0.01; \rho = -0.54, p < 0.01$

and might not text at all:

These *babas* and *mamas* they like calling, calling, calling... and when they saw you texting, [they say] "Why, you are wasting your time, just phone!" and I say "no". (female)

Beeping, too, was more common among the younger student groups than in the oldest student group. In addition, some of the mobile phone features such as alarm clock and picture sending were less often used by older students.

Urban versus rural areas

The field study took place in Iringa Town which, although not a large city, can be considered as a semi-urban centre of the rural Iringa Region that surrounds it.

Many of the ideas related to the mobile phones that can be observed among the users in Iringa Town and in the villages are similar. Many of the perceived benefits and disadvantages are the same, and some ideas such as sharing a mobile phone with family members, for example, is disliked among the students and villagers alike (Tedre et al., 2010).

Nevertheless, there are also many differences between urban and rural areas in Tanzania that affect the ways in which mobile phones are used. Electricity is not available in many rural areas in Tanzania, which makes charging the battery of a mobile phone one particular problem in mobile phone use. The mobile phone network in Tanzania still leaves large areas uncovered, which means that in rural areas, a user may have to travel some distances to find a spot in which a mobile phone can be used. Furthermore, in rural areas airtime vouchers are harder to find.

The above mentioned challenges make mobile phone use more expensive in the countryside, because unlike in towns, users have to pay different kind of extra costs besides the actual cost of airtime. People who sell airtime vouchers in the countryside, for example, can charge 10-20% extra for them, and many users have to pay from

300 to 500 TZS (0.16 - 0.27 EUR) to get the phone battery recharged at telephone towers or at someone who owns a generator (Tedre et al., 2010). In addition, the use of mobile phone is not only more expensive in terms of money but also in terms of time and effort, because getting airtime vouchers, network and the battery charged require travelling; on the other hand, in the countryside the benefits of a mobile phone as reducing travelling required to get certain products is more pronounced than in towns (Ibid.). Thus, although the students at IUCo and the villagers of Iringa both use roughly similar amounts of money on mobile phone use, the rural users get to use the phone less for the same money.

There is also a difference in the patterns of mobile phone communication between IUCo students and mobile phone users in the rural villages of Iringa. In the villages, a majority of users (58%) has been reported to use calling and beeping but no texting, while another 15% uses only beeping (Mpogole et al., 2008). The unpopularity of texting compared to the students may be at least partly due to the fact that the mean age of respondents in the villages was much higher than among the students, whereas beeping is more likely to be related to the more restricted financial resources of the rural users.

6.5 IMPLICATIONS FOR DESIGN

According to Dourish (2006), a failure to provide “implications for design” has been a common lament about ethnographic studies in HCI, reflecting the way in which ethnography’s role in design has been misunderstood. If, indeed, “implications for design” are interpreted as feature lists of technology to be designed, this field study provides none, and was never planned to do so. On the other hand, when it comes to value as the basis of design, or understanding better the cultural context into which one is designing for, the field study reveals many issues that do have implications when designing mobile phone technology in a Tanzanian context.

The study highlights the positive and negative value that Tan-

zanian university students associate with mobile phones. For a designer, they provide an explicit starting point for visioning and negotiating with the users what kind of worth future mobile communication products and services could bring to their users; at the same time, they point out aspects and consequences that are currently experienced as negative by the users, and which a designer may wish to design against.

The results of the field study support interpretation of official mobile phone statistics by giving more accurate and realistic picture of what lies behind the figures. Fifteen million mobile phone subscriptions in Tanzania is far from fifteen million mobile phone owners with a SIM card; instead, there is a great variety of ways in which millions of Tanzanians use mobile phone technology. Some of them have one mobile phone and one SIM card; other ones change between several SIM cards from different operators. Some have not only several SIM cards but more than one phone, some have only a SIM card and rely on others' willingness to lend a phone when they need one. Even those who have their own mobile phone and SIM card use other people's phones. Some users have a phone and a SIM card but no electricity in the village to charge the batteries; other users live in the areas without a network coverage and have to travel some distances every time they want to use their phone. Design of mobile phone technology for Tanzanian users requires that designers understand and take into account the great variety of uses and challenges involved in mobile phone use.

