A Framework for Designing in Cross-Cultural Contexts: Culture-Centered Design Process

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Dedication

For Aylin Ada Berk

Abstract

The design process has become multi-cultural, bringing together designers, users and other stakeholders with different cultural backgrounds as a result of the dynamics of globalization and the rise of emerging markets outside Western culture. Developing new products for the new emerging "non-Western" markets is challenged by the diversity of cultures, the diversity in the environmental, economic, and technological contexts and therefore requires new ways of design thinking. The rationale for this study emanates from the desire to understand ways to design for diverse cultures. This study explores the design processes where designers and users originate from significantly different cultural backgrounds and offers a framework that points out the challenges of the process and the strategies targeting these challenges.

Grounded theory is adopted as the methodological framework for this study. Data were collected through in-depth interviews of purposefully selected designers who have experience in designing products for users whose cultural backgrounds are significantly different than their own. Twenty designers with diverse experiences from different geographical locations in the world were interviewed either face-to-face or by using online communication technologies. Two levels of interviews were used: the first level focused on identifying the process of designing for another culture and included generative questions to determine major concepts. Based on the results from first level interviews, second level of interviews focused on each step of the process, its methods, challenges and strategies. Qualitative Data Analysis Software NVivo was used for data reduction and analysis. The results emerged from three levels of coding: open, axial,

and selective coding. Open coding was used to determine concepts by opening up transcriptions and exposing thoughts and meanings contained in the text. In axial coding the aim was reorganizing the data that was opened up. Similar concepts were merged into categories and developed into a tree structure that shows the relationship between concepts and categories. In the third level of selective coding, data were transformed into a framework as a result of immersion in data over time. At this stage, the visual model and the storyline of the framework that describes the design process in the cross-cultural context named as “Culture-Centered Design Process” was developed.

The process of designing for another culture can be more time consuming, expensive and frustrating without the grounding pre-design phase. Culture-centered design process starts with pre-design phase which is the key to be prepared for the challenges of cross-cultural communication. Cross-cultural communication problems challenge especially the cultural immersion stage. Design teams need to respond to cultural values, norms, linguistic differences to build rapport and gain access to the users’ experiential and environmental contexts at the individual level. Finding the most capable cultural broker helps design teams not only in overcoming language barriers but also in building rapport with the users and catching the subtle nuances. Communication problems are eased and users’ roles in the design process are empowered when research methods are purposefully selected and combined with visual probes.

Designing for another culture is less intuitive and vulnerable to assumptive thinking; therefore cross-cultural design requires constant validation of design decisions with the users. Perceptual filter or assumptive thinking especially challenges reflective

integration and co-design & implementation stages. Designers need to be aware of their biases and assumptions as much as possible to draw insights from the user's reality. Directly or indirectly involving users in the design process through co-design or prototype walkthroughs can act as validation mechanisms.

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CHAPTER 1: INTRODUCTION

Rationale and Statement of the Problem

As a field design evolves by responding to the changes in the socio-cultural, economic, technological contexts (Cagan & Vogel, 2002). Following the Industrial Revolution, the main objective of design was to create a new aesthetics for mass production. Design moved from form-giving to creating usable and desirable products with the development and spread of consumer culture. Today, new conditions related to the practice of design have emerged with the dynamics of globalization and rise of emerging markets outside the Western culture. With the onset of worldwide product marketing, the design process has become multi-cultural, bringing together designers, users and other stakeholders with different cultural backgrounds.

India, China and many other countries in Southeast Asia, Africa, Eastern Europe and Latin America coined as emerging markets have entered the global marketplace with their rapid economic growth and industrialization rates and large consumer populations. As the emerging markets continue to grow, European and American companies are attracted to these markets. Globalization instead of homogenizing Western centric lifestyle and values in emerging markets enriched and diversified lifestyles of people at the same time preserving the local culture. People become more aware of their cultural values with increased wealth and better education, and communicate them globally via internet technologies and vast transportation networks (Friedman, 2005; De Mooij, 2010; Chavan, 2005). Thus, entrance to these new “non-Western” markets which are home to

over 80% of the world's population requires cultural competence (Lonner & Hayes, 2004), ability to design for different socio-cultural contexts, understand and embed cultural factors in product design.

The relationship between design and culture has been approached from different perspectives in the design literature. Existing frameworks such as Hofstede's (1991) cultural dimensions were used as systematic guidelines to understand users in cross-cultural design processes (Röse, 2004; Shen, Woolley, & Prior, 2006). Research on designing contemporary products with reference to cultural elements as an inspiration for form and color were conducted (Lin, 2007; Moalosi, Popovic & Hickling-Hudson, 2007). Users' design preferences and designers' approaches to design were compared across cultures (Christiaans & Diehl, 2007; Röse, 2004; Shen, Woolley & Prior, 2006). Western origin user research methods such as focus groups and interviews were analyzed in terms of their applicability in other cultural contexts. New user research methods sensitive to cultural values that can probe deeper in cross-cultural design contexts were developed. However, there is little information on how the design process is affected by the difference in cultural backgrounds of designers and users. When the designer's cultural background is the same as the user, integration of cultural factors in design happens as tacit knowledge. Designing for another culture has the challenge of making explicit what has been implicit within one's own culture. This research explores the stages and challenges of design processes where the designer and user originate from different cultural backgrounds and presents a design process framework that is developed based on unique challenges of designing for other cultures and strategies and methods that addresses these challenges in different stages of the design process.

The results are grounded in interviews with designers about their design experiences in unfamiliar cultural contexts. Diversity among the cultural backgrounds of the designers interviewed, the cultures they have designed for and the diversity in the products they design increase the practical application of the results.

The Purpose of the Research and Research Questions

The objective of this research was to explore the process of design where designers and user originate from significantly different cultural backgrounds. The research aimed to develop a framework of this process by abstracting from practical design experiences in industry and to point out the challenges of the process, and the strategies and methods targeting these challenges.

This study was guided by four major research questions:

1) What is the design process like when designers develop products for cultures significantly different their own?

a) What are the stages in this process and how do they relate to each other?

2) What are the methods of this process at different stages?

3) What are the challenges of this process at different stages?

4) What are the strategies that address the challenges at different stages?

Research Design

Grounded theory was adopted as the methodological framework for this study. Grounded theory was originally developed in the Sociology domain to generate or discover the analytical schema of a process by systematic data analysis through constant comparative coding (Glaser & Strauss, 1967). The process is complex and iterative where results are grounded in the data from interview of participants who have experienced a particular process (Strauss & Corbin, 1990).

In this study the data were collected through in-depth interviews of designers who had experience in designing for another culture than their own (i.e. Norwegian designer, Chinese user; British designer, Taiwanese user). Prior to actual data collection, a pilot study which included seven interviews with a diverse range of designers was conducted to develop the research design. As a result, open-ended interview questions and probes that encouraged story telling about specific examples of cross-cultural design experience were generated. Interviewees were selected by purposive sampling based on their level of cross-cultural design experience, the distinction between designers' and users' cultural backgrounds and the profile of company of employment. A questionnaire was emailed to professional online databases to determine the eligibility of a designer for an interview based on the above criteria. In addition, a designer's eligibility for an interview was determined based on personal acquaintance with the designers' professional experience. Twenty designers with diverse experiences from different geographical locations in the world were interviewed either face-to-face or by using online communication technologies.

The data reduction and analysis were done using the Qualitative Data Analysis Software "NVivo". The results emerged from three levels of coding: open, axial, and selective coding. Memos were used for research reflections and interpretations of each concept which helped to recognize implicit meanings and connections. Data were transformed into a framework and a visual model as a result of three levels of coding and immersion in data over time.

Assumptions of the Research

There were two assumptions determined and then validated by a pilot study in setting the boundaries of this research. The first assumption of this research was; "Designing for another culture other than your own is a different process than designing for your own culture". The results of the pilot study interviews showed that designing for another culture has unique challenges and addressing these challenges require a different design process compared to where designers and users originate from the same cultural background.

The second assumption of this study was "The process of designing for another culture will show a similar pattern regardless of the product." The process defined by pilot study interviewees who design a diverse range of products from apparel to heavy duty trucks in cross-cultural contexts showed similar patterns. Therefore this research is process focused, not product focused.

Significance of the Research

The idea of investing in emerging markets and designing products for non-Western cultures is relatively new. Most Western companies either benefit from the foreignness of their brands and product as their most desirable attribute or alter and customize their products with changes in color, packaging, name and language, and support it with local marketing endeavors. Products altered with superficial changes for each culture are “not designed for that culture” but “marketed to sell in that culture”. Additionally, although products such as cars, washing machines or refrigerators are globally similar, this does not mean that they can fully meet the needs of individuals across cultures. One size fits for all approach or customization of existing products designed for Western markets are not the best practices in designing for another culture. These approaches are easier and less costly for profit driven companies than investing in understanding people’s needs in their cultural contexts and taking the risk to develop new products.

On the other hand, designing new products for unfamiliar cultural contexts require considering socio-cultural and environmental sustainability. When the large population of emerging markets such as China and India are considered recreating Western like consumption patterns can lead to serious environmental problems (Hart & Prahalad, 2002). By understanding cultural contexts, socio-culturally more relevant products which have long term cultural durability can be designed (Manzini, 1995)

When the emerging factors discussed above are considered, developing an understanding of how to design for different cultural contexts is timely, relevant and significant. By understanding the process of designing in cross-cultural contexts, not only

products culturally and contextually resonant with people and their values can be designed but also companies can discover new market opportunities and gain competition advantage using good practices. This study explores common challenges of designing for other cultures and offers some strategies which can help companies save time and money in the process.

Limitations of the Research

The results of this study were directly dependent upon interviewees' ability to describe their experiences of designing for another culture. The designers interviewed were multinational and interviews were conducted using the common language of English. To minimize the effect of an interviewee's ability of communicating in English language, interviewees were asked to share any written or visual information related to their design experience.

The interviews were conducted using different communication tools because interviewees were located in different geographical locations and in diverse time zones. Designers were interviewed face-to-face, using online synchronous communication technology of video calls or asynchronous method of emailing. Not being able to interview the participants in their own setting and using multiple methods of communication created potential for variety in the depth of the data gathered from the interviewees. To minimize this limitation, the participants were contacted multiple times when it was thought that the provided information was not enough or was not clear.

There may also be recall bias because the participants were interviewed about a past cross-cultural design experience and they needed to recall details of this experience. Choosing participants who have current involvement in practices of designing for another culture helped to overcome this limitation.

Researcher Perspective

As a qualitative researcher, I have the responsibility to keep my biases under control during the data collection and data analysis. I have believed that designers' responsibilities are beyond creating usable and desirable products and they can affect the way individuals live their lives through the design of products. I have always had interest in different cultures and believed that designers are responsible for sustaining local cultures and designing products compatible with cultural values. Throughout this research process I diligently tried to build the results based on what was expressed by the interviewees. I intentionally focused on developing interview questions which will not direct interviewees and conducted a pilot study to test interview questions and the research design. I transcribed the interviews of the participant designers verbatim. To eliminate the risk of forcing data, I used qualitative data analysis software in data coding and coded the data three times. I also reinforced this by use of interviewee's quotes throughout the discussion of the results of the study.

Definitions

Culture in this study represents the national culture of an individual and defined as shared social phenomenon including explicit and implicit patterns that bind a group of

people who were conditioned by the same historical, economic, political and educational contexts within a national border.

Design Process and *Product Design Process* terms are interchangeably used in this study to address the process that refers to development of concepts, prototypes and specifications necessary to create a new product, service or experience.

Summary

The rationale for this study emanates from the desire to understand ways to design for diverse cultures. Emerging markets created a global marketplace which brings together manufacturers, designer and users from diverse cultural backgrounds. Marketing global products actually designed for Western markets or altering products with superficial changes does not always guarantee success as more companies started to invest in emerging markets. The concept of global products does not mean that people create similar experiences with those products and meet all their needs. Although entering emerging markets with large populations is attractive, it is very expensive and the risk for failure is high. Designers need to understand distinct practices and subtle nuances, environmental and economic contexts, religious beliefs and aesthetics of the other culture. Designers need to design products successful over long term, compatible with local environment enriching people's lives and experiences.

The objective of this research is to develop a framework of the process of designing for another culture that explores challenges of this process and strategies to overcome

them. This research fills a gap in the design literature and adds to the knowledge about best practices of designing new products in cross-cultural contexts.

Grounded theory approach was employed in data collection and data analysis. The data collection was conducted through in depth interviews with the designers who have been involved in design processes for different cultures than their own. The interviewees were determined based on how well they can inform the objective of the study. A questionnaire which assessed the level of expertise of the designer in cross-cultural design processes and the significance of difference between designer's and user's cultural backgrounds, was employed to determine interviewees. The interview transcriptions were coded using qualitative analysis software NVivo with three levels of open, axial and selective coding.

This study was built on the assumptions that designing for another culture requires a different design process than designing for your own culture, and designing for another culture will have a similar process regardless of the product that is designed. Some limitations of this study were related to communication barriers between the researcher and the interviewees. Geographical and time zone differences and thus using multiple methods of interviewing and mostly communicating in English which is not native language for both the researcher and most of the interviewees created some limitations in sustaining the same in-depth interview experience.

CHAPTER 2: LITERATURE REVIEW

Introduction

This chapter includes the review of literature on major concepts culture and design process and the existing research on the culture and design. The chapter is organized in three sections of 1) Terminology and Background Information 2) Does Culture Matter for Product Design? 3) Existing Research on Culture and Design. Each section and its subsections are designed to inform and build onto the previous discussions in this chapter.

The first section “Terminology and Background Information” is used to develop definitions of the terminology used in this study such as culture and product design process. Definitions and models of culture from different fields and the relationships of these definitions to design are introduced. The terminology regarding product design process is clarified.

In the second section “Does Culture Matter for Product Design?” the objective is to justify the need for this research. Paradigm shifts in design parallel to socio-economic developments are discussed. Globalization and the rise of emerging markets with diverse cultural backgrounds such as China and India and their effects on design practice are explored and the relevance “global products” for these markets are discussed.

In “Existing Research on Design and Culture” section different types of research conducted in design field about the cultural aspects are introduced. Multiple resources of

books, journal articles, conference proceedings and dissertations are reviewed to provide a breadth perspective of existing research

Terminology and Background Information

Definitions of Culture

The term culture has been defined in various ways in fields of psychology, sociology, anthropology and organizational management studies. The field of design derived definitions of culture mainly from cultural anthropology and organizational management studies. In this section, different definitions of culture are introduced. Examples of definitions developed in the design field are discussed. Finally these definitions are synthesized into a definition of culture which guides this research.

The earliest use of the term culture belongs to anthropologist Edward Tylor. According to Tylor (1871), culture is “complex whole which includes knowledge, belief, art, law, morals, custom, and any other capabilities and habits acquired by man as a member of society” (p.1). According to Geertz (1973) meanings of symbolic forms and their interpretations are what make up a culture. Culture is a form of shared meaning, understanding and sense making within which people live. Similar to Tylor these meanings are encoded in symbolic forms such as language, artifacts, rituals, traditions that should be understood through interpretation. In 1952, Alfred Kroeber and Clyde Kluckhohn published a list of over 150 different definitions of culture. Their list indicated the diversity of the anthropological definitions of culture. The synthesized definition of culture is more integrative than Tylor and Geertz’s definitions. Culture “consists of

patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievement of human groups, including their embodiment in artifacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other as conditioning elements of further action" (Kroeber & Kluckhohn, 1952; p.181). John Bodley (1994) also did a synthesis of many anthropological definitions of culture. The author gathered diverse definitions of the term from Kroeber ad Kluckhohn (1952) in the form a table by grouping under topical, historical, behavioral, normative, functional, mental, structural, and symbolic definition categories (Table 2-1).

Table 2-1

Bodley's (1994) Synthesis of Definitions of Culture

Topical	Culture is composed of things which are on a list of topics and categories. Examples used by Bodley for this definition is religion or economy.
Historical	Culture is social heritage or tradition that is passed from one generation to the next one over time.
Behavioral	Culture is shared and learned human behavior.
Normative	Culture is ideals, values and norms of living
Functional	Culture is the ways human solve problems about adapting to new environments or living together.
Mental	Culture is a complex set of ideas that distinguish human from animals.
Structural	Culture includes patterned and interrelated ideas, behaviors and symbols
Symbolic	Culture consists of the assigned meanings that are shared by a society.

Culture can manifest itself both in visible ways such as art and design and less-visible ways such as habits, preferences and experiences. Spradley and McCurdy (1987) emphasize the relationships between artifacts and culture in their definition of culture. According to authors culture is composed of mentifacts, sociofacts and artifacts. Mentifacts are about what people know and think including ideals, values and norms in one culture and what they think of as right or wrong. Sociofacts are about socio cultural norms of behaving and how people should behave in one culture. Artifacts are what people do, make and create in a culture. Cultural realities are represented in artifacts and as people interact with these artifacts they learn and internalize the culture. For example knowing that one has to dress in black for a funeral is a mentifact, dressing in black and therefore behaving according to the norms is a sociofact and the dress itself is the artifact. Mentifacts and sociofacts also represent themselves in artifacts. For example when one sees a person wearing black leather jacket and boots (artifacts), can guess that person is a biker (mentifact) and expects certain ways of behavior from him/her (sociofact).

In summary, according to the anthropologic definitions, culture is *shared meanings* embedded in *symbolic forms* which may be *implicit* and *explicit*. These meanings are created over *time* through *interpretation*s of *human groups*.

Dawkins, (1989) in his book “The Selfish Gene” introduced the concept of meme using the analogy to genes from an evolutionary perspective to define culture. Csikszentmihalyi (1997) also used the same terminology. Meme is a postulated unit of information, values, traditions, practices and ideas that should be known by the members of a society if a culture is to continue. Memes are transmitted by writings,

speech, rituals and gestures from generation to generation. Similar to genes, memes also evolve over time when a change is accepted by majority of people in a society. Artifacts in a culture are considered as a meme and they evolve throughout time by design.

The definitions of culture in organizational management are widely referenced in the design field. These definitions focus on symbolic and material expressions as well as learning. Several metaphors have been used in this field to define the components of culture. The Iceberg model of culture by French and Bell (1999) defines culture as composed of explicit, clearly visible top layer and implicit, invisible bottom layer. The top layer of culture refers to symbols such as artifacts, laws, written rules and procedures, behaviors and rituals. The bottom layer, which is much larger than the top layer is composed of norms, values, habits, beliefs, attitudes and customs which are not directly visible.

According to Hofstede (1991) culture is a system of shared beliefs, values, customs, behaviors, and artifacts adopted and transmitted by members of a society from generation to generation through learning. Hofstede uses the onion metaphor to illustrate culture in a model composed of several layers from core to the periphery as values, ritual, heroes, and symbols. According to this view, culture is like an onion that can be peeled, layer by layer to reveal the content. The core of the culture is formed by the values which are broad tendencies in a continuum of a plus and a minus side such as evil and good. The next level in composition of a culture is rituals which are socially collective activities like religious ceremonies. Heroes are imagined, alive or dead

characters who serve as role models and represent ideals in a culture. Symbols refer to words, images, objects and gestures that carry a particular meaning in a culture. As new symbols are created old ones disappear.

Schein (1999) defines culture using three levels; artifacts, espoused values and assumptions. Artifacts are the most outer layer on the surface; they can be seen, felt or heard. This level includes language, technology, products, myths or stories which are easy to observe but can be difficult to decipher. Espoused values are the stated or desired cultural elements. These are conscious goals and philosophies. Assumptions are the actual values which are different from the espoused values. Assumptions are hard to discern since they are below the level of consciousness.

The definitions of culture introduced above are synthesized into an integrative visual model (Figure 2-1). According to this synthesis:

1) Culture is a *social phenomenon*; it is shared, adapted and integrated by a social group of people.
2) Culture is a dynamic body of knowledge that is altered by social change through *time*.
3) Culture is transmitted generationally and it is *learned* and *interpreted*. It is not genetically inherited or defined by birth; it is transmitted through interpretation, learning and communication.
4) Culture is *symbolic* and involves arbitrarily assigned, symbolic meanings which are embedded in *visible* and *invisible* forms. Culture is composed of layers of material forms such as arts and artifacts, observable facts and behaviors such as technology, rituals,

language, religion and folklore, and not directly observable implicit factors such as beliefs, values, attitudes.

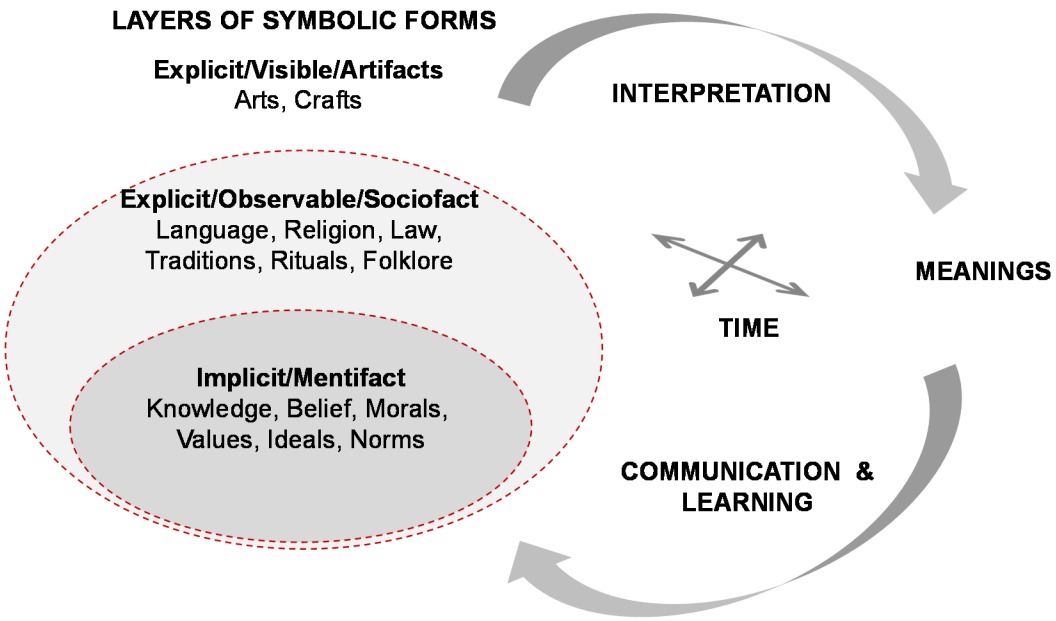

Figure 2-1. A synthesis of definitions of culture.

Culture and Design

The symbiotic relationship between culture and design has been discussed in the design field as forces that reproduce each other and coexist. Rose (2004) defines this relationship as “Design changes culture and at the same time is shaped by it”. Designed objects are influenced by the cultural background of their designer and/or the cultural background of the individuals they are targeted to. Thus, culture can reveal itself through designed objects and the act of designing can be defined as a culture making process. According to Childers (1989) design is equivalent of cultural continuity and for Low

(1988) “design is a culture-making process in which ideas, values, norms and beliefs are spatially and symbolically expressed in the environment to create new cultural forms and meanings”(p.187).

The definitions of culture as a layered structure are derived by the design field to develop new definitions related to design practice and design attributes of products. When a culture is accepted as an organic entity, it has three common aspects; 1) The physical or material, 2) The social, and 3) The spiritual (Leong & Clark, 2003; p.54). The physical or the material aspect includes food, dress, dwelling or related artifacts. The social aspect includes human relationship and social organization. The third spiritual aspect is composed of spiritual enhancements such as art and religion. These aspects of culture are fitted into three levels of culture as outer tangible level, mid behavioral level, and inner intangible level. Leong and Clark (2003) related this layered definition of culture to artifacts and therefore to design (Figure 2-2).

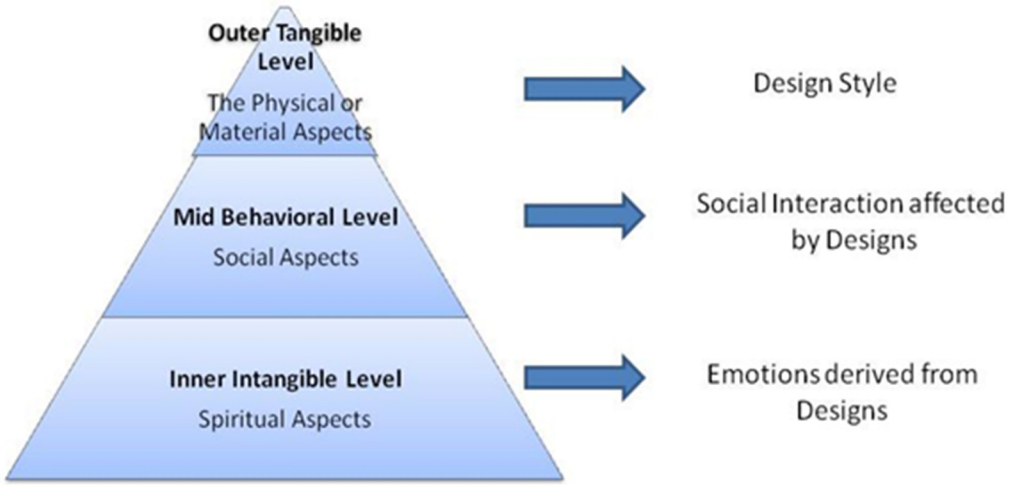

Figure 2-2. Levels of culture as they relate to design by Leong and Clark (2003).

The outer tangible level of culture which includes physicality and materiality is translated into the design style. The mid behavioral level of culture which includes social relationships is translated into social interactions affected by using an artifact. The inner and intangible layer is translated into emotions derived from artifacts.

Lin (2007) built on Leong and Clark (2003)'s cultural model by integrating Norman's (2004) three levels of design into the framework. The three levels of the culture were mapped into three levels of design features; visceral design, behavioral design, and reflective design (Figure 2-3). Visceral design concerns the appearance of an object or the design style. The behavioral design level is about use, function, performance and usability of an object which may affect social interactions and relationships. Reflective level of design concerns feeling, emotions, and affection derived from an object.

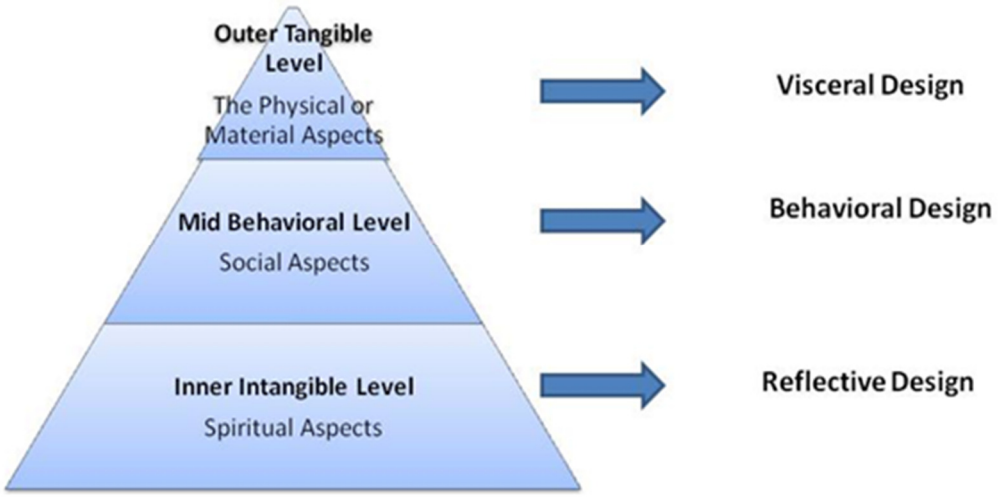

Figure 2-3. Levels of culture as they relate to design by Lin (2007).

National Culture

There are different levels of boundary of a culture as individuals may belong to multiple cultural groups at a time such as minor ones like occupation, family, hobbies, or major ones like linguistic, social, religious, etc. Cultural groups can also be delineated by national borders (Hofstede, 1991). Nations form historically developed wholes usually with a dominant language, religion and ethnic group, common mass media, national economic, political and educational systems. However, it does not mean that there is no diversity within borders. Multiple societies with different religion, ethnicity or language may exist in a country.

There are several dimensions widely used in design literature to address the differences in national level of culture. Hofstede (1991) developed five dimensions based on extensive research of a multinational corporation in 64 countries. According to Hofstede cultural groups at national level can be distinguished by power distance, individualism, masculinity, uncertainty avoidance, and long term orientation characteristics. Power distance is about how individuals respond to authority. Low-power distance cultures tend to challenge authority while high-power distance cultures obey authority. Individualistic cultures value personal time and freedom and people in these cultures are expected to look out for themselves. In collectivist cultures, individuals are bounded with strong ties and are expected to look out for the group they belong to. In some cultures feminine values are more important such as cooperation, living in desirable conditions and having security. Cultures with masculine values tend to value recognition, advancement and sense of accomplishment. Cultures with high uncertainty avoidance tend to perceive

unknown situations as threats and avoid them. Cultures with low uncertainty avoidance are more open to new ideas and uncertain situations. Cultures with long term orientation are characterized by respect for traditions, commitment, stability and strong work ethics. Short term orientation cultures are characterized by rapid change.

Thompenaars & Hampden-Turner (1998) developed similar guidelines to Hofstede's which can be used to distinguish and understand different national cultures. Universalism and particularism refer to whether the culture believes in universal application of ideas and practices or the adaptation of ideas and practices in relation to circumstance and situations. In a diffuse culture public and private spaces such as work and family are closely linked and protected. In a specific culture people tend to have large public spaces and smaller private spaces and there is strong separation between the two spaces. Individualism and collectivism refer to cultural values of leading individual lives, caring and being responsible for only yourself or maintaining strong relationships and caring for the group you belong to. Neutral cultures value keeping one's emotions in check and tend to not show their feelings in public. Emotional cultures show expression of their emotions. Cultures with sequential time approach are inclined to perform one activity at a point in time, value punctuality and plans. Cultures with synchronous time approach tend to engage in multiple tasks at a time and schedules are subject to change based on relationships. Achieved status and Ascribed status are about two types of culture in which individuals are awarded as a result of achievements or as a result of their status or who the person is rather than his/her performance. Inner-directed cultures tend to believe that they are in control of the outcomes of their actions.

On the other hand, outer-directed cultures let things take their own course and believe that they are controlled by the environment.

In this study national level of culture is the focus of interest as it incorporates cultural variables introduced above in ‘Definitions of Culture’ section as well as historical, economic, political and educational contexts within a country. Thus, the definition of culture for the purposes of this study is:

Culture is a shared social phenomenon including explicit (arts, artifacts, religion, language, traditions, attitudes, folklore) and implicit patterns (values, beliefs, morals, ideals, norms) that bind group of people who were conditioned by the same historical, economic, political and educational contexts within a national border.

Definitions of Design Process

This section clarifies some interchangeable uses of terminology related to design process and synthesizes a definition of design process based on literature review to guide this study.

Some concepts are used interchangeably such as New Product Development, Product Design, Innovation, and Research and Development (R&D) in the literature. Margaret Bruce and John Bessant (2002) in “Design in Business” defined *product design* as purposive application of creativity in innovation process. Their definition of *innovation* is the application of new ideas into new practices by the development of new products, services and processes.

Walsh, Roy, Bruce and Potter (1992) defined *new product development* as transformation of technical ideas and market needs into products and their manufacturing, transportation and marketing. *Product design* is the activity that transforms the initial market specification into design concepts, prototypes and instructions needed to manufacture the product. *R&D* is the systematic work that is conducted to increase stock of knowledge and to develop new materials, manufacturing techniques or new products.

The concepts can be ordered based on the breadth of each activity from broadest to the most focused as innovation, R&D, new product development and product design (Figure 2-4).

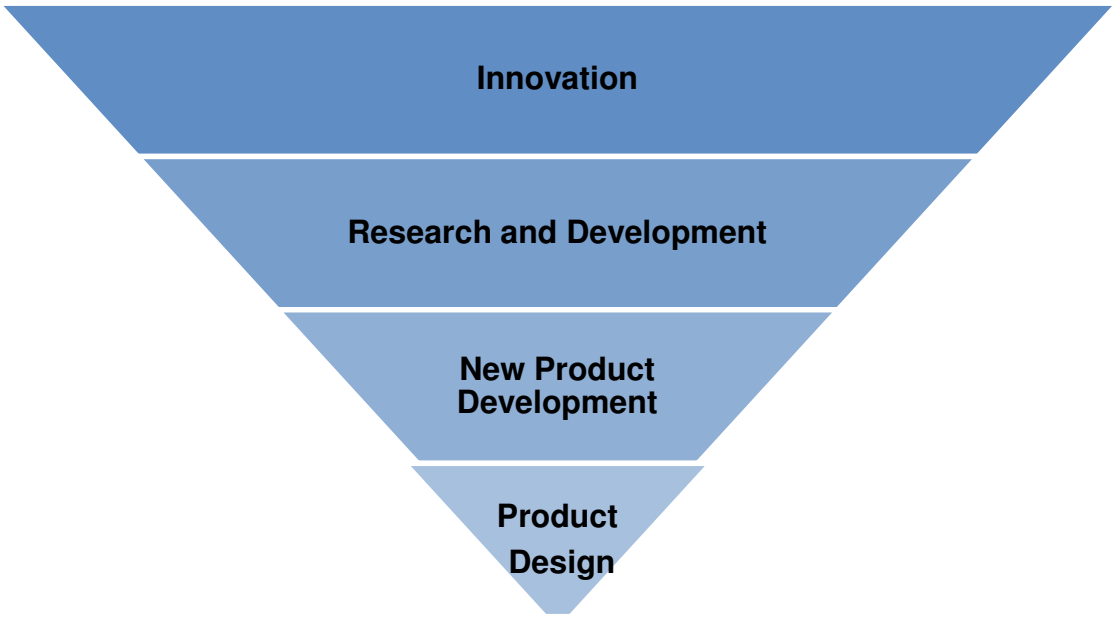

Figure 2-4. Hierarchy of different levels of design related processes.

Innovation can be the result of product design, new product development or R&D activities and innovation process that includes all these activities. R&D is the second widest concept; its result can be an innovation as well as other knowledge. New product development can be run as a part of an R&D activity. New product development process includes manufacturing and marketing activities in addition to product design. Product design refers to the conceptualization of new ideas and prototypes in a new product development process.

Any design process is triggered by changes in technological, economic or social domains. The two classical theories of market pull and technology push are often cited as triggers for a design related activity. According to market pull theory the initial trigger of a new product design process is user need. Product opportunity lies in users' needs and is driven by the market. Usually consumer goods such as clothing and furniture design are driven by market pull. Technology push requires developing the technology first and then finding an appropriate market for the technology (Eppinger & Ulrich, 2003). According to Cagan and Vogel (2002) the initial trigger for product design relies in a product opportunity gap which is called the SET (Social, Economic, and Technological) factor. When there is a gap between existing products and the possibility of development of a new product then it is the result of changing social, economic and technological factors. Social factors refer to changes in the family structures, health issues or social interaction. Technological factors can be results of new scientific discoveries, development of new materials and manufacturing techniques. Finally economic factors refer to changes in the overall economy, stock markets, material prices or disposable income.

Product Development Process

The generic new product development is defined as a flexible, iterative and cyclical process. There are many different definitions and frameworks of this process by different researchers. One of the widely cited frameworks of new product development process is Ulrich and Eppinger's (2003). They defined new product development as "the set of activities beginning with the perception of marketing opportunities ending in the production sales, and delivery of the product" (p.3). The authors defined steps of the new product development as stage-gates and defined other sub-steps of each stage gate. The stage-gates of Eppinger and Ulrich are as follows; 1) Planning, 2) Concept Development, 3) System Level Design, 4) Detail Design, 5) Testing and Refinement, 6) Production Ramp Up. Each step is conducted in collaboration with design, marketing and manufacturing departments in a business. The planning activity is regarded as the phase zero which is prior to the start of actual new product development activities. The result of this phase is the project mission statement which identifies constraints, opportunities and key assumptions. In the concept development stage, target market needs are identified, preliminary design concepts are developed, and evaluated and outstanding concepts are determined for further evaluation. In system-level design the concepts are translated into final product components and the final design is refined. The detail design phase results with complete specification of the product including materials, standard parts and tolerances of the parts. In testing and refinement prototypes of the final product are developed and tested for performance and reliability by the design team and the users. Production ramp up phase requires production of the

product using intended manufacturing system. The products produced in this stage are supplied to users for their further evaluation.

Walsh, Roy, Bruce and Potter (1992) propose a more detailed model with twelve steps to explain the same process. Walsh's model includes 1) Preliminary Investigation, 2) Brief, 3) Concept, 4) Model, 5) Prototype, 6) Evaluation, 7) Tooling (Specs), 8) Small batch production, 9) Test, 10) Large batch production, 11) Launch, and 12) Full Scale production.

LaBat & Sokolowski (1999) developed a three step new product development model that can be applied to the apparel field. The departure point for this study was the synthesis and summary of apparel product development, environmental design, engineering design and product design processes. By synthesizing different processes, authors developed the three step model as following; 1) Problem Definition and Research, 2) Creative Exploration, 3) Implementation. The Problem Definition and Research stage includes development of preliminary problem statement, objectives of the project, planning of the research, implementation and analysis of the research. In Creative Exploration idea generation, conceptual design development, prototype development, evaluation and refinement of designs and decision are the activities conducted. Implementation requires execution of the design solution into a final product.

Product Design Process

Jones (1970) defined product design as a three step process including Divergence, Transformation and Convergence stages. In Divergence phase the aim is to extend the

boundaries of the design problem through research. At this stage design problems and the objectives are tentative. During Transformation the territory of the design problem is determined and the designers focus on the problem at a more practical level. The main objective is to create a pattern from the divergent research results. In the Convergence phase the design problem is clearly identified, objectives have been agreed upon. The aim is to reduce the alternatives until only one alternative design is left. Although Jones describes the process in a linear format, product design process is a rhythmic exchange between divergent and convergent thinking with many iterations. Each iteration leads to more detailed product ideas than the previous.

Archer (1964) developed a three step model for product design as Analytical, Creative and Executive phases (Figure 2-5). The Analytical phase requires inductive reasoning and objective observations. This phase contains two steps; programming and data collection. In programming the objectives are determined. Designers need to restate their objectives in the scope of a product opportunity. In data collection, data related to this objective are collected, classified and stored. At this stage designers gather information from many resources: literature reviews, patent research and material research, competition, market research and trend research. The main type of research conducted by designers is the user research. In user research mainly ethnographic research methods are employed such as interviews, focus groups, user diaries, visual ethnography via use of disposable cameras or observations. Survey techniques and usability tests can be used in user research depending on the requirements of the project. Observation is the most powerful research technique used by designers as it allows the designer to understand the needs the user is not aware of or cannot

articulate. The Creative Phase requires deductive reasoning, subjective judgment, and evaluation. This phase is composed of three steps of; analysis, synthesis and development. In analysis the collected data are broken down into manageable chunks and analyzed, and sub-problems are identified. During synthesis these chunks are recombined usually in forms of visual models or mind maps; the relationships are determined based on how they can inform the design problem. During this phase some obvious solutions to the design problem may occur, designers need to avoid these obvious solutions as well as top-down processing and heuristics. In development, prototype designs are built. These prototypes are often crude or low fidelity prototypes; they are not finished but communicate the final products and their functions. The final Executive Phase requires description and translation of the new design through drawings and working prototypes. This phase contains the single step of communication where necessary documents for manufacturing are prepared. Archer summarizes the whole process as "…a creative sandwich. The bread of objective and systematic analysis may be thick or thin, but the creative act is always in there in the middle" (In Cross, 1994; p.26).

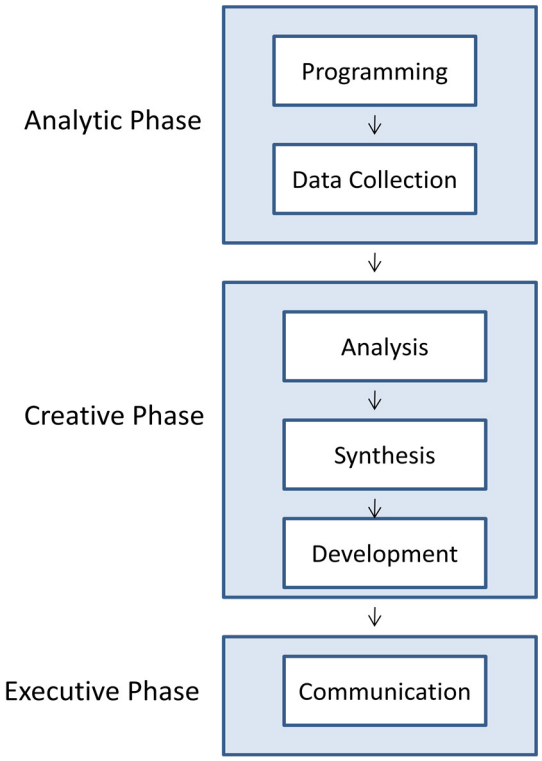

Figure 2-5. Archer's (1964) model for product design process.

Nigel Cross (1994) in "Engineering Design Methods" defined a four step product design process as 1) Exploration, 2) Generation, 3) Evaluation, and 4) Communication (Figure 2-6). Exploration is the very first step of the product design process where the designer attempts to understand a poorly defined problem to develop a well-defined solution. The designer develops a solution proposal to understand what the problem really is. To do so designers break down the design problem into sub problems and recompose them in the context of a product opportunity and set their objectives. The Generation step is regarded as the most creative phase where the designer develops the design proposal through use of sketching and prototyping. Insights are translated into design ideas at

this stage. Designers develop as many ideas as possible; at this stage the quantity of the ideas are more important than their quality. Ideas should be on a continuum of boring to impossible ideas. Designers use sketching, prototyping, note taking, or matrices to build their ideas. In addition to free flow brainstorming, they may employ other formal brainstorming techniques such as attribute listing, forced connections or role playing. After the preliminary ideas are developed; designers reconsider and discuss these ideas in the light of the research results. At this stage they eliminate not so good ideas and combine ideas to form new ideas. Once the designers are confident that all possible ideas are generated, they move on to idea selection. Idea selection is done using formal methods of silent voting or by discussion of team members. Design ideas are decreased to three to four best ideas and they are prototyped for further testing. The design proposal is checked for possible errors and for ensuring that the final design will work in the Evaluation stage. The design proposal is refined to meet certain criteria and this stage is regarded as the most time consuming phase of the process. After this process, the design team can choose to get feedback from users. They take the low fidelity prototypes to the users and observe their initial interaction with the product. After this observation, they may run interviews with open ended questions to understand which idea or ideas can meet users' expectations. When the feedback is gathered from the users, the design team changes and combines ideas and concludes with a final design idea. If the designers are not confident with the final product idea yet, they can run another user feedback procedure. A working prototype of the final design idea is developed for further testing. Usability testing and other necessary performance and reliability testing are conducted and final specifications for manufacturing are developed. Details such as materials and manufacturing technologies are also determined. The

Communication stage refers to describing the product in a way that is understandable to the other stakeholders of the manufacturing process. The product is communicated usually in forms of specification sheets.

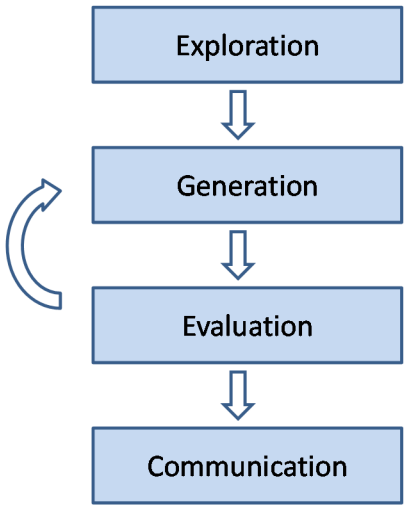

Figure 2-6. Cross' (1994) model for product design process.

There are quite a large number of models and frameworks that explain new product development and product design processes. This section referenced widely cited frameworks of new product development and product design processes. Although the names and numbers of the stages differ, the frameworks and models of these authors describe similar processes which require integrative thinking, empathic and intuitive abilities, pattern recognition and parallel processing skills. These processes can be employed to solve any types of problems from development of new services, restructuring of organizations to designing experiences. The frameworks introduced are

synthesized in the following table which illustrates the relationship and comparison of each author's model (Table 2-2).

This study focuses on the product design process in cross-cultural contexts. The goal is to understand whether product design processes in cross-cultural contexts differ from the generic process described in this section and to understand the challenges designers face and strategies they use throughout the process. "Design Process" and "Product Design Process" terms are interchangeably used to address the process that refers to development of concepts, prototypes and specifications necessary to create a new product, service or experience in this study.

Table 2-2

Comparison of Different Model of Product Design and New Product Development Processes

<table>
<tr><th colspan="3">New Product Development Process</th><th colspan="3">Product Design Process</th></tr>
<tr><th>Ulrich & Eppinger</th><th>Walsh et al</th><th>LaBat & Sokolowski</th><th>Archer</th><th>Cross</th><th>Jones</th></tr>
<tr><td rowspan="2">Planning</td><td>Preliminary Investigation</td><td rowspan="2">Problem Definition Research</td><td rowspan="2">Analytic phase</td><td rowspan="2">Exploration</td><td rowspan="3">Divergence</td></tr>
<tr><td>Brief</td></tr>
<tr><td>Concept Development</td><td>Concept</td><td rowspan="3">Creative Exploration</td><td rowspan="3">Creative Phase</td><td rowspan="3">Generation</td></tr>
<tr><td>System Level Design</td><td>Model</td><td rowspan="2">Transformation</td></tr>
<tr><td>Detail Design</td><td>Prototype</td></tr>
<tr><td rowspan="2">Testing and Refinement</td><td>Evaluation</td><td rowspan="5">Implementation</td><td rowspan="2">Executive Phase</td><td>Evaluation</td><td rowspan="2">Convergence</td></tr>
<tr><td>Tooling</td><td>Communication</td></tr>
<tr><td rowspan="3">Production Ramp up</td><td>Small Batch Production</td><td colspan="3" rowspan="3"></td></tr>
<tr><td>Test</td></tr>
<tr><td>Large Batch Production</td></tr>
<tr><td></td><td>Launch</td><td colspan="3"></td></tr>
</table>

Does Culture Matter for Product Design?