Besides the official statistics, the study can guard against resorting to some stereotypic ideas about mobile phones in the developing countries. The practice of sharing, for example, is often emphasised as something that can increase the access to a mobile phone in the developing countries²⁰. While there is some truth behind such statements, they can also give an overly optimistic idea about the practice of mobile phone sharing, as if it would take place regardless of the context. In case of Tanzania, the field study shows that

²⁰See, for example, (James and Versteeg, 2007): "Especially in Africa, with its culture of sharing, mobile phones are often divided among people."

such phenomena do exist among Tanzanian mobile phone users, but it also points to many situations in which a mobile phone can be considered as a very personal tool in Tanzania. From a design point of view, this means that it would be very misleading to assume, for example, that a presence of a mobile phone in a house would mean unproblematic access to it for all the members of the household.

The study also highlights some general patterns of use that reveal areas of possibilities, restrictions and further inquiry for a designer. The extent in which the students of IUCo have adopted mobile phone and put it to use in their daily co-ordination of studying activities, for example, gives inspiration for visioning how mobile phones could even better support them in an environment in which changes are frequent, information flows mainly through personal contact, and being a part of social network is crucial. On the other hand, the pressure for being constantly available and investing money on communication that is currently experienced by the students raises questions about whether it would be possible to design technological systems that would not only make communication more efficient, but could help its users alleviate such pressures by providing socially acceptable ways of disconnecting themselves occasionally from the network.

A field study similar to the one presented in this chapter can support a design process in many ways, possibly even across many design projects. What it cannot do, however, is to replace the requirements stage in the standard user-centred design process. It can guide the further user and context studies and help in refining their focus, but more detailed level research and design activities are required for creating the requirements.

7 Conclusion

In this chapter I present the main results of the thesis related to the three research questions presented in Chapter 1.4. In addition, I discuss some ideas for further research in cross-cultural interaction design.

7.1 CULTURE IN HUMAN-COMPUTER INTERACTION

The concept of culture has received relatively little attention in the studies of cross-cultural HCI. In this thesis, it is argued that although the extensive discussion about the concept of culture in the fields such as anthropology suggests that there is little hope for reaching a general agreement about the definition of culture, there are other good reasons why the ideas of culture should be discussed in HCI.

Understanding better the phenomenon that is called culture and the extent to which it underlies all human action supports a designer's efforts to understand users and their everyday life in cross-cultural design settings. When designers are aware of how culture affects what people value and how they behave, the designers are in a better position to question their own ethnocentric thinking and develop empathy towards the users and their interests even when there is a large cultural distance between users and designers. In addition, while having such knowledge does not entirely remove the additional stress that is frequently experienced during cross-cultural encounters, it can at least help the designers make sense of and come to terms with such situations.

In a similar vein, by being aware of the complex and diverse nature of culture, a designer is likely to be more sensitive to cultural difference and controversy inside a society or a user group, and avoid making overgeneralised accounts during the design process. When one understands the ambiguous role of cultural process

as both a preserver and transformer, one can recognise the traces of the process in real life and look for ways to think and discuss that go beyond describing culture as a fixed mould into which technology much be fitted, or assuming that “best practices” and “advanced technology” will somehow override any pre-existing cultural values and practices. This is especially important considering that in cross-cultural design, interaction designers often work in the fields characterised by intense interaction between local and global, traditional and modern, persistence and change.

Furthermore, the awareness of cultural diversity and the ways in which cultural processes work raises questions about to which degree the theories and methods of HCI are themselves cultural products. They, too, have been created in particular cultural contexts, which are reflected in the assumptions they make about people and the world. The concepts such as usability or user participation are based on certain ideas of what is important and fair in the design and development of technology, whereas design techniques such as think aloud or contextual inquiry are based on particular expectations about how people behave and what kind of interaction between the designers and users would be the most beneficial during the design process.