The previous section clarified the meanings of culture and design process concepts to set the boundaries of this study. This section frames the significance of the study by discussing paradigm shifts in design practice, effects of globalization and emerging markets on design and relevance of “one size fits all” or “global design” perspectives in the context of these conditions.

Paradigm Shifts in Design

Design is a developing domain and is evolving by responding to the changes in the socio-cultural, economic, technological contexts (Cagan & Vogel, 2002). The evolving nature of the discipline resulted in the development of different approaches in design practice as well as design research and education over the years.

In order to understand the paradigm shifts in design, one needs to consider the shifts in the social contexts of a society. Toffler (1981) categorized socio economic shifts in the society as the first, second and third waves. First wave is the agrarian society where the consumers were also the producers of the goods that they were using. Second wave starts after the Industrial Revolution where the society experiences industrialization, mass production, mass consumption and many technological enhancements. Third wave is defined as the postindustrial society which resulted in accelerated change in every aspect of life and knowledge based production.

Pine and Gilmore (1999) in their book “Experience Economy” also defined similar shift points in the socio-economic history. According to the authors, the earliest society was agrarian and hunter, and the aim was to extract useful resources from the environment. Then, the society moved into the making of products and the manufacturing economy. In this period goods were tangible and the economy was based on manufacturers and buyers. Different from Toffler’s perspective, Pine and Gilmore (1999) suggested service and experience economies following the manufacturing economy. Service economy was based on the intangible services provided to clients. Finally the authors suggested that we are now in the experience economy where businesses stage memorable experiences for the guests. In this economy, sensations and emotions are the driving forces for consumers’ behaviors.

Brown (2009) discusses how these shifts relate to design thinking in his book “Change by Design”. According to Brown, during the pre-industrial society individuals were producers. With the industrial society individuals became passive consumers. Products and services were standardized for industrialization to offer low price, high quality and better living. Consumers were the object of analysis and they were targets of predatory marketing strategies. Brown (2009) calls the era we are in as “Post Industrial Digital Society”. Today there is a deeper collaboration between creators and individuals. Individuals think of themselves as active participants in the creation process rather than as consumers, customers or users of products.

Departing from the relationship between design, and socio-economic and technological shifts, different design approaches developed throughout history. The visual model illustrates the evolution of the focus of the design process (Figure 2-7).

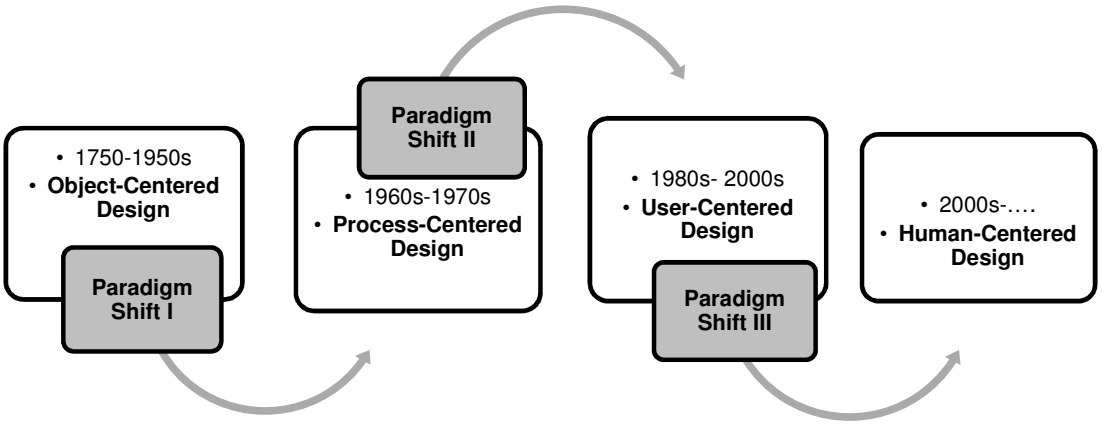

Figure 2-7. The model for paradigm shifts in design.

Object Centered Design

The designers of pre-industrial society were concerned with form giving and "the erratic search for appropriate beauty or the aesthetics that would reconcile the presumed technical functionality of a machine-produced object" (Papanek, 1971). From the Industrial Revolution to the mid-20th century designers started to consider function in addition to the form. The Bauhaus style was marked by the absence of ornamentation and by harmony between the function of an object and its design. The consideration was creation of a form that communicates the function and thus the focus of design was still the object. Object-centered design era focused on the "design of tangible products in the belief that the conceptions of users did not matter" (Krippendorff, 2004; p.8). The designer was the "inspired form-giver" whose role was to give newly advancing technologies physical shapes, in other words to create the interface that bridges technology with the market (Brown, 2009). It was not until the mid-1960s that the

technology push was questioned, and consumers were considered as a part of the process (Poolton & Barclay, 1998) .

Process-Centered Design

The first paradigm shift from design as an artistic form-giving activity to design as a multidisciplinary and process based activity started in the 1960s in academia. This era functioned as a process-centered transition period which moved the focus of the design field from object-centeredness to user-centeredness. The design disciplines began to discuss new ways of designing such as integration of scientific methods, human factors in design, and rationalism in addition to the intuitiveness in design (Simon, 1996; Jones, 1992). Although the design methods movement started in the 1960s, it has not spread to the practice of designing until the 1980s. During the mid-1960s there was shift to market driven product development in the industry with the rise of consumerism but the practice of design continued to bridge technology with the requirements of the market and it was placed in isolation, away from the final user.

User-Centered Design

During 1980s and 1990s, the focus of the design field moved from the object to the users and shifted away from ignoring the final user. Before, final users' input would only be involved in the later stages of the design process when only minimal changes could be applied to the products (Sanders, 2002). Designers' role established as the problem solver and a formal design process was generated where the users were integrated in the process for the first time.

User-centered design approach has grown from efforts with an emphasis on user's needs and usability. The term user-centered design (UCD) originated in Donald Norman's research laboratory at the University of California San Diego in the 1980s. The term became widely used after the publication of "User-Centered System Design: New Perspectives on Human-Computer Interaction" (Norman & Draper, 1986). Norman built further on the UCD concept in his book "The Psychology of Everyday Things" (*POET*) (Norman, 1988) and the later edition entitled as "The Design of Everyday Things". Norman (2002) defined UCD as "a philosophy based on the needs and interests of the user, with an emphasis on making products usable and understandable"(p.188). The term UCD, refers to designing to meet the needs and capabilities and limitations of those who will be using them.

With the turn of the 21st century, there has been criticism of user-centered design which triggered the shift to more humanistic values such as culture. Xin (2007) critiqued the limitations of user-centered design approach as it favors the preferences of more developed societies by ignoring the rest left out of target market categories. Also user-centered approach is criticized for categorizing "humans" as "users" with needs only related to basic human factors such as ergonomics or anthropometrics. Although the one for all concept of user centered design makes systems compatible by standardization, at the same time ignores the social context and suppresses cultural expressions (Shen, Woolley & Prior, 2006).

Human-Centered Design

In human-centered design approach, the focus is the “human” rather than the “user”. The individuals are not seen as “informants of the design process” or the “users”, but they are regarded as human beings with emotions and cultural heritage. The new approach goes beyond design’s traditional focus on the physical and cognitive needs of users and encompasses cultural, social and emotional human factors (Moalosi, Popovic, Hudson, & Kumar, 2005).

The terminology of human-centered design was promoted by Buchanan (2001) and Krippendorff (2004). They argued that designers have more complex responsibilities than solving user problems. In human-centered design the emphasis is on the human dignity and broader thinking about the consequences of design. Human-centeredness is beyond usability, it is “an affirmation of human dignity through an ongoing search for what can be done to support and strengthen the dignity of human beings as they act out their lives in varied social, economic, political, and cultural circumstances”(Buchanan, 2001). Krippendorff (2004) suggested that information technology plus widespread democratization have created a new postindustrial culture in which an object-centered epistemology is no longer viable. He criticized the user centeredness as including the individuals in the design process only as the “human factor.” The traditional techniques of focus groups, interviews or surveys which simply ask what users’ want are not enough; the new design paradigm requires reaching out to people. In this context, the design process evolved from analysis of the relationship with people and products to the relationship between people and people (Brown, 2009).

To summarize, subject focus of design domain evolved from the aesthetics of objects to users' needs and finally to humans' emotions, values and limitations. The role of designers has been redefined; designers have become change agents questioning the consequences of their design and designing to make a change. Today products evolved from tangible objects to intangible experiences which cannot be quantified by using anthropometry or biomechanics. The experiences are beyond physiological needs, they are about cultural, psychological and emotional needs. Maslow developed hierarchy of human needs in the order of physiological needs, safety needs, belongingness and love needs, self-esteem needs, and self-actualization needs. Once people meet the needs at the lower level of the hierarchy they will move on to meeting the needs in the higher up position. Only through a better understanding of people's sensorial perceptions and cultural values, we will be able to move into a new paradigm of quality where products have added value, meet user's true needs and make their experience more meaningful. As the design domain reinvented itself, different fields have also evolved to integrate cultural values of human to design. Design anthropology and cultural human factors or ergonomics are emerging interdisciplinary fields that focus on cultural aspects of design. Design anthropology seeks to answer the question of how do the processes and artifacts of design help define what it means to be human, while cultural ergonomics considers situation- and trait-based variations among cultures (Kaplan, 2004).

The literature also emphasizes the importance of recognizing cultural factors in design. For Baxter (1999) it is imperative for designers to recognize that people are cultural beings. According to Margolin (2002) design is firmly embedded in the user's culture and does not take place in a cultural vacuum. Emphasis is required in the process of

integrating cultural factors in the design practice. The use of a society's cultural factors in design not only makes technologies more appropriate for their social context, but makes better use of culture itself as a resource for innovation (Moalosi, Popovic, Hudson, & Kumar, 2005).

The Effects of Globalization and Emerging Markets on Design

The previous section outlined the drivers of the movement in the design field towards social, psychological and cultural aspects of designing. This section builds on this paradigm focusing on the effects of convergence of cultures and emerging markets on design.

Integrating cultural factors in the design process has become a challenge as the world entered into the new era of globalization and new conditions related to practice of design emerged. First, more designers started work in different countries or design for cultures different from their own as global brands and corporations started to market their products worldwide. The design process became multi-cultural, bringing together designers, users and other stakeholders of the design process with diverse cultural backgrounds.

Globalization enriched and diversified lifestyles of the people by enlarged communications networks, freeing up of trade and commerce, and increased possibilities of personal mobility. On the contrary of the common belief that globalization creates homogenization of Western values in people's lifestyles, globalization made cultural diversity in the world more visible. According to Friedman (2005), globalization

preserved cultures as people had the opportunity to represent and communicate their own culture via internet technologies and convenient ways of transportation. De Mooij (2010) argued that with increased wealth and higher expenditures for better educations, people are more aware of their cultural values which lead to modernization while retaining them. According to the author, the Internet enhanced people's habits and values by providing more information about what is important to people, instead of homogenizing them. Chavan (2005) also discussed that cultures respond to the process of globalization and modernization differently and remain unique.

The dynamics of globalization in social and economic systems has resulted in rapid growth and industrialization of nations with diverse traditional cultural backgrounds such as China and India. The World Bank economist Antoine van Agtmael used the terminology of emerging markets in the 1980s to refer to nations that are in a transitional phase moving from developing to developed economic status. The term emerging markets can be defined as countries experiencing rapid economic growth and participation in the global economy. The emerging markets included Brazil, Russia, India and China often referred as BRIC countries and other countries such as Mexico, Turkey, South Africa, South Korea, Argentina, Malaysia, Nigeria and many others. The common process an emerging market experiences is attracting Western origin companies by the low cost of manufacturing and then enriching its own markets by these investments and trades, and thus becoming a new market opportunity itself (Greving, 2010). Only the BRIC countries hold 40% of the world's population and make up 25% of the world's land mass. Large population, growing middle class and booming consumption makes these markets attractive for many Western companies (Chavan, 2010).

The dynamics of globalization and the rise of emerging markets create many questions and discussion topics for designing new products. Can we simply market identical products globally or do we need to design new products? How can we design new products in an unfamiliar cultural context? Can we treat all emerging markets as a single pool of cultures with similar needs or are the needs of people in slums of India, favelas of Brazil or in Shanghai different?

According to De Mooij (2010) and Chavan (2005), culture is pervasive in all aspects of human behavior and similar products across cultures does not mean homogenized behavior. Although countries national wealth and industrial development may converge from an economic perspective, human behavior and what people do with globally identical products does not converge. De Mooij (2010) lists evidence about the argument that globally homogenous markets do not exist and there may be global products but there are no global people. People in different cultures may do same things for different reasons or different things for the same reason. For example, for a global product such as toothpaste French people placed emphasis on “kills germs in the mouth”, American people rated the same product based on attributes not directly related to the primary function such as “well-known brand” and “freshens the mouth” while Brazilian people put emphasis in attributes such as “color of the paste” and “ease of squeezing the tube” (p.139). OXO’s mantra of “universal design”- promoting products designed to be usable by the largest number of people- failed when the company tried to introduce regular U.S. products in Japan. By collaborating with a Japanese consultant the company found out fundamental differences in American and Japanese women’s use of cooking utensil (Walters, 2006).

When a product that is similar across the globe is designed to resonate with the culture, it gives the advantage of competing with other companies that offer the same product in that market. For example, microwaves are quite standard household appliances and people from different cultures buy them even if they don't completely satisfy their needs. Redesigning a microwave to meet the culture specific needs of people is likely to create competition advantage in a plethora of similar microwaves across the globe. LG developed a microwave oven with charcoal lighting heater which allows cooking Indian foods in a traditional way.

Under these new circumstances created by globalization and development of emerging markets, companies have been struggling between a global design strategy versus a local design strategy that involves higher level of investment in design resources, manufacturing operations and marketing activities (Mallick & Mukhopadhyay, 2001). Aldersey-Williams (1990) defines global design as global brands whose products are not designed, but globally distributed reflecting the national origins and power of their manufacturers such as Coca-Cola, Walt-Disney or Mc Donald's. Aldersey-Williams (1990) argues further that in stylistic terms global design is rooted in traditional Bauhaus and Ulm School functionalism and is nothing more than minimum decoration, simple and rounded shapes for easier molding. The former vice president of Ford Europe was quoted in Aldersey-Williams' book "Nationalism and Globalism in Design" as following:

"Uniformity has taken over to a very large extent, but national differences haven't eroded. Some regional characteristics will become stronger again. The variety of products needed to meet aspirations of smaller group of consumers will create the need to find ways to combine or retain a

high level of economy of scale creating a level of flexibility to respond to the different segments" (Aldersey-Williams, 1990; p.11).

CEO of Sennse, Gregor Gimmy (2006) also explained that cultural orientation will be the new emphasis for the global businesses.

"Culture has taken the steering wheel from technology to become the driving force behind innovation. To achieve world-class innovation, your cultural knowhow will be more important than your technology expertise…Technology is still key! It is like oxygen for our body, without it we just die. But oxygen does not make us happy nor does it give us any personality. It is our brain who makes decisions, defines behaviors and so forth. Culture needs to be the brains of innovation" (Gimmy, 2006; p.1).

Although emerging markets are very attractive niches for many companies, it is very challenging to fully understand needs, aspirations and limitations of people in these cultures. According to Chavan, Gorney, Prabhu and Arora (2009) socio economic gaps are very wide and "for everything you say the opposite is also true" (p. 28), luxurious consumption patterns reside with poverty. Hart and Prahald (2002) argue that the market opportunity for multinational corporations in emerging markets is the world's four billion "aspiring poor" rather than the wealthy and middle-income people. Authors define four consumer groups based on annual income in a pyramid model. Tier 1 represents the wealthiest people with more than $20000 annual per capita income which makes up 75-100 million population in the world. Tier2 and Tier 3 categories represent close to 2 billion people with incomes between $1500-$20.000 ranges. 4 billion people in the world belong to Tier 4 category with less than $1500 annual per capita income that live in rural areas and urban slums outside Western cultures. In Tier 4 markets profit is not driven by high margins but by high volumes and require product development targeted to the

cultural context. According to the authors “so-called global products” designed for people’s use in Tier 1 category cannot succeed in culturally diverse local cultures in Tier 4 category. Success in these markets requires local insight which does not disrupt the culture and lifestyles of people and significant research, creativity, tolerance for ambiguity and empathy.

Intel’s ethnographic researcher Genevieve Bell was interviewed about “Inside Asia Research” which included home interviews in seventeen cities in seven distinct Asian countries (Chavan, 2010). Bell described three myths related to designing products for emerging Asian markets. Myth 1: “You have to make things cheap and cheerful to be successful in these markets”; approaching emerging markets from the point of view of those who can afford Western products and those who are poor and cannot afford is very simplistic. It is the value and the relevance of products to the cultural contexts that make them successful. Myth 2: “All emerging markets are the same”; different histories, governments, geographies, political context and socio-cultural values all influence human behavior. A person from Tanzania would not have the same needs as a person in Indonesia. Myth 3: “The emerging markets are really poor developed markets”; it is not only economic conditions and income that differs developed and emerging markets. People in emerging markets do not necessarily accept Western values and products as they are. In emerging market generalizations derived from Western markets such as the higher the education level, the higher the socio-economic status does not work. Chavan (2010) gave an example by comparing India and United States. Unlike United States where education level and socio-economic status correlates, in India illiterate people can easily be in upper middle income level.

The best practices in product design for another culture require developing and distributing culturally sensitive, environmentally sustainable and economically profitable products that can improve people's lives, rather than marketing global products which are actually designed to meet needs of individuals from Western cultures. Marketing products that are lower quality at lower prices, older-model products, or products that are not meeting Western standards have been some of the ways companies approached cultures outside Western markets. However, companies that want to invest in unfamiliar cultural contexts have new responsibilities related to cultural and environmental sustainability. Designing products that are culturally and contextually resonant with people and their values help to sustain cultural diversity. In addition to socio-cultural sustainability, when the consumption patterns in developed nations are considered, re-creating same patterns in emerging markets can be disastrous for environmental sustainability (Hart & Prahalad, 2002). The solutions to sustainability at the cultural level are the most comprehensive ones and require understanding the interconnectedness of environmental and socio-cultural crisis. By understanding cultural contexts, socio-culturally more relevant products which have long term cultural durability can be designed (Manzini, 1995). Fletcher (2008) supports the argument that a solution to sustainability is considering socio cultural contexts in design. For example, Fletcher uses the example of a polyester blouse to discuss the importance of socio-cultural values; laundering of a polyester blouse results in higher energy consumption than its manufacturing. To solve the problem of laundering social and cultural norms of cleanliness need to be addressed in addition to technical solutions.

Marketing products that are actually designed for another cultural context may present unintended negative consequences on environmental and cultural sustainability. Rogers (1995) provides a case study on the unintended consequences of introducing snowmobiles to Northern Finland natives who are traditionally reindeer-herding people. Reindeers were the main source of food, reindeer sleds were the main means of transportation and trading reindeer meat was the main source of income in this culture prior to introduction of snowmobiles. When snowmobiles were introduced they replaced reindeer sleds and the noise of snowmobiles scared away the reindeers, most of the families stopped herding reindeer and could not find other work and were unemployed. Although companies cannot control who are buying their products, they should be aware that when they purposefully market products designed for Western needs to emerging markets there may always be negative effects on the culture and their environmental context.

Many companies have started to recognize the necessity of developing new products that are relevant with the culture and the context rather than marketing similar products globally. However, it is hard for Western companies to design new products for cultures composed of a number of minority groups and tribes where regional dialects change within a thirty mile radius. It is hard to design for a culture without ever being there. When we look at some of the design and innovation companies that have headquarters in the U.S. or Europe, we see that they have branches in China, India, or Africa: IDEO is in Mumbai and Shanghai; Frog design is in a number of places in India and in Shanghai; Nokia has research centers in Bangalore, Beijing, Shenzhen and Nairobi.

Designing to incorporate cultural factors requires new radical and disruptive ways of design thinking. Integrating culture in the design process requires deeper understanding of cultural context, understanding users with diverse cultural backgrounds and incorporating their needs, wants and limitations in design of products. Examples of innovative products designed to genuinely fit the culture and context exist, even for technology driven products that are widely cited as “global” or “ones size fits all” products. For example, Nokia has become one of the leading mobile phone brands in Africa and India with its user research efforts to understand people’s needs in rural contexts. Nokia has featured mobile phones with multiple contact lists after finding out that in many rural contexts families share one phone, phones equipped with a prepaid tracker that can keep track of usage and call expenses, text messaging in local language. Other mobile phone companies have also launched phones with applications relevant to Indian culture such as cricket-based games, Indian calendars, radio speaker and AM radios.

Emerging markets may lack basic infrastructure available in Western cultures. For example, the biggest barrier in designing household appliances for Indian market is the frequent power outages and uncertain water supplies. Korean LG Electronics has been heavily investing in rural markets in India by conducting intensive user research. The company developed the brand “Stars of India” for the Indian market. “Stars of India” offers products ranging from semi-automatic plastic body washing machines that can restart after a power outage to refrigerators that can keep food cold for long hours without electricity and that come in colors like maroon to avoid staining from spices such as turmeric and oils used in traditional Indian cooking.

Another innovative example of how to incorporate cultural issues in design is the do-it-yourself denim kit designed by an Indian denim mill. The company determined that the rural villagers in India cannot afford to buy denim jeans but long to own a pair. They designed kits that contain the denim fabric, patterns, thread and labels for the denim jean and sold them via local seamstresses for one tenth of a regular denim jean (Dawar & Frost, 1999).

Another example is the Dutch brand “Capsters”, known for its head coverings made from comfortable, stretchy fabrics that come in a variety of styles to match different activities and sports looks: aerobic, outdoor, skate and tennis. Covering a woman's head and neck as stipulated by Islamic or cultural tradition, “Capsters” made it possible for women to participate in sports and physical activities without having to worry about their headscarves shifting (C.V.B, personal communication, February 23, 2010).

Supporting experiences that people want to have is what makes a product successful. Tweaking product features to support localization and developing new products and business plans that target cultural contexts are different ways companies approach other cultures. Investing in new markets not only requires development of culturally relevant new products but also requires disruptive innovation in the value chain and business plan infrastructures.

Existing Research on Culture and Design

Parallel to increasing importance of cultural aspects in design, there have been a number of studies researching design as it relates to culture from different points of

views. Culture-centered design, culture-oriented design, cultural innovation, culturally sensitive design or cross- cultural design are the terms used to define the emerging design approach that has focus on cultural aspects. The literature review showed that the existing research on culture and design can be categorized into four main areas: 1) cultural guidelines for design, 2) cultural inspiration for design, 3) cross-cultural comparison of user and designer behavior, 4) culture sensitive user research methods

Cultural Guidelines for Design

In the first research category cultural dimensions such as Hofstede's are used as guidelines or checklists to systematically analyze a culture for the purposes of product design. For example, Röse (2004) defined culture orientation as an important element in successful design, therefore in user friendliness and self-explanatory functions in design. The author developed a cultural model that can guide user-centered design processes based on Hofstede's (1991) and, Hampden-Turner and Trompenaars' (1997) cultural characteristics. Röse classified user factors that can affect the design process into objective and subjective factors. Examples of objective factors were gender, age, ethnic background and mother tongue. Examples of subjective factors were those that cannot be directly measured such as values, beliefs and rituals. Röse also grouped cultural data in cultural mentalities and cultural environment categories. Cultural mentalities refer to facets within a cultural group's thought and behavior such as aesthetics, language, learning habits and unconscious rules. Cultural environments refer to cultural facets around thoughts and behaviors such as technical development, educational system, physical environment, law and commercial system (Röse, 2004).

Shen, Woolley and Prior (2006) developed a cultural guideline which can be applied to the design processes in Human Computer Interaction (HCI). The guideline developed in this study was a dual layer design filter tool which consists of designer's and user's filters to investigate the selected target group. The designers' filter refers to the design of the interface based on designer's particular socio cultural background. The designer's filter is composed of socio-cultural background, technology, ergonomics and design factors. The user's filter represents users who observe the interface through their own cultural values, individual perceptions and awareness. The designer gathers cultural and technical data and then creates a visual collage of the target cultural group by application of these filters. After application of the filters, generic design process stages of design implementation, iterative testing and evaluation of the user experience and re-formulation of design took place (Shen, Woolley & Prior 2006). Authors applied this process in redesign of a computer interface for Chinese user groups by integrating Chinese cultural elements and tested the new interface with a survey on Chinese and international participants. The results of the study showed that Chinese users did not have any problems in interpreting the new interface.

Approaching the design process through pre-specified cultural guidelines is limited in application because it either employs a very general cultural perspective which does not have practical application or a very specific cultural perspective which can be only applied to a single culture and a single product context. Additionally this approach falls short since it tries to fit the complex and interwoven cultural factors into standardized checklists. For example, widely used characteristics of national differences developed by Hofstede, and Hampden-Turner and Trompenaars focus on behaviors, values and

attitudes and exclude other components of culture such as religion, language, traditions, norms, ideals, arts and artifacts.

Cultural Inspiration for Design

In the second research category the focus is on the application of cultural features to specific products as inspirations derived from traditional objects, arts or folktales. These studies present ways of extracting cultural elements as inspiration for visual characteristics of products such as colors and forms.

Lin (2007) defined culture-centered design as a process of “rethinking or reviewing cultural features and then redefining them in order to design a new product that can fit into society and can satisfy consumers culturally and aesthetically” (p.148). According to Lin (2007) cultural value adding creates the core of product value and design is the motivation for pushing cultural development further. The author established a cross-cultural model to transfer cultural features into design elements. The cross-cultural product design model consisted of three stages as the conceptual model, the research method and the design process. The conceptual model focused on how to extract cultural features from a cultural object and then transfer these features into a design model. The research method phase consisted of identification (extracting cultural features from an original cultural object), translation (transforming these features into design information and design elements) and implementation (designing the cultural product). The third stage which is the design process was composed of four steps namely investigation (setting a scenario), interaction (telling a story), development (writing a script) and implementation (designing a product). Finally authors applied this

framework to a product design using Aboriginal clothing culture as the cultural inspirational source.

A similar study is conducted by Moalosi, Popovic and Hickling-Hudson (2007) to consciously integrate culture in the new product development process. Authors identified a list of socio-cultural factors by content analysis of Botswana's folktales and reports on Botswana's national culture. The list of socio-cultural factors was presented to design students and they were asked to transform the socio-cultural factors into design features. A culture-oriented design model was proposed by analyzing the feedback of students to the given design task. The framework consisted of three phases. The first phase was the identification of socio-cultural factors through folktales, oral traditions, reports, users and so on. The second phase was the designers' domain named as the integration phase. In this phase designers interact with users to integrate socio-cultural factors into culturally acceptable products with functional features. The third phase was named as the cherishable culturally oriented products in which design ideas that are linked to users' needs and culture are generated.

Ko, Lin and Lin (2009) proposed a service innovation design model with the aim of transferring cultural features into service design to reinforce their design value. Through culture and creativity, by allowing craftsmanship and creativity to facilitate branding, it is possible to design services which will lead into a successful cross cultural product (Ko, Lin & Lin, 2009). According to their framework, craftsmanship is at the center of value added design and it needs to be supported by R&D and branding. The authors defined craftsmanship as the use of local materials to develop localized skills and small scale

craft production represents “attention to details”. Taiwanese Cultural Creative Park as an example case of successful service design which is a hub for studios and workshops that provide craftsmanship based product designs is developed.

Huang and Deng (2008) developed a design model which can be applied to social interaction design for specific cultural regions. According to the authors, people’s behaviors, attitudes and motives are influenced by cultural contexts and they question how these cultural contexts influence social activity. Their proposed model is developed based on a case study of Taiwanese tea drinking. A social activity is triggered by participants’ current motives and attitudes, and permanent cognition toward an activity which are influenced by cultural backgrounds. In a design process the cultural context that sustains the social activity has to be distinguished by taking their motives and attitudes into account. Then, several dimensions of social activity need to be considered. One dimension is about objects and environments in a social activity; culturally oriented environment can pave way for natural social interactions

Xin (2007) proposed a formal design process for “culturally-based innovation” to develop products that reference visual and conceptual design elements. This framework is more comprehensive and focused on building insight and in-depth understanding of culture rather than using cultural aspects as a source of design inspiration. According to the author culturally based innovation can be managed as a formal process by using qualitative tools to analyze and synthesize traditions and cultural elements with the aim of developing new product ideas. Xin (2007) defined the cultural product as “a product that reflects the established cultural artifacts and/or fulfills unique cultural needs that are

driven by cultural behaviors" (p.130). Xin's framework was composed of four phases: Identifying Cultural Product Opportunity, Identifying Cultural References, Understanding Cultural References, Developing Cultural Insights. In the first phase a cultural product opportunity was identified by looking at the social, economic, technological, ideological and geographical factors of a society and by identifying the cultural needs of emerging life styles. In the second phase cultural references such as objects, images and behaviors unique to cultural context were determined by using ethnography methods. After identification of cultural references, the next step was to deeply understand them by interpreting cultural artifacts and cultural behaviors. In the last phase named developing cultural insights, the insights of cultural artifacts is captured by the analysis of visual language, cultural behavior insight is captured by analyzing the relationship between the motivation and cultural influences of cultural behavior. After creating the framework the author applied it to different product design processes as example case studies related to Chinese culture.

Cross-Cultural Comparison of User and Designer Behavior

The third research category focuses on cross-cultural comparisons of users' and designers' product feature preferences and behaviors which are valuable in addressing cultural human factors differences.

Christiaans & Diehl (2007) identified the need for a design research approach which focuses on mutual influence of design and culture by defining the two perspectives of object and human need. The object perspective was defined as the designerly use of the interaction between the current products and the users to design pleasurable and

competitive products. In the human need perspective emphasis is on the society and sustainable development of societies and cultural identities. Authors analyzed the object perspective by using a method called “Do it Yourself” (DIY) which is a computer based simulation that allows users to design the interface of a microwave. Dutch and Korean users were analyzed by looking at how they displayed the arrangement of buttons on the interface. Significant differences were reported regarding the arrangement: Korean users focused on functionality of the display while Dutch users preferred aesthetics and functionality together. In the human need perspective the taxonomy of human needs developed by (Neef, 1991) was analyzed. The fundamental human needs were categorized in a matrix as subsistence, protection, affection, understanding, participation, recreation, creation, identity and freedom. Needs were also defined according to the existential categories of being, having, doing and interacting.

Tomico, Karapanos, Levy, Mizutani and Yamanaka (2009) proposed a subjective approach to the exploration of culture in product design based on Kelly’s (1955) theory of Personal Constructs and the Repertory Grid Technique. According to this approach individuals’ perceptions of products are carriers of implicit cultural insight. The Repertory Grid Technique is a semi-structured interview technique that aims at exploring how individuals construct the world around them. The technique uses three measurements to determine differences in product attribute prioritization to analyze cross-cultural differences. This approach was applied to a case study that examined how Japanese pens were perceived by Japanese and Dutch designers with the aim of exploring cross-cultural differences between the product attribute prioritization of the Japanese and Dutch designers. Such cultural differences would evidently impact decision-making in

the design process and therefore the design outcome. Japanese and Dutch designers participated in semi structured interviews where 6 Japanese pens were shown to participants in two triads. During the triading, each participant was asked to *"think of a property or quality that makes two of the products alike and discriminates them from the third."* The results of the study showed that Japanese designers were more concerned with the pragmatic aspects of utility and comfort and the Dutch designers were more concerned with durability. Further, while the Japanese designers referred to the visual aesthetics of the products more frequently than the Dutch designers, the Dutch group seemed to be more concerned with the aesthetics of interaction and unexpected functionalities of the product. Finally, the Dutch designers were found to pay more attention than the Japanese to the symbolic qualities of the product, i.e., its ability to communicate a favorable image of the owner.

Culture Sensitive User Research Methods

The fourth research category is about analyzing user research methods for their cultural sensitivity and developing new user research methods targeting specific characteristics of culture to collect more in-depth user data.

Lee and Sayed (2008) developed three hypotheses for culturally-sensitive design based on three principles that may be used to understand the cultural other and the relationship of these principles with innovative human centered design methods. Hanington (2003) categorized human centered design methods as traditional, adapted, and innovative methods. Traditional methods refer to surveys, interviews and focus groups which can provide information about large number of individuals. Adapted methods refer to

ethnographic techniques including observations and visual ethnography. Innovative methods are the participatory design techniques where users are regarded as the participants of the process rather than informants. The three principles Lee and Sayed (2008) are “local characterization of past and future”, “localization of global processes”, and “reflexive gaze”.

Principle 1: Local characterization of past and future requires that the cultural locale should be understood in the context of past history and future aspirations rather than current “exotic snapshots”. Traditional and adapted design methods such as observation and interviews can only provide snapshots of the current situations and what is meaningful to the designers. The first hypothesis of Lee and Sayed (2008) is innovative human centered design methods enable more culturally sensitive designs by addressing the flux from memories and dreams.

Principle 2: The second principle, localization of global process, requires understanding globalization as local responses to modernity rather than Westernization of the local. The innovative human centered design methods empower individuals by integrating them with the design process that will lead to design solutions that resonate with the local culture. The second hypothesis is innovative methods enable more culturally sensitive design by empowering the user and rejecting the stereotypes.

Principle 3: The third principle is the reflexive gaze that requires intense involvement and empathy of the designer during the design research. By employing innovative design methods the designers have a higher possibility of seeing things from users’ perspectives.

The last hypothesis of the study is innovative methods enable more culturally sensitive designs by involving designers in the user research process.

This study does a successful comparison of existing design methods in the contexts of designing for another culture. The study assumes that these methods can be applied in a different cultural setting in the same way it is applied in a setting where there are no cultural obstacles. The study does not consider the challenges of communicating during these innovative processes such as language differences, cultural communication norms. Innovative human centered design methods may be better in designing culturally sensitive products than tradition methods, but they do not guarantee success in a cross-cultural setting since they ignore other levels of challenges.

According to Lee and Lee (2009) since many user research methods popularly used in design have been developed in Europe and North America, these methods may not work properly in completely different cultures. Authors investigated how focus group interviews work in East Asia where people have different communication styles and a weaker participatory discussion than in Western culture by conducting cross-cultural experiments. The results of first comparative experiment in the Netherlands and South Korea showed passive participation and poor member-to-member interactions from Korean participants. Dutch participants produced more active discussion than Korean participants. When a topic was provided to the participants, Dutch participants told “narratives” related to the given topic, while Koreans gave “short answers.” The Korean participants heavily relied on the facilitator, while Dutch participants proceeded with active discussion among themselves. In South Korea, participants’ utterances and member-to-member interaction increased over time, while Dutch participants discussed

actively from the beginning of the session and did not show much difference in the timeline. Based on these findings authors developed tools to facilitate the group dynamics of focus group interviews in East Asia: “pre-activities” to break the ice and build membership, “Mini-me dolls” to support indirect communication and facilitate playfulness, and an imaginary setting of a “TV home shopping show” to empower participants to express their ideas. Authors tested these tools in the second set of focus group interviews with a group of South Koreans. One of the important findings from the proposed tools was that they facilitated “stimuli” which can boost participants’ interest and motivation in focus group interviews. These “stimuli” then brought “engagement.” Authors concluded with a set of properties for focus groups to be conducted in Asian cultures. Sensitivity and motivation can be fostered by providing playful props and activities. Indirectness by facilitating imaginary roles and situations needs to be provided. Ice breaking is especially important for East Asians. Tasks of evaluation and critique should take place in the latter part of focus group interviews. Visual representation of respect for their participation and information is required. This study proves that cultural values of user groups with different cultural backgrounds cannot be understood by application of traditional methods such as focus groups. Reaching out to user groups outside the main stream Western user groups requires different methods and tools.

Chavan (2005) argues that design research methods originated from West such as think aloud protocols are developed for Western user cultures to articulate their thoughts. However in collectivist cultures like India, users tend to accept and work around issues rather than explicitly stating negative opinions. The author developed series of research methods targeting participation of Indian users. Bollywood Style Evaluation method was

developed based on the popularity of Bollywood movies and movie reviewers. Scenarios with references to using products were generated and Indian users were asked to evaluate them in a format borrowed from critiquing films. Rasas and the Emotion ticket is a design probe that resembles cinema tickets which were categories under nine rasas *(*emotions used in Indian performing arts) such as desire, surprise and anger. Then users evaluated products using these tickets to articulate how they felt and then discussed the reason they felt a particular emotion.

Kelkar (2007) discusses remote research in design using disposable camera studies and rapid immersion workshops when investing in Non-Western new markets. In remote design research, companies can conduct ethnographic research by partnering with local researchers. Disposable cameras and instructions on how to conduct design research are mailed to local stakeholders. Participants of the research are asked to document their daily lives using the disposable cameras for certain period of time and then local researchers interview participants and use the photos to probes questions and ground the research questions. When the results of this research are mailed back to the company, the results are analyzed and synthesized into design insights which are then introduced to other stakeholders of the project with rapid immersion workshops. Rapid immersion workshops introduce the context to stakeholders using the photos from the fields and encourage discussion to reach mutual understanding.

According to Kumar (2004) companies need to understand people's activities in culturally unfamiliar markets if they are looking to expand their businesses in these markets. Kumar introduces the "User Insights Tool" to gather observations about

people's activities, sort, analyze and share this information across multiple projects, teams and cultures. The User Insights Tool is a database where ethnographic design research can be stored and organized based on three frameworks: POEMS, User Experience Framework and Motivations Framework. The POEMS organizes an observed activity into five elements: "1) People – individuals involved in the activity, 2) Objects - things people interact with while doing the activity, 3) Environments - the space, settings, or location where the activity takes place, 4) Messages / Media - information that is being transferred during the activity, and 5) Services - a person or a system offering services to enable the activity" (p.5). User Experience framework helps to determine the relationship between activities and peoples' experience that fall under physical, cognitive, social, cultural and emotional factors. Motivations framework explores the reasons that prompt people to do the activities.

There exists a gap in literature about the process of designing for another culture that is grounded in field experiences of designers and focused on practical application. This research fills a gap by exploring the stages and challenges of design processes where the designer and user originate from different cultural backgrounds.

Summary

The two central concepts of this study "culture" and "design process" have been defined in many ways in the literature. Culture is considered from a national point of view in this study as a collective social phenomenon composed of explicit and implicit symbolic forms and historical, economic, political and educational contexts that bind group of people in a national border. The explicit factors refer to religion, language, traditions,

rituals, attitudes and laws; implicit factors refer to values, norms, morals and ideals. The product design process is the focus of this study and is defined as the iterative process which starts with a design problem and continues with research, ideation, evaluation and detail design, excluding manufacturing and marketing activities.

The paradigm shifts in the design field parallel to socio-economic development increased the emphasis on culture in the design process. From the Industrial Revolution to mid-20th century, design was object-centered and the emphasis was on creating aesthetically pleasing forms. During 1960s, design was considered as a rational process for the first time in academia. This period functioned as a process-centered design era. With the 1980s, the design field reinvented itself and included user's voice in the design process. By 21st century with the acceleration of cultural convergence and development of social and environmental crisis, the field of design moved from user-centeredness to human-centeredness. This new approach increased the emphasis on social and cultural aspects of designing and called for designing for humans instead of the user.

Parallel to the emerging paradigm shift in the design field, other socio-cultural and professional developments triggered the need for consideration of cultural differences in design. Globalization increased the number of stakeholders with diverse cultural backgrounds in a design process. New markets outside the main stream Western society gained importance with their growing economies, consumption patterns and high populations. Globalization instead of homogenizing Western culture across the globe, made the different cultural contexts more visible. "Global products" and "one size fits all" approach have started to fall short to compete in culturally diverse markets like China,

India or Africa. Also the emergence of new markets outside Western consumption patterns brought new responsibilities to designers in terms of cultural and environmental sustainability. Designing for another culture requires consideration of unintended consequences of new designs on maintaining cultural values as well as consideration of the consequences of recreating Western like consumption patterns on environmental sustainability on earth.

The need for cultural orientation in design increased the number of studies dealing with cultural aspects of design. The existing studies form four main categories of research. The first category is focused on developing systematic cultural guidelines which can be used to understand users in a cross cultural design context. The second category focuses on ways of using culture and traditional artifacts as sources for inspiration for product features such as color and form. In the third category users' design preferences or designers' perceptions are compared across cultures. The last category is about developing user research methods sensitive to cultural backgrounds of the users.

Research explicitly connecting theory to real world practice in design has not been done, especially research that is grounded in the analysis of practice. By filling this gap in the knowledge, this study offers a potentially valuable framework to the design field.

CHAPTER 3: METHODOLOGY

Introduction

The first two chapters stated the research problem, outlined the significance of the problem and reviewed the relevant literature related to culture and design to introduce the terminology and to lay out the previous studies conducted in the field. Chapter 3 explains the research methodology of the dissertation which is grounded theory; the pilot study conducted to test and validate sampling and data collection strategy; the assumptions and rationale behind research design; the data collection methods; interviewee selection criteria and process; introduction of interviewees and issues of trustworthiness.

The primary purpose of this research is to develop a framework that describes the process of designing for another culture where designers and users originate from different cultural backgrounds at the national level. For this purpose, grounded theory methodology, which allows building frameworks of processes grounded in experiences of individuals, is employed.

Introduction to Grounded Theory

Designing a good qualitative study requires the researcher to choose appropriate approaches. In order to fully explain the design of this research, in the next few paragraphs, I present the theoretical perspectives that were used, and the methodology and methods that were applied.

Epistemologically subjectivist grounded theory approach is employed in this study. Objectivity in researchers refers to ideas that phenomena exist out there and if we are consistent with our observations and rigorous with our methods we could discover the truth. Subjectivity refers reflexivity by being critical of our knowledge, stepping back and considering alternative perspectives whilst revealing our agency (Rennie, 1994).

Grounded theory methodology was developed in the Sociology domain to generate or discover a theory or an analytical schema of a process by systematic data analysis through a constant comparative coding (Glaser & Strauss, 1967). The founders of grounded theory continued to develop the method over the years independently of each other. Their separated paths led to what now is known as the “Straussian” and “Glaserian” versions of the grounded theory method (Stern, 1994). Grounded Theory according to Glaserian approach emphasizes induction or emergence and the individual researcher’s creativity, while Straussian approach is more focused upon validation criteria and a systematical approach. Glaserian approach is less prescriptive and uses abstract-conceptualization, on the other hand Straussian uses full-description. In this study, Straussian grounded theory approach that provides intricate detail about specific research techniques and procedure is employed. This approach was found to be helpful for this research because it provides careful guidance through the research process.

The key idea of grounded theory approach is that the development of framework is grounded in the data from participants who have experienced a particular process. Grounded theory is defined as a complex and iterative process which does not have an emancipated point of ending. In grounded theory approach the researcher does not start with a theory and test it; instead the researcher starts with a research question in mind,

collects data through interviews and analyzes them simultaneously as he/she develops the concepts, categories and propositions (Figure 3-1). The research evolves as it continues and thus research questions, data collection procedures may change based on the data gathered from the participants. Therefore, grounded theory is not a priori and the data collection and data analysis as well as interpretation and verification have a reciprocal relationship to each other. The results emerge from three levels of open, axial and selective coding of interview transcripts. Interpretation and reflection on the data are conducted by memoing or journaling parallel to data collection and coding. "Memos are the theorizing write-up of ideas about substantive codes and their theoretically coded relationships as they emerge" (Glaser, 1998).

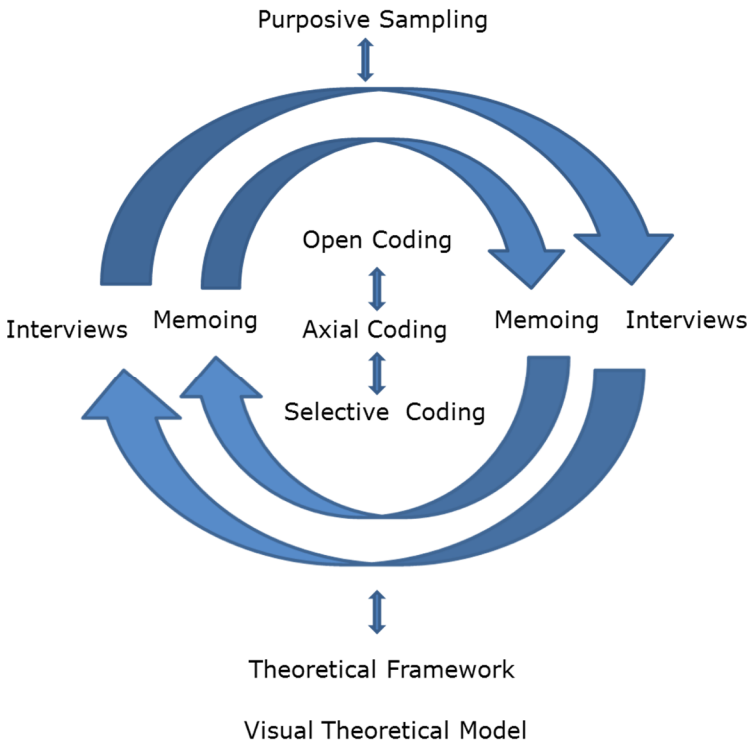

Figure 3-1. Grounded theory process.

In grounded theory creativity of the researcher is also essential and inquiry draws on both critical and creative thinking (Strauss & Corbin, 1998). The researcher needs to be open to multiple possibilities, use nonlinear forms of thinking and classify phenomena in ways which have not been thought about before (Strauss & Corbin, 1998). The researcher switches back and forth between divergent and convergent thinking, since the whole process is iterative.

Pilot Study

A pilot study was conducted in developing the research design, sampling and data collection tools and strategy. The preliminary research question that guided the pilot study was:

What is the effect of cultural difference between designers and users on the product design process?

Possible interviewees were determined by personal connections and searching online databases where designers publish their portfolios and resumes. The main criterion for recruitment was having experience in designing for different cultures. As a result, seven designers with backgrounds in industrial, apparel, and communication design were recruited for the pilot study. There was diversity among the cultural backgrounds of the designers as well as the cultures they have designed for. There was also diversity among the products designed by these designers. Turkish, Dutch, Canadian and Australian designers were interviewed about their experiences of designing for Swedish, Dutch, Rwandan, Ugandan, Italian, American and Turkish markets (Table 3-1).

Table 3-1

Pilot Study Interviewees

Name	**Design Field**	**Product Range**	**Designer's National Culture**	**User's National Culture**
I.O.	Industrial Design	Consumers goods (i.e. household appliances, passenger vehicles)	Turkish	Italian, Swedish
A.M.	Industrial Design	Consumer Goods & Electronics (i.e. healthcare products)	Turkish	American, Swedish
O.B	Industrial Design	Consumer Goods and Electronics (i.e. jewelry, healthcare products, printers)	Turkish	American, Dutch Swedish
E.E.	Industrial Design	Consumer Goods (i.e. furniture)	Turkish	Australian
K.P.	Communication Design	Website, logo, corporate identity	Canadian	Rwandan
C.V.B	Industrial Design &Clothing Design	Clothing and Accessories (i.e. sportswear hijabs)	Dutch	Turkish
L. W.	Industrial Design	Consumer Goods (i.e. stove)	Australian	Batswana

Due to differences in geographical locations interviews were conducted using online communication tools. Semi-structured interviews were conducted using synchronous and asynchronous online communication technologies based on the availability of the designer. Three interviews were conducted using online video chat technologies and three interviews were conducted via email. Video chat interviews took one to one and a half hour. The results of the interviews were recorded and transcribed verbatim. Email interviews went through at least two iterations. As the interviewee replied to the interview questions, new clarification questions were sent to achieve as in-depth communication as possible.

Interview questions that guided the pilot study were open ended questions and varied based on the experience of the interviewee. The interview questions were grouped under three headings:

1) Background information of designer,

   How long have you worked as a designer?

   Please describe the companies you have worked in?

   Please describe the types of products you have designed?

   Please describe your typical design process?

2) Reflection of designers on the process of designing products for a culture other than their own

   Which cultures have you designed for other than your own? And what did you design?

   Please describe a design process where users originated from different cultural backgrounds that yours.

In what ways designing for another culture is different from designing for your own culture?

What tools do you use or what do you do to better understand the culture you are designing for?

Are there any challenges affecting the design process when designing for another culture? If so, can you please give examples?

What do you do to overcome these challenges?

How do you think being an outsider to the culture you design for affects your approach in the design process?

How are you affected by your own cultural background when you design for different cultures?

3) Questions specific to each designer's experience in designing for another culture

The questions in this section were additional questions and probes asked during the interview to receive more in-depth information about each designer's particular design process. Thus these questions were not pre-determined and they were developed based on the flow of the interview.

Reflections from Pilot Study to Research

The pilot study helped to 1) validate the basic assumptions of this research, redefine research questions, 2) determine the purposive sampling criteria, 3) develop the interview method and questions, and 4) develop the data reduction and data analysis strategy.

Validating Assumptions and Redefining Research Questions

The first assumption of this research was; “Designing for another culture other than your own is a different process than designing for your own culture”. The results of the pilot study interviews showed that designing for another culture has unique challenges and ways of addressing these challenges. This finding validated the first assumption and helped to redefine and focus the research questions for this dissertation. The research questions this dissertation attempts to answer are:

1) What is the design process like when designers develop products for cultures significantly different their own?

a) What are the stages in this process and how do they relate to each other?

2) What are the methods of this process at different stages?

3) What are the challenges of this process at different stages?

4) What are the strategies that address challenges at different stages?

The second assumption of this study was the process of designing for another culture will show a similar pattern regardless of the product. The process defined by pilot study interviewees who design a diverse range of products from apparel to heavy duty trucks in a cross-cultural context showed similar patterns. The validation of the second assumption especially highlighted the sampling strategy. Thus, in this research interviewees are selected based on their experience in designing for another culture

regardless of what they design. This allowed being process focused rather than being product focused.

Purposive Sampling Criteria

The results of the pilot study provided insights into development of the sampling strategy. Grounded theory requires purposefully selecting interviewees who can provide in-depth information about the process under investigation. The following factors were found to affect the content of information gathered from interviewees;

1) Experience Level: Designers' depth of experience in designing for another culture than their own.
2) Company Profile:
    a. The size of the company (Large multi-national corporation versus small and medium sized enterprises; from now on SMEs)
    b. Mission of the company (Non-profit company or profit oriented company)
3) The Distinction between Designers and Users Cultural Backgrounds

Experience Level

There was diversity in the level of experience of designing for another culture among pilot study interviewees. The findings showed that this diversity is a positive factor in answering the research questions. Designers who are experts in designing for another culture provided more information about the methods and strategies of designing for other cultures. Designers who are novice in designing for another culture provided more in-depth information about the challenges of this process. Thus, including designers who

are novice and expert in designing for another culture is determined as a purposive sampling criterion.

Company Profile

In the pilot study there was diversity in the size and mission of the companies interviewees were employed at. Two interviewees were employed in profit oriented large multi-national corporations and four were employed in profit oriented SMEs and one was employed in a non-profit SME. The results showed that the company size and its mission create different challenges in designing for another culture. For example smaller companies are less constrained with time while large companies are less constrained with cost of designing for another culture. Also profit oriented companies are more vulnerable to local competition while non-profit companies are more likely to take risks and try different approaches. As a result, including designers who are employed in diverse range of companies was determined as the second purposive sampling criterion.

The Distinction between Designers and Users Cultural Backgrounds

Hofstede's and Hampden-Turner and Trompenaars' comparison of national culture studies point to major differences between Eastern and Western nationalities. In this study cultural diversity between designers and users' are considered in terms of Eastern and Western values although exceptions may apply based on other components of culture which are not considered by authors such as religion, language and ethnicity.

Both the pilot study and the literature review supported that the more distinct the difference between designer's and user's cultural backgrounds, the more challenging the

design process is. In the pilot study there was diversity in the cultural backgrounds of designers and users (i.e. Western designer and Eastern user, Western designer and African user, or Eastern designer and Western user). Thus, the third purposive sampling criterion is set as the significance of cultural diversity between designer and the users they design for.

Developing Interview Method and Interview Questions

The geographical and time zone difference between interviewees and the researcher was a challenge in scheduling the interviews. However, the pilot study showed that providing multiple communication options for the interviewees such as video-chat and emailing positively affected the recruitment process and further check-in with the participants when a topic is not clear. Thus, multiple communication options such as in-person face to face interviews, online video interviews, phone interviews and email interviews are employed in this study.

Using semi structured interviews questions and probes based on the flow of interviews were helpful in encouraging story-telling during the pilot study. Therefore, the study employed semi-structured interview format with probes to trigger stories during data collection.

Grounded theory is an iterative process where focus is based on simultaneous data collection, analysis and reflection. This study employed two levels of interviews where interview questions were revised based on the results gathered from previous level interviews. The pilot study interview questions provided the general insight into the whole process of designing for another culture. Therefore, pilot study questions were

used as guidelines for the first level of interviews used in the research. New interview questions were developed at the second level depending on the emerging results from the first level interviews.

Data Reduction and Analysis Strategy

In data reduction and data analysis the three levels of open, axial and selective coding are employed. In the pilot study at open coding level whole document analysis was employed to determine the concepts. In axial coding, concepts were visually displayed in tree structures to determine the relationships between concepts and form the categories. During selective coding using visual language and developing comparative visual diagrams that lay out the relationships between categories was helpful.

During actual data collection, line by line analysis was used in open coding to capture all the concepts emerging from data and to increase rigor in the study. Based on the experience in coding during pilot study, NVivo software which allows to visually display concepts in tree formats was adopted for data reduction and analysis.

The Iterative Process of Data Collection and Data Analysis

Interviews play a central role in data collection in grounded theory approach (Strauss & Corbin, 1990). The results are developed based on interviews conducted with people who experienced the process that is of interest to the research. In this study semi-structured interviews were the data collection method. Upon the receipt of IRB approval (UMN IRB Human Subjects' Code: 1002E77736) geographically dispersed twenty designers who have experience in designing for user groups with different cultural

backgrounds were interviewed to develop a framework which explains the process of designing for another culture. In a grounded theory study when the participants are geographically dispersed, they provide important contextual information useful in developing categories in the coding phase (Creswell & Clark, 2007).

Interviewee Selection

In grounded theory methodology the sample of interviewees is selected by purposive and theoretical sampling. Glaser and Strauss (1967) define theoretical sampling as " the process of data collection for generating a theory whereby the analyst jointly collects, codes and analyzes his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges" (p.45). Interviewees are selected because of what they know or who they are, rather than through random sampling procedures.

Sampling of interviewees was done based on the criteria developed from reflecting upon the pilot study. As discussed in the pilot study section of this chapter, in addition to having the experience in designing for another culture, a designer's eligibility for an interview was determined against 1) designers' level of experience in designing for another culture, 2) company of employment, and 3) the significance of distinction between cultural backgrounds of designers and users. The pilot study showed that the diversity in these criteria inform different aspects of the process of designing for another culture.

Therefore, the goal was to include novice and expert designers in designing for another culture, designers employed in profit oriented and non-profit organizations, in large corporations and small companies. The final criterion which applied to all interviewees was distinction between interviewees and users cultural backgrounds. The literature also showed that Eastern and Western cultural values show a significant difference in terms of behaviors, values and attitudes (Hofstede, 1991; Hampden-Turner & Trompenaars, 1997). Therefore, for this criterion the goal was to include Western-Eastern or Eastern-African cultural combinations.

Two strategies were used to ensure interviewees met the purposeful selection criteria. The first strategy was sending out a questionnaire which assessed designers' eligibility for an interview. The second strategy was networking among designers for other potential participants.

Recruitment Questionnaire

Designers who displayed their profiles in professional interaction websites such as *Design 2, Linkedin* and portfolio databases such as *Coroflot* were sent an online recruitment questionnaire via email to determine whether they meet the inclusion criteria. Designers were contacted with an email invitation that briefly described the study and included the link to the online questionnaire (See Appendix I).

The recruitment questionnaire included questions that helped to understand, first, if the designer had experience in designing for another culture and second how the designer related to sampling criteria described above. The questionnaire also included a brief description of culture to focus designer's answers to the questions.

Recruitment Questionnaire

The definition of culture in this study includes explicit aspects and implicit aspects that mostly reside in nationality differences such as;

Explicit aspects; Traditions, rituals, religion, language

Implicit aspects; Beliefs, norms, values, ideals

Please respond to the following questions based on the above definition of culture

1) *Have you had experience of designing for another culture than your own where the design process or the end product was affected by cultural differences?*
   - *Yes*
   - *No*

If your answer is "Yes", please continue with the second question.

If your answer is "No", do you know any designer who may have this type of experience? Please include his/her name and contact information.

2) *Please describe one such design projects of yours including the product, the user group and their national background, and the details of design process.*
3) *How much experience do you have in designing for another culture than your own?*
4) *What is your national background?*
5) *Please describe the company you work in.*
6) *If you are interested in being interviewed about your experience in designing for another culture, please include your name and contact information.*

Networking

The second strategy was determining eligible designers who met purposive sampling criteria based on personal networking and acquaintance. With this strategy designers who were known to meet the sampling criteria were directly contacted. These interviewees often had enough information about their backgrounds displayed in the Internet such as their personal websites or their eligibility was clear by virtue of working in companies that are dedicated to designing for another culture. These designers were contacted using an invitation script (Appendix II) which explained the research objectives and researcher's interest in interviewing them along with an informed consent (See Appendix III).

Interviewees

A total of twenty designers from different parts of the world with diverse experience were interviewed (Table 3-2). Four interviewees were recruited based on the results of recruitment survey and sixteen designers were recruited as a result of networking. The professional backgrounds of interviewees ranged from industrial to clothing and communication design.

Table 3-2

Interviewees

Name	Design Field	Product Range	Designer's National Culture	User's National Culture
A.M.C.	Industrial Design	Consumer Goods, Packaging (i.e. blender)	French	Chinese
A.L.	Industrial Design	Consumer Electronics (i.e. camcorder)	British	Chinese Japanese
A.A.	Industrial Design	Consumer Goods (i.e. rice cooker)	American	Chinese
K.S.	Clothing Design	Clothing (i.e. menswear, lingerie)	Korean	American Chinese
A.K.	Industrial Design	Consumer Goods (i.e. air conditioner, jewelry)	Indian	Chinese South African American
K. L.	Industrial Design	Consumer Goods (i.e. life jacket)	Norwegian	Guatemalan Ugandan
C.K.	Industrial Design	Consumer Goods and Electronics (i.e. kitchen goods, mobile phones)	Norwegian	Chinese Japanese

F.B.	Industrial Design	Consumer Electronics (i.e. mobile phones)	French	Taiwanese
J.B.	Industrial Design	Consumer Electronics (i.e. laptops, netbooks)	British	Taiwanese Chinese
J.G.	Industrial Design	Consumer Electronics and Service Design (i.e. mobile phones, banking systems)	Scottish/Italian	Indian Chinese Finnish
R.D.	Industrial Design	Consumer Goods (i.e. furniture, wheelchair)	American	African
L.S.	Industrial Design	Consumer Goods (i.e. lighting)	American	Tanzanian Indian
C.A.	Industrial Design	Consumer Goods (i.e. carrying cart)	American	Tanzanian Indian
O.B	Industrial Design	Consumer Goods and Electronics (i.e. healthcare products, printers)	Turkish	American Dutch Swedish
K.P.	Communication Design	Website, logo, corporate identity	Canadian	Rwandan
C.V.B.	Industrial& Clothing Design	Clothing Accessories (i.e. sportswear hijabs)	Dutch	Turkish

L. W.	Industrial Design	Consumer Goods (i.e. stove)	Australian	Batswana
N.H.	Industrial Design	Consumer Goods and Electronics (i.e. kitchen appliances)	French	Chinese
H.F.	Industrial Design	Consumer Goods, Services (i.e. carrying cart, birth kit)	American	Indian Tanzanian Rwandan Guatemalan
N.W.	Industrial Design	Consumer Goods, Services (i.e. bicycle, carrying cart)	Australian	Tanzanian Indian

The range of interviewees displayed diversity in terms of the sampling criteria. The goal in sampling strategy was to achieve diversity in the experience level between designers who are novice and expert in designing for another culture. The sample of interviewees included ten novice and ten expert designers in designing for another culture (Table 3-3).

Table 3-3

Experience Level of Interviewees in Designing for another Culture

Novice			Expert		
Name	**Design Experience**	**Cross-Cultural Design Experience**	**Name**	**Design Experience**	**Cross-Cultural Design Experience**
O.B.	9 years	1.5 years	A.K.	19 years	8 years
C.A.	2 years	1 year	L.W.	5 years	4 years
R.D.	7 years	3 years	C.V.B	12 years	4 years
C.K.	8 years	Less than 1 year	J.G.	5 years	4 years
A.A.	1.5 years	Less than 1 year	J.B.	14 years	8 years
L.S.	7 years	1.5 years	K.L.	6 years	4.5 years
N.H.	3 years	Less than 2 years	K.S.		
A.M.C.	2 years	1 year	K.P.	8 years	4 years
			H.F.	9 years	6 years
			N.W.	5 years	3.5 years
			F.B.	16 years	7 years
			A.L.	18 years	8 years

The second criterion was to achieve diversity in the company profiles of designers' employment in terms of size and mission. Interviewees who are employed in large multi-national corporations and SMEs, in non-profit and profit oriented companies were recruited (Table 3-4).

Table 3-4

Company Profile of Designers' Employment

Company Size		Company Mission	
Large Multi-National Corporation	**Small and Medium Sized Enterprises**	**Profit Oriented**	**Non-Profit Oriented**
J.B.	C.V.B.	J.B.	K.L.
J.G.	K.P.	J.G.	L.W.
A.K.	K.L.	A.A.	R.D.
F.B.	L.W.	F.B.	L.S.
O.B.	A.L.	C.V.B.	C.A.
K.S.	L.S.	O.B.	K.P.
	R.D.	C.K.	H.F.
	A.A.	K.S.	N.W.
	C.K.	A.K.	
	H.F.	A.M.C.	
	N.W.	N.H.	
	N.H.	A.L.	
	A.M.C		
	C.A.		

Cultural diversity among interviewees and the user group they design for was evident. Defining the difference between two cultures can be challenging since culture is a broad concept composed of implicit and explicit aspects. For this reason a quantifiable measure of cultural difference was employed. Hofstede's cultural dimension scores were used to determine the significance of cultural difference between designer and users. The table below displays national backgrounds of interviewees and user groups and cultural dimension scores of each nation based on Hostede's (1991) criteria of power distance (PD), individualism (I), masculinity (M), uncertainty avoidance (UA) and long term orientation (LO) (Please refer back to Chapter 2 for the detailed discussion of Hofstede's cultural dimensions). Here I provide one example of how cultural dimension scores for an American designer and Chinese user show difference. Power distance refers to the relationship with authority. USA exemplifies a culture where people challenge authority with a score of 40 compared to China where people obey authority with a score of 80. USA represents an individualistic culture with an individualism score of 91 while China values collectivism with a score of 20.

As displayed in the below Table 3-5 the cultural dimension scores of designer and user show opposite scores at least for one dimension. Thus, the diversity between designer's and user's cultural backgrounds was achieved in interviewee selection.

Table 3-5

The Distinctiveness of Cultural Difference between Designers and Users According to Hofstede's Cultural Dimension Scores

Name	Designer National Culture	Hofstede Score					User National Culture	Hofstede Score				
		PD	I	M	UA	LO		PD	I	M	UA	LO
A.L.	Chinese	80	20	66	40	118	American	40	91	62	46	29
							Japanese	54	46	95	92	80
A.A.	American	40	91	62	46	29	Chinese	80	20	66	40	118
K.S.	Korean	60	18	39	85	75	American	40	91	62	46	29
							Chinese	80	20	66	40	118
A.K.	Indian	77	48	56	40	61	Chinese	80	20	66	40	118
							South African	49	65	63	49	
							American	40	91	62	46	29
K. L.	Norwegian	31	69	8	50	20	Guatemalan	95	6	37	101	
C.K.	Norwegian	31	69	8	50	20	Chinese	80	20	66	40	118
							Japanese	54	46	95	92	80
F.B.	French	68	71	43	86		Taiwanese	58	17	45	69	87
J.B.	English	35	89	66	35	25	Taiwanese	58	17	45	69	87
							Chinese	80	20	66	40	118
J.G.	Scottish/ Italian	50	76	70	75	34	Indian	77	48	56	40	61
							Chinese	80	20	66	40	118
							Finnish	33	63	26	59	

R.D.	American	40	91	62	46	29	Sudan	80	38	52	68	
L.S.	American	40	91	62	46	29	Tanzanian	64	27	41	52	25
C.A.	American	40	91	62	46	29	Tanzanian	64	27	41	52	25
O.B	Turkish	66	37	45	85	66	American	40	91	62	46	29
							Dutch	38	80	14	53	44
							Swedish	31	71	5	29	33
K.P.	Canadian	39	80	52	48	23	Rwandan					
C.V.B.	Dutch	38	80	14	53	44	Turkish	66	37	45	85	
L. W.	Australian	36	90	61	51	31	Batswana					
H.F.	American	40	91	62	46	29	Tanzanian	64	27	41	52	25
							Indian	48	56	40	61	77
N.W.	Australian	36	90	61	51	31	Tanzanian	64	27	41	52	25
							Indian	48	56	40	61	77
N.H.	French	68	71	43	86		Chinese	80	20	66	40	118
A.M.C	French	68	71	43	86		Chinese	80	20	66	40	118

Interviews and Interview Questions

As stated previously in grounded theory, data collection takes place parallel to data analysis. Thus, semi-structured interviews followed a pattern which highlighted the data analysis process and interview questions evolved based on the emerging results. Two different sets of interview questions were used as guidelines at different stages of this study. A total of twenty interviews were conducted using two levels of interviews and simultaneous data analysis. This iterative process, together with reflective memoing,

formed the theoretical framework and the visual model, which describe the process of designing for another culture, named “Culture-centered Design Process” (Figure 3-2).

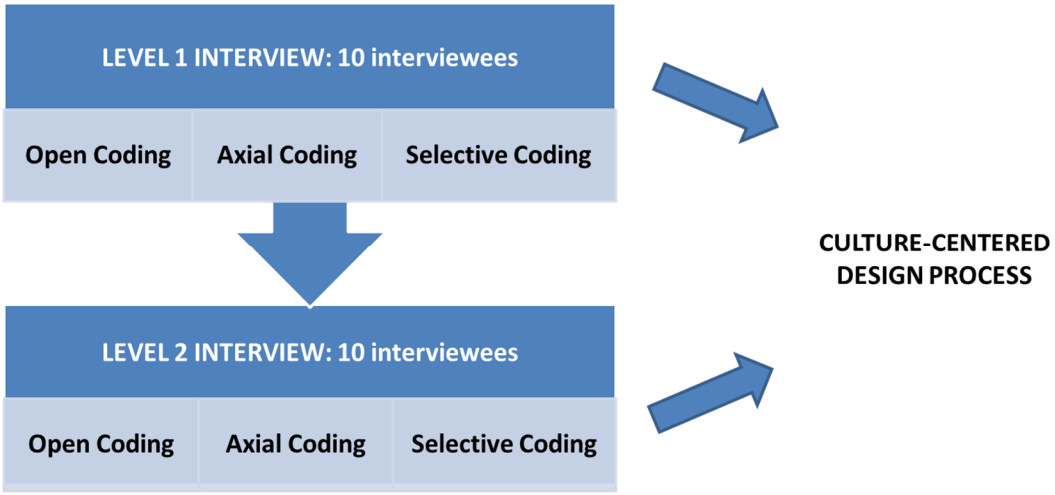

Figure 3-2. The iterative interview and data analysis process.

The interviews were conducted either 1) face to face, 2) using video chat technologies or 3) using asynchronous emailing based on the availability of designers. Three interviews were conducted face to face; two in Hong Kong and one in Washington DC. Fourteen interviews were conducted using video chat technologies. Three interviews were conducted via emailing because the interviewee did not have an Internet connection or time to conduct the video interview, or the interviewee was not fluent in spoken English. In this case iterations of sending questions and answers back and forth were employed to clarify interviewee’s responses and to gain in-depth results comparable to the synchronous interviews. All the interviews were recorded and transcribed verbatim.

Level 1 Interviews

Grounded theory methodology calls for a deductive approach in data collection, and interviews start with general questions and get more focused as the process evolves. Thus, the first level interviews focused on identifying the process and included generative questions to determine general concepts. The interview questions were the same with the pilot study and helped to develop a general understanding of the process of designing for another culture, its methods, its challenges and the strategies employed by interviewees. To revisit the interview questions used in this stage please refer to the previous “Pilot Study” section.

Six designers were interviewed at this stage (Table 3-6). Four very productive and pertinent interviews from pilot study were included in the analysis of first level interview results. The shortest interview at this stage took around an hour and the longest interview took two hours. I decided to move on to the Level 2 interviews with more specific questions based on the saturation reached in the codes that emerged from Level 1 interview results.

Table 3-6

Level 1 Interviews

Name	Recruitment Type	Interview Type
F.B.	Networking	Video-Chat
A.L.	Survey	Video-Chat
A.A.	Networking	Video-Chat
K.S.	Networking	Face to face
A.K.	Networking	Face to face
C.K.	Survey	Video-Chat
O.B	Pilot Study	Video-Chat
K.P.	Pilot Study	Video-Chat
C.V.B.	Pilot Study	Video-Chat
L. W.	Pilot Study	Email

Level 2 Interviews

Later interview questions in grounded theory emerge from the results of previous interviews and focus on core phenomena. Interview questions were designed to understand what was central to the process (core phenomena), what influenced or caused this phenomenon to occur (casual conditions), what strategies were employed

during the process (strategies), and what effect occurred (consequences) as a result of the core phenomena.

Analysis of the first level interviews determined the steps of the culture-centered design process and the major challenges, strategies, and methods used at each step. The steps of the culture-centered design process were determined as follows: Pre-design Phase including background set-up, presupposition awareness and finding access; Design Phase including cultural immersion, reflective integration, co-design and implementation, and evaluation. Based on these results, in addition to background questions, Level 2 interview questions focused on each step of the culture-centered design process independently.

Background Questions

1. *How long have you worked as a designer?*
2. *Please describe the companies you have worked for so far?*
3. *Please describe what types of products you design?*
4. *Please describe the typical design process you engage in?*
5. *Which cultures have you designed for other than your own? And what have you designed?*

Culture-Centered Design Process

For the following questions, I am particularly interested in specific examples of your experiences in cross-cultural design; please tell me about these examples in answering these questions.

1. *Can you tell me about specific cross-cultural design projects you were involved in? Please describe the process step by step from the moment you received the design brief?*

Pre-Design Phase

2. *How do you prepare yourself for the cross-cultural design before the design process starts? (Background set up)*
    a. *What methods do you use to prepare yourself for the cross-cultural design?*
    b. *What are the challenges of this stage?*
    c. *What strategies do you use to overcome these challenges?*
3. *How do you find access into the other culture? (Finding Access)*
    a. *What methods do you use?*
    b. *What are the challenges of this stage?*
    c. *What strategies do you use to overcome these challenges?*
4. *Do you feel biased when you design for another culture? If so, How do you remove yourself from these biases? (Presupposition Awareness)*
    a. *What methods do you use?*
    b. *What are the challenges of this stage?*
    c. *What strategies do you use to overcome these challenges?*

Design Phase

5. *Which cultural immersion methods (design research methods) do you use in cross-cultural design? Why? (Cultural Immersion)*
    a. *What are the challenges you face during cultural immersion?*
    b. *What strategies do you use to overcome the challenges you described?*

6. *What do you do to reflect on your findings from cultural immersion stage? (Reflective Integration)*
    a. *What methods do you use?*
    b. *What are the challenges of this stage?*
    c. *What strategies do you use to overcome these challenges?*
7. *Which idea generation methods do you use in cross-cultural design? (Co-design and Implementation)*
    a. *What are the challenges you face during idea generation and concept development?*
    b. *What strategies do you use to overcome the challenges you described?*
    c. *Do you involve the users in the idea generation? If so, how?*
        i. *What methods do you use?*
        ii. *What are the challenges of this stage?*
        iii. *What strategies do you use to overcome these challenges?*
8. *What are the challenges you face in implementing the design ideas into actual products? (Co-design and implementation)*
    a. *What strategies do you use to overcome the challenges you described?*
    b. *How do you implement aesthetic values of the other culture in your design?*
    c. *Do you experience differences in human factors issues (ergonomics) in cross-cultural design? If, so how do you implement these differences?*
9. *How do you evaluate the success of the product you designed in a cross-cultural context? (Evaluation)*

Reflection Questions

10. *How do you think being an outsider to the culture you design for affects your design process? (What are the differences between designing for your own culture versus designing for another culture?)*
11. *What are the influences of different cultural aspects (such as values, beliefs, religion, norms, rituals, aesthetics, language) on design when you are in a cross-cultural context?*
12. *How are you affected by your own cultural background when you design for other cultures?*

Ten designers were interviewed using Level 2 interview questions face-to-face, with video-chat or emailing (Table 3-7). The shortest interview at this stage took forty minutes and the longest interview took one and one-half hours

Table 3-7

Level 2 Interviews

Name	Recruitment Type	Interview Type
H.F.	Networking	Video-chat
N.W.	Networking	Video-chat
J.B.	Networking	Video-chat
J.G.	Networking	Video-chat
R.D.	Networking	Video-chat
L.S.	Networking	Video-chat
C.A.	Networking	Face to face
K. L.	Networking	Video-chat
N.H.	Networking	Email
A.M.C.	Networking	Email

Data Reduction and Analysis

Data analysis in grounded theory is done by a constant comparative method which requires collection and analysis of data at the same time by constantly comparing and coding new with older data. There are three levels of coding in data analysis: open coding, axial coding and selective coding. The coding process is supported with memoing where the researcher reflects on the emerging results. This section will only

provide a brief introduction to the process of data reduction analysis. Chapter 4 will discuss data reduction and analysis in detail.

NVivo software was used to conduct the three levels of coding in this research. The three levels of coding were employed after Level1 and Level 2 interviews. In open coding main concepts were abstracted from interview transcriptions using line by line analysis which requires analysis of phrases and words. Strauss and Corbin (1998) suggest this type of coding in the earlier phases of the study to determine the initial concepts. Also at this stage memoing was used to reflect on the concepts which allowed determining the links between concepts and how they form categories. The software also allowed memoing and storing memos linked to each concept.

In the axial coding stage the concepts were transformed into larger categories. NVivo software provided the option to merge similar concepts together and form tree structures to identify the links between concepts and categories. In addition to determination of the linkages between categories, several core categories were determined at this stage. A core category is defined as a category that appears frequently in the data.

In selective coding, propositions between categories were built as well as the propositions between a category and its concepts. Along with this process of coding, visual integrative diagrams were developed to display the results. The final version of these visualizations illustrated the visual model of the theoretical framework. The visual model is the abstract visual representations of the story line and does not need to contain all the concepts and categories that emerged from analysis.

In the data coding I went through two cycles parallel to Level 1 and Level2 interviews (Figure 3-2). The first cycle of open, axial and selective coding after Level 1 interviews led to the preliminary framework of culture-centered design process. From this finding the Level 2 interview questions which were discussed in the above section were determined. Level 2 interviews were again coded using the three-level open, axial and selective coding. The results emerging from these interviews helped to embrace the preliminary framework of culture-centered design process and finalize its visual model.

Limitations

The main limitation of this study was communication. Communication during interviews was challenged from two perspectives. First, using online communication technologies caused problems of interruption of the flow of interviews due to poor Internet connection. Second, ability of understanding and speaking English and the accents of non-native English speaker designers challenged communication during interviews. The limitations faced during interviews were addressed by multiple check-in with the interviewees when a topic was not clear. Additionally the interview transcriptions were proofread at least once to avoid any errors in transcriptions.

Issues of Trustworthiness

According to Guba (1981) researchers need alternative models appropriate to qualitative designs to ensure rigor without sacrificing the relevance of qualitative research. Guba's model describes four general criteria for evaluation of research (Table 3-8). I used

several methods to increase rigor and address the trustworthiness of this study based on Guba's model.

Table 3-8

Guba's (1995) Model of Rigor in Research

Criterion	Qualitative Approach	Quantitative Approach
Truth value	Credibility	Internal Validity
Applicability	Transferability	External Validity
Consistency	Dependability	Reliability

Dependability

Dependability in a qualitative study can be reached by triangulation, dense description of research methods and peer examination. I employed data triangulation (Denzin, 1978) which involved time, space and people. Data sources can vary based on the times the data were collected, the place, or the setting of data collection and from whom the data were obtained. Variance in events, situations, times, places, and persons add to the trustworthiness of the study because of the possibility of revealing atypical data or the potential of identifying similar patterns from diversity, thus increasing confidence in the findings. In this study the interviewees were located geographically in different parts of the world and the interviews were conducted over time. The diversity among the professional backgrounds of the interviewees and the cultural diversity among them increased data triangulation. In addition, I used dense description of the research

methods. I tried to make the coding steps in data analysis as explicit as possible. Discussions with my advisor functioned as peer examination during the research period. Another way of increasing dependability is repetition during analysis such as repetitive reading of transcriptions. This was achieved naturally since grounded theory approach is very iterative and requires multiple reading of all the data.

Credibility and Transferability

In qualitative research credibility and transferability address whether the research explains what the researcher said he/she would be explaining. It therefore deals with the appropriateness of the method to the research question and the validity of the interpretations of the data. In qualitative research interpretations are subjective, so one has to trace the ways by which he/she has arrived at this particular interpretation. The researcher is responsible for showing that he/she did not "invent" the interpretations, but that they are the product of conscious analysis. This involves constant justification of interpretations. Literature reviews and referential adequacy play an important role in addressing credibility. In this study I employed literature review in the beginning of the study to justify the decisions made about the research design and back up of the research questions. I also referenced literature in the discussions of Chapter 5 to show how the results of the study related to existing studies. Another way of increasing credibility consists of showing participants excerpts of the interpretation of their interviews. I employed participant check in as much as possible and asked participants provide additional feedback in later stages of the study. By doing this participants were put in a position to corroborate or disapprove the interpretations. Using quotes from field notes, transcripts of interviews also increase credibility. I used direct quotations of the

participant during discussion of results. Finally reflexivity of the researcher adds to credibility. This was achieved naturally by employing the grounded theory approach. Grounded theory requires memoing and therefore constant reflection of the researcher throughout the research process.

Transferability or the applicability of the research in another situation is increased by dense explanation of the sample. In this study the sample were described in detail, using critical information about professional backgrounds, design projects they were involved in and the company of employment.

Conformability

Conformability or the objectivity in this study was achieved with data triangulation and reflexivity efforts. As described above memoing was the main reflection tool which was constantly used during the entire research process. The interview data were triangulated by the diversity in backgrounds of participants and by the extensive time frame in which interviews were conducted.

Summary

This study proposes to develop a theoretical framework to describe the process of designing for user groups with different national cultures than the designer. For quick reference and an overview of the study and its methods refer to the following Table 3-9.

Table 3-9

Overview of the Study and Its Method

Research Questions
1) What is the design process like when designers develop products for cultures significantly different their own? a) What are the stages in this process and how do they relate to each other? 2) What are the methods of this process at different stages? 3) What are the challenges of this process at different stages? 4) What are the strategies that address challenges at different stages?
Purpose
To develop a framework that describes the process of designing for another culture where designers and users originate from different national cultures.
Significance
Rapid development of culturally diverse emerging in markets Increasing cross-cultural design practices in businesses with the effect of globalization Lack of research explicitly connecting theory to real world practice in designing for another culture
Methodology
Qualitative Grounded Theory
Participants
Designers who experienced designing for another culture than their own

Data Collection
Two levels interviews
Data Analysis
Open Coding with line by line analysis
Axial Coding with tree structures
Selective Coding using comparative visual models

This study used a grounded theory methodology which is iterative and emerging. The primary data collection tool was interviews. Interviewees were selected using purposive sampling. Purposive sampling criteria were developed as a result of the pilot study. The criteria included experience level in designing for another culture, company profile where the interviewee is employed, and distinction in the backgrounds of designers and users. Novice designer with less experience in designing for another culture provided insight into the initial challenges of the process, while expert designers provided insight into methods and strategies. Including designers from large and smaller size companies and profit and non-profit companies again highlighted different challenges and methods in the process. The recruitment was done by using a recruitment questionnaire which assessed the sampling criteria or by personal networking. Twenty interviews were conducted either face to face, using video-chat or email depending on the availability of the designer, his/her geographical location and the time zone difference between the designer and the researcher.

The interviewing and data analysis took place parallel to each other. Two levels of interviews were conducted starting with the general and moving to more specific and

structured questions. Ten designers were interviewed at the first level, ten designers at the second level. At each level of interviews the three levels of open, axial and selective coding were employed. The theoretical framework and the visual model of culture-centered design process emerged from this iterative interviewing and coding. Line by line analysis was employed to abstract the concepts from the data during the open coding stage. Memoing about each concept was employed as a reflection tool to form categories and link concepts to each other. In the axial coding stage the linkages between concepts and categories were developed into a tree structure. Core categories of the framework were determined. In selective coding propositions and the story line of the framework as well as the visual model describing the culture-centered design process was developed

The trustworthiness of the study was supported in multiple ways. Data triangulation was achieved by the diversity in professional backgrounds of the designers as well as by the diversity in their cultural backgrounds. The data were collected over time with two levels of interviews. Participant check in, peer examination, dense description of research methods and participants, repetitive review of transcriptions, explicit coding, referential adequacy and reflective memoing were employed to increase the trustworthiness of the study.

CHAPTER 4: FROM DATA ANALYSIS AND REDUCTION TO THEORETICAL FRAMEWORK

Introduction

This chapter illustrates the three levels of coding process and how this process led to the emergence of the “Culture-Centered Design Process” theoretical framework and the visual model. Categories and concepts that emerged at different levels of the coding process are presented.

Twenty interviews were recorded and transcribed verbatim. Each interview took between an hour and one and one-half hour. The transcription of the interviews yielded a total of single spaced 191 pages of raw data. As stated in Chapter 3, analysis of this data was done using NVivo software. Interview transcriptions were imported in the software and coded three time using open, axial and selective coding steps of the grounded theory methodology.

Open Coding

NVivo allows coding the raw data into different types of “nodes” called free nodes and tree nodes. Free nodes are the basic unit of analysis which forms the concepts. A concept is an abstract representation of an event, object or interaction. Theoretical frameworks can't be built with actual incidents or activities as observed or reported. The raw data needs to be given conceptual labels. These conceptual labels called the concepts are the building blocks of a theoretical framework and they are developed by

constant comparison. To form the concepts data are broken down to discrete ideas, incidents, events, and given a name that represents them (Strauss & Corbin, 1998).

The first step of coding to determine concepts is called open coding in grounded theory because the thoughts and meanings contained in the transcriptions are opened up to develop the concepts at this level. Thus, in this research main concepts and the tentative linkages between concepts were determined in the open coding stage.

Line by line analysis was employed at this stage of coding. Each sentence in each interview was coded by constantly comparing the data and grouping similar data under the same free node label in NVivo. The process was very extensive and 223 free nodes were created during this stage of analysis. The list of all the free nodes emerged at this level of the coding can be found in Appendix IV. Each free node represented one idea in the transcription scripts. “Language barrier” is an example of a free node or a concept from interview transcriptions. This node emerged from the answers to the “what are the challenges of designing in a cross-cultural context?” interview question. The following are examples of sentences from different interview transcripts that were coded under this free node:

“I think certainly language is an issue in China.”

“The biggest challenge is the language difference”

“We have of course language problem, because there is a lot of info and message we miss “

After the open coding of interview transcriptions, writing memos helped to internalize what each concept meant or what it exactly stood for. The memos are in depth

reflections and interpretations of the researcher noted in the form of free writing. Memoing helps to recognize not so obvious meanings or connections and therefore to identify the meaning of each concept. Memoing was done for as many concepts as possible at this stage of data coding. However, concepts with a higher number of references were given priority in writing the memos. In open coding, writing the memos not only helped to internalize the meaning of important concepts but also to identify which concepts were clustering together to form a category and thus moved the coding process from open coding to the axial coding stage. NVivo software allowed to link memos with the nodes and saved them in the text format. An example of a memo written for “Cultural Human Factors” free node is the following:

> *Human Factors issues are grouped under physical, emotional, cognitive and cultural human factors. At the physical level of human factors, anthropometrics which is related to measurement of human body can vary among cultures. Especially in clothing design it becomes a big concern. The body structure of individuals change from culture to culture and this needs to be considered in the design of clothing. Cognitive level of human factors such as decision making or visual cognition is usually universal across cultures. Emotional human factors are vulnerable to cultural difference, especially when they are used as non-verbal communication tools. A cultural human factor is related to the context that surrounds design problem residing in cultural differences such as values, beliefs and knowledge or technology.*

In addition to the memos, NVivo also allowed to link small annotations, websites and manuscripts and books available in the Internet to a related node or to the related section in an interview transcription. The following is an example annotation recorded for an interview transcription section.

Interview Transcription

> *"We went to his home, we saw his studio, took pictures of everything, video-recorded him, took notes and just watched him. We spent several hours just talking, talking… We were looking towards how he works, asked all sorts of questions*"

Annotation, 2/4/2011, 1:58 PM

> *Once you have the access, personally experience and see the ways of life in the other culture; this might require getting into somebody's home. Visually record everything because you are there for a limited time and you need to remember the details; you need to understand the context around the design problem. Reflection on what you see is important, you need to take notes and reflect on what you are observing. Verbal communication with the user, talk and ask questions. The aim is to understand things from his point of view; create empathy.*

Axial Coding

In Axial coding concepts emerged from open coding were grouped into larger categories and sub categories and the relationships between these categories were determined. The second element of grounded theory, category, is defined as higher in level and as more abstract than the concepts they represent (Strauss & Corbin, 1998). Categories are the "cornerstones" of developing a theoretical framework and they provide the means by which the theory can be integrated. The grouping of concepts forms categories. They are generated through the same analytic process of making comparisons to highlight similarities and differences used to produce lower level concepts.

In the axial coding stage NVivo software allowed the merging of similar concepts together into larger categories and relating of the categories and sub categories to each other using the tree nodes option. Tree nodes contain parent and child nodes and help to organize data into a tree structure where relationships between concepts and categories can be managed. It basically functions as a helpful tool to sort the data into groups. For example, “design research” can be a category including lower level categories or concepts such as “user interviews”, “design probes”, and “observation”. Using Nvivo software it is possible to cluster together all interview transcripts that discuss “user interviews” and its context, then search and compare that information with any literature data or memos. Please refer to the Appendix V for examples of how axial coding was done using the tree nodes in NVivo

After organizing categories and concepts in a tree structure, the parent categories which embed a high number of sub categories and concepts were determined as the core phenomena. The core phenomenon has analytic power and pulls all the other categories together to create an explanation. Once the core phenomenon is decided, the researcher goes back to the surrounding categories and organizes them in 1) conditions, 2) strategies and 3) consequences (Figure 4-1).

Conditions are sets of events that might arise out of time, place, culture and organizations. Conditions can be causal, contextual and intervening. *Causal conditions* represent what influences the core phenomenon or conditions that led to the occurrence or development of a core phenomenon. To be able to determine causal categories the researcher should ask questions such as “what caused the core phenomenon to

happen? *Intervening conditions* mitigate the impact of causal condition; they are general conditions bearing upon action/interactional strategies. *Contextual conditions* are specific sets of conditions that intersect to create sets of circumstances to which persons respond through actions. To determine contextual conditions the researcher should ask "what are the results of using these strategies?"

Strategies are the acts taken to resolve a problem and to shape a phenomenon in some way. To determine strategies, the researcher should ask "what strategies are developed in response to core phenomenon?"

Consequences are the outcomes from strategies.

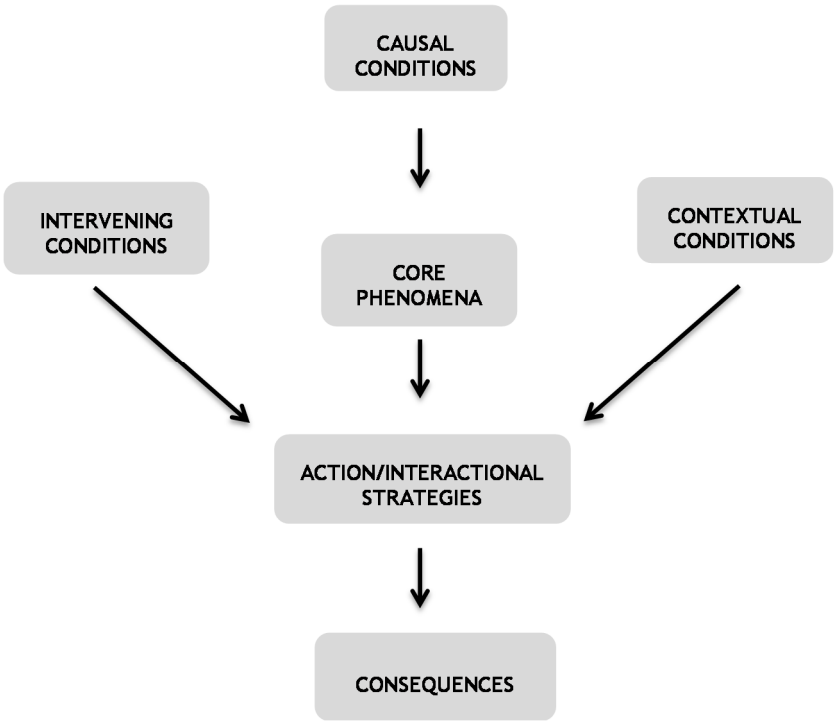

Figure 4-1. Conditions, strategies, consequences and core phenomena in grounded theory axial coding.