In case of design methods, there is the same dilemma as with designing technology for a particular cultural context: to which extent the technology must be fitted to the existing values and practices, and to which extent one can expect to successfully introduce new elements? If a design method is based on the ideas of what is good design but the same ideas go against the local values and practices in the design context, a designer must find a way to reconcile them. In Tanzanian context, for example, such cultural ideas and practices as expressions of power distance, expectations for collective support and regular foregrounding of personal agendas can interfere with many rules of the contextual inquiry (master-apprentice model, refusing to offer technical assistance during the inquiry, trying not to affect the user’s opinions). Yet both sticking to the original ideas behind the method despite the local differences

and adopting entirely to the local conventions could have equally harmful effects on the design process.

To date, there have been many approaches to cross-cultural design in HCI, each of which is best suitable for answering particular type of questions about culture and human-computer interaction. The theories and methods of cross-cultural psychology can be used in cross-cultural comparison studies in order to examine the cultural differences in HCI at a detailed level. Even resorting to country-level abstractions can be beneficial during some stages of the design project. Nevertheless, from a design point of view experiments and generalised guidelines suffer from the same problems in cross-cultural design as they do in interaction design in general: although they can provide some rules of thumb for the design, they do not consider the contextual and situational variation in human-computer interaction. That, as argued by the researchers of user-centred design since the end of the 1980s, requires studying the users in the context of use.

Regardless of the approach chosen, the concept of culture remains an issue. There are many significant theoretical and methodological challenges in cross-cultural surveys and experiments¹, which to date have not received enough attention in HCI. On the other hand, despite the popularity of Hofstede's cultural dimensions in HCI, there has been very little discussion about the ideas of culture behind his cultural model and their effects on the research. As cultural dimensions do not consider the opposite tendencies of culture, they rather enforce than challenge the idea of culture as nearly permanent and homogenous, and as the origin of thematic restrictions that limit the possibilities of both users and designers. Furthermore, the abstractness of cultural dimensions means that they cannot offer reliable support for interaction designers in understanding how culture affects the ways technology is valued and used, or what kind of design techniques should be used. From that point of view, it is not surprising that the benefits of cultural dimensions in HCI have remained so modest that the visibility of cultural

¹See, for example, Matsumoto and Juang (2004).

dimensions can be described as being highly disproportionate to their usefulness in the field. While cultural dimensions have set many researchers and designers in HCI thinking about “culture’s consequences” (Hofstede, 1984), more attention should be paid to the consequences of using cultural dimensions in cross-cultural design projects.

7.2 THE CHALLENGES OF CROSS-CULTURAL DESIGN

The concept of cross-cultural design has been used to refer to a design setting that involves cultural differences at a national level. Such differences can create a large cultural distance between users, designers, contexts of use and design, and the theories and methods used during the design process. Cross-cultural design can be contrasted with intracultural design, in which the differences are at a subcultural level only. The line between cross-cultural and intracultural design, however, is not clear-cut; the difference is more of a degree than of quality.

In this thesis, the main challenges of cross-cultural design have been located in the five key areas:

Ideas of culture The theories and methods that are used in cross-cultural design are based on particular ideas about culture. The researchers and designers need to make the ideas explicit in order to evaluate their benefits and weaknesses for the intended purposes.

Values and worth The design process should be based on understanding of the positive and negative value of technology as seen by the users. What is seen as worthwhile, however, is not universal, and users’ and designers’ ideas of worth can differ greatly not only due to the individual differences but because the cultural frameworks against which the options are weighed are different. As values are intangible, they are less evident than cultural differences in behaviour or artefacts. Thus the risk of ethnocentric thinking, evaluating others against the standards of one’s own culture, is high in cross-cultural design.

Wider context of use In intracultural design, designers need to

learn about the immediate context of use, but users and designers usually share knowledge about the wider context of use at the level of society. In cross-cultural design, such shared knowledge and experiences may be missing. This makes it more difficult for a designer to understand the immediate context and to vision how well particular design ideas would work in the long run.

Wider context of design The lack of information and experience about the wider context affects also the design process. The local infrastructure, politics, business practices and laws, to name but a few, must be considered when planning and executing a design project. Furthermore, a designer needs skills in cross-cultural communication in order to find the most suitable ways of approaching users and communicating with them.