The concepts from open coding stage were ordered and grouped in a sequential order as they take place in a cross-cultural design process. Then, seven major categories emerged as core phenomena. *Background Set-Up* was the first of seven core phenomena in the sequential order. Here, how the surrounding categories were organized to form *Background Set-Up* as a core category is introduced as an example (Figure 4-2). The relationships between concepts clustered under each core phenomenon were examined to determine casual, intervening and contextual conditions, strategies and consequences. *Lack of Cultural Competency* concept was recoded as the causal condition which led to occurrence of the core phenomenon *Background Set-Up.* Design teams need background set-up due to lack of cultural competency when they are designing in a cross-cultural context. The contextual conditions were *Cross-Cultural Communication* and *Cultural Contexts Related to the Design Problem.* Design teams need to gather background information about cross-cultural communication before they have in-person contact with the users. They also need to gather background information about the cultural context surrounding the specific design problem to develop their user research questions and strategy. Intervening conditions that relate to cross-cultural communication were *Behavioral Norms* and *Language*. Intervening conditions that relate to the cultural context surrounding the design problems were *Technology*, *Economy a*nd *Demographics.* Strategies used by designers to increase their cultural competency as a background set-up for designing for another culture were *Literature Reviews, Gathering Visual Contextual Information, Reaching Out to Prior Information, Dos and Don'ts List* and *Learning the Basics of Language.* The consequences of using these strategies to develop cultural competency were *Saving Time in the Later Stages of the Design Process* and *Preliminary Grounding for User Research*. This example is only provided

with the aim of illustrating the axial coding process; the concepts emerged from this stage are discussed in detail in Chapter 5.

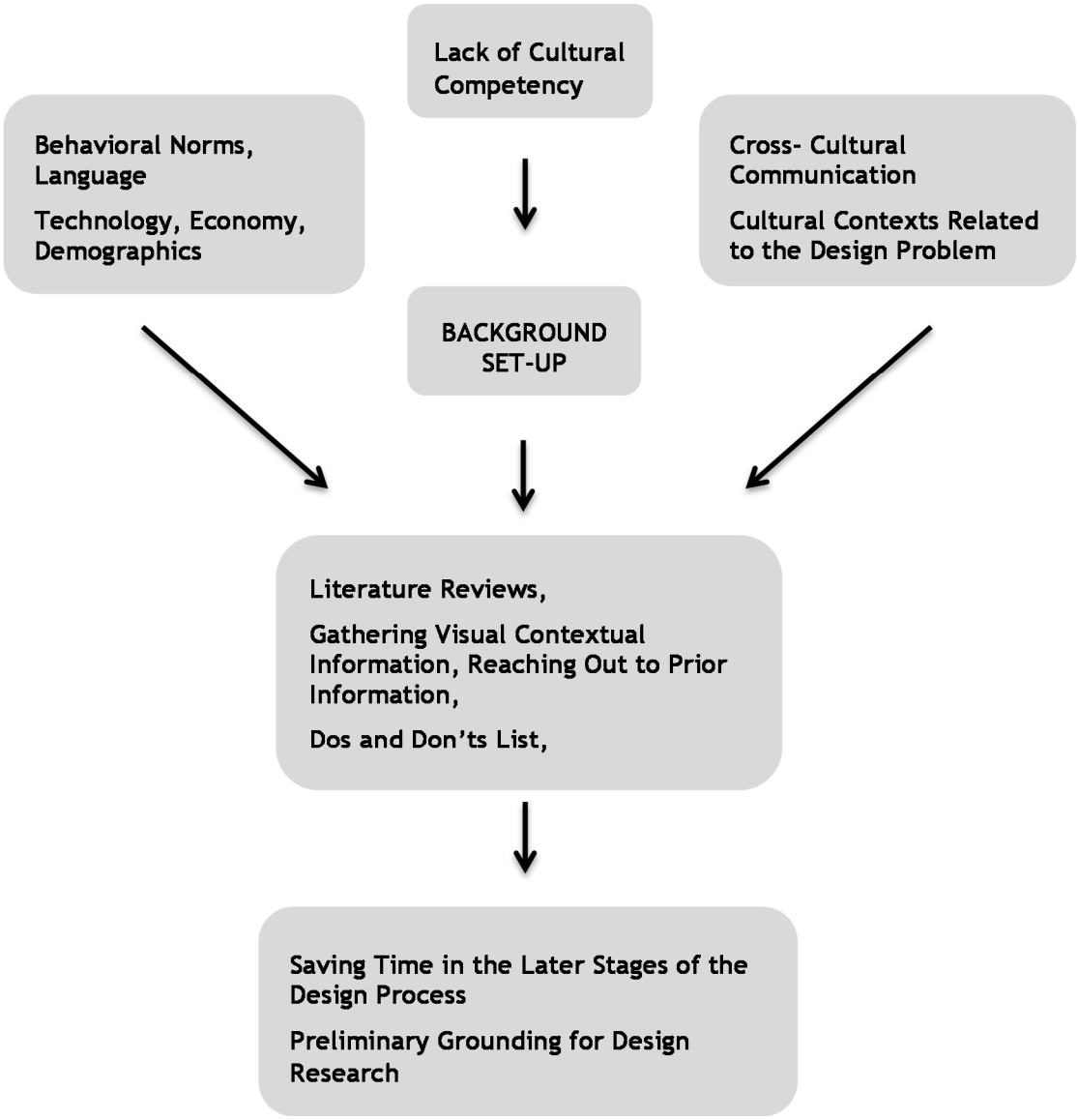

Figure 4-2. Background set-up core category and the surrounding conditions, strategies and consequences.

Using the same process as stated in the above example, seven core phenomena were developed: Background Set-Up, Presupposition Awareness, Access, Cultural Immersion, Reflective Integration, Co-design & Implementation, and Evaluation. Table 4-1 lists each core phenomenon, the conditions, strategies and consequences clustered under each phenomenon.

Table 4-1

List of Seven Core Phenomena and the Surrounding Conditions, Strategies and Consequences

Core Phenomenon: BACKGROUND SET-UP	**Causal Conditions**	Lack of cultural competency
	Contextual Conditions	Cross-Cultural Communication Cultural contexts related to design problem
	Intervening Conditions	Behavioral norms, Language, Religion, Technology, Economy, Demographics
	Strategies	Literature review Gathering visual contextual information Reaching out to prior information Dos and Don'ts List Learning the basics of Language
	Consequences	Preliminary grounding for cultural immersion stage
Core Phenomenon: PRESUPPOSITION AWARENESS	**Causal Conditions**	Preconceived judgments of culture
	Contextual Conditions	Risk of Ethnocentrism Cultural Imposition
	Intervening Conditions	Assumptions Stereotypes Prejudices
	Strategies	Keeping a log of presuppositions
	Consequences	Avoiding perceptual filter at reflective integration stage
Core Phenomenon: ACCESS	**Causal Conditions**	Building Organizational Individual Networks
	Contextual Conditions	Differing Cultural Roles and Norms
	Intervening Conditions	Recruitment Agencies Local Universities and Organizations Cultural Leaders Incentives

		Dress Codes Gender Roles Selection of Professional Gear Multi-cultural, Multi-Disciplinary Teams Number of Team Members
	Strategies	Finding Cultural Broker Building Strategic Design Teams
	Consequences	Saving time in cultural immersion stage
Core Phenomenon: CULTURAL IMMERSION	**Causal Conditions**	Physical or remote exposure of designer in users environment
	Contextual Conditions	In-person user research Immersive Observation Engaging Interviews Participatory Research Culture Specific Research
		Remote User Research Cultural Probes
	Intervening Conditions	Building Relationship Role Negotiation Otherness Factor Communication and Language Need for more time Cost Health and Safety
		Bureaucratic Procedure Safety of Data Communication Limited ability or understanding of users
	Strategies	Personal Demeanor Learning Basic Language &Gestures Selection of research methods Communicating the role of designer and design Educating Interpreter Emphasis on Observation Changing mode of communication from verbal to visual Culturally appropriate gestures Involving users in the research Constant Debriefing Multiple researcher in the field
		Flexibility Consideration of Context Pilot testing
	Consequences	In-depth understating of users and cultural context

Core Phenomenon: REFLECTIVE INTEGRATION	**Causal Conditions**	Analysis of research data from cultural immersion stage
	Contextual Conditions	Visual display of research results
	Intervening Conditions	Perceptual Filter Missing Contextual Information Environmental Contexts Socio-Cultural Contexts Technological Contexts Economic Contexts Lack of Stationary Physical Space Difficulty of communicating design insights to stakeholders
	Strategies	Self-Critical Awareness Empathic Skills Dramaturgical Methods Systems Thinking and Identification of Contexts Integrative Visuals and Videos
	Consequences	Culturally relevant design insights
Core Phenomenon: CO-DESIGN AND IMPLEMENTATION	**Causal Conditions**	Developing design ideas based on design insights from reflective integration stage
	Contextual Conditions	Direct user involvement in design Indirect user involvement in design
	Intervening Conditions	Aesthetic Bias Cultural Human factors Communicating design ideas to users Limited Ability and Understanding of Users
	Strategies	Iterative Prototyping Generating Inspiration Boards
	Consequences	Culturally Relevant Products
Core Phenomenon: EVALUATION	**Causal Conditions**	Evaluating new products in the new market
	Contextual Conditions	Outsider perspective
	Intervening Conditions	Local competition Cost effectiveness Distribution
	Strategies	Flexible design
	Consequences	Products sustainable over time

Selective Coding

Selective coding is the process of “integrating and refining the theory” (Strauss & Corbin, 1998; p.143). Data are transformed into a theoretical framework at this stage as a result of immersion in data over time. Propositions of the theoretical framework and the theoretical model are developed at this stage. Propositions are statements of interrelation which tell the story of the theoretical framework in a narrative format. The theoretical model is the visual representation of this story.

In selective coding, building the storyline of the theoretical framework required standing back and reading all the data including all the interview transcriptions, codes from open and axial coding stages, memos and annotations in a general sense. As a result, seven core phenomena from axial coding were categorized in two phases namely pre-design and design according to the order they take place in the process of designing for another culture (Table 4-2).

Table 4-2

Grouping of Seven Core Phenomena into Pre-Design and Design Phases

Pre-Design Phase
Background Set-Up
Presupposition Awareness
Access
Design Phase
Cultural Immersion
Reflective Integration
Co-design and Implementation
Evaluation

Next, the theoretical models that visually displayed the process emerged from coding was developed. The theoretical model went through two iterations before the final version was created as a result of reflecting on the findings over time. In the first version the process of designing for another culture was broken into two cycles as pre-design and design and the flow from one stage to the next (one core phenomenon to the next) was displayed (Figure 4-3).

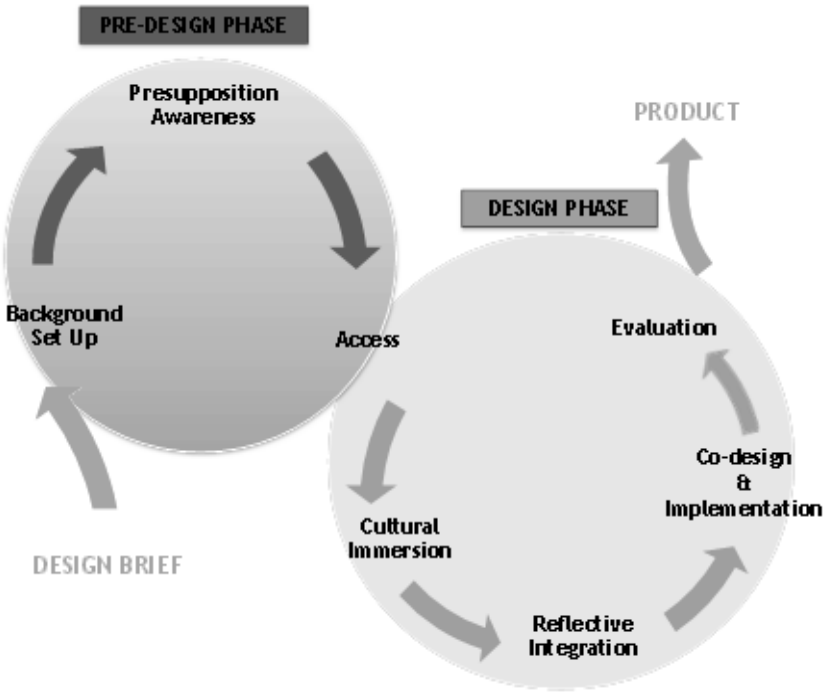

Figure 4-3. Theoretical visual model iteration 1.

In the final version, the dual structure of the model featuring the process as composed of predesign and design phases stayed the same but the relationship between seven core phenomena have changed (Figure 4-4). In the final version of the model, the metaphor of two meshing gears transmitting rotational motion to each other was used to display interconnectedness of the two stages Background Set-Up and Presupposition Awareness. Access is the connector stage where design teams move from pre-design to design phase. Color coding was used to visually display transitioning the two phases of pre-design and design. Black font and light gray arrows and gears displayed the pre-design stages of background set-up, presupposition awareness and access. Light gray font and black arrows and gears displayed the design phase stages of cultural immersion, reflective integration, co-design and implementation, and evaluation. The

metaphor of meshing gears was again used to display the interconnected relationship between cultural immersion, reflective integration, co-design and implementation stages. Finally the trio of cultural immersion, reflective integration and co-design and implementation leads to a final design idea, a working prototype or a manufactured end product which should be evaluated. The outcome of the final evaluation phase is the end product.

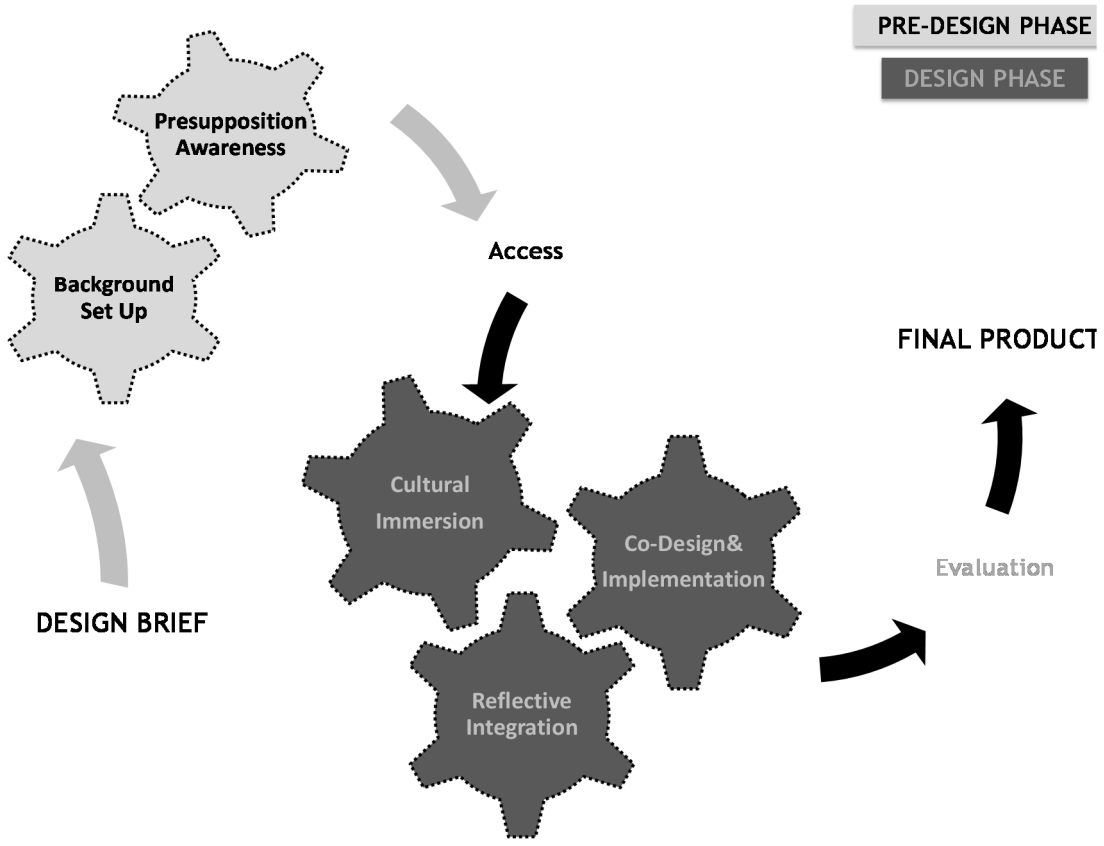

Figure 4-4. Theoretical visual model iteration 2: Final visual model for culture-centered design process.

NVivo software embeds the codes into the transcribed text and thus it enables searching the coded transcriptions for quantitative data such as code frequencies. However

grounded theory is concerned with conceptualization rather than quantification and often the two processes are held mutually exclusive. Therefore, the results emerged from analysis of data are supported with in depth discussion of concepts, and its relation to literature, and quotes from interviews in Chapter 5. In the following section the framework of the process of designing for another culture is introduced briefly.

Culture-Centered Design Process

Pre-Design

The pre-design is the very first cyclical phase where the design team prepares itself to design for a different culture and takes several precautions that will ease the design process in the future stages. Pre-design is the preparation phase where design teams take precautions related to the challenges of designing for another culture and develop the design strategy accordingly. Getting out of the comfort zone and embracing the fact that cross-cultural contexts may bring extra ambiguity and complexity in the design process are necessary for designers prior to the project. Pre-design prepares designers to get out of their comfort zones and ground the design phase. No design decisions are made at this stage. The pre-design phase is composed of three stages: background set-up; presupposition awareness; the transition stage of access.

Background Set-Up

Background set-up is the preliminary data collection stage which grounds the actual user research. In the background set-up, design teams employ secondary research on the culture and the design problem for two reasons:

1. The cultural difference between designer and the user may challenge the communication process. Thus, designers should be prepared to understand the accepted norms of behavior and communication prior to meeting the users in-person during the design phase.

2. Design teams need to develop a general understanding of the cultural dynamics surrounding the design problem to develop their user research strategy and their research questions which will guide the cultural immersion stage in design phase.

The background set-up can also be helpful in bringing out the assumptions and stereotypes a designer may have about the other culture and thus highlight the next step which is presupposition awareness.

Presupposition Awareness

Background set-up and presupposition processes are two stages that take place in parallel and reproduce each other. Similar to background set up, presupposition awareness stage also helps to increase cultural competency of design teams and prepares them for the cross-cultural design process. The process of designing for another culture requires addressing and withholding cultural bias in the form of stereotypical judgments, assumptions and prejudices as much as possible. Presupposition awareness stage is where designers address any pre-conceived judgments they might have about the culture and the design problem.

Access

In the access stage, design teams move from pre-design phase to design phase by finding access into the other culture. Finding access refers to developing the individual and organizational networks and relationships which will link the design team with the users in the other culture during user research. Finding access into the other culture is a two-step procedure. First, design teams need to find the ways to reach out to the end-user, and then they need to develop strategic research teams who will be welcomed by these users. So, the first step is to find access into the user population at a general level and then the second step is finding the personal level of access into individual user's environment and their experiential contexts.

Design Phase

The design phase is composed of the trio of cultural immersion, reflective integration, co-design and implementation, and the evaluation stages. Although generic user-centered design process also suggests that the design process is iterative and none of the stages take place in a vacuum, there is stronger emphasis on the iterative and reproductive nature of between cultural immersion, reflective integration and co-design and evaluation stages when designing for another culture.

Cultural Immersion

The first step of the design phase is the cultural immersion. Cultural immersion in design refers to designers' individual exposure to persons or groups markedly different in culture from that of the designers. Cultural immersion stage refers to user research

where designers immerse themselves in the other culture in-person or remotely using different types of data collection methods.

Reflective Integration

Reflective integration stage is about analyzing and synthesizing user research data from cultural immersion stage and turning them into design insights. After the cultural immersion stage is completed, design teams need to reflect on the research results rather than reacting to them. Products are designed based on the interpretation of the data gathered from cultural immersion stage. The data is interpreted through a chain reflective integration and reasoning. The design teams move from the observed fact and integrate similar observations with reflective reasoning and create a number of hypotheses and a focus. Design teams should be able to see the breadth of data, determine patterns and details in the data without losing variation and meaning from the perspective of multiple cultural contexts such as such as socio-cultural, environmental, technological and economic contexts around a design problem.

Co-Design and Implementation

Co-design and implementation stage is where designerly skills of creativity, 2D and 3D visual communication are used to move from a design insight into products. In co-design and implementation stage the design team develops preliminary ideas and implements these ideas into a final product together with users.

Cultural immersion, reflective integration, co-design and implementation stages should almost take place parallel to each other through iterative cycles. None of these stages

takes place independent from each other. The design team should update cultural immersion strategy and tools as they reflect on what they find. Design teams should allow time to reflect upon and integrate the data collected from cultural immersion and move on to the next step of data collection based on these results. Similarly design ideas should be tested with the users and the design team should reflect on the feedback and gather more data if necessary. These stages require divergent and convergent thinking skills, embracing improvisation, putting things together and taking them apart until a final design solution is created.

Evaluation

Evaluation stage refers to factors of competition, distribution, cost effectiveness and the ongoing redesign and development of a product after it is in the market in another cultural context based on the market feedback and emerging conditions.

Summary

This chapter described the three levels coding process and the emergence of culture-centered design process framework and visual model. The coding of interview transcriptions was done using NVivo software. In open coding interview transcripts are coded line by line to form the concepts. In axial coding the concepts were grouped as conditions, strategies and consequences under seven core phenomena or core categories. Then, these core categories are organized into pre-design and design phases based on the order they take place in a cross-cultural design process. Background set-up is the first stage of pre-design phase where designer build cultural

competency to minimize challenges of cross-cultural communication in later stages of the design phase. Background set-up stage is interconnected to the presupposition awareness because designers build awareness of their assumptions and biases about another culture as they develop their cultural competency with background research. Access stage connects pre-design phase to the design phase. At this stage designers develop personal and organizational networks and strategies to gain access to the user populations in another culture. The design phase starts with cultural immersion stage. Cultural immersion refers to personal or remote exposure of designers to users' cultural contexts to collect data on user needs with interviews, observations or other methods. At the reflective integration stage designers build design insights based on the data from cultural immersion stage. Co-design and implementation stage is where design insights are translated into product ideas. In cross-cultural design contexts there is strong emphasis on the iterative nature of cultural immersion, reflective integration, co-design and implementation stages. Designers need to constantly reflect on the data from cultural immersion, update research strategy and methods. It is also important to test design ideas and gather feedback constantly and iterate back to cultural immersion or reflective integration stages when necessary. The final evaluation stage is about ongoing consideration of local competition and local distribution channels when the product is launched in the market.

CHAPTER 5: CULTURE-CENTERED DESIGN PROCESS

Introduction

The three levels of coding process yielded the theoretical model which displays the process of culture-centered design (Figure 5-1). The culture-centered design process is composed of two iterative cycles of pre-design phase and design phase. Background set-up and presupposition awareness are the two intertwined steps of the pre-design phase. Access is the transition stage that links the pre-design phase to the design phase. Then, the design phase is composed of the trio of cultural immersion, reflective integration, co-design and implementation steps and the evaluation step.

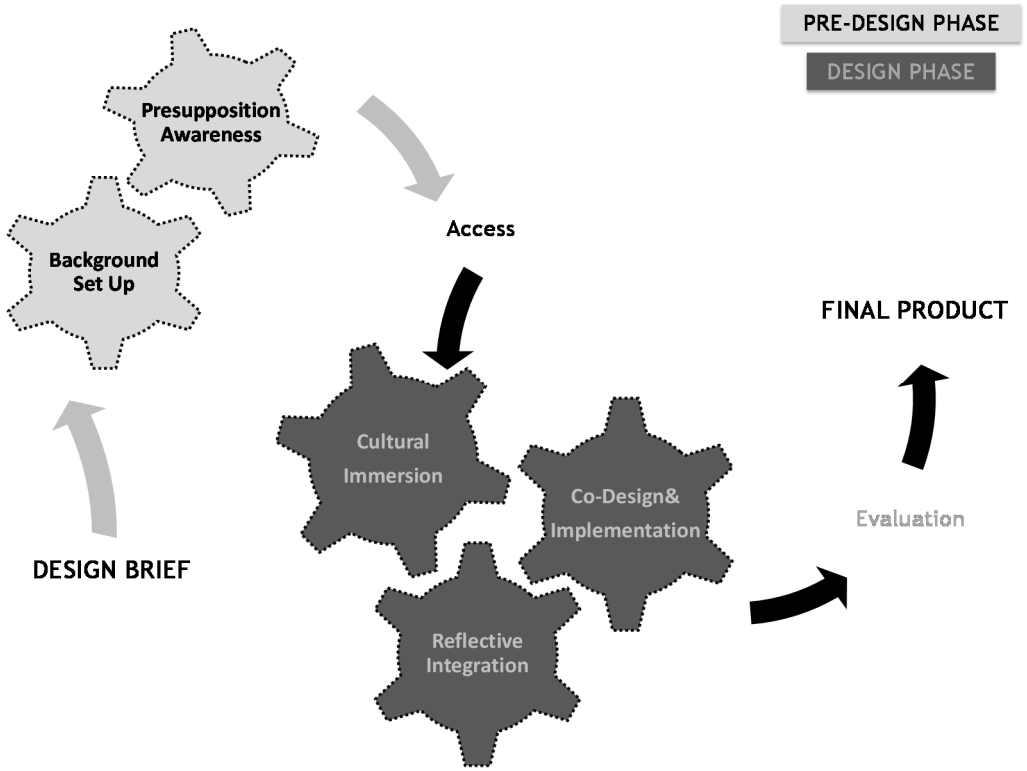

Figure 5-1. Culture-centered design process.

This chapter introduces and discusses the culture-centered design process framework which points out the challenges of designing for another culture, and the strategies to overcome them. Figure 5-2 displays the possible challenges and strategies in different stages of the culture-centered design process emerged from the analysis of the data. The attention sign signifies the challenges at each stage of the design process and the checkmark sign signifies the suggested strategies.

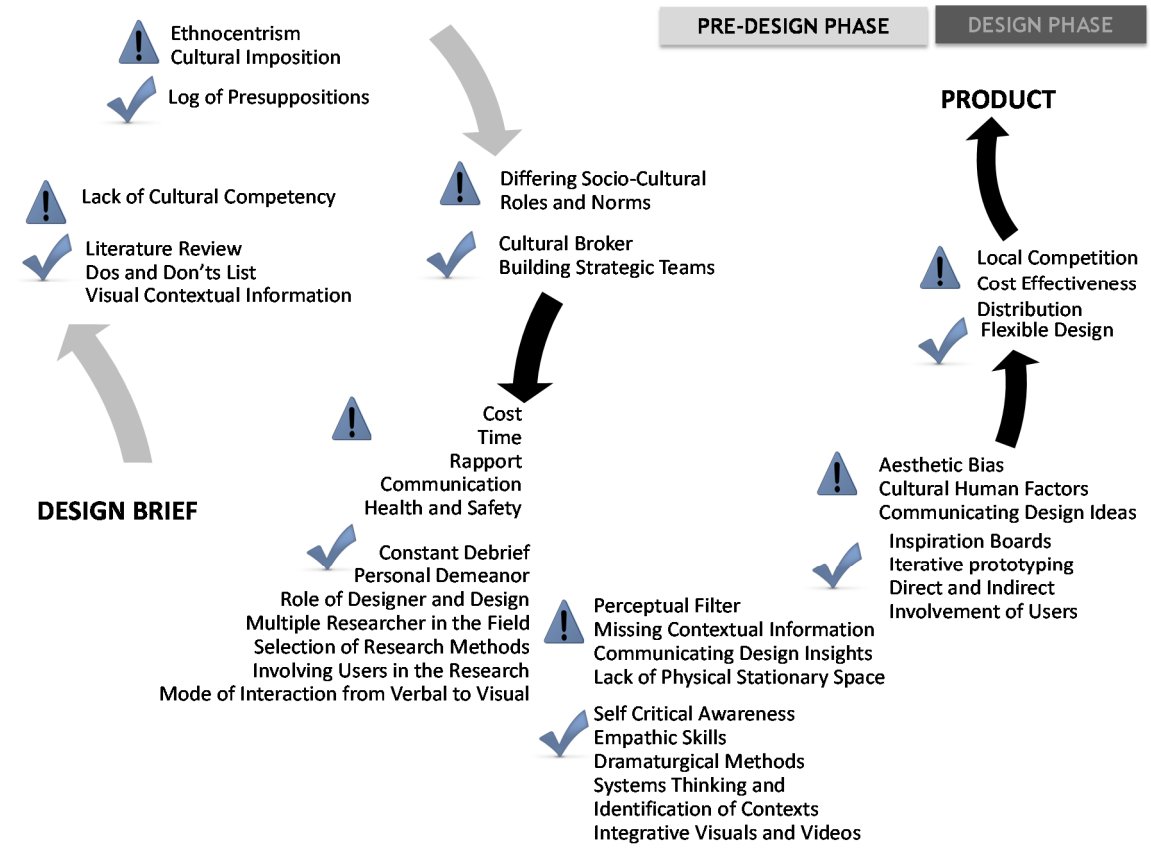

Figure 5-2. Brief summary of challenges and strategies of culture-centered design process.

This chapter also discusses and further explains the culture-centered design process by highlighting the major concepts resulting from the analysis of interviews. The major themes resulted from coding and listed in the previous Chapter 4 are written in bold for easier recognition. Relevant literature is referred in discussion to compare and contrast the resulting framework with the existing knowledge.

Pre-Design Phase

In designing, designers not only need to embrace the “wicked” design problems but also the ambiguous and iterative design process which usually does not have an exact anticipated end point. The design process becomes even more ambiguous and uncomfortable when it takes place in cross-cultural contexts according to the interviewees. A Canadian designer explains how she felt about designing in Rwanda as follows:

“It can feel that you are going in a very long and random circular route than maybe what you are comfortable with or normally do” (K.P.)

Designing for another culture requires prior preparation before any design activity. The pre-design phase helps the designers to take precautions about the challenges that are likely to appear once the design phase starts. All 20 interviewees indicated that they go through preparation and planning before they start the actual design phase. The planning defined by interviewees was coded under three main categories of background set-up, presupposition awareness and access.

Background Set-up

Interviewees all reported that they gather background information and conduct different types of research as a preparation to design in an unfamiliar cultural context. The information collected at this stage helps to minimize the challenges of cross-cultural communication in the design phase and provides a preliminary understanding of the cultural context as it relates to the design project. Interviews also validated the importance of collecting background information about the culture before starting the design phase. A designer who designs for Chinese culture explained:

"…It gets you little warmed up with the users whose homes you are going to go when you walk into their home as a total stranger and say I come to spend three hours with you and I want to know everything about your life…" (A. K.)

Failure to collect background information in advance of the design phase is likely to lead to a waste of time as the team spends time out in the field to gather the already available data. However, at the same time it should be acknowledged that background set-up yields mostly superficial knowledge and thus design teams should refrain from jumping to conclusions or developing design ideas based on this knowledge. De Angeli, Athavankar, Joshi, Coventry and Johnson (2004) describe their background research process as British designers who conducted design research about the use of ATMs in India. According to the authors' experience although literature reviewed on the culture and consulting with Indian peers were helpful in initiating the project, it was "superficial knowledge". Thus, design teams should keep in mind that the background set-up stage is necessary to start the design project, to take precautions for possible future

challenges, and to increase the cultural competency of the designers, but the knowledge gained at this stage should not supersede the data gathered from cultural immersion.

Interviewees also described the danger of **relying on the data gathered from background set-up** stage to develop the product. Below are representative quotes from interviewees' experiences in different cultural contexts:

"…you never know if you are right because you always have to assume... Even the market statistics, they don't tell you whether you are right or wrong, they don't compare culture, they compare numbers, they wouldn't tell you why these numbers came out… "(A. L.)

" I have my team go out and do their own research which is basically web based because our clients are generally not local, and try to get information on the user. Even though my team gets lots of fantastic information, so you get great statistics about such as poverty is on the decrease, people are getting more job, lots of people own air conditioners. This type of information really gives you a sense of India, yet it is really nonsense because my team has never been to India or they aren't grown up there, they don't get a sense of the fact that someone who has an air conditioner still has never owned a land line in their lives or is still riding a bicycle to work. It is these disparities that you would never connect." (A. K.)

"We definitely, did a lot of world bank research, just got the raw statistics, on the percentage of the population living off grid, how much money they were spending per year on kerosene use, buying batteries. We wanted to have a strong background in everything we could read about before we went over there. But, didn't want to just accept them as facts or truth, we actually wanted to verify them by talking with the users, So, for example, we had statistics in our head, that, which is a world bank statistic, a family spends over 30% of their income on kerosene which was huge. And, so what we did, to basically corroborate that, was to go around to 7 different villages and did mass surveys and instead of asking the question, how much, what percentage of your income do you spend on kerosene? which no one is going to be able to answer right off head? we asked them, ' How much do you spend on kerosene a week? How many kerosene lanterns do you have?' And, did the math from there. We definitely did a lot of research beforehand, but we wanted to make sure we're verifying our research over there." (L. S.)

Challenges & Strategies

Challenge: Cultural Competency

Strategies: Literature Review, Gathering Visual Contextual Information, Reaching out to Prior Information, Dos and Don'ts List, Learning the Basic of Language

Background set-up stage addresses the challenge of **cultural competency**. Cultural competency refers to one's ability to interact with another culture. The main premises of cultural competency are cultural awareness, cultural knowledge, cultural skill, cultural encounters and cultural desire (Campinha-Bacote, 2002). Increasing one's cultural competency requires cultural awareness about biases that may arise from one's own culture. This concept is discussed in detail in the forthcoming section of "Presupposition Awareness". Cultural skill refers to the ability to learn and apply culture-specific professional knowledge. Cultural encounters refer to the presence of a process that encourages cross-cultural interaction. Cultural desire is about an individual's motivation for interacting with other cultures. Finally, cultural knowledge is the process of seeking and obtaining a sound educational foundation about the other culture. According to Lonner (1997) to increase cultural competency, cultural knowledge can be gained in three ways: by experiencing the other culture or simply by being there; participating in formal education and by academic discourse; researching available literature on the other culture.

Interviewees described the process of background set-up taking up to a week where they gather two types of readily available data in the literature:

1. **Cultural data specific to design problem**

2. **Cultural data specific to communication**

Cultural data specific to design problem refers to developing the basic understanding of the other culture from the perspective of the design problem. For example, conducting research on eating habits of Chinese people can be cultural data specific to a design problem if a design team is working on a design project on rice cookers. With cultural data specific to communication the team develops an understanding of the norms of behavior such as greeting and thanking to people, the values of the other culture, and the basics of the other culture's language to start and probe communication.

A Norwegian designer explained how his design team gathered both types of data:

"…we have project program partners in Guatemala and Uganda which are the universities, the local university at which we have continuous contact with. So that makes up an ongoing research on learning the culture, the business culture and how you do things and get to know the country. So you can say it's sort of an ongoing preparation and to learn how things work in Guatemala and then how to overcome the cultural hinders that move us out of the project. All the designers that go to work in Uganda and Guatemala in the project, they also do a three week culture course with FK Norway, which is an organization that works with exchange of people between south and north on how to handle different cultures, how to be open minded and how to interpret communication, customs, socializing, diseases, politics, everything." (K. L.)

An American designer who is experienced in cross-cultural design contexts including India, Africa and South America also described the two faceted background data collection:

"We prepare our different facets, so there is cultural preparation, there is also kind of like data preparation to make such a trip until we know very concrete objectives and what we want to get out of it. In terms of cultural preparation, we are very fortunate that most of the places we work are places actually where we have been, but nonetheless, I usually do historical readings and

historical meaning for the last 20 years, not too far back, far enough that I might understand some of the things maybe I am not supposed to talk about or maybe sensitive issues in politics for example that I may not want to mention while I am on the ground. We also do more superficial things like watching movies or read a book that is written by an author from the country that we are visiting, we try to learn some basic language such as at least like 'how are you', 'thank you'." (H. F.)

By increasing cultural competency and gathering data specific to the design problem and culture, the design team will be confident during cultural immersion, gather more in-depth user data and save time. A French designer shared his experience about failure to collect background information on Chinese culture and limited cultural competency before moving onto the design phase:

"Another interesting challenge is the cultural, social and religious rules you must to be aware of before you do any interview in foreign country. Like the manners and rules to follow inside a Chinese house… I have a personal experience, it was during a family interview and as a gift to thank to the wife of the house in welcoming me for this interview I gave her a bunch of flowers (it's maybe my French cultural background)… She was very uncomfortable, because it's not good to offer flowers to a married woman when you are not the husband." (N. H.)

Interviewees defined their methods and strategies to increase cultural competency: conducting literature research; gathering statistics; demographic information; watching videos and documentaries to capture the general cultural context visually; reaching out for prior experience and gathering strategic data; developing a Dos and Don'ts list; and learning basic language.

Literature review of academic papers, demographic information, government statistics and annual reports can all provide prior insight into the design problem and can help to develop research questions which will guide data collection. Maps and transportation

information are relevant data that should be collected if the design team conducts the design research in the other culture.

Gathering visual contextual information through video documentaries and photos can both provide helpful insight for the design problem and cross-cultural communication. An American designer preparing for design projects in India and Tanzania explains the importance of watching videos at this stage:

"We were able to get our hands on a documentary…video is a huge help, because you can completely ignore what they are talking about in the documentary and just take little snippets of what they are actually doing…But yeah, video is a huge help. A very big help. And believe it or not, YouTube…In the Tanzania project, they had taken trips to Africa before. And there were oodles of video; particularly of their mockup carts in use and of the women transporting the water. And, you know, even if while you're taking the video you are thinking one thing, you're completely oblivious to some of the situations there, watching the video again there could be a million things that you didn't see before." (C. A.)

Multiple designers explained that they gather photos through contacts in the local culture and to develop a general understanding of the cultural context.

"I tried familiarize myself to the reality of the ground as best as I could, I haven't been to India but I definitely had contacts there and friends who have been there so I did a lot of talking with them and used my own research to try to get a picture of what is on the ground. Really what I was interested was the precise area, Bangalore where the project was taking place. I had friends staying there and I asked them to send me pictures and explain them to me." (N. W.)

Reaching out to prior information, consulting with peers and colleagues who may have experienced the other cultural context was defined as helpful for both types of data collection purposes by majority of interviewees. Any former experience in the company

and in the design team should be shared prior to starting the design process so as not to start from scratch.

"The preparation really comes from networks obviously, there are people internally. You have a hypothesis of what you know, so you work with that, what are you going to ask, how are you going to approach them, who are you going to approach. You would then try and find people to check that with. Colleagues, designers tend to work in places where there are people from lots of different cultures. If you work in a company like Company N, it's amazing because you have everything at your fingertips. There is even a design center in Bangalore so we really have great people to check things with and obviously any regular research. Google is your friend and go out and find what you know already, any internal market research. Big companies obviously have a lot of buying power and they buy a lot of these big market analyses. So you know, just a lot of homework before you even decide on whom and how to approach." (J. G.)

Developing **Do's and Don'ts list** and learning the language were commonly defined by the interviewees as strategies in addressing cross-cultural communication challenges. Do's and Don'ts List that addresses cultural norms, values, and sensitive issues can be used as behavioral guidelines by the design team at the design phase. The following is an exemplary transcription excerpt about the need for developing an understanding of cultural factors prior to moving onto the design phase:

"I often will draw up a list of dos and don'ts. When you come to somebody's home, in India for example, if there's an elderly person at home, be polite to them first before looking, making eye contact to anybody as the way expected in India. Sort of similar in China also… People don't like the informality that Americans might sometimes have. At the same time the rules that you might have in the U.S., you don't really have in India. So there is a fine balance of informalness-formalness." (A. K.)

Learning the basic of language such as key words, greetings, and learning culturally appropriate gestures will help the design team in building a relationship with users and

encouraging their participation in the design research. Additionally, knowledge of language can allow the design team to look knowledgeable and more interested in the culture and improve the quality of interviews. All 20 Interviewees shared their experiences on the importance of being prepared for the initial cross-cultural communication and role of basic language and greeting gestures. The following two quotes exemplify the role of language and culturally appropriate gestures in design projects in India and Tanzania:

"Anywhere you go; like, a thank you, if you're in Japan, you learn how to bow, if you, are in a culture where you need to greet one person first, like, the head of the family first. In China they're really into business cards. So, again through that process of finding out things from people before hand, you make sure, like I would never carry business cards around, it's not something I do. But, I make sure I have them pinned up, and you have your job title on there and that, there's just a ritual around that, when you first meet somebody. Also, things like how you give, how you hand over money. So, if we pay for an interview. In India, we didn't check this particular thing because we were focused on the interview and we tried to hand people money at the end of the interview and they were grossly offended. By this point we built a rapport, we've been there, we had eaten their food, and that was completely inappropriate. So, we had to stop doing that and just giving them Thank You letters." (J. G.)

The other example:

The first thing that we learned was how to greet people. And very interestingly, there were a lot of different levels of how to greet people based on who you are greeting. For example, the small children in the Masai tribe – you just want to pat them on their head. The old women and this other tribe – you say "Sheek-a-mu." And it was kind of like we've got to memorize who we are greeting and what we say to them and this is how we are going to establish rapport with them. This is how we're going to get them to trust us. If we just know this one tiny word in Swahili or in Masai, or whatever tribe we were working with. So, we prepare ourselves with those small greetings. It just opened up and made the conversation with anyone we were talking to much more comfortable." (L. S.)

Presupposition Awareness

Although design teams should develop a basic understanding of the other culture, at the same time it is necessary to start with a blank page as much as possible in terms of addressing stereotypes, assumptions and prejudices, and acknowledging cultural bias. There is an increased tendency to draw upon self-experience when actually trying to understand and evaluate user's experience in cross-cultural design contexts where the users and designers originate from different cultural backgrounds (Kim, 2003). Presuppositions are preconceived judgments of a group and its members. In other words, it's an evaluation of people simply because they belong to a particular group. Presupposition awareness refers to self-examination of one's own culture and recognition of biases, prejudices, and assumptions about the other culture.

Challenges & Strategies

Challenges: Risk of Ethnocentrism, Cultural Imposition

Strategy: Keeping a Log of Presuppositions

The interviews showed that one of the biggest obstacles designers face is to perceive the design problem from their own cultural perspective or the risk **of ethnocentrism** and **cultural imposition**. Ethnocentrism is defined as the tendency to evaluate people based on assumptions and ideas generating from one's own culture (Faucheux, 1976). Cultural imposition is the tendency of an individual to impose his/her beliefs, values, and patterns of behavior on another culture (Leininger, 1978). A Norwegian designer shared his experience of ethnocentrism challenge during a design project in Africa:

"For example that we design a laptop for a developing country, we don't think of making it out of shiny white ABS plastic which will be scratched and get dirty in two days or maybe we think of applying UV filters so it will not just fall apart in a few days. We think that we need this or that and we specify a specific screen so that you can look at it in bright sunlight on the laptop, for example. However when we get there, we realize that no one will sit in the sun with a laptop. Don't hold guard yourself for something that will not happen." (K. L.)

These challenges emerge even before the design team starts the design project in the form of presuppositions, stereotypes or prejudices. The biases designers have may not become visible before the later stages of the design process, or worse the designer may never be aware that he/she is approaching the design problem based on these presuppositions. Approaching the design problem with presuppositions can challenge development of effective research questions, and reflection on the data gathered from user research. The following example by an American interviewee who designs solar powered lighting in rural Africa, described the risk of designing based on assumptions when they are not addressed before hand:

"…so before we went to Tanzania the first time, we wanted to have at least four or five different prototypes that we wanted to test and we had this huge assumption in our head that families were always around the house. Whether they were cleaning the house, usually the woman, we had this big assumption that the woman was always around the house taking care of the children, cleaning the house or you know doing whatever else a Tanzanian woman does. And because of that, this one product we were designing basically required an adjustment every couple of hours to face towards the sun, and we had rolled that assumption into all these early prototypes. And once we got there we realized: "oh my gosh, these women leave their houses every day and go work in the fields which may be like miles away. They're not by their house every day. Like, why did we ever think that?" (L. S.)

The following exemplary quote describes the challenge of stereotypes:

"…some of the biggest challenges are just getting past knowing what questions to ask, because the design process starts as soon as you ask the first question. So you've almost got to design the process to try and keep kind of agnostic, to keep away from the stereotypes. Stereotypes are very useful, but also you need to understand how powerful those things are. You need know which assumptions you need to challenge, or are not true, or are true or that need to be amplified. For me it's always, to stop jumping to conclusions." (J. B.)

According to Deasy (2003) the antidote of assumptive thinking is to constantly look out for the assumptions that may be built into the design process. The finding from interviews also supported this view. Interviewees defined strategies about how to make these implicit presuppositions explicit before starting the design process. Writing down preliminary hypothesis and **keeping a log of presuppositions**, stereotypes, and prejudice about the culture before starting the design project was a common strategy:

"We do something called assumption breaker, which is just a posted exercise. I ask people to dump their ideas on a large white board, everything that is on their mind regarding the project brief, I get the most hilarious and the sometimes the great stuff. I was working in India for a client about what the next generation of AC should be in people's homes who already have two small ACs. So we were talking about people who have enough money to run 2 ACs, which means that they have decent electricity, they must make enough money so it means middle income. Despite the brief and the secondary research, my team was still saying things like 'what do we expect when we go to India, men with swords, dead cows on the street', this kind of stuff. I was glad they said that because it is good to clear your mind from all kinds of subjective, objective thoughts. Some of the stuff they said were true and some of them were rubbish because men with swords while they exist they have nothing to do with this consumer group." (A. K.)

" …we literally made this little... we called it a "chi-chi" need finding book, where we made a bunch of hypotheses in the beginning about what we thought we were going to see, and basically a list of energy questions we could ask the consumers about these different aspects, and then go from there. Where we just wrote down all the things we thought we were going to encounter, all the questions we wanted to get answered for each of those needs." (L. S.)

The background set-up stage and conducting secondary research also feed into creating awareness of presuppositions. Especially if the design team is not familiar with the environment, collecting visual data and watching available videos on the other culture can help to break assumptions by viewing their reality prior to actually experiencing it. Role playing exercises among the design team by creating scenarios around this list of stereotypes can also increase awareness and alertness of designers towards these biases.

Literature suggests that cultural desire or the “motivation of, to want to, rather than have to” is important in the process of becoming culturally competent and increasing presupposition awareness. Cultural desire involves a genuine passion to be open and flexible with others, to accept differences and build on similarities, and to be willing to learn from others, to respect and empathize with the other culture (Campinha-Bacote, 2002; Lonner & Hayes, 2004).

Access

In access stage design teams move from pre-design phase to design phase and develop networks and strategies which will link them with users in the other culture. Designers build organizational and personal relationships to find access in users’ experiential contexts to conduct design research in cultural immersion stage.

Setting participant criteria to determine who to talk to and the sample size is an important decision in finding access into the culture. According to Beebe (1995) it is important to differentiate between “key informants” and “individual respondents”. Key

informants are individuals with in-depth knowledge, who can provide a broader perspective and information about the behaviors of others. Individual respondents are purposefully selected for diversity and they are observed or interviewed for their own knowledge, experience and behavior rather than what they think about the others.

Interviewees pointed out the importance of maintaining an attitude of diversity and going for all users, i.e. extreme users, secondary users, average users. The following is an example from a design project in India:

"…It was Company N that had asked my team to understand what could they possibly play in the space of like small mobile laptops and so on and if they made them really cheap, would even India be the right market for it, for example. And before we went out there, we had to do an awful lot of preparation in terms of getting an understanding of how technology is used by which groups. I mean obviously if you go to very wealthy, very highly educated families and go and talk to them it's going to be not that far away from what you and I know already. But then you can get the other extreme which might be a slum in India which are illegally hooked up to electricity networks. So you have to decide who you are going to talk to and why." (J. G.)

Challenges & Strategies

Challenges: Building Organizational and Personal Networks

Strategy: Cultural Broker

Building organizational and personal networks in an unfamiliar culture is a challenge for designers. They need to build relationship in order to find access in users' environments and understand their needs, aspirations and limitations. Designers explained the main strategy in finding access into another culture as having a **cultural broker**. Jezewski and Sotnik (2001) defined culture broking as "the act of bridging, linking or mediating between groups or persons of differing cultural backgrounds for the

purpose of reducing conflict or producing change". Usually the culture broker is from one or the other of the cultures but could be from a third group. They are often capable of acting in both directions. In a cross-cultural context finding access can be more challenging since designers and users cannot communicate in a common language most of the time. Although an important attribute of cultural broker is to act as an interpreter between both languages, the role covers more than that. The cultural broker should have access to a wide range of people and be able to direct the design team to user groups and environments where interesting behaviors related to the design problem are likely to be observed. They should be able to help the design teams to reduce design research time by pointing out where and when to look for which type of information.

The interviewees provided examples of cultural brokers which changed from recruitment agencies, cultural leaders to local universities and organizations. In Asian countries the common practice was defined as hiring a **recruitment agency** to act as a cultural broker. In this case, agencies recruit participants for design research and **incentives** are given to the individuals in return. It is the agencies' responsibility to negotiate the communication process between two parties.

For more rural cultures such as in Africa, giving incentives to access the culture may not work. Interviewees emphasized the importance of understanding the **leadership roles** in the culture and first access those leaders so that they can convince the community to participate in the design research. An Australian designer, designing a stove for rural Uganda, explained the challenges she experienced as follows:

"…when I was working in rural Uganda I needed to organize a workshop for the local villagers. I simply put posters up around the village and told everyone I ran into. On the day of the workshop no-one turned up. I couldn't understand why. I later found out that the process I went through to mobilize the people was all wrong. I used what I knew worked in my culture. But in this village I needed to inform the council speaker, who would then inform the village elders, who would then mobilize the people." (L. W.)

Another example provided by an American designer in Africa:

"We always went through basically the chief of the village. I don't know the exact name. Basically, we sat down with him in his office, told them, him or her, what we were doing. We got a signed formal letter from them saying, this is why these men and women, these people, are in your village trying to talk to you" (L. S.)

Interviewees pointed out the importance of **local universities and organizations** in finding access to another culture. Individuals from local institutions not only provide an insider perspective and decrease the risk of ethnocentrism, but also help the design team build better relationships with the users. Four designers described that they would include local university students from fields of design or social sciences to help them throughout the data collection process. Two examples are provided below:

"We were looking at consumers who live in really low income communities in India, make less than a dollar a day, to understand their way of life and come up with innovations that would benefit them. It's a big problem because we got lots of information off the web. I didn't dare go into some areas doing research because I realized – I didn't have the – how do you behave in a place like that? You dress like this? you know, -- I know this is wrong. I would dress in Indian clothes, but I don't know how to behave and my English doesn't sound very Indian. It would have been a mess. So in that situation what we did was, instead of being a cowboy and going in there and saying yes, I'm going to do it, we instead worked with master's students of a social work program. Because these students, really, this is what they do. They spend a lot of their time in

places like this, informing women about sex education; children about education, jobs, all of that stuff. So we worked closely with them to help us understand social issues." (A. K.)

"The biggest savior is having local guides so we've often hired students from the place and they will help with everything from recruiting to giving you a nudge and saying you can't say that or you can't stand like that or things that you wouldn't even expect. We were just taking pictures and there was a notebook on the floor, our own notebooks, I mean honestly just for sketches. J.C. and we were together in India. He was taking pictures, and he put his foot on the book and pushed the book away and everyone in the room just sort of stopped and gasped and we were like, what did we do wrong? But books are sacred in India; you can't touch it with your foot. So just small things like that you do need to be so careful and there's just no way of doing it without a local guide. I really think they're everything. We wouldn't get to where we get to without them." (J. G.)

Challenges: Differing Cultural Roles and Norms,

Strategy: Building Strategic Design Teams

Differing cultural roles and norms such as gender roles and dress norms can challenge design teams in finding access in user's environments. Hence, **building strategic design teams** in cross-cultural design processes is very important for designers to be welcomed by users in cultural immersion stage.

Gender roles refer to the set of social and behavioral norms that are considered to be socially appropriate for individuals of a specific sex in the context of a specific culture, which differ widely between cultures and over time. Especially in feminine cultures such as Asian countries where people value relationships and quality of life, it is important to employ female designers on the design research team (Hofstede, 1991). There were a number of examples where gender roles created challenges in finding access to the

users in different design contexts. A Norwegian designer explained how they structured research teams in a project in China:

"…We were very strategic when it comes to the (research) groups; we never went like if there was a man in the group we ensured that there are two women, especially if the man was a foreigner… People don't want to let like three foreign guys in their flat which I can understand. So, we went with two women, one from Hong Kong, and one Chinese mainlander or one foreign woman or man. Of course we were asking questions as well but we were more a little bit in the background. I think most people do not really want to have strangers in their homes." (C. K.)

The following two examples are from different design projects in India described by two interviewees:

"… we were going to see more middle class families, usually the male, the husband, was out working. So there would be the mother, and especially if there was no son, there were just daughters around, I would always be there and I would probably conduct the interviews as well because if the husband comes home and finds, you know, their wife or their daughter with a strange man in the house that can destroy their reputation. So we just have to be really careful about navigating these things" (J. G.)

"… a baby incubator for a low birth weight babies which is like a sleeping bag that has wax in it, that keeps the body temperature... But they had a lot of trouble with having a male interviewer talking to these mums about these very sensitive issues about birth and children and nursing. It was really interesting that once the male interviewer left the hut or whoever they're talking to, and just the females are left, the interviewee just opened up." (L. S.)

In some other contexts it is advised to include both men and female team members, such as the following examples provided by another Norwegian interviewee and an American interviewee designing in Africa and India where male users were intimidated by being approached by a Western female designer:

"…if you are a women it can be a gender issues which means that men will not be honest with you because they might not have respect for you or that they might be intimidated because they think it is difficult to talk to a women or may be a white woman which it can be very distractive." (K. L.)

"… whenever I travel to rural India I always have to bring a male with me to give focal point for dialog cause I think a lot of people prefer to answer my male counterpart as opposed to me. He would ask the question for me something like that and we just try to collect information and also it also works for disadvantage, one time we went to interview some women at their house, at that time it was almost like a disadvantage to have my male counterpart with me, we had to wait until the father came home before he could enter the house. So, it is something that we are very conscientious about. "(H. F.)

Dress codes are an important element of finding the personal level of access to the user group. The design team should consider norms of modesty in dress prior to moving into design phase so as not to offend the users whose environment they will go to. The following quotes illustrate the importance of setting up dress codes in building the design research teams in Africa and India:

"… we have had projects where the collaboration didn't work at all and we suspected this because our participant was working around in the business environment with like a tank top and you know she is in a male dominated environment and I was there and I can tell no one had any respect for her and so now we are really really strict with dress code because, and that is also another thing" (K. L.)

" When I'm in India, I had to cover my head and my shoulders. Often I would get into the house, and especially if it was all women, they would tell me to take it off...that I could expose my hair. That was a sign for me that they were getting more comfortable with me, because they would do that after a half-hour or something. And then, obviously, if you dress too smart, you make the atmosphere too formal sometimes as well. So you need to always check with your local guides and people in your network that can help you to understand what's appropriate, and what's neither too formal, but not too informal as well." (J. G.)

"We did everything we could to try to fit in. The other female that I was with tried to wear their fabrics as much as possible because the woman in the villages would take a sheet of fabric and wear that and there is not like a dress or anything. So we tried to do that just to fit in as much as possible." (L. S,)

The professional gear used by design teams is another factor that affects finding access. Interviewees pointed out that the use of cameras can negatively affect participation of the users in the design research as they might be uncomfortable about being recorded or it might be offensive in their cultures. Using smaller size, less visible and less-disruptive cameras was defined as the best way to gather visual data. Interviewees agreed that design teams should strategically decide what type of gear to use beforehand:

"We have had situations where we reduced the number people that are going into an interview…Getting rid of your pen and paper. Sometimes like, when you go in and you got a clipboard, you look very official, put that stuff away, just relax, obviously watch your body language, and your tone of voice..."(J. G.)

"People are intimidated by film, so you have to make a judgment whether you are going to use that or not. If you're going to use film, I think the little flip cams are really good, because they're so small that people can forget that they're there, rather than having a big camera poking in their face." (J. G.)

Interviewees also defined the importance of developing **multi-disciplinary and multi-cultural design teams** where possible. The diversity of the expertise of team members and the diversity of cultural backgrounds can help to build relationships in the design phase with participants and capture richer data in faster way.

“I always always try to create multi-cultural teams because typically what I take for granted, my team members will see something bizarre & different. So I think it is more about creating cross cultural and cross disciplinary teams that help research wherever you do it.” (A. K.)

“…being an outsider, you will never ever have the same amount of insight as a local designer in terms of understanding all the language insights, all the subtle cultural insights, probably the name of the product that works well in English it doesn't work well in Chinese or in Indonesia or Australia or whatever. So you're definitely an outsider and you lack some of the subtlety. But on the other hand if you're an outsider you can also ask the bigger questions, I think it's easier to ask the bigger questions: "why do you do this" and "why do you go there on a Sunday" and "who is this". I think there's a certain amount of naivety which is also... naivety is bliss and naivety is kind of important. I think you can have some good bounces by either hiring Chinese people to be on the ground, working on the American team or people who have grown up in America or you have Westerners off on the ground in Asia that could answer some of those questions. So I think having a range, you want a very, very local company doing some work for you, you want international companies helping you, you want international people on the ground, you want locals from that country back on the ground and you want people completely outside the culture. So I think it's almost like you want a range of different people to sort of help you build up the picture.” (J. B.)

Considering the **number of team members** is another strategic decision in finding access prior to moving on to the design phase. According to Chambers (1983), small teams are always preferable to larger teams. A large team may intimidate the users and cause them to be more cautious and share less with the design team. It is harder for larger teams to build relationships with the users and this is likely to slow down the design phase and negatively affect the depth of data gathered from the users during the cultural immersion stage. The following quote described how the number of members in a design team was strategically determined in a project in Africa:

“…usually we have about 4 people, talking to one family, or, one set of users at one time and we basically delegate that, one person is taking pictures, one person literally sitting there and just

observing, things around them, what the interviewee was doing, another person was interviewing. We had this system worked pretty well, because we wanted to make sure that we were giving the interviewee our full attention and that, we weren't trying to write and take pictures all one person." (L.S.)

Design Phase

Cultural Immersion

The term "cultural immersion" was widely used by interviewees together with "environment"; therefore cultural immersion required **physical** or **remote exposure of the designer in the user's environment**. A Norwegian designer working in China to design the "future Chinese kitchen" explained the importance of experiencing the environmental context with the following example:

"…a lot of people are making their own soy milk from soy beans and they have this machine like a blender I have never seen, I haven't seen it in Beijing. I hear that it is more used around Shanghai, that part of China. Even if we didn't directly integrated in the kitchen that's quite interesting finding and also shows that China is not one China it is so different in every region of China. And they put those soy beans on floor on a small tray then dry them there and use this small machine to make the milk. I think that's a typical thing I would never have figured out if I stayed in Europe and tried to design a kitchen for China." (C. K.)

A similar example provided by an Indian designer:

"I think you don't necessarily need to do the research but you should be in the environment. Go and feel it and experience it. Go into the retail environment yourself and see how things are stacked and stored. You'll understand a whole new meaning of packaging. For instance, if you go into a mom-and-pop store in India, you realize how little packaging matters and how much more price point matters; how little loyalty matters; how much more relationship with a shopper matters.

All these things are needed to be aware of when you are a researcher. So certainly I would think immersion is crucial when you are going into another culture of some sort."(A. K.)

Another example by an American designer:

"It's much more efficient to be in person. I would rather actually not work on projects where I don't have the direct access to the user in these kinds of situations. That's one of the difficulties of that hippo roller project and it kind of was one of the reasons that we decided that we were not going to do that kind of work anymore because we didn't feel like we could evaluate concepts thoroughly, test concepts of users, establish an effectiveness in field or even sell concepts outside of the kind of vision of a specific parameters of the project without having access to those people. Not just users, but manufacturers, distributors, all these kinds of stake holders."(R. D.)

Cultural immersion can be done through in-person user research or remote user research depending on the financial resources and time available to the design team. During in-person research the design team physically experiences the other culture while remote user research offers design teams the tools to capture the other cultural context without physical presence. The next two sections discuss the in-person and remote user methods used by interviewees, the challenges of each process in a cross-cultural context, strategies defined by interviewees and strategies that are readily available in the literature.

Cultural Immersion: In-Person User Research

Interviewees often emphasized the importance of employing in-person user research and its effectiveness over remote user research. In-person user research provides design teams first hand interaction with the user and experience of the other cultural context. Although in-person user research offers rich contextual information, it also

creates more challenges and requires more preparation from the design team. Thus, the importance of pre-design phase increases when design teams involve in in-person user research. The selection of data collection methods, the research questions and precautions which will ease the in-person user research process should be grounded in the knowledge gathered during the pre-design phase.

Methods

Designers interviewed defined in-person cultural immersion methods they use in cross-cultural contexts as ethnographic research methods. Ethnography aims at contextual and in-depth information about people based upon interpretation of the data gathered from the field.

Immersive Observation

The very first method is non-participant observation where the design team is quiet, watching users and trying to understand and experience their way of life, behaviors and environment. This method is defined as the general level of observation to develop a preliminary understanding of the cultural context. A designer doing design research in India for a global mobile phone company describes how they employed this method:

"One thing we did in India which might sound strange, got up at 5 am in the morning and (this was Jan's idea) to go and to see the city wake up. This sounds strange but you learn so much, but we saw people who live outside and they had cricket bags in their beds, like outdoor beds, you see the love for cricket in India, or dogs roaming the streets, people walking around, even though they might not have much money, they really care about their health, because they have these, do you know these plants they use as a tooth brush, people handing those out in the morning at 6 am , really just watching by observing." (J. G.)

After non-participant observation and passive experience, design teams employ participant observation where they actively experience and feel users' life by shadowing them. An Australian designer described how she participated in Rwandan women's daily lives through participant observation:

"…I went with them to where they extracted the plants, they ultimately were weaving with, and I involved myself in that experience with them, to try to get in their shoes and understand, how far the distance it is they had to travel, and sort of the whole complexity of their reality that is not my reality."(K. P.)

Another participant observation example provided by a designer doing research on mobile phones in India:

"I think just walking in people's shoes is really the number one way to do that. So again, hanging off of -- I'm sure Company N wouldn't like it if they knew that's exactly what we were doing -- but hanging off the back of a truck while going village to village with all these thousands of dollars of equipment on our backs is probably…you kind of know if someone tells you that, that thinking about travel apps for farmers between...you know, it's while they travel between A and B is a good solution. But you don't forget it if you actually live it."(J. G.)

An American designer described their immersive participant observation in designing light for Tanzanian users:

"We didn't want to bring out any of the flashlights that we had anywhere near these villages. We didn't want to take out our headlamps anywhere near these villages. Many times we tried to walk down bumpy roads and tried not to fall and we still didn't use our headlamps. It's all about putting yourself in your user's situation…We made sure to take at least three kerosene lanterns and what they called quarter boys which is what are little steel cans that you literally dump kerosene into and set on fire and those were their two main light sources. So we made sure to buy a lot of those, take them back here, use them for one night and try to read a book by them. Kerosene

lanterns were huge to bring back whenever we forgot how terrible to read by kerosene lantern, we would go, get it and see what it was like." (L. S.)

One French designer reported how he imitated a Chinese garbage collector to design a system for recycling:

"…Experience the local will clearly reveal the reality for who you design for. When I worked on the recycling project for China…I spent a huge amount of time observing and following the different actors, actions and interactions to picture the whole local road-map of the recycling (life cycle of products).I even performed as a Chinese garbage collector to understand the reality of their work (issues, constraints, motivation)" (N. H.)

Cultural immersion through observations and having direct contact with users who are culturally different from oneself in a real life setting helps designers to empathize with users and get insights into their needs, limitations and aspirations. During observation sessions it is important for designers to be descriptive about what they observed rather than to be prescriptive or judgmental (Blomberg, Giacomi, Mosher, & Swenton-Wall, 1993). An example of being descriptive and prescriptive in notes about observations could be as follows:

Descriptive--The woman put the clothes into a large plastic container filled with hot water. Then, she rubbed the clothes together for half an hour…

Prescriptive--The woman still washes the clothes by hand. Trying to clean clothes by hand is very tiring and slow.

Engaging Interviews

Unstructured and/or semi-structured interviews as a cultural immersion method were described as informal and friendly talks or as discussions. In semi-structured interviews there may be a reference check list developed as a result of background set-up phase, but not a sequence of questions. An American designer describes interviews with Tanzanian users:

"...just interact with them in a very informal setting where, there was no, you know, one person in a room interviewing another, it was 'Hey, let's eat a meal together and just talk about things' and I definitely think that we learned the most that way, for example, when we went to Tanzania, no one I went with had ever been to Africa at all. And, I think that the most we learned about the culture and a lot of what influenced our design was based on these interactions. It wasn't formal interview setting at all. It was literally just like let's hang out. So, so we did a lot of planning, based around questions that we wanted answered and how we are going to answer them." (L. S.)

Being quiet, letting the user talk and using encouraging probes to trigger stories are the actions that should be taken by the design teams. In this way, there can be greater freedom and equality in the process and the process moves from being closed and formal to open and informal. Design teams should also offset any possible cultural biases by avoiding interruption and putting forward their own ideas in asking questions. An American designer provides an example of an approach to Middle Eastern refugees during an interview:

"We try not to be so rigid in how we ask questions. It's really just a conversation. You go in, it's like "tell me about yourself, what's going on in your life, how do you enjoy your new house, how are you liking the adjustment to the United States, what's some of the difficulties you have?" A lot of these families were doubled up in the same house for cost of rent reasons, so talked about their interaction, "how do you like that, are there ways you mitigate that or avoid it or embrace it?"

Just basic conversation about what they're experiencing. It's how you ask the questions, how you frame your questions—open-ended and you're not trying to beat somebody to an answer or kind of restrict their answers. You're going in very…let's say…you can't go in with assumptions, of course, but you also can't have authority. Because they are the authority on their lives, you're just there to learn and listen to whatever they have to say. So if they pronounce something wrong, quote unquote, you then have to pronounce it wrong because it's their house. Otherwise that sets up a dynamic of like, "oh, I'm correcting you". You avoid all that kind of stuff—you're just there to observe, listen, learn, and let them speak on what they want to speak on." (R. D.)

According to the interviewees, the interviews should be conducted under the conditions or in **local environments** related to the context of the design problem. In this way, the team can observe the context at the same time point out and show things to ask the users to walk them through certain processes. The following quote describes the importance of in-house interviews for designers:

"…especially if you're in their house, where you're in context, they're much more comfortable to let you see things. So it sounds like a small thing, but even seeing their house and how they live and where their things are and just documenting how things are organized in spaces can tell you a lot about the person and their habits. So I think that's probably the number one thing that we would do." (J. G.)

Some interviewees defined employing focus group interviews as an alternative to individual interviews. According to Chambers (1994) some sensitive topics may be discussed more easily than individually, dominance of single voice is eliminated, and overlapping spread of knowledge is gained at once by employing focus groups. However, interviewees also defined some disadvantage of employing focus group interviews such as participants influencing each other:

"…you're talking about your online habits and it's best for us to get a group of people who are all in a room together and discuss. Usually we find, or my personal preference, is sometimes in a

group together they tend to influence each other. I don't think you can get as personal necessarily, but sometimes that fits." (J. G.)

Another example:

"It could be a challenge to get people to tell the truth and practically speaking, that means you have to be really aware of what mix of people you have when you have a focus group because if you have people from different statuses, you can bet people that have low status will not tell the truth and they will not be honest with you because they are afraid of what repercussions can result, if they say something that can be perceived as negative, you might end up getting just the answer that they think you want to hear, just the answer you need to hear. And so the challenge is knowing who is present when you are interviewing someone and try to get people that are not threatened by each other to be together because you can have 20 people and you have one senior manager present in the room, it will be a waste of time because no one will tell you the truth because people are afraid of how it will influence the situation." (K. L.)

During interviews, regardless of whether an individual or focus group interview, there is always the danger of summary and abstraction. People tend to summarize their experience by abstracting from a number of concrete experiences when they are asked to talk about them. It is human nature to provide a general impression instead of focusing on all the little details that formed that general impression. Thus, design teams need to avoid abstractions and summary during interviews.

Interviewees described the use of **visual probes** in addition to supportive and encouraging manners as a strategy to overcome such risks. By visual data sharing the information becomes visible and public. Both researcher and user can point out, manipulate and discuss the information. In this way, users own the project, and the perception of the design team as the expert coming into their house and questioning them will be eased. User photo diaries and collages are the two specific probes

described during the interviews. In photo diaries, users were sent disposable cameras prior to any in-person contact and asked to document their daily activities via photographs; then these cameras were sent back to the design team. The team analyzed the photos to develop the interview questions. When the design team met with users for the interview, they would use these photos to ask the questions, point out things. This process was defined as not only triggering stories but also exciting users and giving them an active role in the research process. In addition, collecting these images before meeting the user group in-person helps to break some of the presuppositions the designers may have about the culture as well as to validate the facts about the environment of the users. A designer shares the advantages of using this method to open up conversation during user interviews:

"When these pictures come back it is really great fun because even if you are familiar with the environment or not, you really get a good sense of who it is that you are going to go to spend time with. If you are not familiar with the environment it helps to break a lot of assumptions which is very important before you go out to do research because it is human nature to make assumptions and be subjective. It also helps to validate the fact, I thought the streets would be dirty and yes they are. So, it is a very good way to balance yourself. Second advantage of this process is it gets you a little warmed up with the user whose home you are going to go into, a total stranger, when you walk into their home and say I come to spend three hours with you and I want to know everything about your life even though it is personal. It first helps to put everyone on the same page; it helps to put you and your participant in the same level. Participants by taking these pictures of their daily lives and sending them to you, it almost says you are welcome to my home. You break the first barrier as a stranger walking into somebody's home. The third part of the process I go in with one or two people into somebody's home and use those pictures and ask them to talk about these pictures. That works like magic, these people haven't seen the pictures they took, and everyone wants to see the pictures. I do if I take pictures I want to see what they look like, This is so and so, they just get involved with these pictures and these pictures trigger stories that they wouldn't have told me otherwise, It is amazing the information that I get out of

that, of course then I have a discussion guide so, and I stir in questions out of that guide, but I often use those pictures and ask 'is there anything here that can help you?"(A. K.)

Another quote from the same interviewee illustrates how using visual probes can trigger answers:

"For one research project we had really difficult questions, trying to understand what the consumer's understanding of clean was for China and India, what your sense of clean and my sense could be worlds apart, even if we both live in NY, It is a very fuzzy word. So we would say do you have any pictures here that you would show clean, because they would say anything ranging from I use detergent that smells like antiseptic, for me this smell is clean, and once my house smells like that I know it is clean. Somebody else would say when I touch the floor when no dust comes off I know it is clean, some talk about the smell, some talk about the dust, so the pictures help them describe more, getting those stories around the questions really helped us to move to the next stage in our analysis." (A. K.)

In the aspirational collage technique the users were provided with tools such as images, boards and markers and were asked to visually present a topic. And similar to the user photo diaries, the interview questions were developed based on these collages and they were used to open up discussions with the users:

"We were trying to understand how to make an accessory more desirable for our user group. And so, what we did was, we had six women all different cultures around the world. And we asked them, 'can you bring in your favorite piece of jewelry, two or three pieces for this workshop?' Then we said, ' put that jewelry aside we will talk about that later, here a bunch of fashion magazines', we gave everybody three to four really glossy wonderful magazines, and nice big size paper, and we said can you make a whole bunch of collages by cutting out stuff from these magazines, to describe what your dream accessory would be. The girls had a blast, they came with the most fantastic collages I have seen ever. Then, we interviewed them one by one. We said, 'this is your jewelry this is your collage. Can you tell me why you brought this jewelry and not something else?' So they started telling us stories and it's interesting that as the stories came out, a lot of what they told us about their stories connected to the collages they were making. So that the

collage that they made we called user aspiration, the product that they owned we called it something like user reality. And we said basically, what the designer needs to achieve is this sweet spot in between. "(A. K.)

Backing up observations and interviews with collecting visual data through photographs and videos was the common practice among interviewees. All twenty of the interviewees described collecting visual data in addition to verbal and written data. Collecting visual data increases the understanding of the environmental context surrounding the design problem. The visual information is also described as the best way to communicate design research results to other parties or team members who may not be present at the research environment.

Asking for permission and making sure that users understand the purpose of visual recording was defined as very important. A Norwegian designer shared his experience in Uganda where taking a photo of a person meant stealing one's soul:

"The best way to get information is to be patient and listen to people's stories. And then when people trust you, they will tell you their stories and somewhere in those stories the most obvious and ingenious solutions will appear to your problems. Especially like following people in their daily lives which can be a challenge as well because you have social borders. For example taking pictures of someone in Uganda, it can be tricky business because some people think that you steal their soul if you photograph them." (K. L.)

According to Belk and Kozinets (2005) videos of observations or interviews offer advantages over field notes. Body language and body expressions, what people do in addition to what they say can be captured and coded. On the other hand similar to cameras, using videos can be disturbing and hinder formation of rapport between designers and users.

Participatory Research

In participatory research users are involved in the research process with active roles rather than being the passive object of the research, thereby the power distance between designers and researcher can be minimized. This method provides design teams the opportunity to observe a course of action and at the same time ask questions about it.

The do-it-yourself method in participatory rural appraisal asks individuals to teach local tasks to the researcher. Participatory rural appraisal is described as “an approach and methods for learning about rural life and conditions from, with and by rural people” (Chambers, 1992, p.5). The methods of participatory appraisal are borrowed from field research, participatory research and applied anthropology. The do-it-yourself method of participatory rural appraisal provides more in-depth understanding of behavior as compared to activity walkthrough where designers ask “can you show me how you do this task?” By asking “can you teach me how to do this task?” (i.e. washing clothes, cooking...) designers not only observe the behavior but also experience it. By asking the users to be teacher, the design team can also overcome the perception of “being an expert” and develop better relationships between with the users.

Beyer and Holtzblatt (1998) defined similar of approach as the “master/apprentice model” where master symbolizes the user and apprentice symbolizes the designer. A master teaches in the context of doing and this way the implicit structure becomes apparent and visible to the apprentice. People usually are not aware of the reason for their actions as they are built based on years of experience, or they may have simply

become habits. Showing and doing create a natural flow of conversation and each step of doing a certain task can remind other details and create new questions.

Culture Specific Research

According to Chavan, Gorney, Prabhu and Arora (2009) in order to successfully develop products for diverse cultures of emerging markets, designers need to have awareness of culture and the context. Western origin design research methods such as interviews or focus groups work better to understand Western markets and keep designers in their comfort zones. Designing for another culture, especially emerging markets where collective expression or individual expression is favored require specialized techniques or tweaking established methods to fit the cultural context (Chavan, 2010; Medhi, 2007). For example, Asian users are hesitant to make negative comments, need more context for communication, and are sensitive to higher hierarchy of the designer in the communication process (Chavan, 2010). Some of the strategies methods introduced by Chavan are as follows:

The Funky Facilitator: This strategy suggests interviews conducted by young interviewers so that participants can speak and interact with them without apprehension.

Mata, Pitah, Guru, Daivam Technique: Users can use core characteristics of Mata (mother; care), Pitah (father; protector), Guru and Daviam (destiny, god; wisdom) to associate with products or product features.

Jungian Archetype Folk Probes: This technique uses symbolic meanings associated with Chinese archetype folk characters. User can evaluate a design by pairing features with

these characters, where they are more comfortable providing negative feedback by using characters with negative attributes.

The Bizarre-Bazaar Method: is defined as an informance method works well with Chinese users. According to Chavan's experience, asking Chinese users about their needs and feeling yields more in a dynamic trading environment where designers pretended to sell products or prototypes to users. The bargaining environment provided rich information on user's reactions and feedback.

Challenges & Strategies

Challenge: Building Relationship, Otherness Factor

Strategies: Personal Demeanor, Learning the Basic Words and Gestures

The interviews showed that **building relationship** with another culture is the most important and challenging process in any in-person design research activity. The literature also supports this finding; according to Chambers (1992) "relaxed rapport" between an outsider and a local is the key to facilitate participation. Below are exemplary quotes on building the initial relationship with users at cultural immersion stage:

"I think it's really all about getting people to relax, making the person feel comfortable with you. And, I think that sometimes half your interviews are about doing that, really, and you collect all the good stuff towards the end when they feel comfortable with you. So, if you get offered any tea, or if you get any food, you should never turn down because that can be rude, you never know. You may chit chat about the things that they are obviously passionate about, be really observant." (J. G.)

"I put a lot of emphasis on that rather than jumping in a situation and pulling out surveys or pulling out a pen and asking "can you draw me your idea or whatever?' I would happily spend several

days to just become acquainted with the people, because they are willing to give their time which is very valuable …In Tanzania we spent a lot of time talking to women within this banking group, we shadowed their day, the notes we took were not guided by pre-allocated categories, we pretty much tried our best to not to pull out our notebooks at all and try not to break the flow of the day with our methods, just tried to absorb, when people eating we ate, when people preparing food, we prepared food with them, we tried to experience the day with them." (N. W.)

Users participating in the design research will become more open and cooperative when the designers show interest in them regardless of their design goals. A Dutch designer who designs veils specialized for high impact sports activities for Muslim immigrants in the Netherlands explained her experience of building relationship:

"…you engage yourself in society and you work co-work with women, any user group. You can't go in there as a business meeting saying this is what I need and then leave. You start relationships. You need to go in there and show interest regardless of your design goals. So the first meeting would always be talk and coffee or tea and relaxed…" (C. V.B.)

Personal demeanor of showing humility, respect, patience and interest is an important element in building relationship (Chambers, 1992). Interviewees used the terms "people's person", "approachable", "friendly", "respectful" to describe how they should be reaching out to individuals in design research. Making compliments and using phrases like "I hear you", "I understand you" to encourage the participant users to be more open was defined as helpful:

"I will tell the user, 'Yeah, I totally hear you. This is how I feel. So worst moment isn't it? because you think your grocery is over and you are waiting another hour to get home and guess what, you have to also unload that grocery.' And that's when the user starts nodding their head you know and that's when you become sisters or sisters and brothers." (A. K.)

Learning the basic words and gestures of the host culture's language is defined as a positive factor in starting communication with the users and therefore building the initial relationship. Especially, greeting and thanking terms can help to build relationships and provide interest into other culture. Interviewees designing for entirely different cultures like Chinese, Rwandan and Turkish shared similar experiences:

"…so learning the local language was a way, people are always impressed with you, not just as a traveler, but as a designer, it helps bridge barriers of understanding if you attempt to learn the language, so I'd say that's another skill set or tool that I worked to access…" (K. P.)

"So with most of the women Dutch language is not optimal and my Turkish, you think now I speak fluently Turkish that fools you. (She laughs). It is just these basics, and if you would have a conversation with me that would be impossible. So now knowing the formalities in Turkey I can break the ice, but I need the Dutch or English language to communicate with these women. So language is sometimes a problem, especially in Rotterdam. …But even with my little Turkish, or little whatever, it's always possible to make a spark." (C. V. B.)

The **otherness factor** was defined as another challenge. Especially, in design contexts where the design team and the user group come from diverse ethnical backgrounds and stand out as "the other" based on their physical appearances (i.e. Caucasian designer designing in Asia or Africa) building relationship becomes harder. According to Medhi (2007) in emerging markets like India, Western designers are perceived as wealthier outsiders and approached with undue respect. The interviewees often used phrases like "as a white man", "as a white woman" to define how they were perceived as "the other" by users in Asia and Africa. Interviewees described the otherness factor as a barrier to invisible cultural immersion and a disruptive factor in local contexts. Three Western designers shared similar experiences in different cultural contexts:

"…just by your own presence being there you're changing the context so you're not really observing it as it really is. When we went out, well we did go to a slum in India and they had never seen a white female before so I had the whole village trying to touch me. The interviews were not going to happen. I just had to get out of there and then leave the guys to it because they weren't as bothered about the men as they were about seeing a female, but I don't think they'd seen Westerners anyway, ever. As much as it was a great experience we just weren't able to get around improving a distraction… to an extent you've got to always understand that you will change the context just by your presence and we just have to be aware of that, there's no way around that I don't think. And if there really is difficulty then you have to find a way of hiring people locally to do it. " (J. G.)

"…when I've been working on the kid's PCs, I've spent time in classrooms in Asia, in Europe, in America. So I've visited half a dozen schools, sat in the back of class watching, watching, watching teachers give the class but sometimes you want to have very invisible research, and sending a white guy into a classroom in China is not really very invisible. Sometimes you have to have local companies do the work for you because it's very interesting for me to be there, but it kind of changes the experiment when I am actually on the ground… I think it is much better to have a local team, let them do the work; that will be much less disruptive in the local environment than sending in a bunch of foreigners. So I think it is good to get the designers involved but you should not expect realistic results or something like that it is more, it is more just for their reference. " (J. B.)

"…we're not going to get completely mutual perspective of what they are doing because we're intrusive. We're not being fly on the wall observers, we are still an intrusive observer, but we did our best to take ourselves away from the situation and to not impose our time pressures on the people that we were working with." (N. W.)

Building multi-cultural design teams, employing local designers or researchers in the team and working with a capable cultural broker can help to overcome the perception of otherness especially when there is physical evidence of belonging to different cultures between designers and users.

Challenge: Role Negotiation

Strategies: Communicating the Role of Designer and Design, Selection of Research Methods

In building a relationship with the user group, design teams should also focus on **role negotiation** which also relates to the otherness factor challenge. This concept refers to redefining the perception of the design team as the expert and the users as the research subjects. Both the design team and users should embrace each other as co-partners. Users should be comfortable in creating ideas with the designer, using the designer's expertise, tools and skills, and designers should be humble about their roles and make the users feel as an important stakeholder in the process. Interviewees often described how they were perceived as the expert or the power figure that can provide physical or financial solutions for problems immediately. Three designers explained how they were perceived by the users in different cultural contexts:

"Depending on what culture you're in, as a Western woman I hold a power card that I'm probably richer, I have more education and more freedom, or perceived to have more freedom at least than some of the cultures that I've worked in, and women are not put in a lower class in my culture. So I think some of that impacts design process and design conversations with them, because they think you have the right answer because you're perceived as the expert…I'm the white woman who has the power card, and you (participants) might feel pressured to answer me in a certain way, out of fear that I might remove my services or my time or my investment in you." (K. P.)

"I believe you should be equal. I always have respect to the person I talk with .I think the basis of co-working has to be equality because if I keep my position as a designer and say "I know it all!" then what is there to ask the users?" (C. V.B.)

“You will often be perceived as extremely resourceful almost like in a magical way and you will be perceived as an expert and almost like a superstar, like a movie star and you have to be really aware of your status. Your status is extremely high when you get into this setting which means that people will answer all kinds of different things and maybe they hope that you can personally help them … you have to be so self-aware about who you represent and what is your perceived role and your status and everything.” (K. L.)

Especially in designing for emerging markets where educational levels are not very high, designers should be able to **communicate their role as a designer as well as what a design process is**. When a design team meets with users they need to be transparent and as explicit as possible about who they are and what they are doing. Interviewees emphasized the difficulty of communicating their objectives as a designer and that the design processes have physical outcomes over time:

“Company N for example in India, it's a big brand. So, us going to their house, for many mothers we realized it was almost like a job opportunity for their children, which hindered us because we were not there to interview the children obviously. They would treat us as though, they had to impress us. So, we'd have to spend a really long time, sort of getting used to one another and getting them comfortable with us and also having them understand why we're really there.” (J. G.)

Interviewees also defined the importance of providing a physical explanation of what their objectives are using images, drawings or prototypes instead of conceptually explaining it with words:

“A very important part of the research is actually explaining who a designer is. And it has to be divided into what a designer can do, and what a designer cannot do… design as a method needs to be explained. And in the first case it needs to be explained visually and with examples. And the concepts...so it's almost like the concept of concepts is extremely complicated and very complex. And in developing countries the concept of a concept might be something that no one has heard about. And something needs to be pulled down to something concrete and they need to see some examples of what a possible solution can be. Everything needs to be exemplified.” (K. L.)

Selection of research methods is another aspect that affects role negotiations. According to Chambers (1994) there is a scale of formality to informality through structured surveys to unstructured interviews and interactive conversations around a set of visuals developed by users. The traditional methods of interviewing empower the designer even more as he/she is the person in control of the discussion content and time spent. Design teams should purposefully develop and plan their user research strategy and bring the users into the partnership and avoid researcher/ respondent or the expert/novice perceptions. Design teams are not there to fulfill the task of collecting answers to a set of questions from the users, nor as the experts who are there to help the users and answer their questions. Host/guest perception of design team is another obstacle in role negotiation (Beyer & Holtzblatt, 1998). The presence of design teams as strangers in the user's environment may result in the host role for the user and the guest role for the designer. In this type of relationship users may try to please the designers and make them comfortable. Role negotiation in a cross-cultural design context should create a mutual relationship where both parties are equal, honest and open.

Challenge: Communication and Language

Strategies: Educating Interpreters, Culturally Appropriate Gestures, Emphasis on Observation, Changing the Mode of Interaction from Verbal to Visual, Involving Users in the Research

Communication and language are defined as other major barriers in conducting design research in cross-cultural design contexts. Both the differences in verbal language and non-verbal body language cause major communication problems between design teams and users. To overcome this challenge design teams hire translators or

interpreters when they reach out to users for interview or observation sessions. However, interviewees all agreed that they miss a lot of contextual information as well as a link or connection with the other culture when they have to use interpreters. An Indian designer working on a design project in China explained her struggle with language as follows:

"when we were doing research in China, one of the big issues that kept coming up was that – we hired simultaneous moderators from the agency that we work with. But if that simultaneous moderator, if his or her English isn't – how do you say – if their vocabulary isn't extensive enough, they tend to keep repeating their words and this becomes a big problem, because I don't think the Chinese language is simple by any means. But when it's translated, it sounds simple. Everything is just a repetition of what they said five minutes ago, which I don't believe. So we miss out a lot of information. So it's a little more time-consuming because we do also ask the agency to transcribe and the transcriptions are good. But then you have to read through all the transcriptions and think. And then you don't have the time to ask some of the questions that you would have liked to ask if you had understood. So language is certainly a barrier." (A. K.)

Educating interpreters is defined as a strategy to avoid missing contextual details during translations. Beebe (1995) suggests going over the interview strategy with the interpreter, making sure that the interpreter understands that the design team is looking for more than the basic description of answers. During the interviews it is also suggested that the interpreter stays physically behind the design team and the users, and designers keep eye contact with the users and direct the questions to them. According to the designers interviewed capabilities of a good interpreter are probing deeper in conversations, proficiency in both languages, and understanding the expectations of the design team and the design process:

“If we are going somewhere where there is absolutely no chance that they speak any English, and if we are going to have any interaction or what so ever, we would have somebody really experienced with us, who knows how to probe deeper in conversations.” (J. G.)

“I think the biggest challenge was the communication barrier and having to go through a translator. Obviously, our knowledge of Swahili is very limited. So, we had excellent translators, whose English was great. They not only spoke Swahili but they spoke several tribal languages which helped us get around easily. But still, we had to make a big effort to make sure we were talking directly to the interviewee and not through the translator, and the translator talking through you, we wanted to make that direct connection. And then, you know, kind of like, classic movies a lot of times that the interviewee would answer very long but the translator would give us a one word answer. And, we really wanted to know why, really get that whole explanation. There's a lot of work with the translator saying that “We want to know anything the interviewee says, even if it seems like the most mundane thing, it doesn't matter at all, we want to know it”. So there's a lot of education about the design process to the translator, as well in describing why we want to know everything the person was saying.”(L. S.)

The background-set up stage plays an important role to overcome the challenge of language and keep the conversation with the users freely moving. Using **culturally appropriate gestures,** smiling and nodding and probing by using user’s language can help the design teams to run better interviews. The changes in the body language from culture to culture are also defined as an obstacle to communicate with users from the other culture. A Turkish designer in the Netherlands described her struggle in understanding body language:

“…The mimics people have on their face, the body language changes from culture to culture. It is possible not to understand what they mean and that causes disconnection with the user. Even you can communicate in a common language and understand each other; still the body language is hard to understand.” (O.B.)

The communication challenges designers face forced them to develop different strategies than only relying on the interpreters. Interviewees commonly described that they became better observers due to limited verbal communication. The following three representative quotes describe the increased **emphasis on observation**:

"…I become a better observer, since I am not distracted by the words. I can sense and name the problems easier, because sometimes words may cover up the core of the problem." (O.B.)

"We do a combination of interviews and observations. The interviews can be very challenging for us in the places where we don't speak the language, so tend to use both probably fifty fifty, the stuff that we can really rely on is primarily the observation. Past few years we are doing a testing work in Rwanda, I was always the one over there and I basically couldn't say a thing and I told my translators that I wanted to know verbatim what was being said but there were three languages involved so I am pretty positive that the answers I was getting were lost between the translations of three languages. What can you do in a situation like that so I tried to be more visual, more rooted in observation and less relying on what people were saying."(H. F.)

"…we did have someone with us who was translating when we had trouble communicating. I know a little bit of Swahili and did my best to use it, just in pleasantries to guide the conversation. But it definitely creates the need for more attention, not speaking the same language. Like pointing is a really simple one, looking at a device where people are playing and watching people play with the device. So, observation that doesn't require language…" (N. W.)

Changing the mode of interaction from verbal to visual by developing visual probes such as visual dictionaries, cards with images, graphs and smileys, prototypes and photos taken by users are strategies defined by interviewees to back up verbal communication:

"…I always carried with me drawing tools, so that whenever I learned a new word, I could put it in my book and visualize, using imagery around the words. So I would remember visually what this

word actually meant, and so whenever I get into situations of not being clear, I could open this book and show that I understood." (K. P.)

Another example of using visual tools:

"I think that the physical prototypes that we had were very instrumental in that. If we had nothing that we were showing – we couldn't go in a household and be "Do you want light?" But if we hand them a light and we say, Hey, what do you think of this? – It's much more powerful. And they really understand it much quicker. I can't remember times where we were trying to describe something and it just wasn't working out at all, we drew a picture and that clicked much faster. One time we came with basically a large color palette of different colors and we said, "Point to which color you like best. We're trying to decide what color we want to make the light." So very simply, visual interaction was much more powerful than just more questions." (L. S.)

One French designer described his tools to change mode of interaction from verbal to visual during interviews in China:

"… The language barrier… in reality can be more an advantage for a designer because it forces you to involve more visuals which is the strength of a designer…The idea I developed during my cross-cultural interviews was to be as much visual as possible. I created cards around different aspects: actions, feelings, desires, etc…It permits facilitating the communication and interaction with the interviewee. And help the interviewee to picture his/her answers." (N. H.)