Design theories and methods as cultural products The theories and methods that are commonly used in cross-cultural design have been developed in a context that can be vastly different from today's cross-cultural design settings. Consequently, they do not consider the specific challenges of cross-cultural design, and include cultural assumptions that may not hold in every design context. A designer must review the theories and methods critically and be prepared to improvise or come up with new design techniques that suit better the local design setting.

7.3 ETHNOGRAPHIC APPROACH TO CROSS-CULTURAL DESIGN

As a multidisciplinary field that has connections to a variety of disciplines, HCI offers many possible ways to address the challenges of cross-cultural design discussed above. This thesis introduces one approach that borrows mainly from ethnographic research in anthropology and worth-centred design in HCI.

The approach is founded on the idea of culture as a complicated process during which there are several opposite tendencies. Instead of considering culture as a static description that applies to a country as a whole, attention is also paid to cultural difference

and controversy within, and to the ways in which cultural process both maintains and transforms values, practices and artefacts.

When developing their understanding of the wider context of use, designers should take into account many aspects that are usually not considered as cultural, but which nevertheless are closely interconnected to cultural issues. Natural environment, infrastructure and politics are all aspects of the wider context that interact with culture and shape the way technology is valued and used in a particular context. The overall aim is to provide rich representations of the local context that can guide both the design process and the design decisions.

Similar to worth-centred design that focuses on value and worth, the ethnographic approach to cross-cultural design starts from investigating value in the local context, which in the later stages will be the basis for negotiating the worth of the technology to be designed with users and other stakeholders. Making clear the users' viewpoints on positive and negative value guides the designers towards the most promising design alternatives, whereas representing the values against the backdrop of the local context decreases the risk of ethnocentric interpretations by highlighting the reasons behind particular user sentiments.

The approach is not a fixed method: it dictates neither the design techniques nor the order in which they should be used. It is based on the assumption that coming up with a universal design method that would work equally well in all the design contexts would be as impossible as coming up with a universal design that would work equally well regardless of the context of use. Therefore, the details considering the design process and the techniques used must be tailored for each design context.

Nevertheless, the approach gives some guidance towards designing the design process and choosing the techniques. The techniques must support a designer in making explicit what users value and in challenging a designer's own ethnocentric assumptions. A designer should be able to learn enough about the users and the context of use in order to recognise also the factors that affect the

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interaction with the users and the design process. In addition, the design techniques should provide possibilities for rechecking and questioning what the designer has learnt. Considering these requirements, a long-term design process that enables flexibility and use of multiple techniques that can inform each other is useful, as well as an extended period of fieldwork which can be complemented with long-distance techniques.

Considering the wider context also from the design point of view informs the choice of design techniques. In addition, it diverts the discussion about the suitability of different design techniques away from country-level generalisations to discussing how culture can affect different elements in a design situation. Thus instead of discussing whether individual interviews, for example, work or do not work as a design technique in countries such as Tanzania or Finland, the researchers can focus on what elements in the design situation make a difference in particular cultural context. Understanding the effect of culture on design techniques and the use of multiple design techniques expose misunderstandings and controversies in the interpretations of the designers, increasing the validity of what they learn about users and the context of use. In addition, it can show culture as the resource for inspiration in design, pointing to ways in which cultural specificity not only sets limits but provides opportunities for the design process.

The ethnographic approach to cross-cultural design can be integrated into the standard user-centred design process as a new phase of understanding that precedes and feeds the other four phases of the UCD process. In order to support cross-cultural design, the phase of understanding in this case includes the study of value in the context of use, but aims also at giving the designer better understanding of the wider contexts of use and design. As such, the phase of understanding helps in setting the design focus towards promising directions and finding the most appropriate design and evaluation techniques in the later phases of the design project.

The case study about mobile phones in the life of Tanzanian students illustrates many of the points mentioned above. From the

design process point of view, several factors affecting the design process and the use of design techniques were recognised, which could be used to steer later design activities. It was learned, for example, that both individual and group sessions can be beneficial depending on the circumstances such as perceived power distance between designers and users, which is affected by factors such as gender, age and perceived status. The presence of someone who is perceived as having a higher status may inhibit users from communicating in one-to-one interviews, but on the other hand if power relations are more equal the users may actually feel more willing to speak if there are no others present. It was also noted that at least in student population, the participation in the research was often expected to be encouraged from the above, and the arrangement of formal interview sessions was very time consuming even when small incentives were offered.