Changing the mode of interaction from verbal to visual not only helps to overcome the language challenge but also improves the relationships between users and designers. Visual literacy as compared to verbal literacy is almost universal and thus is accessible when language is not shared. The process of asking questions and extracting answers changes to a process of presentation and discussion by using visuals. Information is built collectively and the roles of designer and user are negotiated. The designer

becomes the facilitator instead of the prober, and the user becomes the presenter instead of the respondent (Chambers, 1992).

Involving users in the research with a more active role is a helpful tool in cross-cultural settings where communication in common language is not possible. In classical design research methods of observation and interviews, users have passive roles and the information is appropriated by the designers and thus it becomes “unverified and owned” by the designer (Chambers, 1992). Involving users in the research process and moving them away from the passive role can create fruitful results. Probes are often used to engage users in the process. Common probes described by interviewees were photo diaries, time chart diaries, and visual communication cards, sketching or building something.

Challenge: Need for More Time

Strategies: Constant Debrief, Multiple Researcher in the Field

Need for more time is another major barrier in cross-cultural design processes. Designers interviewed emphasized their need for more time to immerse themselves in the other culture. Understanding a design problem in the context of another culture not only requires understanding the problem itself but also the people and their way of life. Designers explained that they miss a lot of information by “fast fashion style”, quick design projects. There was a common desire among interviewees for a longer design process:

“If I was an outsider coming in; I'm often on a timeline and there is budgeted amount of time like any design project. But, when you are getting into a cross-cultural situation it is like you have to

ramp that up even higher because you are designing something but you are also trying to figure out what culture you are designing for." (K. P.)

Another specific reason for longer time allocation for cultural immersion in cross-cultural contexts is that the biases and assumptions designers may hold towards the culture can be recognized over time. The more time a designer spends with the other culture, the more he/she sees the context of the design problem from the perspective of the other culture without judgments.

"…I think it is better to have a longer amount of time if you can because there are things that I think shifted in my mind from when I first landed to when I was ready to depart, even in the way I review it now that I'm removed from it immediately."(K. P.)

Chambers (1992) defines two extreme types of time allocation in cross-cultural research; "the rushed tourist "and "the resident expert". The rushed tourist does not have the time and the sensitivity to build a relationship with the user and to understand the design problem context in-depth and only grasps the surface level data which seems exotic about the other culture. On the other hand, the resident expert would spend years and show such sensitivity that she/he believes you cannot understand a cultural context unless you become part of it. The design teams should balance between prolonged cultural immersion which opposes the dynamics of product development and manufacturing today and rushed cultural immersion processes. They should keep in mind multiple unexpected factors that can delay the process and plan the process accordingly and at the same time be flexible about time allocation. Optimizing trade-offs refers to being able to make trade-offs between timeliness, quantity, accuracy and relevance of data (Chambers, 1992). Thus, design teams should **constantly debrief**

about process and decide the next steps and trade-offs by reflecting on the information gathered from the users.

The literature in human computer interaction and rapid rural appraisal both offer strategies which can be derived by the design field to overcome the challenge of time in cross-cultural design contexts. Millen (2000) describes the strategies that respond to the time challenge in design research as follows; determining key informants, using multiple data collection techniques, collaborative data collection and analysis method. Millen also suggests that using a wide-angle focus in design research is problematic and the time spent looking at the broad picture instead of the areas related to the product design problem is wasted. Although this type of approach seems to save time, in cross-cultural design it is vital to get an understanding of the whole cultural context and then quickly focus on the related areas as suggested by rapid rural appraisal methods.

Rapid rural appraisal and participatory rural appraisal are the two terminologies used in the field of rural development from which the design field can borrow and reproduce new methods to deal with time challenges. Rapid appraisal refers to “quickly developing a preliminary understanding of a situation where specific research techniques are chosen from a wide range of options such as observations and semi-structured interviews” (Beebe, 1995, p.43). Systems perspective, triangulation of data collection, and iterative data collection and analysis are the main concepts in rapid appraisal and employing these concepts can help to save time in data collection. The systems perspective suggests initial consideration of the other culture with all the contextual aspects and then quick identification of key contexts and optimal ignorance of the rest. Triangulation refers

to combining consciously different research methods, and different team members with diverse expertise based on cultural context under investigation. Iterative data collection and analysis require blocks of time dedicated to collecting data and reflecting on the data in parallel. This allows the team to make decisions about what other data to collect, what methods to use, where to go next and what to revise. Interviewees also defined having **multiple design researchers in the field** simultaneously where they split up the work, daily debriefing and reflection meetings as helpful in overcoming the time pressure. Thus, scheduling the time for team gathering after field work is very important before returning to data collection again. Below are two exemplary quotes about constant debriefing and employing multiple researchers in the field:

"So, you're typically debriefing in a coffee shop in the half hour you have between one place and another. Because, I think it's really important to debrief as often as you can with everybody, so as you go, you evolve, you never stick with the questions you had at the start. Usually you find a thread that's interesting and then you'll adjust your questioning to whatever it might be." (J. G.)

"Every night it was kind of information overflow. Every night, after we'd do a whole day or a whole day and night of user research, we'd go back and download everything we heard. We'd write down quotes; we'd pick out the best pictures that we took during that day, and posted everything on a wall. We kind of had a war room, which we called it, where we put faces on the wall; we put observations – we just wanted to get things down before we forgot them. And then, again, we wanted to sift through our notes of the day and pick out the most important things. So every day we would do that. Every day we would tweak the questions that we wanted to ask. And if we still had some overarching question, we developed a way to answer that question the next day. I think this was really important, because our first trip over to Tanzania was two months, so it's a long time. But our subsequent two trips were seven to ten days. So we needed to get as much out of every waking moment." (L. S.)

In addition, careful selection of the sampling strategy or who to talk to and the cultural broker in the pre-design phase, employing more engaging and interactive data collection tools are helpful strategies to gather rich data in shorter periods of time.

Challenge: Cost

Overcoming the time challenge will also help to ease the **cost challenge**. Cost is one other obstacle in cross-cultural design contexts especially when design teams travel to the other culture. Transportation and accommodation of the design team, hiring recruitment agencies, interpreters, and incentives given to the participants add to the cost of the design project. Remote design research tools such as cultural probes which are explained in the next section may be used by companies to decrease the cost of cultural immersion. Companies may also hire local design consultant agencies that would function as cultural brokers between the company and the culture they design for instead of investing in sending an in-house design team to the other culture.

Challenge: Health and Safety

Health and safety are concerns when designers conduct design research in a different culture, especially in less-developed countries and neighborhoods where crimes rates are high:

"…In south Africa my client was so freaked, they were South Africans and they said listen 'No you just stay in your hotel; we will pick you up and drop you back every day; you don't venture anywhere by yourself.' Johannesburg is a very dangerous place. So I never went to Johannesburg downtown because of the horror stories I heard there." (A. K.)

Extreme weather conditions and regional diseases are defined as a safety issue. One of the interviewees told the story of how she got malaria in Africa while she was conducting design research. Thus, design teams should increase their awareness of health and safety issues and be flexible about changing data collection methods where their safety is challenged.

Cultural Immersion: Remote User Research

Remote user research in cultural immersion is employed when design teams do not have the financial resources, time and infrastructure to relocate. According to Kelkar (2007) remote research provides quick and efficient design research especially in cross-cultural contexts. Remote user research also addresses some other challenges of conducting in-person research such as otherness factor. In cross-cultural contexts presence of a designer may be disturbing and the information provided by users may be "made up or tailored to impress rather than real." (Kelkar, 2007, p.104).

Methods

Cultural Probes

The main method employed by interviewees in remote user research is the cultural probe. Cultural probes provide a way of gathering information about people and their activities which allows users to self-report through diaries (Gaver, Dunne & Pacenti, 1999). They allow design teams to reach out to contextual information related to the other culture. Users are given a set of materials and guidelines about what and how to

record through a specific period of time. Cultural probe kits usually include a diary, pens, sticky notes, recording devices and cameras.

Cultural probes are often used to gather visual and contextual information related to certain behavior, but they can also help to gather numerical data as an alternative to questionnaires and surveys. Although none of the interviewees mentioned use of questionnaires as a data collection tool in design research, cultural probes can be used as a more engaging and fruitful way of gathering statistical data if necessary. The users may be asked to keep diaries of demographic data, numerically evaluate certain experiences related to prototypes or rank their preferences over time. In this way, the use of cultural probes can especially be helpful if the design team needs specific information which can only be gathered over prolonged periods of time, or when the team needs to monitor a course of actions over time.

Challenges and Strategies

When conducting remote research through cultural probes in another culture there are several challenges that need to be considered in developing the toolkit as well as in data processing such as data safety, flexibility, bureaucracy, and communication.

Challenge: Bureaucratic Procedure

Strategy: Flexibility

The design team needs to consider the **bureaucratic procedures** of sending the cultural probe materials. One interviewee explained how the design project was affected by the delay in sending cultural probe kits due to the bureaucracy in Indian customs.

Especially in Asian countries sending toolkits which include a high number of cameras or other digital recording devices are likely to get stuck in customs:

"If you want to do a big ethnography project in a place like India and you send 24 cameras through DHL, like a client did. Don't expect those cameras to come out of customs before two weeks. You are just making yourself suspicious. Same in China. And suddenly your project is delayed; everything is messed up. And as much as I told the client, "Don't do this. Do them in small batches." But they really have this cowboy mentality. They were like, no, but we've done this in other places, so this should work. But it was like, you don't know the Indian bureaucracy, if anything can go wrong in India, it will. This is how a bureaucracy runs. So you have to work backwards. You say, whatever can go wrong, it will. Therefore, if I need four weeks for a project then I need to plan eight weeks in advance. And then if things go fast great, then the camera can sit with the agency in India till they are ready to come." (A. K.)

Flexibility towards unexpected delays such as the customs example described above is an important asset a design team should have in cross-cultural contexts. Remote user research in another culture requires flexibility in time as well as being flexible in changing the structure of data collection. Learning directly from local people rapidly and progressively requires flexibility in use of methods as well as iteration and improvisation. Reinventing the process depending on the context and the design problem under investigation is necessary. "Routinization and ruts" or slipping into methods only design teams have experienced beforeand overlooking other possibilities should be avoided (Chambers, 1992).

Challenges: Safety of Data, Limited Ability or Understanding of Users

Strategy: Consideration of Context

Safety precautions are needed to make sure the data collection tools will be returned and the data recorded by the participant users will not be spoiled. Also limited ability or

understanding of the users to complete the tasks asked in the probe kit should be acknowledged. This requires **consideration of the context** and where the cultural probe kits will be used.

Two different cultural probe kits were described by the interviewees as examples of how different cultural contexts require different toolkits. In the first example, the probes were designed for a group of women working in the fields in Rwanda. The kit included notepads, pencil crayons, camera, aspiration cards and a field bag designed by the interviewee. The Rwandan women were asked to draw things which they think will improve their community as a part of tasks required in the probe kit. When Rwandan women's daily ritual of working in the fields is considered, they don't have a place to sit and do the tasks asked in the probe kit. Thus, the interviewee designed a bag to hold the probe kit materials which can also be converted into a tablet for writing and drawing.

"I incorporated drawing into this toolkit; because I figured there would be different things that would emerge from sketches, so I developed the toolkit and I sent them with some friends, who were involved in an organization in Rwanda, to hand it off to my colleague there who administered the kit for one week and then I have them back and he collected all of the contents."(K. P.)

The second cultural probe kit example was developed for a design project in South African low income communities where crime rates are high. In this example, the probe kit was developed also to ensure security of the data and kit components. Instead of using the standard disposable cameras which they thought might be stolen, the design team decided to include a Polaroid camera which would not be worthy of stealing since its films are expensive and its resale is not common. The team also included a metal box

of biscuits as an incentive and used the metal box as a container to store photos taken by the users. In this example, the design team switched from using disposable cameras to Polaroid to secure the return of data collection tools. By using Polaroid cameras the design team also planned to engage participants in the research more and encourage their participation. Different from disposable cameras, Polaroid cameras allowed users to see the photos they took and share them with their community and talk about them.

The design team also took precautions to secure the **safety of the data** --the photo taken by the participants--:

"…The problem then was what if the pictures get spoiled? So then we decided let's get something that is a metallic box, maybe something like chocolates or cookies or something in it. And we'll give them the box and tell them to consume the cookies and chocolates, and then clean the box, and then start using the camera and save the pictures from the camera. So this way the pictures will be safe in a nice box. So we did that. And the users were delighted. Of course with this expensive box of biscuits that they don't even buy once a year, they were very happy." (A. K.)

A commonly described obstacle in using cultural probes was **limited ability and/or understanding**. Using these types of active probes is context dependent and they would not work in the situations where users are not familiar with camera technology or the idea of using a pen and creating ideas is not common. Thus, probing to engage users in research was commonly defined as hit/miss situations:

"I like to try and get some kind of activity where participants may draw or map out, this is my day, or this is my week, and I get them to draw it. I've found it's always hit-or-miss whether that works. Sometimes it works like a dream, and sometimes it's such a failure, you drop it after a day, because they're just not comfortable with mapping out, or they don't quite understand what you're asking from them. But I think it's always worth trying. It can get some very unexpected results, actually. Yes, probes are, again, hit-or-miss. It can be good." (J. G.)

"…how can I have communication with people who don't speak my own language, what are the other things I can do, in terms of body language, sketching or building something. I tried to have people help me fill out graphs like pie chart or kind of draw out their day and associate that with a time chunk and a clock. It worked moderately OK." (H. F.)

"… In Guatemala now they have used cameras, the challenge there with technology is that, people may not know how to use it and I learned yesterday that after two days the camera was broke.…we always aim for the lowest tech you can use so that it does not matter if the electricity is off or the camera is broken or everything is stolen from you, so everything that can be done on a sketch pad or with a pen is good… if you want people to keep a diary then you need to be extremely specific on what you want it for...you cannot expect anything, so prepare for everything" (K. L.)

Challenge: Communication

Strategy: Pilot Testing

Communication is a challenge in remote research contexts. Design teams need to keep in mind that the communication channels such as Internet may not be available. Design teams need a cultural broker who will communicate between the two cultures and conduct the cultural probe exercises and send the kits and results back.

Design teams' another way of communicating with the participant users will be the guidelines provided in the toolkit. Therefore, instructions should be very clear and easy to understand. The guidelines may also require translation into the user groups' language. **Pilot testing** the toolkit before sending it out helps to overcome any communication problems resulting from not very clearly-written instructions.

"…maybe 40% of the photos were not useful, they were either too dark or not relevant. But I think that's all right. You just had to make sure or be aware that you cannot use 100% of the photos and still get a lot of insights. From the experience of this, it is very important to have very tidy

instructions because some groups got photos from outdoors that were not part of the research at all. That was because of lack of information in the instructions, I think the instructions, just like a very simple sheet with some lines that's enough, but you have to be very clear." (C. K.)

Reflective Integration

Products are designed based on the interpretation of the data gathered from cultural immersion stage through a chain reflective integration and reasoning. The deliverables of this stage are usually design insights communicated in different formats and possibly some preliminary design ideas. After reducing the complex data from cultural immersion into design insights through iterative cycles of reflection and integration, then it is necessary to communicate these insights to the other stake holders. Stakeholders can range from other designers, other departments within the company, to clients and users.

Method

Visual Models

Reflective Integration stage is the most implicit stage from which design insights are developed. To make this implicit process more explicit and to synthesize often overwhelmingly rich data, interviewees described their method as visual display of the research results in different formats. There are a number ways to visually analyze and synthesize data such as mind maps, affinity diagrams, contextual maps and story boards. These visualizations make the concepts and discussion concrete and visible, and provide a physical medium for the design team to understand each other and come to an agreement. Design teams display, share, manipulate and discuss relationships and connections between design insights and determine the sweet spots for product

development. Design teams may create a number of visual models showing different things such as the flow of an activity, sequence of things, environmental context and objects in this flow, or the cultural constraints affecting the process (Beyer & Holtzblatt, 1998).

Challenges, Strategies

Challenge: Perceptual Filter

Strategies: Self-Critical Awareness, Empathic Skills, Dramaturgical Methods

One challenge in synthesizing design research results to create meaning out of them is the **perceptual filter** of the design team and the risk of ethnocentrism. Reality is a very fluid concept and what someone perceives as real goes through his/her perceptual filter, or in other words the filter of their belief system, judgments, prejudices and stereotypes. A Dutch designer developing sportswear veils for Muslim immigrants explained how her perceptual filter worked in developing her problem statement:

"…the image of covering or veiling was then of suppressed women walking ten meters behind her husband living a very isolated life and being a fundamentalist… now we have migrants living in our country and the image we had of the first generation is not up to date anymore…. now these women are demanding a place in the work place… they've become lawyers and they have become teachers." (C. V. B.)

It is also challenging to understand and redefine the design problem based on the reality of the user group, because designers often feel responsible for improving lives of people by bringing their efficiencies into the other culture. The following quote from an Australian designer designing for Africa illustrates an example of how perceptual filter can be a challenge especially in designing for emerging markets:

"…One of the hardest things to erase is cultural biases though. It's hard not to sometimes try to change the way others do things just because you might think that your way is more logical or efficient. Often there are reasons for their way of doing things that perhaps you don't understand." (L. W.)

Perceptual filtering is an intuitive and implicit process and **self-critical awareness** should be adopted by designers to overcome this challenge. Designers working in another culture should continuously examine their own thinking and behaviors, embrace and welcome mistakes to avoid futures ones. The assumption breaker exercise described in the pre-design phase is a helpful tool at this stage as well to keep the teams' awareness of their biases alive. Rural development literature suggests the "shoulder tapping" strategy to tackle this type of challenge which can also be adopted by design teams working in cross-cultural contexts (Shah, 1991). Shoulder tapping can be defined as a contract between design team members to tap the shoulder of colleagues who approach the design problem with cultural biases and ask leading questions of the users.

In cross-cultural contexts, **creating empathy** with the other culture is vital when the design team moves from research into redefining the problem based on the results. Empathizing with the users becomes a necessity in understanding their realities and seeing the problems from their eyes in order to develop solutions that will be adopted in that culture over time. According to the interviewees the more you develop your empathic abilities, the less you are biased by your own cultural background. Empathy is defined as the "intuitive ability to identify with other people's thoughts and feelings – their motivations, emotional and mental models, values, priorities, preferences and inner conflicts" (Fulton Suri, 2003). Another definition explains empathy as "the altered

subjectivity that can come from immersion into a particular context" (Plowman, 2003). Being able to develop empathy is strongly tied to the amount of time spent with the users. By reflective integration stage designers should have immersed themselves in the other culture to increase their empathic skills. During the reflective integration stage it is still important to suspend any judgments and approach the design problem with a genuine understanding of the cultural context. A designer explains this with the following words:

"...when designing as an outsider to the problem you have to understand the problem from a different point of view even when you think the solution is obvious." (L. W.)

Dramaturgical methods can help in cross-cultural contexts and increase empathetic ability of designers in developing design insights. Performing as users is especially defined as helpful when designers and users have culturally little in common and are culturally remote from each other (Johnson, 2003). There is an extensive literature available on dramaturgical design methods such as 1) focus troupe (Sato & Salvador, 1999); 2) body storming (Oulasvirta, Kurvinen, & Kankainen, 2003); 3) embodied dramatic personas (Kantola, Tiitta, Mehto, & Kankainen, 2007); 4) design improvisations or performance ethnography; 5) informances or "informative performances" (Burns, Dishman, Verplank, & Lassiter, 1994). The core idea of these dramaturgical methods is similar; enactment of user behavior by the designers to cultivate empathy and creative end results (Johnson, 2003). The focus troupe method is a dramaturgical method that combines a focus group and a forum theater. The focus troupe sessions begin with a brief opening demonstration of the concepts surrounding the design problem. Then, the concept is acted out which is followed by a discussion session. Bodystorming is "the

transformation of abstract ideas and concepts into physical experiences". Embodied dramatic personas require acting out the fictional character described in a traditional persona. By acting out this fictional character, designers experience the three dimensional space, time, other characters and concrete contexts. Design improvisations are iterative series of performances where there are no other audiences than the team members. Informances are more polished performances for an audience which may require more props.

By using these techniques designers act out certain behaviors they have observed and recorded in the field. Adding speech to enactment or speaking the subtext where designers verbalize a character's thoughts adds another level of consciousness about user's behavior. The vocalized subtexts help designers to pinpoint cognitive and emotional aspects of user experience (Laurel, 2003). The environmental context related to the user behaviors is also often recreated in dramaturgical methods. In addition to fostering empathy with the users, dramaturgical methods are helpful to communicate the other cultural context to project members who may be remote from the cultural immersion stage.

Challenge: Missing Contextual Information

Strategy: Systems Thinking and Identification of Contexts

Missing contextual information is very easy when a design team tries to determine the system of different cultural contexts and their interactions from an overwhelmingly rich data in a limited period of time. Systems are complex and when we consider the cross-

cultural context as a system it is not possible for design teams to capture all the aspects of this system at once.

Designing for another culture requires understanding human behavior in the cultural context. It is also important to note that the relationships and elements within a system cannot be identified in advance, or decisions cannot be made about what element of the system is important to focus on in advance. As design teams culturally immerse themselves and reflect on the data gathered, they will identify the important contexts; they will focus and redesign data collection tools and questions accordingly.

The concept of **systems thinking** refers to **identification of different contexts** surrounding design problems and their relationship to each other. To develop systems thinking ability, designers need to see the problem beyond the context of use and understand the whole context of the experience related to a product or a behavior. Some common important contexts influencing the behavior around design problems described by interviewees were: the environmental context, socio-cultural context, economic and technological contexts.

Environmental Contexts

The environmental context refers to the physical habitat and the other objects present in that environment. Depending on the design problem environmental context, which can be as diverse as the geographical, natural, and weather conditions, can have direct and indirect influence on human behavior. For example, certain climates may require certain house types and this may lead to a certain type of kitchen and all these environmental

factors can affect and shape user behavior related to cooking. Environmental contexts affecting design can be macro and micro (Table 5-1). Macro environmental contexts are related to natural resources and habitat, weather conditions, geographical conditions and infrastructures, while micro environment are related to built-environments and objects.

Table 5-1

Environmental Contexts

Macro	**Micro**
Natural resources, Infrastructures, Weather conditions, Geographical conditions	Built environments including buildings and objects

Numbers of examples were provided by interviewees on how environmental contexts can affect design solutions in different cultures. An American designer developing lighting products for Tanzanian users explained:

"…when we went to Tanzania, we took this one wooden prototype that we finished with, and we've made at least four other wooden prototypes. We brought them to the villages but villagers were like, 'you know we have termites here. And they'll eat woods; you might not want to make products out of wood'. We're like, 'Oh, I didn't think of that'."(L.S.)

One Norwegian designer developing products for Ugandans explained:

"We have been developing internet or information kiosks to make rural areas access to important information, education, and health. They are tamper proof units with a computer inside and a keyboard outside. They are basically made out of metal but this is the African sun, you don't need

to be a rocket scientist to see that you will fry your fingers if you try to type on it. And these are good example of solutions that have been developed out of context. When it's implemented, you have the contextual factors like climate, is it dusty, and can it be maintained? (K. L.)

Another example about a design project for Finnish users:

"…in Finland you can't take your gloves off every time you want to use your touch screen because it's really cold outside. So, maybe there's more of a bias towards buttons, for example."(J. G.)

Socio-Cultural Contexts

Socio-cultural contexts are composed of roles, ideologies and rituals (Table 5-2).

Table 5-2

Socio-Cultural Contexts

Roles	Ideologies	Rituals
Gender roles	Religion	Traditions
Family roles	Values	Daily routines
Occupational roles	Norms	
Cultural leadership		

Individuals have multiple roles such as gender, occupational and family in any culture. Multiple individuals with different roles may be interacting with products. One of the examples given by an interviewee was about the use of washing machines in India. The interviewee explained in a typical higher income household in India, individuals interact with a washing machine with user and owner roles. The user is the maid in the household and the owner is the mother of the household. The maid actually washes

clothing in the washing machine while the owner displays it. The maid is concerned with the functionality of the washing machine while the owner is concerned with the prestige of owning that particular washing machine. In this example, one socio-cultural role required simple and easy to use washing machines and the other socio-cultural role required the elegant look. And, the overall cultural context surrounding the washing machine was the experiences related to dress in India, the long Saris and their delicate materials. Therefore, the washing machine should be able to wash meters long Sari without getting stuck, it should be simple enough to be used by a maid, and elegant enough to be displayed by the owner to enhance her self-image.

Another example is provided by an American designer about how socio-cultural roles affected their product development decisions in designing a LED light in Tanzania:

"We were faced a lot by the big question of who's going to be the buyer of our product. Is it going to be the husband or the wife or the kid? Who's going to influence the ultimate purchasing decision? And I think that question is very easy to answer from a U.S. standpoint but very different question for a Tanzanian family choosing whether or not to buy this light. So understanding the cultural family interactions was the key for helping us think about the product. On the surface we thought it was the husband making decisions because the husband controls the finances and the husband is the decision maker of the household. But burrowing even deeper, we realized the children have a ton of influence on their parents. The parents are focused on a really good education for their children and a lot of what they do surrounds getting a good education for their children. We saw cases where children would be very excited about the solar product and their parents would see the excitement of their children and then something click in their head and say "oh yeah, this product could actually really help my children study at night". So on the surface, it may be a pressing decision of the husband but on the underlying percentage of the glacier, it's actually the children who are actually influencing that decision." (L.S.)

Leadership is another socio-cultural role which may function as a context affecting the design process. In some rural cultures any new idea should be first approved by the leaders of the community in order to be adopted. The following exemplary quote represents an interviewee's experience with Aborigine people:

"… I am going to help a group design a mentorship program for Aborigine people in Australia. Basically they need to design for the elders because they have such a strong influence and such a strong network that if the elders disapprove or say something bad about this program, that just in essence tries to help them, the program can be over. So you realize that, the networks and the word of mouth are so incredibly important that we need to bring that focus in much stronger and figure how we get that right." (J. G.)

Ideologies as an element of socio-cultural context are about religious beliefs, norms and values in a culture. They refer to implicit beliefs which shape human behavior. Thus, ideologies should be considered in developing design solutions for another culture. An interesting example shared by an interviewee about the effect of ideologies on design is the following:

"Sydney is very multi-cultural city and there's a very strong Chinese area called The Hills in North Sydney. It is very affluent area and I've just been observing what's been happening at some of the bank branches. The system for the bank numbers and for the accounts was designed so that you get whatever number you get. The Chinese customers that come in, got a number that meant instant death or something really terrible in Chinese culture. So, she got really upset because this is her money account and this poor banker is telling her, like, I can't change it for you because the system hasn't been done like that." (J. G.)

Rituals are reoccurring behaviors as results of belonging to a certain socio-cultural group. Traditions and daily routines as elements of socio-cultural contexts encourage

certain behavior. An Australian designer shares her experiences in a design project in Uganda:

"You truly have to understand the culture in order to provide a solution that is sustainable and one that the local people will actually subscribe to. After all, creating change is very difficult and often met with resistance. For instance when designing the clay stove , one of the things I had to understand was that the local women preferred portable stoves so they could sit in groups and gossip when cooking. If I had not understood this, and just used my own cooking experiences, then I may have come up with a solution where the stove was fixed in the kitchen and in the end the women may have resisted using it." (L. W.)

Another example was provided by an American designer on how daily rituals can shape design ideas:

"We spent a lot of time walking around villages at night and talking to different families. Our biggest take-home was when we saw again and again four or five children together at once, either siblings or neighbors, all setting around one kerosene lantern. And we would never have gotten this picture in our mind if they had just told us, "Oh yeah, my children sit by a kerosene lantern at night." It was like, Wow! Light is a very social aspect. Children have very strict schedules of study for two hours every night by the kerosene lantern. We definitely wouldn't have seen that if we didn't interact with any family. So that was an observation that just completely trumped any of the questions. And that was kind of the kicker when we decided to make our light a permanent stationary room light that would illuminate an entire room, and not just a point light or a splash light or something." (L. S.)

One British designer shared his reflection on the daily rituals in Chinese classrooms:

"We are in the class before the class begins and the kids come in and it's a kind of computer based class and there's just a pile of computers on a cart in the corner and the kids are taking computers and some of the computers are working and some of the computers are not working, some have 50% batteries, it's just a nightmare and probably ten or fifteen minutes at the start of class is wasted just getting the kids started with their computers. And again five, ten minutes at

the end taking the computers back with all the cables, it is just rubbish. So based on that we developed a kind of cart system where you roll in this buggy and all these computers slided into this cart, twenty-four computers in one cart, and they've all been charging and they are all set up to go perfectly and you just slide them in and at the end of the lesson you just slide them back…" (J. B.)

Technological Contexts

Technological context refers to materials and products, services and technological infrastructures available to the individuals in a particular culture. For example, availability of internet service or electricity infrastructure can be the technological contexts influencing certain user behavior. An example given by a Canadian interviewee is about a design project in Rwanda where the design team developed a corporate logo for the small business of a group of Rwandan women extracting agave plants. Rwandan women did not have the technological service to print the logo to use in their corporate documents or product labels. In this case, the technological context directly affected the product design:

"…what I realized was Rwandan women couldn't get things printed, they couldn't afford it. So the way that I could translate and adapt technology was to make the logo into a rubber stamp and so I turned the logo into a stamp. It could be repeatedly used. I sent them a small ink blotch. That would have been easy to do even with some of the inks that they have to dye agave plant to give color to the baskets that they weave." (K. P.)

Economic Contexts

Economic context can be approached at macro and micro levels (Table 5-3). The macro level is the overall economic conditions of a region or a country. The macro economical context is easy to understand through secondary research such as statistical data about

GDP and export, import rates. The micro level of economical context is related to the disposable income or the expenditures of individuals or families and how they use this income to sustain their lives in one culture.

Table 5-3

Economic Contexts

Macro	**Micro**
National	Family
Regional	Individual

Influential Contexts and Motivational Contexts

Environmental, socio-cultural, technological and economic contexts all together form the influential context around a behavior or the pattern of recurrent experiences (Table 5-4). Influential contexts are vulnerable to cultural differences. A designer needs to explicitly consider how these contexts influence design ideas when designing for another culture.

Table 5-4

Influential Context

Environmental		
Macro	**Micro**	
Natural resources	Built environment	
Infrastructures	Objects	
Geography		
Weather		
Socio-cultural		
Roles	**Ideologies**	**Rituals**
Gender	Religion	Traditions
Family	Values	Every day routines
Occupational	Norms	
Technological		
Economic		
Macro	**Micro**	
National	Family	
Regional	Individual	

In addition to the influential contexts, there is also the meta-level motivational context which is about psychological and emotional aspects of human behavior. The motivational context is the psychological and the emotional reason behind pursuing a certain action. This context can also be regarded as what individuals in one culture aspire to. The sweets spots for new designs often appear between influential and motivational contexts. Product function, appearance and the interaction of the product

with an individual should fulfill the needs that arise from influential and motivational contexts. (Figure 5-3)

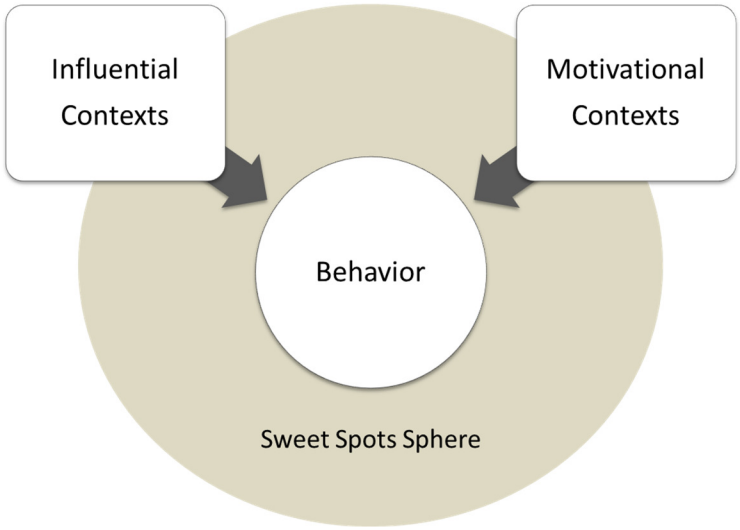

Figure 5-3 Sweet spots for product development.

Challenge: Lack of Stationary Physical Space

The practical application of reflective integration stage in a cross-cultural context can be challenging**. Lack of stationary physical space** where design teams can analyze and synthesize data can be a challenge when the designers employ in-person user research in the field. Designers often need a large physical space like walls and boards where they can display research results such as field notes and photographs to reflect on them. Interviewees emphasized the difficulty of trying to reflect on extensive research data in

small hotel rooms. Interviewees also pointed out that designing in another country requires being on the go and carrying around all the data and any boards or prototypes created. Keeping everything organized and accessible when needed is very important when a design team is mobile and does not have a stationary space. The following is an example quote by an Italian designer in India about the challenge of integrating results from cultural immersion on the go:

" there is this really practical issue of you are in a different country and you don't have necessarily an office and you are running from place to place , I really believe in having good wall space and being able to get a team of people together and being able to put everything up, obviously when you are in the field you have to download as you go, there are practical issues around that, having the team spread out around the city all interviewing in different places, or doing whatever they are doing in different places, you might hear something that makes you want to change the interview questions but then your colleagues are at the other end of the city and you don't know how to get to them, you need to wait until the end of the day, it is a very tiring and exhausting process, where you need to do things on the fly and work in taxis, cars, rickshaws." (J. G.)

Challenge: Difficulty of Communicating the Insights to Stakeholders

Strategy: Integrative Visuals and Videos

Communicating the insights and the in-depth knowledge gained as a result of cultural immersion and reflective integration to other stakeholders who do not have the same cultural competency as the design team is defined as a big challenge by the interviewees. The challenge is providing the context to people who have never experienced it. One American designer explained the difficulty of communicating user needs to clients who have not been to Tanzania:

"…it's hard to demonstrate the need for the cart because obviously clients don't have any personal or emotional response to the cart, yet over there, in Tanzania, there would be a huge response to it. So I guess conveying that emotional resonance to the cart to the investors would be a big issue, actually to, I think getting emotional feedback" (C. A.)

Interviewees defined that they organize presentations and workshops to share these results with stakeholders. **Integrative visuals and videos** from the field research, use scenarios and behavioral personas were described as the methods interviewees employed to share insights with partners. The importance of visually sharing the context with partners, engaging their thinking and involvement via small actives was defined by an interviewee:

"I often do something called remote immersion. And I really insist to bring stakeholders in a workshop and show them these pictures we have on the users – we have the pictures of people's homes, where they live, where they shop, things that surround them-- and get them on the same page. I find this a very crucial part. Very often a product will get designed, particularly if it's a Western company they will go "Well, this looks like who will buy this" because they have never stepped into a store in India or China, they have no idea that Beijing is very different from Nanjing. I think a remote immersion helps where I take a client through a forty slides show that goes for about twenty minutes." (A. K.)

Interviewees especially emphasized using videos as an effective tool in displaying the cultural context from which the design insights emerged:

"A lot of times it is hard for people I am talking to understand energy needs in rural Tanzania. So the first thing before we even start pitching business model, or pitching how we are going to reach these sales numbers, is showing pictures of a child sitting by kerosene lanterns and telling that story. I think it has been the most powerful way of having people understand our business with that one story, one picture." (L. S.)

A similar experience was shared by another interviewee:

"I think it's very hard to go and witness something, and have such an immersive experience, and even designers with all their visual capabilities, and all the pictures and videos you take it's very hard to come back and get your customers or clients or your stakeholders, or people who haven't come with you to really believe and feel all of this place and people you've met. That's a big challenge. I think this is where film can convey the tone and the feel of a place, and the people, and what they're saying." (J. G.)

Video is very helpful tool to engage other stakeholders and have them gain cognitive knowledge about the other cultural context. Video not only helps to communicate the context but also provides emotional and resonant connection with the other culture, and "reduces the distance between decision making executives and the users they are trying to understand" (Belk & Kozinets, 2005, p.136). However, in creating the videos to tell the story of the other culture and point out design opportunities, designers should be aware that by adding visceral effects such as music, sounds, imagery and color they can manipulate and shape the reaction of their audience (Belk & Kozinets, 2005).

Co-Design and Implementation

Having a solid understanding of the user needs may not always guarantee the design of successful products. Designers should be able to translate this understanding into genuine products which respond to influential and motivational contexts as well as cultural aesthetic and human factors:

"I think always the hardest thing is to jump from an insight and defining a problem to actually making it. An idea is easy, but actually making it something physical and getting that right I think is a difficult skill. It's just that the translation can be quite a jump and that's where I think some people are very apt at it." (J. G.)

The following quote describes how a French designer moved from reflecting on the environmental context in China to developing a physical product, an external refrigerator:

"…I've been living in China for 2 years…Observing their behaviors and habits; I tried to focus on how they deal with small spaces. In big cities like Shanghai, space is a luxury so people find ways to make those small apartments bigger using for example the outside as part of their own space. I observed and analyzed this behavior in the north of China, where during the cold season they take advantage of the outside low temperature to keep the food fresh on their balcony. This permits to unplug their fridge in winter, save money and by saving energy…Thus I developed an external refrigerator which can be fixed directly on the outside wall of residential buildings." (N. H.)

Methods

Direct and Indirect User Involvement in Design

Interviewees use the classical individual and group brainstorming techniques to develop ideas. In addition to classical idea generation, interviewees often defined the need to involve individuals in developing design ideas or in testing and critiquing these ideas in another cultural context. There were examples of **direct involvement** of people where they were asked to design things in collaboration with designers and **indirect involvement** where people were asked to test, critique and redesign provided prototypes. The following is an example of direct user involvement in the development of product ideas shared by a Canadian interviewee in Rwanda:

"I think the best decision I made was to ask them to design that, asking them to draw it. The best thing I did was getting myself out of the way and say 'I think that you have ideas, so can you show me'. I did a small workshop with about ten women. We went into their little work area. I had two by five index cards and pencils and our contact who is Rwandan translated for me. They drew things from baskets to chairs, in the end we decide that the agave plant as an invasive

species was the thing that set them apart and made them a unique cooperative of weavers in Rwanda where there are tons of weaving cooperatives. I took those sketches back and I began to look at them, I worked on a few ideas and I showed them again, they were thumbs up, this is great, we love it." (K. P.)

Another example by an Australian designer who designed handcarts in Tanzania:

"…not just doing it ourselves, but encouraging people to help us in the process, involving the local people in prototyping. We added sidewalls to the cart and we all sat down together and made sidewalls and put them on. We problem solved together. And probably because it was just an informal prototype we did not worry about the quality of products. So we were just happy to play and encourage as much play as possible. We also left the carts with them for a week. And it encouraged – because we had already prototyped with them – they understood what we were saying to them can you please continue with adaptations of the prototype?" (N. W.)

Building relationship and role negotiation were discussed as useful strategies in cultural immersion section. In co-design and implementation stage the challenge is taking this relationship to the next level and making users co-designers. Interviewees defined **limited ability and understanding of users** as the biggest obstacle in user involvement. Based on the examples provided by interviewees, in some cultures individuals may not have the ability to hold a pen or understand the concept of creating ideas, imagining things:

"…in Guatemala we had this project with the weavers and they had actually never created a product from their imagination. Our designer came down there to give them tools to develop new products… and say "Oh, so, let's draw." And then she realized that none of these women had ever held a pen because having a pen is a luxury and so they didn't know how to draw. So, she had to teach them to translate their thoughts into a drawing and when they did this they made drawings and then she taught them how to make the drawings into a product. But, when they saw their own drawing, they thought that the product that they made would be as sloppy as their

drawing and, so they didn't see the connection behind the sketch being a concept and that it can become a great product." (K. L.)

Feedback on new products or prototypes was a commonly described indirect user involvement during the design and implementation stage:

"…almost naturally the user plays a part in that process. So it doesn't necessarily mean they design but they always are in involved whether it is getting feedback at an early stage so when I have drawings, the styles, or even when I have prototypes. For example, we have a panel of local Muslim woman, we invited them a few times a year to come over for dinner, and then they also were invited to try on my new design, so, in front of the mirror they were trying it down and were giving feedback, and it was very valuable for us… we listen to the feedback we receive from our users. We also have a fan-page at Facebook. We have over a thousand members who give feedback on our designs. We listen to questions." (C.V. B.)

In addition to feedback interviews about prototypes and design ideas, interviewees described examples of feedback observations where a prototype is taken to participants and they are asked to perform different tasks:

"We actually did some very effective, observational research, where we took these complete solar systems that families had to install them into their homes and so they had to climb on to their roof and basically attach the solar panels to the roof. And then, wrap the wire, into the house to the light. And, we said, here's the product, we just want to watch what you do, and you can keep the product afterwards, there's no obligation to give it back to us and we're just going to sit here and watch. And, this was actually very effective because they were very excited to use these products and very happy to let us sit there and take pictures. They couldn't ask us questions about the instructions or anything. We found that very effective." (L. S.)

Challenges & Strategies

Challenge: Communicating Design Ideas to the Users

Strategy: Iterative Prototypes

Another challenge of involving users in the design process was defined as not being able to clearly communicate design ideas to the users. **Communicating design ideas to the users** is necessary when design teams want especially indirect user involvement through testing, critiquing and redesign. Communicating design ideas can be done showing users paper prototypes or physical three dimensional prototypes. Presenting the design ideas in two-dimensional format is a new language which must be learned and understood by the users. It is limited in providing the experiential context related to the product ideas because users cannot touch, feel or try out the idea. Therefore, using paper prototypes may be challenging when users don't have the ability to check and articulate their experience against a proposed design idea. With these prototypes often users reaction will be "I like that" or "I don't like that" and their reaction will not provide the in-depth knowledge to iterate the product idea (Beyer & Holtzblatt, 1998). The following is an exemplary quote from an interviewee about the difficulty of communicating ideas verbally or on paper especially when there is a language barrier:

"You can't expect to get the relevant feedback from a written proposal or a concept. You need to be: "This is what we are thinking of, it works like this and that". It needs to be visual, preferably a prototype. And then you will get the feedback that you need. For example again from this packaging project, we had support from the company that we were working but they didn't really understand what this was all about. I ended up 3D rendering a crate container and I put in boxes which simulated a box of Jerry Cans with oil, we put the boxes in the container and counted the number of boxes that would go in the container and then we compared that to the same kind of container with the competing shelf Jerry Can which was what they aspired to be, and their

harshest competitor. And then it appeared that with the current design that we had they would get 400 more Jerry Cans onto the container than their competitor. Visually I had a stack of boxes with a number underneath and I asked them "does this make any difference for you transport-wise?" And the management just completely, they were in awe. So then I got 100% support and then they suddenly realized what the design as a method can do. Before that I had explained it 2,000 times, but no one understood it." (K. L.)

Prototypes enable users to play out the experience and show what they like and they don't like about the product and suggest improvements. Prototype testing or prototype walkthroughs enable co-designing with users without requiring their ability to visually communicate ideas. Users can simply help to iterate and refine product ideas by showing and describing them to the design team. However, communicating design ideas with low fidelity, rough prototypes can also lead to some challenges although they are better than paper prototypes. Interviewees described how hard it was to convince the user that a rough prototype is not the finished product and that its appearance will change:

" A lot of the design process involves very early prototypes that might not look anything like a product. Be made out of wood, be really ugly. Maybe it doesn't even function, maybe we want to test whether it looks good to user, or maybe it functions but it has exposed circuit boards or what have you. It was a challenge getting the information we needed from testing with these users, from these early prototypes. When someone would be looking at it and saying, what is this? that came down to education about what we were trying to do and formulating our questions to make sure they were very targeted." (L. S.)

Also, the way these prototypes are presented to the users and tested can be another challenge. An interviewee described a mock-up store they developed to test the prototypes with the users and to see whether the price point is correct for the product:

" One of the fail techniques we tried. A big question in our head was, what price point can we design a product for and how much do we think we can sell them for? So, we took our four prototypes and set them and put post it notes on each of them, saying, OK. This is the price for this one and this is the price for this one, and we set up kind of a mock store. And it failed miserably because there was a big communication challenge between them understanding that this was like totally pretend, and we didn't actually want them to buy the product and so them thinking we are just trying to sell them these products, which were clearly not any good products at all because they were made out of wood. They were very early prototypes." (L. S.)

Using prototypes as close to the finished product as possible and clearly explaining to users their roles in testing these prototypes are very important in user involvement. Iteration is necessary in developing products; design teams need to go through iterations of prototyping and testing until all the problems are resolved. The continual involvement of users is important in cross-cultural design, showing prototypes excites and interests users because they see how their input during design research shapes the design of the product.

Challenge: Aesthetic Bias

Strategy: Generating Inspiration Boards

Interviewees described aesthetic appearance in design such as forms, colors and textures and materials as factors that should be considered in a cross-cultural design context. From the human factors perspective, visual aspects of design are considered as universal, hardwired and evolutionarily driven since responses to visual stimuli are subconsciously acquired. Gestalt principles discuss how our brains group elements into an unified whole to aid in processing of the visual information. The golden ratio or the divine proportion in art and design also addresses the hardwired response to visceral characteristics. However, in a cross-cultural design process the cultural context, date,

time, place as well as values and ideals of a society can affect the aesthetic perceptions (DeLong, 1998). The aesthetic or what is regarded as beautiful and valued by a culture are sensitive to cultural differences. There was significant emphasis by interviewees especially on preference of colors in different cultures. A Korean clothing designer designing clothes for African-American males described her experience with the color choice in design:

"You don't mix a color with this and these are cool colors for the African American style, so don't even think about putting other colors because it's not going to sell…When you look at the color preference, it's just shocking. How can you like this color mustard? I hate it; I don't like mustard. But then they love it. And when you put the mustard color on their skin, it's great, you know. But the thing is, it doesn't go with me because I'm Asian, yellow." (K. S.)