The case study highlighted both the positive and negative value of mobile phones among Tanzanian university students, revealing how such issues as being constantly connected to one's social network or efficient communication were perceived as mixed blessings, and how the local context affected the ways mobile phones were valued among the students. The study of value provided inspiration and design ideas but also raised some concerns. Although a mobile phone was recognised by the students as providing a connection their support network, there is also some pressure for staying in contact and spending money on communication, which can in some cases make the students use a mobile phone beyond their means.

Besides the ways in which mobile phones are valued among the students of IUCo, the study revealed some interesting patterns of mobile phone ownership and use. It was found out, for example, that the users have a preference for keeping the cost of communication low, but in many cases they try to achieve it by different strategies of use and not necessarily by cutting down the amount of communication. Several differences between the students and rural users in Iringa were recognised in the patterns of mobile phone

use. In addition there were age and gender related differences among the students, which affected communication preferences, use of services and the ways in which the cost of communication was distributed.

7.4 FURTHER RESEARCH

Considering the range of challenges in cross-cultural design, there are many topics that remain outside the scope of this thesis but which would make timely and important research topics for further research. One evident limitation in this thesis is that it focuses solely on the activities that are supposed to take place during the new, initial phase of understanding in the user-centred design process. The ways and the extent to which the activities of the initial phase can inform and support the later phases such as design and evaluation would need to be studied empirically in different design settings.

One interesting topic that has not been discussed in detail in this thesis is cross-cultural communication in interaction design. It would be interesting to study in more detail how cross-culturality affects the communication between users and designers during the design activities using the methods of discourse analysis, for example. Another fundamental issue is the question of representation: how should the cultural context of use and design be represented to the rest of the development team and other stakeholders so that it would help them to break their ethnocentric assumptions and empathise with the users while conveying also the dynamic and controversial aspects of culture?

When it comes to design methods, cross-cultural HCI in the third wave is not about a particular type of methods but about finding the most suitable methods for each research setting, regardless of whether the methods are quantitative or qualitative or a mixture of both. More attention should be paid to the validity of methods, both in cross-cultural comparisons in laboratory settings and in contextual studies. The search for new design methods will be

supported by the other research areas in the third-wave HCI, as the researchers working with design for all or worth-centred design are confronting similar challenges such as dealing with diversity and finding ways to represent and communicate about value.

In the global world of ICT, culture will without doubt remain of interest. Many further studies in cross-cultural design will continue to investigate the suitability of different design theories and techniques in a variety of cultural contexts. As time goes by, these studies will not only help the designers to confront better the challenges of cross-cultural design, but increase the field's understanding of what really happens during interaction design.

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A Questionnaire form

A Survey on Mobile Phone Use

Dear student at Tumaini University,

Thank you for your interest in this survey. This survey is a part of a study that aims at understanding the use patterns and needs of Tumaini's students concerning mobile phones. Your participation in this survey is voluntary. The study consists of about 100 short questions, and it takes about 15–20 minutes to answer. Your answer is anonymous and only the researchers of this study will have the access to the answer sheets.

All the students who fill in this survey can take part in a draw, in which the prizes are an MP3 player, a USB flash disk and an airtime voucher for 5000 TSH. When you return the filled survey, please write your name and contact information on the separate list from

which the winners will be drawn after the survey has ended. The results of the draw will be announced on the Tumaini University's Science Park notice board and the winners will also be contacted by email / phone if possible.

In a later stage of this study we will be interviewing students of Tumaini University about their use of mobile phones. Please mark in the draw list whether we can contact you later and send you an invitation to the interviews.

By returning this survey you agree that the collected data can be used for scientific research and scientific reports. If you have any questions concerning this survey, do not hesitate to contact either of the principal investigators, Dr. Matti Tedre and Ms. Minna Kampuri.

Section 1. General information

1.1 Age and gender: _____ years	<input type="checkbox"/> Male <input type="checkbox"/> Female	1.2 Nationality: <input type="checkbox"/> Tanzanian <input type="checkbox"/> Other, what? _____
1.3 Faculty:	<input type="checkbox"/> Faculty of Arts and Social Sciences <input type="checkbox"/> Faculty of Law <input type="checkbox"/> Faculty of Theology <input type="checkbox"/> Faculty of Business and Economics <input type="checkbox"/> Faculty of Science and Education (IT, B.ED)	1.4 Year of study: <input type="checkbox"/> 1 st year at university level <input type="checkbox"/> 2 nd year at university level <input type="checkbox"/> 3 rd year at university level <input type="checkbox"/> 4 th year at university level <input type="checkbox"/> 5 th year at university level

Section 2. Access to phone

2.1 Do you own a mobile phone? <input type="checkbox"/> Yes <input type="checkbox"/> No	2.2 For how long have you <i>owned</i> a mobile phone? _____ years and _____ months
2.3 How many different mobile phones have you owned (including your current one)? _____ different mobile phones	2.4 For how long have you <i>used</i> a mobile phone? (Your own or someone else's mobile phone) _____ years and _____ months
2.5 How often do you use someone else's mobile phone? <input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately _____ times per month. <input type="checkbox"/> Weekly, approximately _____ times per week. <input type="checkbox"/> Daily, approximately _____ times per day.	2.6 Whose mobile phone(s) do you use? (You can tick several options if necessary) <input type="checkbox"/> My own <input type="checkbox"/> Friends' mobile phone <input type="checkbox"/> Relatives' mobile phone <input type="checkbox"/> Someone else's (Whose? Fill in: _____)
2.7 How often do other people use your mobile phone? <input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately _____ times per month. <input type="checkbox"/> Weekly, approximately _____ times per week. <input type="checkbox"/> Daily, approximately _____ times per day.	2.8 Who uses your mobile phone? (You can tick several options if necessary) <input type="checkbox"/> Me <input type="checkbox"/> My friends <input type="checkbox"/> My relatives <input type="checkbox"/> Other people (Who? Fill in: _____)
2.9 How often do you use a regular phone (landline phone) for making or receiving calls? <input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately _____ times per month. <input type="checkbox"/> Weekly, approximately _____ times per week. <input type="checkbox"/> Daily, approximately _____ times per day.	2.10 How often do other people use a regular phone (landline phone) for calling you? <input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately _____ times per month. <input type="checkbox"/> Weekly, approximately _____ times per week. <input type="checkbox"/> Daily, approximately _____ times per day.
2.11 How often do network problems prevent you from calling someone or sending a message? (e.g. cannot connect, cannot send an sms, etc.) <input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately _____ times per month. <input type="checkbox"/> Weekly, approximately _____ times per week. <input type="checkbox"/> Daily, approximately _____ times per day.	2.12 How often do network problems affect the quality of your calls or messages? (e.g., sound is bad, message arrives late, etc.) <input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately _____ times per month. <input type="checkbox"/> Weekly, approximately _____ times per week. <input type="checkbox"/> Daily, approximately _____ times per day.

Section 3. Technical Information

3.1 Do you know the model of the mobile phone(s) you use? (e.g. Nokia M80, Ericsson FZ800, Samsung SA-1)

- Yes. The model is: _____
 No

3.2 The following list includes examples of features that mobile phones can have. Please indicate if your phone has or does not have those features. If you do not know if your phone has some feature, choose "I don't know." Mark your answer with a cross.

	Yes	No	I don't know
1. Does your mobile phone have a camera?			
2. Does your mobile phone have a calculator?			
3. Does your mobile phone have a sound (voice) recorder?			
4. Does your mobile phone have a torch (flashlight)?			
5. Does your mobile phone have an alarm clock?			
6. Does your mobile phone have a web browser (Internet)?			
7. Does your mobile phone have a radio?			
8. Does your mobile phone have a calendar?			
9. Does your mobile phone have games?			
10. Does your mobile phone have a timer (a stopwatch)?			
11. Can your mobile phone show color photos?			
12. Can your mobile phone show videos?			
13. Does your mobile phone have Bluetooth?			
14. Does your mobile phone have FX-Net?			