In Chinese, Korean, and Indian cultures that have rich symbolic contexts surrounding color, understanding and reflecting upon this context in design is a necessity. For example in designing for Asian cultures ideological contexts such as Feng Shui which is the practice of designing built environments to achieve a balance and harmony with nature, can affect the aesthetic preference. East Asian aesthetics value complexity, decoration, naturalism, display of natural objects and symbolism (De Mooij, 2010). The Korean home appliances company LG has been investing in research to design for the Indian market. The company developed the "Stars of India" line of household appliances for Indian users. Dark red color and floral patterns were incorporated in the design of washing machines and red color is associated with purity in Indian culture.

Aesthetic bias was a common challenge designers faced when they are designing in cross-cultural contexts. Although designers all know that the final arbiters of their

designs are users, there was emphasis on personal or cultural bias in the choice of forms and colors. Interviewees described their struggle between their own designerly aesthetic preferences versus the aesthetic expectations of that culture. The following two examples are from design projects for Chinese and Tanzanian markets:

"…when working on the rice cooker and the induction cookers, when we were sketching out the induction cookers they wanted to put all these flowery graphics on the cookers. To us it just looks really ugly, and we wanted to make it plain and with nice curves, they wanted it to look like it was from 90s very floral, we didn't like but again it is not for us." (A. A.)

Another example:

"You see Tanzanian women in the kind of fabrics they wear. They're bright orange and bright yellow and bright green. So they want their products, and their house to reflect that same vibrance. And if you were to come out with a bright green or bright yellow house light for the U.S. market, it's like no one would buy that, they would consider it gaudy, they would consider it cheap-looking and there's no way they'd ever display that prominently in one's house. So, definitely, we got to keep going back to the interviews, to the pictures that we took and say: "okay, even if no one in the U.S. market wants this, we decided on like a darker blue." But even, this is like their main product that they're putting in the middle of their house that they're very proud of and a blue light is exactly what they want. It's not a black light or a white light, it's colorful. So that's a fun example of just aesthetics and where we need to throw our U.S. aesthetics out the window. Just, remember who we're designing for, really. (L. S.)

Generating mood boards or inspiration boards related to the other culture was defined as a strategy to incorporate other culture's aesthetic ideals in design. Also **involving users in the design process** was defined as helpful in overcoming the challenges of cultural and designerly bias in aesthetic design choices as well as in application of cultural human factors.

Challenge: Cultural Human Factors

Human factors can vary among cultures both at physical, cognitive and emotional levels and cultural human factors deal with these differences. At the physical level, anthropometrics which are related to measurement of the human body can vary among cultures. Especially in clothing design it becomes a big concern. The body structure and proportion of individuals change from culture to culture and this needs to be considered in the design of clothing:

"… the black lady has very pronounced hips. And I cut the pattern for her, an A-line skirt, it didn't fit. I don't know how to fix it. And I was so worried because it doesn't fit. And I asked another pattern maker, how do you fix the problem? And he's, 'oh just rotate the skirt.' What do you mean, rotate the skirt?... So I immediately rotate when I do the fitting." (K. S.)

Another example:

"…no one can swim in Uganda and they are extremely afraid of water— the bone to mass ratio of Ugandans is different from a Norwegian. So that means that they sink much faster than a Norwegian, it's more difficult to stay afloat. We saw that when we demonstrated how a lifejacket works, asked them to use the lifejacket and jump in the water which is a huge thing because most people thought that they would just sink, the life jacket would just add weight to their bodies. They were like "Oh no are you crazy? We can't wear an extra thing. It would just make the process of drowning even faster, it is like having a big backpack and you jump." These people had complete trust in us as strange people from Norway and jumped off in Lake Albert with this lifejacket and learned they can actually float." (K. L.)

Human factors can also show differences among cultures at the cognitive level. One designer described her experience with Chinese users and how they process complex visual data:

“In China you watch people consuming media, teenagers have things flashing all over the place, they are just so used to watching these extreme things because they have these little low quality videos which are interrupted by advertisements all the time. Everything is free to them, they don’t care and that’s how they are used to doing it. We all know we have short attention spans online, but this was just another level, that was something so normal to them. It was just so different to us, I couldn’t even watch the screen, it was so overloaded with things... I think it's not a question of how they absorb it, it's a question of tolerance in that instance. They have a high tolerance for it because the tradeoff is that it's free so all the adverts and all the this-and-that.” (J. G.)

The example below on designing veils for Muslim women to be worn during sports activities is an example of how human factors can be affected by ideological context. According to their religious belief the veil needs to cover the women’s hair and neck, therefore the designer deals with issues of securing the veil during high impact physical activities, and finding materials that do not shine through:

“…I chose a stretchable material that fits most women snug around the face. Some are adjustable with Velcro, it's not supposed to shine through so the material needs to be thick enough. It needs to be safe, so on one model we have Velcro, when you pull it rips off so you don't get stuck. One of the first prototypes that I made for the tennis model was that of a more firm piece of material that I used. When the women were wearing it they said that it causes noise and hearing problems. Prior to production I changed it to a more flexible material…the outdoor model made of red fleece, I made with a big zipper on the neck because it translates the atmosphere and the styling of the outdoor sweaters and the women said "I don't feel comfortable with a zipper on my neck." so we replaced it with Velcro” (C. V. B.)

Evaluation

At the evaluation stage design solutions should be considered from two perspectives; local competition and possible consequences of the solutions on the culture.

Challenges & Strategies

Challenge: Local Competition

Strategy: Outsider Perspective

As markets outside the main stream of Western consumption culture are expanding, more and more companies are trying to enter these markets while local design driven brands are also emerging. Therefore, designing for another culture requires understanding of the local competition related to the specific product. Especially for large Western corporations **local competition** in another culture can be very challenging. Companies need to follow and respond to local competition after they launch their products in the market. Smaller local companies are nimble and flexible enough to respond to any competition and hold the advantage of understating the culture. The following quote exemplifies the common experience about local competition:

"The other thing that is very interesting about the emerging markets is that multinationals do not only compete with companies of their own level and size, they have to compete with lots and lots of local competition because they say, that's what they are selling I can make it cheaper and they make it cheaper and they sell it. Especially in India and China consumers don't have problem buying local brands they are not so attached if it is a low involvement product they are not brand conscious. So that puts companies in a very difficult place." (A. K.)

Although the cross-cultural context put foreign companies in a disadvantaged position in local competition, **outsider perspective** can also provide opportunities. Interviewees stated that in a cross-cultural setting they are able to see the big picture and recognize the details that might not be possible if they were a part of the same culture. Design teams do not take things for granted and they are likely to catch the details related to the design problem. The following quotes are the examples of why cross-cultural contexts

may offer more creative results. One interviewee reported not taking things for granted when designing for another culture:

"…I think I am usually better designing for another culture than I am for my own culture because when I do research in my own culture, I take everything for granted." (C. K.)

Three interviewees described they are able to start with a blank page and observe beyond what insiders can see:

"if I was designing a product for the French culture I am a part of the culture and I think I know what they want but when you are too much in this culture you are not starting with a blank page so, being an outsider and learning about the culture you have no idea really what it is like, you don't start off with all these ideas in your head. You observe things insiders can't see little details I think it definitely helps, in understanding and catching little details." (A. A.)

"The great thing about cross cultural research is, of course it is easier for me for my own culture because I am more in-tuned with it, it is intuitive I don't need to think about it so much, but when I go somewhere else it is so clear, the things which are just every day to them are so different for me that I can see them a mile away." (J. G.)

"But I actually really like the feeling of wiping out any preconceived notions beforehand and just going in with a blank slate in a sense from a design perspective, because you allow yourself to be a lot more creative in the solutions you think of. If I were designing a flashlight for the US market, I think it would be very difficult, because I have in my mind, decades of experience of what I think I want a flashlight for the US market to be, because I'm in the US market. But going into that with a blank slate, I think makes the decision much easier. As long as you can keep telling yourself, keep that blank slate, and only make judgments based on what you hear from your users." (L. S.)

Challenge: Cost Effectiveness

Cost effectiveness in responding to local competition was defined as the biggest obstacle. As stated earlier developing a new product for another culture is costly.

Transportation, accommodation and longer product development processes are additional costs for a company. On the other hand, especially in emerging markets where people's expenditure is limited, companies are challenged by making profits. Interviewees explained the difficulty of cost effectiveness:

"Price point was huge challenge. We had heard people saying I can't afford anything over 10 dollars and that's actually very hard for us as there is a lot of 10 dollars products in the market that provide electric light. We had to come back as designers and say ok they are saying one thing that they can't afford anything of 10 dollars but they are spending much more than that on kerosene every week, every year, There is always gap between what they think they can afford and the money they are actually spending." (L. S.)

Challenge: Distribution

Distribution of the new product once it is launched could be another challenge. Especially in more rural areas the services to deliver a product may be missing. Although distribution of a new product is not directly related to design activities, design thinking can offer solutions to ease distribution process:

"there is really challenges in how do you get this product into a place there isn't really a road, and there is not a lot of incentive to deliver products and services to these areas because they are considered so poor, it is not economically viable. So finding organization in countries that are focused on rural distribution is something that we always look out for to address these challenges, what we can do at this point is keep on looking at who is doing it, who is doing it successfully.(H. F.)

Strategy: Flexible Design

In addition, cross-cultural contexts in design may create some unintended consequences which refer to outcomes that are not the outcomes intended by a

purposeful action. According to the unintended consequences theory an intervention in a complex system always creates unanticipated outcomes (Merton, 1936). Design in a cross-cultural context can also be considered as an intervention in that cultural system.

Thus, it is important for the companies to follow up on the influence of their product on the culture for further development of the products and to be **flexible in their designs**. One of the interviewees described how they purposefully designed their product in a modular structure. In this way, they would be able to change the product easily in the future as they gather feedback about it in the market:

"One thing that we really wanted to do was to make it so that we could easily change something about our product if our sales aren't going well or customers would come back and say, this doesn't work with my house. So even if we have the plastic parts made, we still want to make sure the internals can be easily changed, to adjust the brightness level, which would then adjust the price point of the product. I can see, even a year from now, that we're still going to be getting feedback from our users, feedback from our sales numbers, and tweaking that out. It's never finished, it's never perfect as long as they can still be changed." (L. S.)

Summary

The predesign phase, composed of background set-up, presupposition awareness and the access stages, is the very first cyclical step which takes place after the design brief is given to the design team. At this step, the team prepares to design for a different culture and takes several precautions which will ease the process in the future. For example, the cultural difference between designers and users may challenge the communication process during the later stages of the process. Thus, designers should be prepared to understand the accepted norms of behavior and communication prior to meeting users in

person. Getting out of the comfort zone and the fact that understanding the cross-cultural context may bring extra ambiguity and complexity in the design process should be embraced by designers prior to the project.

At the background set-up stage, the design team develops a basic understanding of the culture they will design for through secondary research. Collecting background information about the culture before starting the research in-person is defined as an important step by the interviewees. Strategies used by designers to gather background information include conducting secondary literature research on the culture, gathering statistics and demographics, watching videos and documentaries related to the culture. Designers described this process as usually taking up to a week which helps them to structure the design research and develop their questions which will guide their data collection in that phase. Developing a “Dos and Don’ts List” as a result of background research prior to moving into design research was defined as a method used to ease future stages.

The interviews showed that one of the biggest obstacles designers face is ethnocentrism, which is perceiving the design problem from their own cultural perspective. This challenge emerges even before the design team starts the design project in the form of presuppositions, stereotypes or prejudices which designers may have about the other culture. These biases of designers do not become visible before the later stages of the design process or worse the designer may never be aware that he/she is approaching the design problem based on these presuppositions. Therefore, it is important that designers become aware of their biases and stay alert and above all not

make design decisions based on them. Keeping a log of stereotypes, presuppositions and prejudices about the culture before starting the design project is vital in pre-supposition stage. Role playing exercises among the design team by creating scenarios around this list can also increase awareness and alertness of designers towards these biases.

In a cross-cultural context finding access can be more challenging since designers and users often cannot communicate in a common language. Designers explained the main strategy in finding access into another culture as having a cultural broker. Designers also emphasized the importance of understanding the leadership roles in the culture and first accessing those leaders so that they can convince the community to participate in the design research. Determining the sample size for the design research is an important decision for design teams in finding access into the culture. The interviewees pointed out the importance of maintaining an attitude of diversity for all users, i.e. extreme users as well as secondary users. Norms of behavior, culturally defined values and roles in a culture should be considered by the design team in developing the cultural immersion strategy. Especially in so-called feminine cultures such as Asian countries where people value relationships and quality of life, it is important to employ female designers on the design research team (Hofstede, 1991).

The design phase is composed of four steps cultural immersion, reflective integration, co-design and implementation, and evaluation. At each step there are different challenges a design team should be aware of and different methods to overcome these challenges. The first step is the cultural immersion which can be done through in-person

user research or remote user research. Building relationships with the other culture is an important aspect of in-person design research. Users participating in the design research will become more open and cooperative when the design team shows interest in them regardless of design goals. In building a relationship with the user group, design teams should also focus on role negotiation. This concept refers to redefining the perception of the designer as the expert and the users as the research subjects. Both the design team and users should embrace each other as co-partners. Also learning the basic words of the host culture's language is defined as a positive factor in building relationship with the users. Interviewees defined cultural immersion methods as having direct contact with users in their real life setting to empathize with them. The very first method is non-participant observation where the design team is quiet, watching and shadowing users and trying to understand and experience their way of life, behaviors and environment. After non-participant observation and passive experience, design teams employed participant observation where they actively experience and feel users' life by imitating them. Interview as a cultural immersion method is described as informal and friendly talks and discussions. Being quiet, letting the user talk and using encouraging probes to trigger stories are recommended by the designers. Interviewees described the use of visual cultural probes in addition to supportive and encouraging manners to have the users talk during interviews. In classical ethnography methods of observation and interviews, users have passive roles, involving them in the research process and moving them away from the passive role by engaging them in the process creates fruitful results. In this way, users own the project and the perception of the design team as the expert coming into their house and questioning them is eased. Language --both verbal and non-verbal-- was defined as the major barrier for cultural

immersion in cross-cultural design contexts. To overcome this challenge design teams hire interpreters when they reach out to individuals for interview or observation sessions. However, interviewees all agreed that they miss a lot of contextual information as well as a link with the other culture when they have to use interpreters. The changes in body language from culture to culture were also defined as an obstacle in communication. The challenges designers face forced them to develop different strategies than only relying on the interpreters. Interviewees described that they became better observers due to limited verbal communication and they use visual tools, such as images, and visual cultural probes in design research. Involving users in the research with a more active role and developing visuals dictionaries were defined as helpful tools when communication in common language is not possible. Time is another major barrier in the cross-cultural design processes. There may be multiple and unexpected factors that can delay the cultural immersion stage as well as the whole design process; therefore cross-cultural design contexts call for flexibility in time. Interviewees explained that they miss a lot of information by “fast fashion style”, quick design projects. There was a common desire among interviewees for longer design processes, especially in the cultural immersion phase. Understanding a design problem in the context of another culture not only requires understanding the problem itself but also the people and their way of life. Additionally, biases and assumptions designers may hold towards the culture can be recognized over time. The more time a designer spends with the other culture, the more he/she sees the context of the design problem from the other cultures’ perspectives without judgments. Safety is a concern when designers conduct design research in a different culture, especially in less-developed countries, in neighborhoods where crimes rates are high. Cost is one other challenge in cross-cultural design contexts when design

teams travel to the other culture. Transportation and accommodation of the design team, hiring recruitment agencies, interpreters, and incentives given to the users add to the cost of the design project. The extended schedules can also increase the cost of cross-cultural design processes.

Remote user research in cultural immersion is employed when design teams do not have the financial resources, time and infrastructure to relocate. The main method employed in remote user research is cultural probes. When conducting remote research through cultural probes in another culture there are several challenges in developing the toolkit as well as in running the process, such as data safety, flexibility, bureaucracy, and communication. Instead of adopting existing toolkits, developing the toolkit based on the context where it will be used is a vital step if data collection is done remotely in the other culture. In remote cultural immersion, the design team needs to consider the bureaucratic procedures of sending the cultural probe materials. Being flexible towards unexpected delays such as the customs example is an important asset a design team should have in cross-cultural contexts. Remote user research in another culture requires flexibility in time as well as being flexible in changing the structure of data collection. Communication is a challenge in remote immersion contexts. Design teams will need a cultural broker who will communicate between the two cultures and conduct the cultural probe exercises and send the kits and results back. Guidelines provided in the toolkit are the only means design teams communicate with users. Therefore, instructions should be very clear and easy to understand. The guidelines may also require translation into the user groups' language. Pilot testing the toolkit before sending it out helps to overcome any communication problems that may occur due to not very clearly-written instructions.

Reflective photo and video journaling, role playing, behavioral personas, affinity diagrams and mind maps were reported as useful methods to integrate research results from cultural immersion. Redefining the problem statement based on design research results requires systems thinking. It refers to conceptual thinking about the cultural context surrounding the design problem, understanding roles, actors, behaviors and context around it. To develop systems thinking ability designers need to see the problem beyond the context of use, understand the culture from multiple perspectives which means not only see them through the lens of judgments, biases, and stereotypes but see the actual reality of the users. However, one challenge in synthesizing design research results to create meaning is the perceptual filter of the design team. Reality is a very fluid concept and what someone perceives as real goes through his/her perceptual filter; the filter of their belief system. It is challenging to understand and redefine the design problem based on the reality of the user group, because designers often feel responsible for improving lives of people bringing their efficiencies into the other culture.

Involving users in the development of product ideas was a common practice among interviewees. Users were involved in the idea generation process with simply sketching and discussing their ideas, low-tech prototyping, developing inspirational collages, and testing and critiquing early prototypes. This process was defined as helpful in overcoming the challenges of 1. cultural and designerly bias in aesthetic design choices, 2. application of cultural human factors. Designers referenced aesthetics and appearance in design such as forms, colors and textures as factors that need to be considered in a cross-cultural context. The cultural context, date, time, place as well as values and ideals of a society can affect the aesthetic perceptions. Designers

interviewed stated their struggle between their own designerly aesthetic preferences versus the aesthetic expectations of that culture. Cultural human factors is also related to the context that surrounds design problem residing in cultural differences such as values, beliefs and knowledge or technology.

At the evaluation stage design solutions that have been developed should be considered from two perspectives: local competition and possible unintended consequences of the solutions. As markets outside the main stream Western consumption culture are expanding, local design driven companies are emerging. Therefore, any culture-centered design process requires understanding of the local competition related to the specific product. On the other hand, cross-cultural contexts can provide opportunities to design creative solutions. Because of the cultural difference the design teams do not take things for granted and they are likely to catch the little details related to the design problem. Design in a cross-cultural context can also be considered as an intervention in the other cultural system. Thus, it is important for the companies to follow up on the influence of their product on the culture for further development of the products. One of the interviewees described how they purposefully designed the product in a modular structure. In this way, they would be able to change the product in the future easily as they gather feedback about it in the market.

CHAPTER 6: CONCLUSIONS, IMPLICATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

This chapter summarizes findings of this study and presents reflections on these findings. The chapter also discusses potential implications of this study by design practitioners and concludes by pointing out the potential future research areas.

Summary and Discussion of the Results

The results of this research are grounded in the interviews about cross-cultural design experiences of twenty designers who were involved in the design of a variety of products ranging from clothing and kitchen appliances to packaging and consumer electronics. Although this research is process-focused rather than product-focused, one overarching question that may come to mind is “are all products vulnerable to cultural difference?” or “does cultural difference matter for product design?”

The demands of mass manufacturing create hegemony of similar products across cultures. Some mass-produced modern products such as mobile phones, cars, washing machines or laptops are usually similar across cultures and they are intended for use by millions of people around the world. It is less time intensive, costly and risky for profit-driven large multinational companies to manufacture a “global” product and market it across cultures with only superficial adjustments in language, color or packaging. However, this does not mean that global products can recognize cultural differences and can meet needs of individuals across cultures. As stated with examples in Chapter 2 and 5 people’s activities are determined by the culture they live in and by the environmental,

technological and economic context of the national culture they belong to. Therefore even they use similar products; they create very different experience out of them (De Mooij, 2010; Chavan, Gorney, Prabhu & Arora, 2009). People work around homogenization of products across cultures by reconfiguring the same product in different ways to better fit them to their cultural needs. In Chapter 5 interviewees who had experience in designing products such as mobile phones and laptops or other consumer electronics described how different contexts affected people's experiences with these products. Thus, the focus of the design should be what people do with the products available to them rather than the products themselves. In some industries which are globally dominated by a single brand such as the smart phone industry, some companies look for new market opportunities in rural contexts in emerging markets where people's expenditures are very limited. Other examples have been discussed in literature; a washing machine in India or Brazil may look the same to those in Europe or in the U.S., however washing behaviors are extremely different. In India people need a washing machine which does not coil meters of long saris (Kumar, 2004) and in Brazil people wash clothes in cold water because the link between cleanliness and hot water is not strong.

In this research a definition of culture at the national level was adopted and the term culture has been used to refer to cultural aspects of a group of people that belong to a nation. Seventeen out of twenty interviewees were designers originating from European and American cultures and developing products for emerging markets in Asia and Africa where Western ways of thinking and behaving do not work at all times. Chinese, Indian and African markets have been attracting many Western companies with their rapid

economic growth rates and large population. For many Western companies the common practice of localizing products has been funneling marketing and advertisement efforts to relate the products to the local context, and thus to find viable foreign markets for existing products. Often times these products are adopted because of their association with modernity and Western lifestyles. Culture has been an underutilized source of product design and market opportunity for many large multinational corporations; however as more Western companies invest in these markets and new local companies emerge, the role of design has become more critical and important. Also, it is not the best practice in design to slightly modify products and benefit from reputation comes from the foreignness of the brand or the company. This not only diminishes the richness of the other culture and its connection to historical roots but also creates major environmental sustainability issues when Western like consumption patterns are recreated in the emerging markets. The best practice is to design and offer new products that are relevant to the socio-cultural context and to consider the long term effect of the products on the culture.

Entering emerging markets with new products is challenged by the diversity of cultures, the diversity in the economic and technological contexts and therefore requires new ways of design thinking. China is not one China; there are fifty-five minority groups, seven official and over a hundred indigenous languages. The same applies to India and Africa where regional dialects, languages, religions and customs change within a thirty mile radius. Frog Design's chief creative Mark Rolston describes the difficulty of designing new products in these large and culturally diverse markets (Kuang, 2005):

“They key idea is that it’s not just emerging market. This is a bunch of people that don’t have a habit of buying things, because they’ve never been able to. Now they’re staring at these companies saying, "What do you have to sell?" And the companies are saying, "I don’t know. What do you want?"

Understanding the link between culture and product interactions is critical to innovate and develop new products. But how can designers actually understand what people need and want when there is significant cultural difference between them? Can designers apply the same generic design process they normally use when they are in a cross-cultural context? What does the process of designing for another culture like? This research analyzed twenty designers’ product design processes in cross-cultural contexts to develop a framework of the process of designing for another culture and to explore the challenges of this process. Twenty designers, who have diversity in the products they design and cultures they design for, were interviewed using online communication technologies or face-to-face. Grounded theory approach which allows abstracting from practical experiences to develop a theoretical framework of a process was employed to in data collection and data analysis. Two iterations of interview questions were used as the data was analyzed simultaneously through three level open, axial and selective coding using the qualitative analysis software NVivo.

The in-depth interviews with the designers showed that designing for other cultures is difficult because it is unfamiliar territory from the perspective of cultural, linguistic, environmental, technological and economic contexts. Conducting ethnographic design research to understand users and abstracting from this data with minimum effect of assumptions and biases were defined as the most challenging aspects in the design process. The highest numbers of codes in data analysis were clustered under the

cultural immersion category which discussed issues of conducting ethnographic design research in other cultural contexts. The culture-centered design process framework that emerged from analysis of the interview transcription presents a pre-design phase and a design phase.

The pre design phase mostly targets the challenging cultural immersion stage in the design phase and helps the design team to take precautions which will save time and money at the cultural immersion stage. The pre-design phase is composed of background set-up, presupposition awareness and access stages. During the background set-up stage, designers develop cultural competency by addressing cross-cultural communication issues and the cultural contexts surrounding the design problem. Lack of cultural competency in a cross-cultural context deeply affects the cultural immersion stage during design phase. Many examples about how lack of knowledge on appropriate ways of greeting or thanking, and limited understanding of leadership and gender roles can delay the design research were shared and discussed in Chapter 5.

Ethnocentrism -- the tendency to evaluate people and things based on assumptions-- and cultural imposition --the tendency to impose own beliefs to another culture --are both addressed at the presupposition awareness stage. The presupposition awareness stage is about designer's self-examination of any cultural bias, stereotype, prejudice or pre-conceived judgments of the other culture. During the cultural immersion stage where designers are in an unfamiliar environment and cultural context, it is very easy to make decisions based on assumptions, biases or what looks to be exotic about the other culture in initial contact. Designers need to take precautions in the pre-design phase to

remain as objective as possible when they are conducting the ethnographic design research in the design phase.

The final stage in the pre-design phase is access which helps to link pre-design phase to the design phase. Access stage is about developing networks and relationships to enter the user's domain in another culture. Finding cultural brokers, who are capable of mediating between two differing cultures, is the key at this stage of the process. Cultural brokers are often local guides and interpreters, recruitment agencies, local organizations or local educational institutions.

The design phase is the second phase that is composed of the trio of cultural immersion, reflective integration, and co-design and implementation, and the final evaluation stages. Cultural immersion stage is the physical or remote exposure of the design team in user's environment with the aim of understanding needs, limitations and aspirations related to a specific design problem. Building relationship with users, otherness factor, language, time and safety are the major themes emerged under the challenges of in-person cultural immersion. In designing for another culture designers and users often times cannot communicate in a common language. The differences in cultural ethnicity add a second layer of otherness. Negotiating the role of the designer and user in the design process and overcoming the expert-subject relationship is another challenge. Designers also need to deal with safety issues when they are in the field which may lack basic infrastructure, proper roads, communication systems, healthcare and accommodation. These challenges residing from the cultural difference between designers and users result in increased time allocation for cultural immersion and therefore increased cost if

the design team does not follow the pre-design phase and take necessary precautions. During remote cultural immersion, designers struggle with practical issues of conducting research using remote data collection tools like cultural probes. Bureaucratic procedure of sending probe kits overseas that may include electronic devices such as cameras is a challenge. Once probe kits are delivered to users there is the challenge of managing the process remotely and ensuring that data collected by users will be returned to the design team safely.

Next stage is reflective integration where data gathered from cultural immersion stage is interpreted through a chain reflective integration and reasoning. Reflective integration stage presents the challenge of perceptual filter which is processing the data gathered from cultural immersion stage through the lens of designers' own belief systems. It is very easy to miss contextual information from an overwhelmingly rich data in a limited period of time. Designers also need large stationary physical space like walls and boards where they can display research results such as field notes, photographs to reflect on them. Interviewees pointed out that designing in another country requires being on the go and carrying around all the data. Communicating the insights and the in-depth knowledge gained as a result of cultural immersion and reflective integration to other stakeholders who do not have the same cultural competency as the design team is defined as a big challenge by the interviewees.

In co-design and implementation stage, designers translate the design insights they have developed with reflective integration into genuine products which respond to influential and motivational contexts as well as cultural aesthetics and human factors.

Although designers all know that the final arbiters of their designs are users, there was emphasis on personal or cultural bias in the choice of forms and colors. Human factors vary among cultures both at physical, cognitive and emotional levels and designers need to deal with these differences. In the co-design and implementation stage, involving users in the design process with more active roles is the key to successful results. Interviewees defined limited ability and understanding of users as the biggest obstacle in user involvement.

The final evaluation stage refers to maintaining sustainability of the product in the market by ongoing evaluation of local competition. Developing a new product for another culture is costly: transportation, accommodation and longer product development processes are additional costs for a company. On top of that in emerging markets people's expenditure is limited, companies are challenged to make a profit. In more rural areas the services to deliver a product may be missing. These challenges should be considered at the evaluation stage.

Summary and Discussion of Methodology

Grounded theory was used as a method of data collection and analysis in this study. It provided a useful guideline to rationalize the uncertain nature of conducting qualitative research. As Strauss and Corbin emphasize, grounded theory is a very emerging process where data collection tools change as the researcher analyzes the data in parallel. Conducting a pilot study helped to create a foundation for data collection and data analysis, validate the assumptions this research was built on, and reiterate the research questions. The main ideas pulled from pilot interviews mostly highlighted the

purposive sampling criteria for interviews. A questionnaire was developed to assess eligibility of an interviewee based on the sampling criteria. Pilot study was also helpful in testing the interview questions and developing the Level 1 interview questions for data collection.

Grounded theory was a very work-intensive methodology. The two levels of interviews in conjunction with three levels of coding, memoing and reporting results were very tedious. The three levels of coding and going through data on a line-by-line basis allowed for new insights, and ensured that no important themes were overlooked. The use of the qualitative analysis software NVivo was a worthwhile endeavor in dealing with large data, simultaneous and tedious data collection and analysis, and reflection process. The software was a very helpful organizational tool and highlighted themes that may not have been identified otherwise if I were simply reading through and trying to do the manual coding. Also the use of the software helped in making the coding process more explicit.

Using grounded theory methodology was a good fit with the objective of the study. It was helpful in discovering the underlying contexts, assumptions and experiences of designers involved in designing products for unfamiliar cultures. The rigor in grounded theory helped to build confidence in results drawn from complex and iterative design processes. The grounded theory process encouraged interviewees critically reflect on the dynamics of designing for another culture and question their own assumptions. From the researcher perspective grounded theory process enabled creative and innovative thinking and reasoning.

Implications for Practical Application

There are several implications of the current research. First designing new products for another culture requires a different process and has unique challenges. Companies that want to invest in new markets with diverse cultural backgrounds should be aware that they will need to employ a different process and be prepared for the challenges. The framework presented as a result of this research can provide companies with the insight about how to approach designing for another culture, provide a list of possible challenges during the design process and examples of how others have overcome these challenges.

Second the results of the study showed that the most challenging stage in the process of designing new products for another culture is cultural immersion. The cultural immersion stage is where design teams conduct ethnographic design research in-person or remotely. Bottlenecks in research are likely to occur because of the socio-cultural and contextual differences. Therefore, companies should consider employing professionals trained in design research or social scientists such as sociologists and anthropologist in their design teams to minimize the challenges of cultural immersion stage. Also, it is beneficial to employ local designers or researchers in the team. For companies not large enough to have multi-disciplinary and multi-national design teams it is important to have local partners at cultural immersion stage and find the best possible cultural broker.

Implications for Future Research

The results of this research presented an overview of the process of designing for another culture. For further research it is possible to expand upon the existing data. Each stage in the process can be examined in detail with further literature review and supplemental interviews. The resulting framework can be further developed using a "research through design" (Schon, 1983) approach where the framework is tested with practical design applications. The results of this study can be applied to the design processes for different national cultures or other cultural groups. The definition of culture can be widened to any group of people experiencing a set of knowledge built over time. The resulting framework can also be tested in a quantitative study. Resulting themes can be translated into measurable variables and designers can be surveyed about the effects of these variables in a cross-cultural design context.

The interviews provided extensive data and in this research only results relevant to the objectives of the study were shared. There were data that fell outside the scope of this research which could be used for further research. For examples interviewees provided information about working in China as a designer, the Chinese way of product design versus Western way of product design and the dynamics of working in multi-cultural design teams in China. It is possible to work with this existing data and expand the literature and result in a study that discusses the patterns of working in China as a Western designer.

In addition to working with the existing data, new related research can be conducted. New design research methods and ideation methods that respond to challenges of

cultural difference between design teams and users can be developed. Design research techniques such as focus groups or integration techniques such as personas can be evaluated for their applicability in different cultural contexts.

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Appendix I

Recruitment Email Template

I am contacting you regarding a research study about cross cultural design processes and integration of cultural factors in the design process.

I am currently a doctoral student in the College of Design at the University of Minnesota, USA. I would like to invite you to participate in a very brief online survey which you can access by clicking on the following link:

https://umsurvey.umn.edu/index.php?sid=66763&lang=um

The time commitment for the survey is around five minutes. The survey is conducted to determine designers who had experience in designing for users with different cultural backgrounds. Designers with such experience may be invited for an interview about their experience based on their replies to the survey. The interviews can be conducted face to face, by phone, by online communication technologies such as Skype or by e-mail according to the availability of the designer.

Please reply to this email (goncu006@umn.edu) if you have questions about the study.

I appreciate your time in responding to the survey,

Sincerely,

Gozde Goncu-Berk

PhD Candidate

University of Minnesota

Design Program

Appendix II

Interview Invitation Script

I am a doctoral student in the College of Design at the University of Minnesota, USA. I am contacting you regarding a dissertation research study which investigates cross-cultural design experiences and integration of cultural aspects in the design process.

My goals are to understand the challenges of designing for different cultures and methods used by designers to overcome these challenges. For this research, I have been interviewing designers who have experience in designing for other cultures than their own. I would like to invite you to participate in an interview about your cross-cultural design experience. You are being contacted because I believe that you may have experience in designing for users with different cultural backgrounds.

The interview will be about your experience in designing for users with different cultural backgrounds, the challenges you faced, and the strategies you developed in solving these challenges. The time commitment for the interview will be about an hour. The interview can be conducted face to face, by phone, by online communication technologies such as Skype, or by email based on your availability and preference.

Please reply to this email (goncu006@umn.edu) to let me know if you are interested in participating or if you have questions about the study. I can provide more detailed information about the study and we can discuss your preference of interview method. Thank you for your time,

Sincerely,
Gozde Goncu-Berk
PhD Candidate
University of Minnesota
Design Program

Appendix III

Statement of Informed Consent

UMN IRB Human Subjects' Code: 1002E77736

Culture-Centered Design Research

You are invited to participate in a research study which investigates cross cultural product design experiences and integration of cultural aspects in the design process. You were selected as a participant based on your design experience for different cultures. Participating in this research requires that you read this consent form and ask any questions you may have before agreeing to be in the study. The study is being conducted by Gozde Goncu-Berk, doctoral student, College of Design, University of Minnesota.

Procedures:

You will be interviewed about your experience in designing for users with different cultural backgrounds at different steps of the design process, the challenges you faced, and strategies in solving these challenges.

Risks and Benefits of Being in the Study:

There is no physical risk to participating in this study. There is no fee paid or other benefits. Identifying information will be removed from all collected data. Un-identifiable data may be used in research publications.

Confidentiality:

All information gathered will be kept confidential and private. In any sort of report that might be published, any information that will make it possible to identify a subject will not be included. Research records will be stored securely and only the researcher will have access to the records.

Voluntary Nature of the Study:

Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota.

If you decide to participate, you are free to withdraw at any time without affecting those relationships.

Contacts and Questions:

The researcher conducting this study is Gozde Goncu-Berk. You may ask any questions you have now. If you have questions later, you may contact Gozde Goncu-Berk at (612) 644-6632

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), contact Research Subjects' Advocate line, D528 Mayo, 420 Delaware Street Southeast, Minneapolis, MN 55455. Telephone: (612) 625-1650

Appendix IV

Open Coding-Free Nodes

Free Nodes

Name	Sources	References	Created On	Created By
Ability to communicate in that culture's language	6	9	2/4/2011 2:51 PM	GG
Ability to deal with Chinese partners	2	2	2/4/2011 12:24 PM	GG
Ability to Speak Chinese	2	3	2/4/2011 12:24 PM	GG
Acknowledging that not all data from cultural probes are us	2	2	2/5/2011 12:02 AM	GG
Affected by cultural background in selection of colors	4	7	2/4/2011 3:36 PM	GG
Affected by cultural background on approach to design pro	4	11	2/9/2011 6:57 PM	GG
Applicability of design research to products, services, tech	1	2	2/10/2011 12:18 PM	GG
Appreciating the culture based on new knowledge	4	5	2/4/2011 2:49 PM	GG
Ask users many questions	5	7	2/4/2011 12:52 PM	GG
Aspiration cards as remote cultural probes	1	1	2/9/2011 8:48 PM	GG
Aspiration cards vc user involved drawing	1	1	2/9/2011 8:49 PM	GG
Assumption breaker exercise prior to research	2	4	2/10/2011 2:20 PM	GG
Assumptions about the user	5	10	2/8/2011 2:32 PM	GG
Avoiding user research	1	1	2/4/2011 9:58 PM	GG
Be friendly and encouraging	3	11	2/4/2011 2:25 PM	GG
Behavioral persona	1	4	2/10/2011 1:26 PM	GG
Being aware of assumptions and biases over time	4	5	2/9/2011 6:50 PM	GG
Being aware of cultural bias through visual cultural probes	1	4	2/10/2011 2:16 PM	GG
Being blind to the contextual details in same culture	4	4	2/4/2011 3:34 PM	GG
Being familiar with cultural norms	3	4	2/8/2011 10:52 PM	GG
Brainstorming for concepts	2	2	2/4/2011 1:22 PM	GG
Build relationship with the user	4	16	2/4/2011 3:05 PM	GG
Catching the nuances in the other culture	5	7	2/4/2011 3:31 PM	GG
Challange for Western companies in Asian market	2	8	2/4/2011 3:43 PM	GG
Challanges of geographical difference	1	1	2/10/2011 4:50 PM	GG
Chinese based Western design	2	4	2/4/2011 12:22 PM	GG
Chinese market--too fast	1	5	2/10/2011 12:51 PM	GG
Co-create with the users	2	3	2/8/2011 10:13 PM	GG
Co-design workshop	4	5	2/9/2011 7:19 PM	GG
Collecting background info about user through photos befo	1	2	2/10/2011 2:39 PM	GG

Free Nodes

Name	Sources	References	Created On	Created By
Collective vs individual brainstorming	1	1	2/4/2011 10:40 PM	GG
Companies product focused rather than research focused	1	2	2/10/2011 1:49 PM	GG
Comparison of designer's culture and the other culture	3	7	2/11/2011 12:50 PM	GG
Complexity of culture	2	3	2/9/2011 6:49 PM	GG
Conflicting aesthetic preferences between designer's and	5	8	2/4/2011 3:38 PM	GG
Conflicting cultural design ethics	4	5	2/8/2011 2:52 PM	GG
Conflicting ways of designing in West and East	2	2	2/8/2011 2:23 PM	GG
Contributing to the society through design	3	9	2/9/2011 11:05 AM	GG
Cost of primary research (travelling and accessing to the u	3	3	2/8/2011 2:33 PM	GG
Creating a relaxing environment for brainstorming	1	1	2/4/2011 1:47 PM	GG
Creating new ways of communication	1	1	2/9/2011 4:30 PM	GG
Cultural diversity in China	2	2	2/8/2011 3:01 PM	GG
Cultural human factors	3	11	2/9/2011 2:04 PM	GG
Cultural immersion	4	9	2/4/2011 12:40 PM	GG
Cultural sensitivity is context specific	7	13	2/8/2011 2:55 PM	GG
Cultural sensitivity of design problem	1	1	2/8/2011 10:46 PM	GG
Culture beyond geographical difference	1	2	2/4/2011 12:31 PM	GG
Design as shaper of the culture	1	1	2/9/2011 8:12 PM	GG
Designed in China for local market	2	2	2/4/2011 12:29 PM	GG
Designed in China for Western market	2	4	2/4/2011 12:28 PM	GG
Designer as negotiator between the firm's and user's need	3	6	2/9/2011 4:56 PM	GG
Designer's personal style and preferences in design	3	4	2/4/2011 3:37 PM	GG
Designing based on personal assumptions	2	4	2/4/2011 3:39 PM	GG
Designing in 3D (in Asia) vs hand sketch	2	4	2/4/2011 10:42 PM	GG
Desire for primary research	3	5	2/4/2011 10:22 PM	GG
Details	1	1	2/10/2011 6:21 PM	GG
Developing wrong insights in a cross-cultural context	2	2	2/10/2011 6:34 PM	GG
Development of the problem statement	6	11	2/8/2011 3:52 PM	GG
Difference between real and percieved culture	1	2	2/10/2011 3:47 PM	GG
Different aesthetic preferences across cultures	2	4	2/9/2011 11:08 AM	GG

Free Nodes

Name	Sources	References	Created On	Created By
Differing dress codes between user and designer	4	5	2/4/2011 1:13 PM	GG
Differing knowledge between user and designer	1	1	2/4/2011 1:15 PM	GG
Differing mentifacts in different cultures on the same topic	2	3	2/8/2011 10:46 PM	GG
Difficulty of designing for Chinese user for Western compa	2	3	2/4/2011 11:20 PM	GG
Difficulty of detaching from your own culture as a designer	1	1	2/11/2011 6:54 PM	GG
Difficulty of getting feeback after the product launched	2	2	2/11/2011 12:38 PM	GG
Difficulty of making up for the primary research in later pha	2	2	2/4/2011 10:39 PM	GG
Emerging need, hole in the market	2	4	2/9/2011 2:09 PM	GG
Emerginig markets are expanding	1	1	2/9/2011 11:27 AM	GG
Empathize with the user	7	9	2/8/2011 2:26 PM	GG
Empowering the local community economically	2	5	2/8/2011 3:16 PM	GG
Empowering the social status of user group	2	4	2/8/2011 10:48 PM	GG
Encourage story telling	1	2	2/10/2011 6:11 PM	GG
Encourage user to talk (be quiet and Listen)	4	7	2/4/2011 2:24 PM	GG
Engineers as negotiaters between manufacturing and desi	2	2	2/4/2011 10:45 PM	GG
Equality	4	7	2/9/2011 2:15 PM	GG
Esatern users desire for Western products	1	3	2/10/2011 12:57 PM	GG
Ethnographic research	1	2	2/10/2011 1:54 PM	GG
Excite and engage users in the research with visual cultur	2	7	2/10/2011 2:50 PM	GG
Expanding the product context for idea development	3	5	2/4/2011 1:48 PM	GG
Experience user's way of living=home	7	30	2/4/2011 12:46 PM	GG
Fashion trend	1	1	2/11/2011 5:27 PM	GG
Feedback from users at early stages of the desing process	4	4	2/8/2011 9:59 PM	GG
Feedback research after the product is in the market	3	10	2/10/2011 12:27 PM	GG
Feeling outsider in the culture	5	7	2/4/2011 1:12 PM	GG
Feeling responsible for the problems of the users	1	3	2/8/2011 11:07 PM	GG
Feeling the users context	3	4	2/10/2011 8:57 PM	GG
Find access into the culture	6	15	2/4/2011 1:10 PM	GG
Flexibility in time during remote research	1	1	2/10/2011 4:38 PM	GG
Forcing Western culture to others through design	2	3	2/9/2011 8:12 PM	GG

Free Nodes

Name	Sources	References	Created On	Created By
Gather a dos and donts list prior to contact	1	2	2/10/2011 3:40 PM	GG
Gathering bakground info about culture prior to contact	3	7	2/8/2011 10:22 PM	GG
Gender roles in the culture	6	10	2/8/2011 2:25 PM	GG
Getting out of comfort zone	3	4	2/4/2011 2:36 PM	GG
Giving incentives to access into the culture	2	3	2/4/2011 11:21 PM	GG
Hands on experience in manufacturing plant	2	2	2/4/2011 10:43 PM	GG
Hard to measure cultural factors	1	2	2/11/2011 1:07 PM	GG
Having different point of view	2	2	2/8/2011 2:46 PM	GG
Human factors	2	6	2/8/2011 2:49 PM	GG
Imitate the user	6	12	2/4/2011 1:50 PM	GG
Importance of clear instrusctions when involving users in t	1	1	2/5/2011 12:03 AM	GG
Importance of prototyping	3	3	2/10/2011 1:59 PM	GG
Increasing design ability of other culture instaed of designi	2	5	2/9/2011 6:38 PM	GG
Indirect communication with factory	1	1	2/4/2011 10:44 PM	GG
Indirect inflence of the user on the creative process	2	3	2/8/2011 10:14 PM	GG
Influence of designer's culture on the design style	1	1	2/8/2011 2:01 PM	GG
Integrate and present research results (video)	1	1	2/4/2011 1:40 PM	GG
Integrate cultural aspects in design	1	1	2/4/2011 3:42 PM	GG
Integrate research results into criteria	2	6	2/10/2011 1:36 PM	GG
Integrating and presenting research (board)	4	6	2/4/2011 1:51 PM	GG
Interview users by using visual cultural probes they create	1	3	2/10/2011 2:48 PM	GG
Intuition	3	5	2/8/2011 11:31 PM	GG
Involve user in the design process	5	11	2/8/2011 7:17 PM	GG
Involve user in the design process to overcome cultural bia	2	4	2/9/2011 6:58 PM	GG
Involve user in the research phase	3	5	2/5/2011 12:00 AM	GG
Involve users in the manufacturing process (Co-manufactu	1	3	2/8/2011 3:14 PM	GG
Involvement of the user in the creation of cultural probes.	1	1	2/9/2011 8:48 PM	GG
Iteration in the design process	3	3	2/9/2011 2:48 PM	GG
Keeping the balance in asking questions	1	1	2/4/2011 3:23 PM	GG
Knock off design	1	1	2/11/2011 5:14 PM	GG