3.3 If your phone has other features than those mentioned above, what are they?

Section 4. Mobile phone use

<p>4.1 How often do you use a mobile phone to call someone?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately ____ times per month. <input type="checkbox"/> Weekly, approximately ____ times per week. <input type="checkbox"/> Daily, approximately ____ times per day.</p>	<p>4.2 How often do you receive calls to mobile phone?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately ____ times per month. <input type="checkbox"/> Weekly, approximately ____ times per week. <input type="checkbox"/> Daily, approximately ____ times per day.</p>
<p>4.3 How often do you <i>send</i> text messages (SMS) with mobile phone?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately ____ times per month. <input type="checkbox"/> Weekly, approximately ____ times per week. <input type="checkbox"/> Daily, approximately ____ times per day.</p>	<p>4.4 How often do you <i>receive</i> text messages (SMS) to mobile phone?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately ____ times per month. <input type="checkbox"/> Weekly, approximately ____ times per week. <input type="checkbox"/> Daily, approximately ____ times per day.</p>
<p>4.5 How often do you beep (call someone but hang up before he/she can answer) other people with a mobile phone?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately ____ times per month. <input type="checkbox"/> Weekly, approximately ____ times per week. <input type="checkbox"/> Daily, approximately ____ times per day.</p>	<p>4.6 How often do other people beep you (call you but hang up before you can answer) with a mobile phone?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately ____ times per month. <input type="checkbox"/> Weekly, approximately ____ times per week. <input type="checkbox"/> Daily, approximately ____ times per day.</p>

4.7 Do you use your mobile phone in some ways not mentioned above? In what ways?

4.8 The following list includes examples of activities that can be done with mobile phones. Please mark how often you do such **activities with mobile phone**.

	Never	Have done a few times	Monthly	Weekly	Daily
1. Calculating something					
2. Taking photographs					
3. Recording speech					
4. Giving light (flashlight)					
5. Setting an alarm (alarm clock)					
6. Using Internet					
7. Sending pictures or photographs					
8. Using calendar					
9. Playing games					
10. Timing something with the timer (stopwatch)					
11. Composing your own ring tone					
12. Watching videos					
13. Watching photos					
14. Listening to the radio					
15. Listening to MP3 music					

4.9 The following list includes examples of services that are provided by mobile phone operators. Please mark how often you have used such **operator services with mobile phone**.

	Never	Have done a few times	Monthly	Weekly	Daily
1. Checking balance (airtime)					
2. Sending "Please call me" message					
3. Receiving "Please call me" message					
4. Calling someone after receiving a "Please call me" message					
5. Sending airtime to someone					
6. Receiving airtime from someone					
7. Sending money to someone (through M-pesa or other similar service)					
8. Who-called service (finding out who called while your phone was switched off)					
9. Buying new ringtones					
10. Buying logos or picture messages					
11. News (local, international, weather) service					
12. Sport results service					
13. Financial information (stock prices, etc.) service					
14. Timetables (bus, flights, TV, cinema) service					
15. Prayer service					
16. Jokes, quotes etc. of the day service					
17. Information about the operator (e.g., tariffs)					

4.10 If you use other mobile operator services than those mentioned above, what are they?

Section 5. Cost of mobile phone

<p>5.1 From where did you get your current mobile phone?</p> <p><input type="checkbox"/> From a shop <input type="checkbox"/> From a relative <input type="checkbox"/> From a friend <input type="checkbox"/> From somewhere else (Where: _____)</p>	<p>5.2 How much did your current mobile phone cost to you?</p> <p><input type="checkbox"/> It was a gift and cost me nothing. <input type="checkbox"/> I paid for it, it cost me _____ TSH</p>
<p>5.3 Which mobile phone operator(s) do you use? (You can tick several options if necessary)</p> <p><input type="checkbox"/> BENSON <input type="checkbox"/> TIGO <input type="checkbox"/> TTCL <input type="checkbox"/> ZAIN (Celtel) <input type="checkbox"/> ZANTEL <input type="checkbox"/> VODACOM</p>	<p>5.4 Why did you choose your current operator(s)? (You can tick several options if necessary)</p> <p><input type="checkbox"/> Those operators have cheap rates or good offers <input type="checkbox"/> Most of my friends / family use the same operator(s) <input type="checkbox"/> Those operators have good network coverage <input type="checkbox"/> Those operators have good network quality <input type="checkbox"/> Other reason (What? Please specify: _____)</p>
<p>5.5 How often do you use offers from operators that allow you to talk all day for a fixed fee (e.g., XTREME)?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Monthly, approximately _____ times per month. <input type="checkbox"/> Weekly, approximately _____ times per week. <input type="checkbox"/> Daily</p>	<p>5.6. On average, how much airtime do you use per week? Approximately _____ TSH per week</p> <p>On average, how much of that airtime do you pay yourself? Approximately _____ TSH per week</p>