Free Nodes

Name	Sources	References	Created On	Created By
Language barrier overcome by observation and photos	2	2	2/8/2011 2:41 PM	GG
Language barrier-dialects	1	1	2/4/2011 2:13 PM	GG
Language barrier-not adequate ability	6	15	2/4/2011 2:13 PM	GG
Learning the basics of langauge to build relationship	3	5	2/8/2011 11:28 PM	GG
Level of innovativeness is dependent on the cultural conte	1	1	2/9/2011 8:39 PM	GG
Limited interviewing due to transcription	1	1	2/10/2011 3:29 PM	GG
Limited time	5	12	2/4/2011 1:23 PM	GG
Limited user research in China	3	9	2/4/2011 10:12 PM	GG
Local people assisting the research phase	5	14	2/4/2011 2:12 PM	GG
Local vs Chinese manufacturing	2	2	2/9/2011 1:58 PM	GG
Locally focused products	4	6	2/4/2011 9:58 PM	GG
Making users feel important	4	8	2/4/2011 3:24 PM	GG
Missing contextual information	3	5	2/4/2011 1:43 PM	GG
Missing contextual information with translation	4	9	2/4/2011 2:54 PM	GG
Missing cultural details when you don't experience the oth	2	2	2/4/2011 11:11 PM	GG
Missing details as an disadvantage of limited time	2	3	2/4/2011 1:42 PM	GG
More time allocation to research phase	5	7	2/4/2011 1:25 PM	GG
Multiple co design workshops	1	1	2/9/2011 7:37 PM	GG
Multiple view points in a cross cultural context	3	4	2/9/2011 6:29 PM	GG
Need language translators	6	16	2/4/2011 2:15 PM	GG
Needing to know the norms= accepted ways of behaviour	7	17	2/4/2011 3:01 PM	GG
Not reflecting on the results of the research	1	3	2/10/2011 1:56 PM	GG
Observe behaviours in that culture	7	15	2/4/2011 12:54 PM	GG
Observe user's way of living and environment	9	19	2/4/2011 12:50 PM	GG
Openness, honesty and equity	3	4	2/9/2011 2:14 PM	GG
Opportunity created by being outsider	3	4	2/8/2011 11:05 PM	GG
Outsourcing design in China	1	1	2/4/2011 12:04 PM	GG
Patience	1	1	2/8/2011 11:21 PM	GG
Perception od the culture by the designer	2	4	2/9/2011 8:26 PM	GG
Perception of Chinese design firms by Western	3	3	2/4/2011 12:21 PM	GG

Free Nodes

Name	Sources	References	Created On	Created By
Perception of other culture's aesthetics	4	5	2/8/2011 11:42 PM	GG
Perception of the designer as the expert	2	7	2/9/2011 4:11 PM	GG
Personal interaction with user is better than secondary res	4	6	2/4/2011 1:21 PM	GG
Planned obselecense by design	1	2	2/11/2011 5:19 PM	GG
Please the user	1	2	2/11/2011 5:39 PM	GG
Positioning in the market among competitors	5	9	2/4/2011 10:26 PM	GG
Pretending to look comfortable in interacting with the other	2	3	2/4/2011 2:56 PM	GG
Previous experiences of the company about the culture	1	6	2/11/2011 5:57 PM	GG
Price point	1	1	2/11/2011 5:30 PM	GG
Prior thoughts about the culture	4	8	2/4/2011 2:45 PM	GG
Procedures of doing remote research	2	10	2/10/2011 4:37 PM	GG
Realising cultural diversity in one country	2	2	2/4/2011 11:07 PM	GG
Redesign products for Chinese market	1	1	2/4/2011 12:30 PM	GG
Reflect on the feedback from users	3	8	2/9/2011 11:22 AM	GG
Reflect on user's way of living and enviroment	1	2	2/4/2011 12:47 PM	GG
Reflecting on the design process	2	3	2/8/2011 11:31 PM	GG
Reflecting on the user research	4	7	2/8/2011 11:32 PM	GG
Remote design research	4	12	2/9/2011 4:16 PM	GG
Representing users, being vocie to their problems	1	3	2/8/2011 10:17 PM	GG
Resistance to co-design from users	1	1	2/13/2011 11:21 PM	GG
Resistance to new design ideas by the culture	2	3	2/9/2011 8:32 PM	GG
Safety	1	8	2/10/2011 4:22 PM	GG
Sample size in user research	1	1	2/10/2011 2:10 PM	GG
Search for inspiration from existing products	1	4	2/11/2011 5:14 PM	GG
Secondary internet research	4	9	2/4/2011 1:20 PM	GG
Secondary internet research on statistics	1	1	2/10/2011 2:17 PM	GG
Secondary research--reading	3	9	2/8/2011 3:53 PM	GG
See desing problem beyond the context of use	7	17	2/9/2011 11:13 AM	GG
See the big picture	6	17	2/8/2011 2:48 PM	GG
Selection criteria of users in design research	1	1	2/10/2011 2:11 PM	GG

Free Nodes

Name	Sources	References	Created On	Created By
Showing interest in the culture	1	1	2/4/2011 3:23 PM	GG
Simple, easy to understand instructions	2	3	2/5/2011 12:03 AM	GG
Starting with a blank page to understand culture	2	5	2/4/2011 2:40 PM	GG
Staying at the bakground	3	4	2/8/2011 2:27 PM	GG
Stregth of images and interviews over video and voice rec	1	1	2/8/2011 1:52 PM	GG
Sustainability of design solution in the culture over time	2	7	2/9/2011 7:37 PM	GG
Sustainbaility not consdered in China	1	1	2/8/2011 2:51 PM	GG
Systems thinking in design	5	16	2/9/2011 2:39 PM	GG
Taking things for granted in a similar cultural setting	5	6	2/4/2011 3:29 PM	GG
Talking to the user in detail	5	7	2/4/2011 12:51 PM	GG
Tecnology challange in communication with remote resear	1	2	2/9/2011 4:28 PM	GG
Temporary brand attachment in China	1	1	2/10/2011 3:17 PM	GG
The number of design projects for the same culture	3	4	2/8/2011 1:55 PM	GG
The strength of primary research over secondary	3	4	2/4/2011 10:22 PM	GG
Theoretical vs practical research	2	2	2/8/2011 3:55 PM	GG
Time	6	12	2/4/2011 10:29 PM	GG
Travel to the user's environment	6	16	2/4/2011 1:55 PM	GG
Trend research in Asian market	1	2	2/10/2011 1:25 PM	GG
Trigger stories with visual cultural probes	2	9	2/10/2011 2:51 PM	GG
Understand the culture from multiple perspectives	6	20	2/4/2011 1:05 PM	GG
Understand values of the culture	4	17	2/9/2011 6:42 PM	GG
Understandig the sense of humor in the culture	2	2	2/10/2011 3:33 PM	GG
Understanding body language	3	3	2/9/2011 2:51 PM	GG
Understanding the hierarchical roles in the culture	3	4	2/4/2011 2:51 PM	GG
Understanding the meaning of expressions	3	3	2/4/2011 3:16 PM	GG
Unintended negative consequences of design	1	3	2/9/2011 6:33 PM	GG
Universal design	4	11	2/4/2011 9:57 PM	GG
Use local materials to design new things	2	3	2/8/2011 3:15 PM	GG
Use visual and textual tools to communicate	2	5	2/9/2011 4:27 PM	GG
User feedback on prototypes	1	3	2/8/2011 10:12 PM	GG

Free Nodes

Name	Sources	References	Created On	Created By
User panels in friendly environment	1	1	2/8/2011 10:11 PM	GG
Users owning the design project	3	5	2/9/2011 8:35 PM	GG
User's want to share and educate the designer about the c	1	1	2/4/2011 3:21 PM	GG
Using cultural probes to redefine equality between designe	2	2	2/9/2011 4:21 PM	GG
Visual and textual co-design workshops	2	3	2/9/2011 7:26 PM	GG
Visual cultural probes	2	6	2/9/2011 4:19 PM	GG
Visually experience user's reality through remote research	3	7	2/5/2011 12:01 AM	GG
Visually record user's way of living and environment	3	7	2/4/2011 12:50 PM	GG
Voice recording	1	1	2/4/2011 11:58 PM	GG
Western design for Chinese market	1	2	2/4/2011 9:52 PM	GG

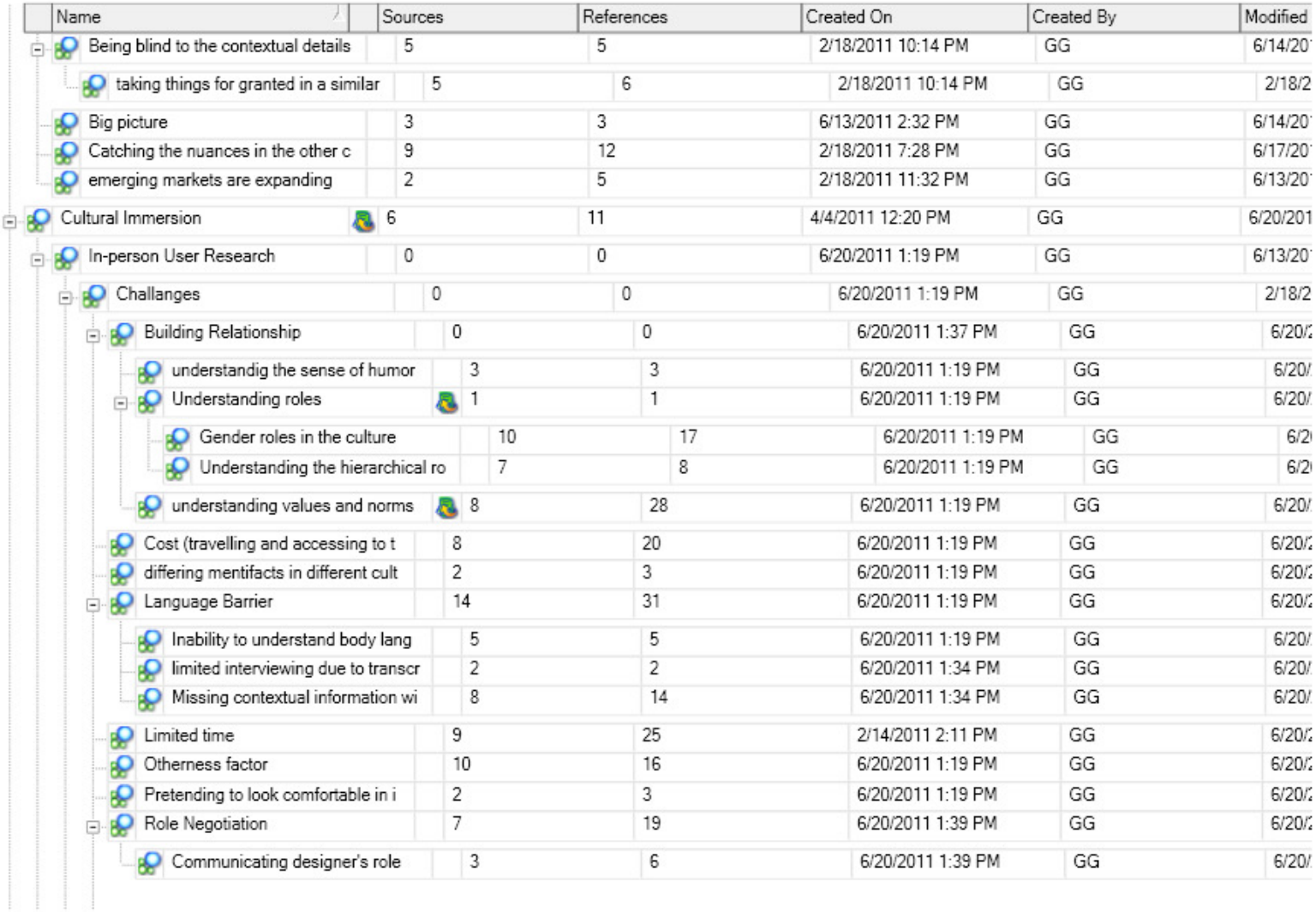
Appendix V

Axial Coding-Tree Nodes

Tree Nodes

Name	Sources	References	Created On	Created By	Modified
Chinese Context	0	0	2/18/2011 7:03 PM	GG	2/18/201
Co-design&Implementation	0	0	2/18/2011 9:51 PM	GG	6/20/201
Challenges&Strategies	0	0	6/20/2011 2:14 PM	GG	6/20/20
Aesthetic preferences	13	25	2/16/2011 5:01 PM	GG	6/14/2
Communicating design ideas	0	0	6/20/2011 2:30 PM	GG	6/20/2
Prototyping	9	17	6/13/2011 4:02 PM	GG	6/20/
Users not understanding prototyp	2	3	6/13/2011 12:19 PM	GG	6/14/
difficulty of detaching from your ow	3	3	2/18/2011 7:27 PM	GG	6/14/2
designer's personal style and pref	3	4	2/18/2011 11:50 PM	GG	2/18/
influence of designer's culture on a	6	13	2/18/2011 10:22 PM	GG	6/14/
influence of designer's culture on t	6	9	2/18/2011 10:24 PM	GG	6/14/
Limited Ability	1	1	6/14/2011 10:17 AM	GG	6/14/2
resistance to co design from users	1	1	2/18/2011 11:41 PM	GG	2/18/2
resistance to new design ideas by t	4	5	2/18/2011 11:42 PM	GG	6/14/2
Methods	0	0	6/20/2011 2:14 PM	GG	6/20/20
Brainstorming	5	6	6/13/2011 10:53 AM	GG	6/14/2
Cultural human factors	10	28	2/18/2011 11:47 PM	GG	6/14/2
Feedback from users (Indirect invol	11	33	6/13/2011 9:42 AM	GG	6/20/2
reflect on the feedback from users	3	8	2/18/2011 11:17 PM	GG	2/18/
Users being agreeable	2	2	6/13/2011 10:49 AM	GG	6/13/
intuition	4	6	2/18/2011 11:40 PM	GG	6/13/2
Involve users in the design	8	28	2/16/2011 4:49 PM	GG	6/20/2
Involve users in the manufacturing	1	3	2/18/2011 11:23 PM	GG	2/18/2
search for inspiration from existing	1	4	2/18/2011 10:37 PM	GG	2/18/2
use local materials to design new th	6	7	2/18/2011 11:13 PM	GG	6/14/2
Cultural Difference as Opportunity	4	5	2/18/2011 7:28 PM	GG	6/13/201

Tree Nodes

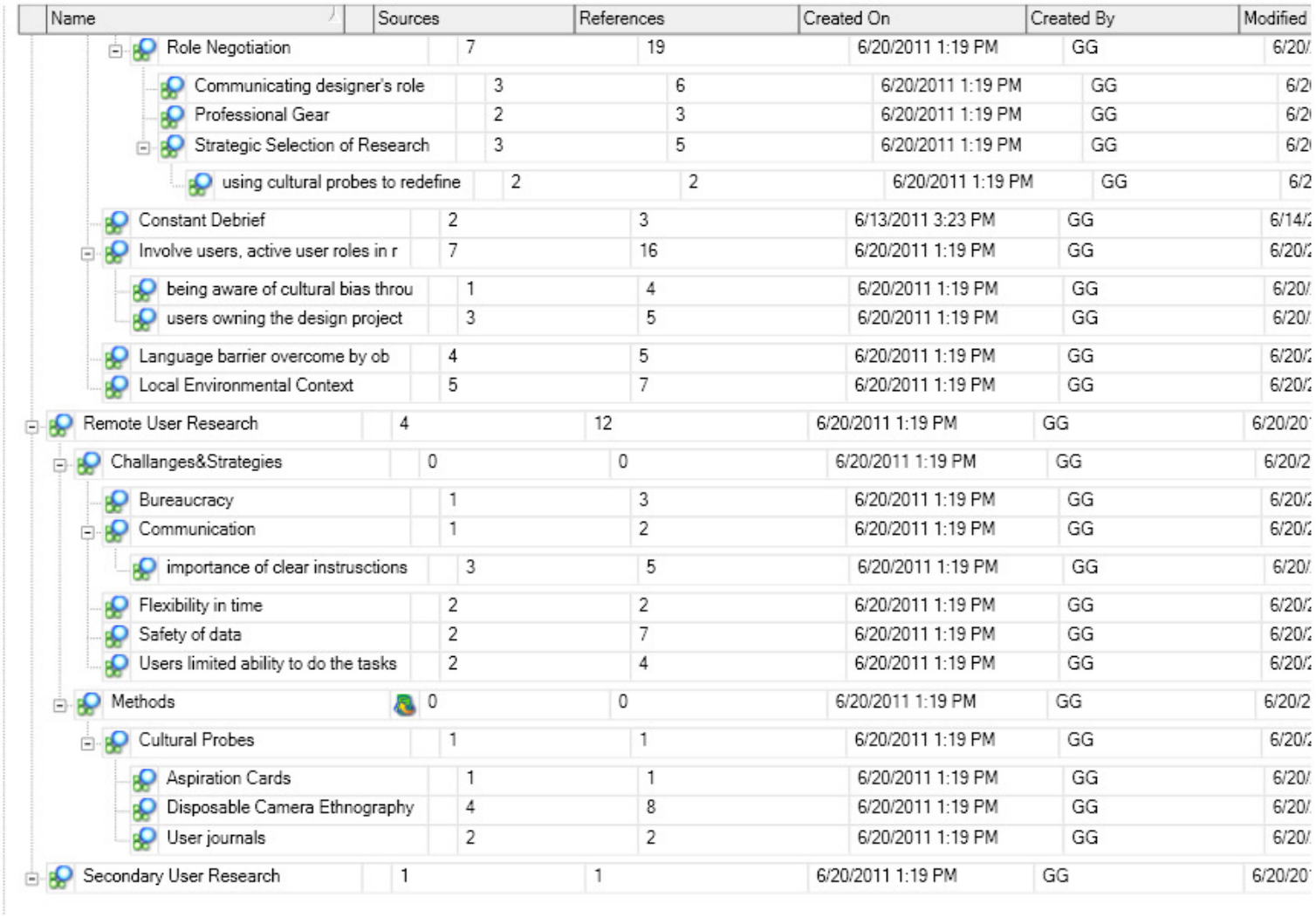


Name	Sources	References	Created On	Created By	Modified
Being blind to the contextual details	5	5	2/18/2011 10:14 PM	GG	6/14/20
taking things for granted in a similar	5	6	2/18/2011 10:14 PM	GG	2/18/2
Big picture	3	3	6/13/2011 2:32 PM	GG	6/14/20
Catching the nuances in the other c	9	12	2/18/2011 7:28 PM	GG	6/17/20
emerging markets are expanding	2	5	2/18/2011 11:32 PM	GG	6/13/20
Cultural Immersion	6	11	4/4/2011 12:20 PM	GG	6/20/201
In-person User Research	0	0	6/20/2011 1:19 PM	GG	6/13/20
Challanges	0	0	6/20/2011 1:19 PM	GG	2/18/2
Building Relationship	0	0	6/20/2011 1:37 PM	GG	6/20/2
understandig the sense of humor	3	3	6/20/2011 1:19 PM	GG	6/20/
Understanding roles	1	1	6/20/2011 1:19 PM	GG	6/20/
Gender roles in the culture	10	17	6/20/2011 1:19 PM	GG	6/2
Understanding the hierarchical ro	7	8	6/20/2011 1:19 PM	GG	6/2
understanding values and norms	8	28	6/20/2011 1:19 PM	GG	6/20/
Cost (travelling and accessing to t	8	20	6/20/2011 1:19 PM	GG	6/20/2
differing mentifacts in different cult	2	3	6/20/2011 1:19 PM	GG	6/20/2
Language Barrier	14	31	6/20/2011 1:19 PM	GG	6/20/2
Inability to understand body lang	5	5	6/20/2011 1:19 PM	GG	6/20/
limited interviewing due to transcr	2	2	6/20/2011 1:34 PM	GG	6/20/
Missing contextual information wi	8	14	6/20/2011 1:34 PM	GG	6/20/
Limited time	9	25	2/14/2011 2:11 PM	GG	6/20/2
Otherness factor	10	16	6/20/2011 1:19 PM	GG	6/20/2
Pretending to look comfortable in i	2	3	6/20/2011 1:19 PM	GG	6/20/2
Role Negotiation	7	19	6/20/2011 1:39 PM	GG	6/20/2
Communicating designer's role	3	6	6/20/2011 1:39 PM	GG	6/20/

Tree Nodes

Name	Sources	References	Created On	Created By	Modified
Safety	3	10	6/20/2011 1:19 PM	GG	6/20/
Users influencing each other	3	3	6/20/2011 1:19 PM	GG	6/20/
Users limited in articulating needs	3	3	6/20/2011 1:19 PM	GG	6/20/
Users trying to please designer	1	1	6/20/2011 1:19 PM	GG	6/20/
Methods	0	0	6/20/2011 1:19 PM	GG	2/14/2
Activity Walkthroughs	2	3	6/20/2011 1:19 PM	GG	12/23
Focus Group	2	2	6/20/2011 1:19 PM	GG	6/20/
imitate the user	11	19	6/20/2011 1:19 PM	GG	6/20/
Interview Users	14	29	6/20/2011 1:19 PM	GG	6/20/
encourage story telling	2	3	6/20/2011 1:19 PM	GG	6/20/
Keeping the balance in asking qu	2	2	6/20/2011 1:19 PM	GG	6/20/
triggering stories with visual cultu	7	23	6/20/2011 1:19 PM	GG	6/20/
Observe and experience behavior	14	62	6/20/2011 1:19 PM	GG	6/20/
Visual recording	7	12	6/20/2011 1:19 PM	GG	6/20/
voice recording	1	1	6/20/2011 1:19 PM	GG	6/20/
Outcome	0	0	6/20/2011 1:19 PM	GG	2/18/2
Appreciating the culture based on	4	5	6/20/2011 1:19 PM	GG	6/20/
Strategies	0	0	6/20/2011 1:19 PM	GG	6/13/2
Building relationship with the user	6	21	6/20/2011 1:19 PM	GG	6/20/
Dress codes	7	8	6/20/2011 1:19 PM	GG	6/20/
Learn basics of user's language	5	7	6/20/2011 1:19 PM	GG	6/20/
Personal Demeanor	1	1	6/20/2011 1:19 PM	GG	6/20/
Being friendly and Encouraging	4	12	6/20/2011 1:19 PM	GG	6/2
Encourage user talking by being	5	9	6/20/2011 1:19 PM	GG	6/2
Opennes and honesty	4	5	6/20/2011 1:19 PM	GG	6/2
Showing interest in the culture	1	1	6/20/2011 1:19 PM	GG	6/2

Tree Nodes

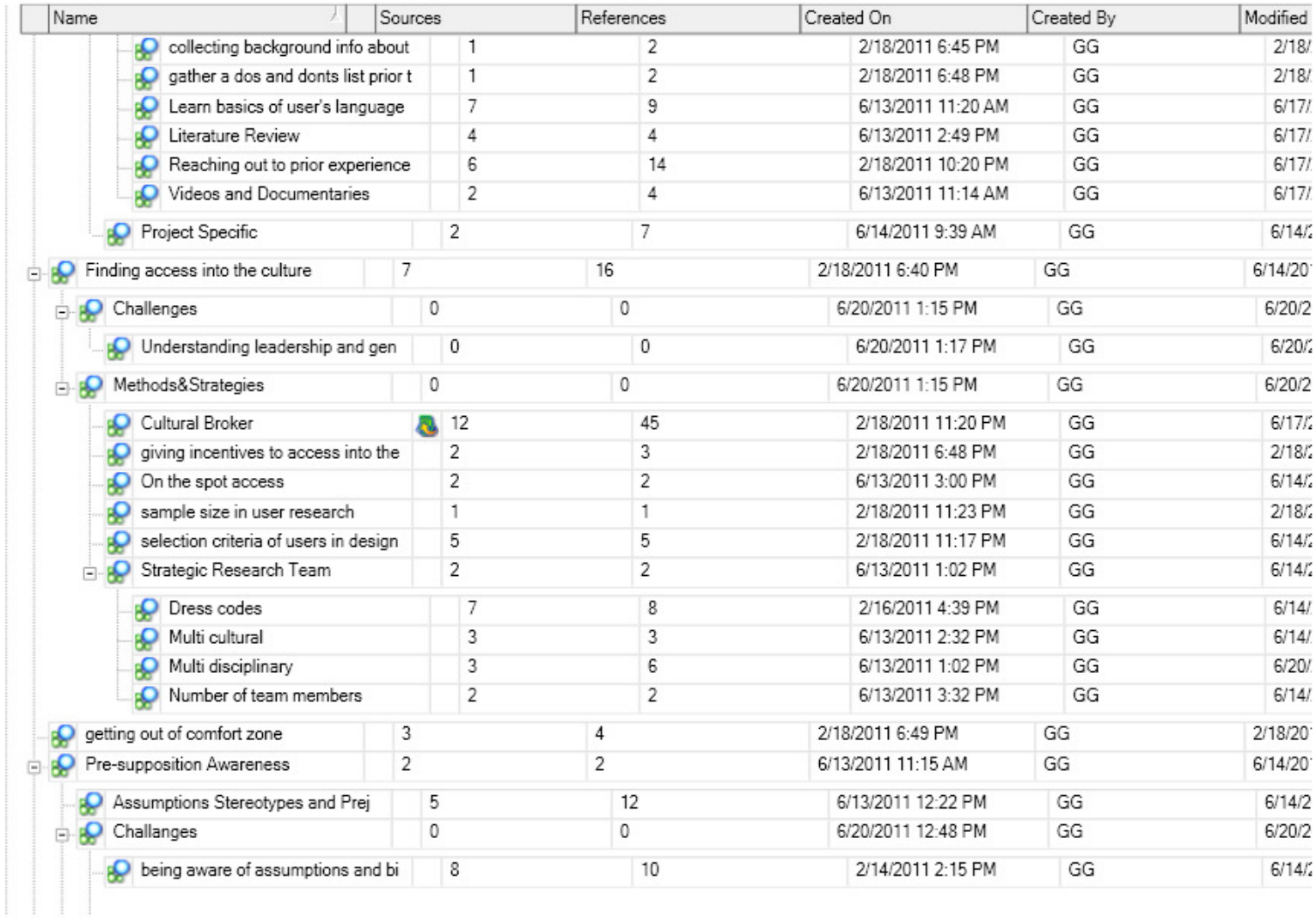


Name	Sources	References	Created On	Created By	Modified
Role Negotiation	7	19	6/20/2011 1:19 PM	GG	6/20/
Communicating designer's role	3	6	6/20/2011 1:19 PM	GG	6/2
Professional Gear	2	3	6/20/2011 1:19 PM	GG	6/2
Strategic Selection of Research	3	5	6/20/2011 1:19 PM	GG	6/2
using cultural probes to redefine	2	2	6/20/2011 1:19 PM	GG	6/2
Constant Debrief	2	3	6/13/2011 3:23 PM	GG	6/14/
Involve users, active user roles in r	7	16	6/20/2011 1:19 PM	GG	6/20/
being aware of cultural bias throu	1	4	6/20/2011 1:19 PM	GG	6/20/
users owning the design project	3	5	6/20/2011 1:19 PM	GG	6/20/
Language barrier overcome by ob	4	5	6/20/2011 1:19 PM	GG	6/20/
Local Environmental Context	5	7	6/20/2011 1:19 PM	GG	6/20/
Remote User Research	4	12	6/20/2011 1:19 PM	GG	6/20/20
Challanges&Strategies	0	0	6/20/2011 1:19 PM	GG	6/20/2
Bureaucracy	1	3	6/20/2011 1:19 PM	GG	6/20/
Communication	1	2	6/20/2011 1:19 PM	GG	6/20/
importance of clear instrusctions	3	5	6/20/2011 1:19 PM	GG	6/20/
Flexibility in time	2	2	6/20/2011 1:19 PM	GG	6/20/
Safety of data	2	7	6/20/2011 1:19 PM	GG	6/20/
Users limited ability to do the tasks	2	4	6/20/2011 1:19 PM	GG	6/20/
Methods	0	0	6/20/2011 1:19 PM	GG	6/20/2
Cultural Probes	1	1	6/20/2011 1:19 PM	GG	6/20/
Aspiration Cards	1	1	6/20/2011 1:19 PM	GG	6/20/
Disposable Camera Ethnography	4	8	6/20/2011 1:19 PM	GG	6/20/
User journals	2	2	6/20/2011 1:19 PM	GG	6/20/
Secondary User Research	1	1	6/20/2011 1:19 PM	GG	6/20/20

Tree Nodes

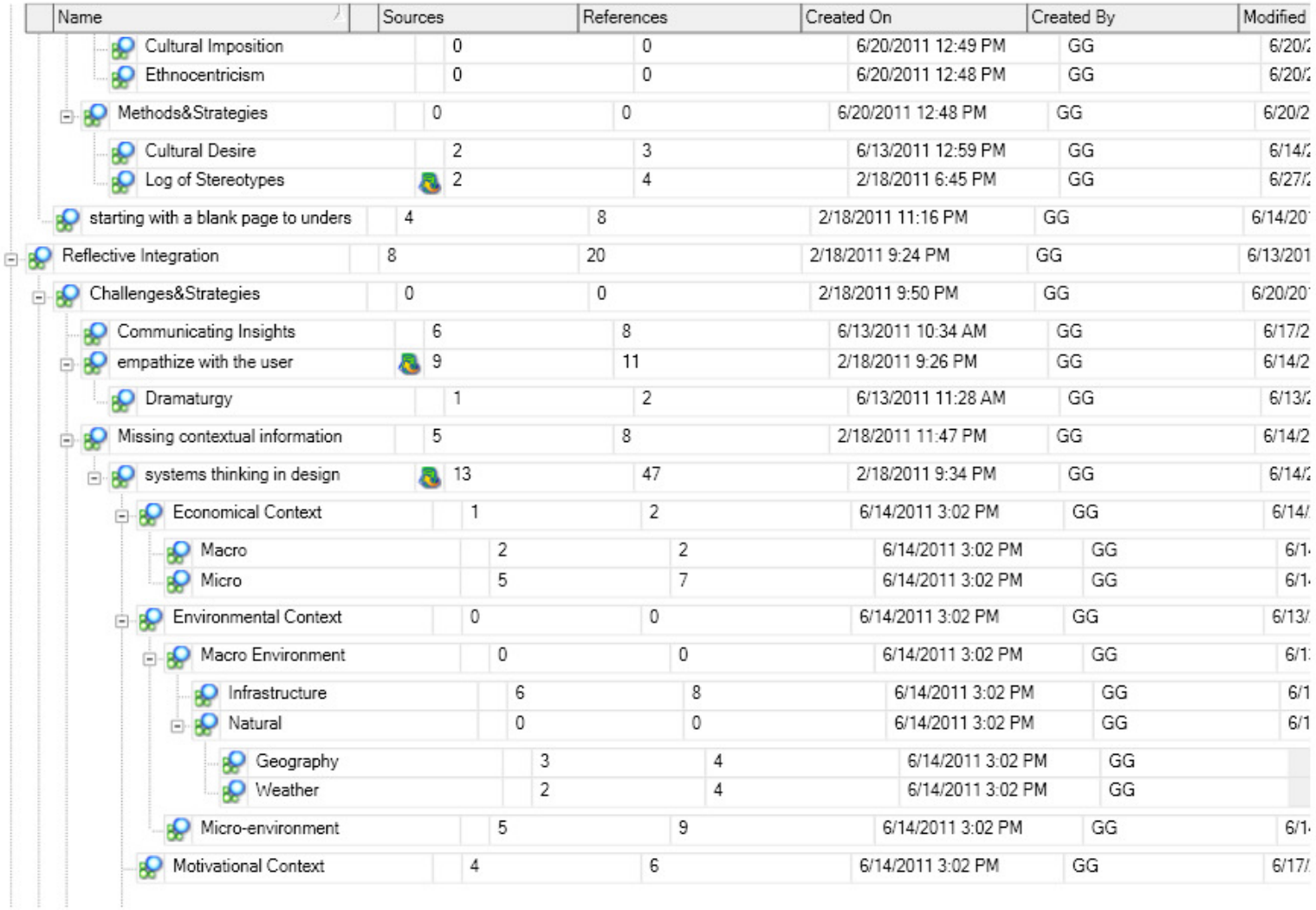
Name	Sources	References	Created On	Created By	Modified
Challenges	0	0	6/20/2011 1:19 PM	GG	6/20/2
missing cultural details whne you d	2	2	6/20/2011 1:19 PM	GG	6/20/2
the strength of primary research o	7	13	6/20/2011 1:19 PM	GG	6/20/2
Methods	0	0	6/20/2011 1:53 PM	GG	6/20/2
Internet research	5	10	6/20/2011 1:19 PM	GG	6/20/2
Literature review	4	10	6/20/2011 1:19 PM	GG	6/20/2
previous experiences of the comp	2	7	6/20/2011 1:19 PM	GG	6/20/2
Quantitative Research	1	2	6/20/2011 1:19 PM	GG	6/20/2
differing mentifacts in different cultur	2	3	3/2/2011 2:54 PM	GG	2/18/201
Evaluation	0	0	2/18/2011 11:15 PM	GG	2/18/201
Cost effectiveness	3	9	6/13/2011 10:00 AM	GG	6/14/20
distribution	1	3	6/17/2011 12:19 PM	GG	6/17/20
Flexibility	2	2	6/14/2011 12:35 PM	GG	6/14/20
Local competition	6	11	2/18/2011 11:45 PM	GG	6/14/20
Profit and volume	4	4	6/13/2011 2:35 PM	GG	6/14/20
reflecting on the design process	2	3	2/18/2011 11:55 PM	GG	2/18/20
sustainability of design solution in t	4	9	2/18/2011 11:15 PM	GG	6/14/20
unintended negative consequences	1	3	2/18/2011 11:15 PM	GG	2/18/20
Pre-Design	4	5	2/18/2011 6:44 PM	GG	6/14/201
Background Set-up	9	15	2/18/2011 6:48 PM	GG	6/17/20
Challanges	0	0	6/20/2011 12:47 PM	GG	6/20/2
Relying on background set up data	2	5	6/14/2011 9:45 AM	GG	6/20/2
Cultural Competency	5	7	6/13/2011 11:16 AM	GG	6/17/2
Methods&Strategies	0	0	6/20/2011 12:47 PM	GG	6/20/2
Culture Specific	0	0	6/20/2011 12:46 PM	GG	6/20/2
Behavioral norms	11	24	2/18/2011 7:56 PM	GG	6/17/

Tree Nodes



Name	Sources	References	Created On	Created By	Modified
collecting background info about	1	2	2/18/2011 6:45 PM	GG	2/18/
gather a dos and donts list prior t	1	2	2/18/2011 6:48 PM	GG	2/18/
Learn basics of user's language	7	9	6/13/2011 11:20 AM	GG	6/17/
Literature Review	4	4	6/13/2011 2:49 PM	GG	6/17/
Reaching out to prior experience	6	14	2/18/2011 10:20 PM	GG	6/17/
Videos and Documentaries	2	4	6/13/2011 11:14 AM	GG	6/17/
Project Specific	2	7	6/14/2011 9:39 AM	GG	6/14/2
Finding access into the culture	7	16	2/18/2011 6:40 PM	GG	6/14/20
Challenges	0	0	6/20/2011 1:15 PM	GG	6/20/2
Understanding leadership and gen	0	0	6/20/2011 1:17 PM	GG	6/20/2
Methods&Strategies	0	0	6/20/2011 1:15 PM	GG	6/20/2
Cultural Broker	12	45	2/18/2011 11:20 PM	GG	6/17/2
giving incentives to access into the	2	3	2/18/2011 6:48 PM	GG	2/18/2
On the spot access	2	2	6/13/2011 3:00 PM	GG	6/14/2
sample size in user research	1	1	2/18/2011 11:23 PM	GG	2/18/2
selection criteria of users in design	5	5	2/18/2011 11:17 PM	GG	6/14/2
Strategic Research Team	2	2	6/13/2011 1:02 PM	GG	6/14/2
Dress codes	7	8	2/16/2011 4:39 PM	GG	6/14/
Multi cultural	3	3	6/13/2011 2:32 PM	GG	6/14/
Multi disciplinary	3	6	6/13/2011 1:02 PM	GG	6/20/
Number of team members	2	2	6/13/2011 3:32 PM	GG	6/14/
getting out of comfort zone	3	4	2/18/2011 6:49 PM	GG	2/18/20
Pre-supposition Awareness	2	2	6/13/2011 11:15 AM	GG	6/14/20
Assumptions Stereotypes and Prej	5	12	6/13/2011 12:22 PM	GG	6/14/2
Challanges	0	0	6/20/2011 12:48 PM	GG	6/20/2
being aware of assumptions and bi	8	10	2/14/2011 2:15 PM	GG	6/14/2

Tree Nodes



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Cultural Imposition	0	0	6/20/2011 12:49 PM	GG	6/20/2
Ethnocentricism	0	0	6/20/2011 12:48 PM	GG	6/20/2
Methods&Strategies	0	0	6/20/2011 12:48 PM	GG	6/20/2
Cultural Desire	2	3	6/13/2011 12:59 PM	GG	6/14/2
Log of Stereotypes	2	4	2/18/2011 6:45 PM	GG	6/27/2
starting with a blank page to unders	4	8	2/18/2011 11:16 PM	GG	6/14/20
Reflective Integration	8	20	2/18/2011 9:24 PM	GG	6/13/201
Challenges&Strategies	0	0	2/18/2011 9:50 PM	GG	6/20/20
Communicating Insights	6	8	6/13/2011 10:34 AM	GG	6/17/2
empathize with the user	9	11	2/18/2011 9:26 PM	GG	6/14/2
Dramaturgy	1	2	6/13/2011 11:28 AM	GG	6/13/2
Missing contextual information	5	8	2/18/2011 11:47 PM	GG	6/14/2
systems thinking in design	13	47	2/18/2011 9:34 PM	GG	6/14/2
Economical Context	1	2	6/14/2011 3:02 PM	GG	6/14/
Macro	2	2	6/14/2011 3:02 PM	GG	6/1
Micro	5	7	6/14/2011 3:02 PM	GG	6/1
Environmental Context	0	0	6/14/2011 3:02 PM	GG	6/13/
Macro Environment	0	0	6/14/2011 3:02 PM	GG	6/1
Infrastructure	6	8	6/14/2011 3:02 PM	GG	6/1
Natural	0	0	6/14/2011 3:02 PM	GG	6/1
Geography	3	4	6/14/2011 3:02 PM	GG	
Weather	2	4	6/14/2011 3:02 PM	GG	
Micro-environment	5	9	6/14/2011 3:02 PM	GG	6/1
Motivational Context	4	6	6/14/2011 3:02 PM	GG	6/17/

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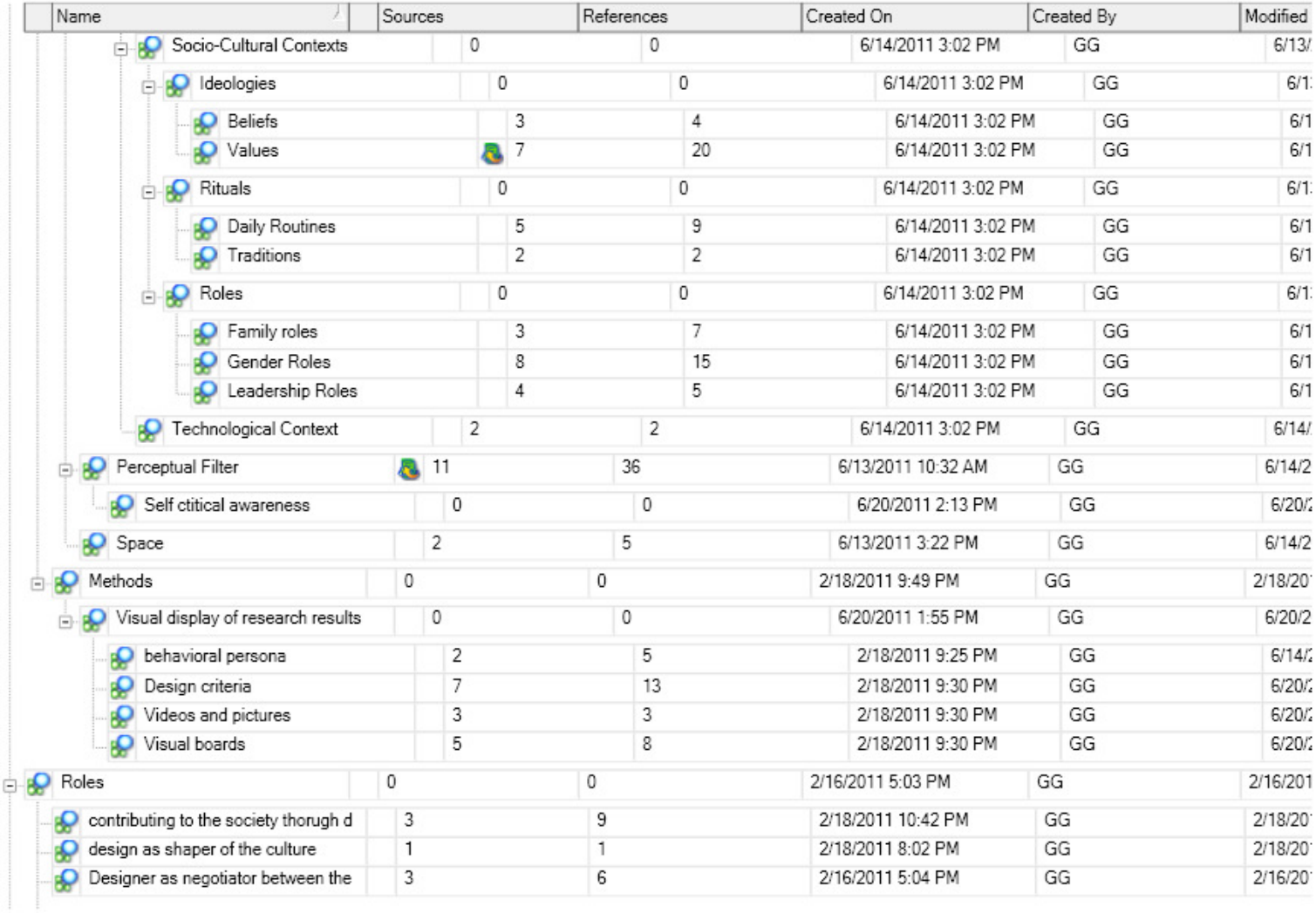

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Socio-Cultural Contexts	0	0	6/14/2011 3:02 PM	GG	6/13/
Ideologies	0	0	6/14/2011 3:02 PM	GG	6/1:
Beliefs	3	4	6/14/2011 3:02 PM	GG	6/1
Values	7	20	6/14/2011 3:02 PM	GG	6/1
Rituals	0	0	6/14/2011 3:02 PM	GG	6/1:
Daily Routines	5	9	6/14/2011 3:02 PM	GG	6/1
Traditions	2	2	6/14/2011 3:02 PM	GG	6/1
Roles	0	0	6/14/2011 3:02 PM	GG	6/1:
Family roles	3	7	6/14/2011 3:02 PM	GG	6/1
Gender Roles	8	15	6/14/2011 3:02 PM	GG	6/1
Leadership Roles	4	5	6/14/2011 3:02 PM	GG	6/1
Technological Context	2	2	6/14/2011 3:02 PM	GG	6/14/
Perceptual Filter	11	36	6/13/2011 10:32 AM	GG	6/14/2
Self ctitical awareness	0	0	6/20/2011 2:13 PM	GG	6/20/2
Space	2	5	6/13/2011 3:22 PM	GG	6/14/2
Methods	0	0	2/18/2011 9:49 PM	GG	2/18/20
Visual display of research results	0	0	6/20/2011 1:55 PM	GG	6/20/2
behavioral persona	2	5	2/18/2011 9:25 PM	GG	6/14/2
Design criteria	7	13	2/18/2011 9:30 PM	GG	6/20/2
Videos and pictures	3	3	2/18/2011 9:30 PM	GG	6/20/2
Visual boards	5	8	2/18/2011 9:30 PM	GG	6/20/2
Roles	0	0	2/16/2011 5:03 PM	GG	2/16/201
contributing to the society thorugh d	3	9	2/18/2011 10:42 PM	GG	2/18/20
design as shaper of the culture	1	1	2/18/2011 8:02 PM	GG	2/18/20
Designer as negotiator between the	3	6	2/16/2011 5:04 PM	GG	2/16/20

Tree Nodes

Name	Sources	References	Created On	Created By	Modified
Designer as the voice of user's prob	1	5	2/18/2011 6:59 PM	GG	2/18/20
empowering the local community e	2	5	2/18/2011 10:42 PM	GG	2/18/20
empowering the social status of use	2	4	2/18/2011 10:42 PM	GG	2/18/20
Engineers as negotiaters between	2	2	2/18/2011 7:00 PM	GG	2/18/20
increasing desing ability of othe cult	2	5	2/18/2011 11:23 PM	GG	2/18/20
Universal design	7	14	2/18/2011 11:52 PM	GG	6/14/201
cultural sensitivty is context specific	7	14	2/18/2011 11:53 PM	GG	2/18/20