Section 6. Opinions on mobile phone use

6.1 In the following table there are 30 statements about different aspects of mobile phone usage. Rate your agreement with each of the statements by using the scale "Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree." Try to answer every question.

	Strongly agree	Agree	Not agree, not disagree	Disagree	Strongly disagree
1. Mobile phone allows me to be more in contact with my friends.					
2. It does not matter if someone's mobile phone rings in the middle of a lecture.					
3. One cannot survive in today's world without a mobile phone.					
4. I am worried about spending too much money on my mobile phone.					
5. Mobile phone has improved the quality of my life.					
6. Because I can contact my friends through the mobile phone, we meet less often than we would without mobile phones.					
7. I try to make my phone calls at those times when it is cheaper.					
8. Using a mobile phone is expensive.					
9. Life without a mobile phone would be hard for me.					
10. Sometimes I wish that I did not have a mobile phone.					
11. Sometimes I wish that people could not contact me all the time.					
12. I feel embarrassed if my phone rings in the middle of a meeting					
13. A mobile phone makes me feel closer to my family members.					
14. I think it is ok to discuss personal matters over mobile phone in public places.					
15. I feel that the benefits of mobile phone are worth the cost of using it.					
16. A mobile phone makes me look stylish.					
17. A mobile phone allows me to change meeting plans in short notice.					
18. Using a mobile phone is fun.					
19. A mobile phone helps me to take care of family responsibilities while I am at work or school.					
20. A mobile phone relieves boredom by letting me call people any time.					
21. Before I had a mobile phone I often queued up for a public telephone					
22. A mobile phone encourages immoral behavior.					
23. Because of mobile phone I have less time for studying.					
24. A mobile phone makes it easy to chat and gossip.					
25. Before I had a mobile phone I always carried with me coins for public telephones					

	Strongly agree	Agree	Not agree, not disagree	Disagree	Strongly disagree
26. A mobile phone elevates my status among other people.					
27. When I have a mobile phone I never need to look for a landline phone anymore.					
28. I use the mobile phone for getting personal advice.					
29. A mobile phone makes me feel safe and secure in case of emergency.					
30. I prefer talking business things face to face instead of using a mobile phone.					

Section 7. Feedback to researchers

If you have any suggestions, comments, criticism, or ideas you want to tell to the researchers about this survey or mobile phones, write your message in the box below. If you think that we have forgotten to ask something important, let us know about that too.

Thank you for your time! We greatly appreciate your participation in this survey!

Yours truly,

Matti Tedre, PhD
Associate Professor

Minna Kamppuri, PhLic
Researcher

MINNA KAMPPURI
*Theoretical and
methodological challenges
of cross-cultural
interaction design*

Cultural diversity has become a significant challenge in human-computer interaction (HCI) and in the design of interactive technology. This thesis discusses culture in HCI and the challenges of cross-cultural design, and suggests a new design approach that borrows from worth-centred design and ethnographic research tradition to address the identified challenges. A case study about mobile phones in the life of Tanzanian university students serves as an example of how the approach can support design process by highlighting user values and general patterns of technology ownership and use in the local context.



UNIVERSITY OF
EASTERN FINLAND

PUBLICATIONS OF THE UNIVERSITY OF EASTERN FINLAND
Dissertations in Forestry and Natural Sciences

ISBN: 978-952-61-0407-2 (PDF)

ISSNL: 1798-5668

ISSN: 1798-5676