

THE NECESSITY OF DESIGN RESEARCH INTO CULTURAL ASPECTS

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ABSTRACT:

This paper discusses the necessity of design research into the aspect of cultural diversity. Existing cultural models do not provide extensive information about how knowledge about cultural differences in a meaningful way can be applied to human product interaction and hence to the design of products. Thus far, studies on the impact of culture on product design show a rather pragmatic approach by investigating specific objects in specific situations. The danger is that this approach will not lead to a higher-level thinking regarding for instance a new design methodology. In this paper we try to bring the discussion to this higher level by making a difference between two perspectives an *object* perspective and a *human need* perspective.

I. INTRODUCTION

Since the eighties disciplines such as archaeology, anthropology, ethnology, and sociology hold the view that artefacts play an important role in the appropriation and (re)production of culture. Artefacts represent existing cultural categories. And people flexibly internalize these categories in interaction with objects. People and artefacts continuously create each other, especially during daily routine actions. This specific view on the role of artefacts in people's everyday life has given rise to new research, but only recently the design disciplines take part in this research. They are not only interested in knowledge about material culture in understanding the past, but the more in how and in what way products have an impact on culture. Just as we create material culture, so too are we shaped by the material culture that surrounds us. As a specific area within cultural studies the interaction between people and products as a cultural phenomenon has hardly been described yet.

In most theories (i.e. Hofstede (1991) Trompenaars and Hampden-Turner, C. (2002) and Laroche (2003)) culture has been defined as a system of shared beliefs, values, customs, behaviours, and artefacts that members of a society use to cope with their world and with

one another; and that are transmitted from generation to generation through learning. So, culture is not genetic or defined by birth. Culture manifests itself both in a visible (art, language, etc.) and a non-visible way (habits, preferences, experiences). The term *material culture* refers both to the meaning, that physical objects in the environment have to people in a particular culture and to the range of manufactured objects that are typical within a culture and form an essential part of cultural identity. Thus far, studies on the impact of culture on product design, or material culture in general, show either an historical approach in understanding the past or a rather pragmatic approach by investigating the meaning of specific objects in specific current situations. Less attention has been paid to the influence products have (had) to culture and social change. As Lowe states: "Design is also 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 (Lowe, 1988, p. 187) (see Figure 1 for some examples of products with a major impact).



Figure 1: Influence of products on culture and social change

In this paper we try to make clear the need for a design research approach which focuses on the mutual influence of design and culture. by making a difference between two perspectives an *object* perspective and a *human need* perspective. The first one is the common designerly way of thinking; in order to get immediate design and marketing requirements the current interaction between human beings and the surrounding products as an expression of the reproduction of culture is studied. The object view is seen as a strategic source for designing pleasurable and competitive products based on mass customization. In the human need perspective the importance of designing products for society within a perspective of social and cultural responsibility and commitment will be stressed, so as to enable the promotion of emancipation, sustainable development, improvement of quality of life as well as the cultural identities of individuals and social groups. Both perspectives will now be elaborated upon.

2. THE OBJECT PERSPECTIVE

'Globalization leads to homogenization of all consumption and behaviour all around the world' is often stated to identify the consequences of a global world. From the 1980's, the number of multinational companies grew enormously. This growth resulted in an extreme expansion of world merchandise trade and world trade of commercial services. In 2004 the total value of global trading was nine thousand billion euros, of which 2.5 thousand billion euros were spent on international trading of products: office, telecom, automotive, personal & household goods and scientific and controlling instruments (World Bank, 2005).

With the trend of internationalization, products are marketed all over the globe. Cultural diversity is on the decline, would be a logical conclusion. So why should we, as product designers, be bothered by culture at all? We should do, because in this increasingly global market many companies and designers are facing cultural diversity. Products that initially are designed for local markets will be purchased and used in different parts of the world in a different economical and cultural context. As a consequence, there is an emerging interest in the impact of cultural dimensions on the interaction between people and products, both from a professional and an academic point of view (Christensen et al., 2006).

More and more important is which role a product plays in an international context. Is a product only suitable for one specific context only? Or are there products acceptable no matter which context they are in? The older the product category the more cultural manifestations it has (de Mooij, 2004). Although the alignment of product designing with corporate guidelines and international trends is noticeable, the symbolic, practical and technical requirements vary among cultures, demanding product differentiation (Ono, 2005). The statement of Percy Barnevik, CEO of ABB 'think globally, act locally' is all we have to do while acting in an international perspective whether one want to solve a conflict, to sell things, and also to develop products for the international market. Although the statement is very simple, the consequences are rather complex. So it is for product design.

No wonder that companies realize the importance of flexible and adaptive design according to local markets. A company's failure to acknowledge cultural differences often limits its product's marketability. Therefore, a number of global companies already started to develop methods and projects to study cross-cultural aspects. Intel developed his own 'Culture Capsule', a physical cultural environment that can simulate every cultural interior and atmosphere you like (Foucault and Russell, 2004). Microsoft, Hewlett Packard, Philips and Siemens, among others, are conducting cross-cultural studies to understand not only matters regarding culture and human interaction design but also how to gain profit from emerging markets.

From this object perspective human beings are perceived as users irrespective their needs for the manufacturers' artefacts. Cultural-specific variables are related to users' expectancies about usability. Depending on their cultural background, users may focus on aspects concerning effectiveness, efficiency or satisfaction (or combinations of each) when using such products. Therefore, assuming there is a linkage between culture and attitude towards usability, products should be modelled to the user's local cultural background in terms of producing systems that accommodate user's cultural characteristics (Diehl and Christiaans, 2006).

3. ILLUSTRATIVE CASES

To illustrate the broad spectrum of products involved with cultural diversity and similarity, some specific product cases are presented here. With many people interested in cultural diversity regarding the field of product design, the discussion if culture is a factor of importance is still going on. The iPod family (see figure 2) proves that the physical appearance of a product doesn't have to be different to be a success. But also the iPod is a highly diverse product, affected by the factor culture: the music on the iPod defines its cultural identity.



Figure 2: iPod Family

The physical appearance (apart from some colour trends and promotional prints) of the ball pen differs not much in the world (see Figure 3). The function of it is cultural neutral, but not the output. This product works around the world because the person who is writing with it is able to express his cultural knowledge (language).



Figure 3: Ball pen

The kitchen environment is always a nice example for cross-cultural issues (see Figure 4). Here we can see the 'western' style sink and the 'Central America' sink. Apart from the use, in Central America they also do the laundry in the sink, the functionality and appearance differs. In Central America, each sink includes three compartments: one water reservoir in the middle and two 'workplaces' (suitable for all kind of activities). Due to the environmental circumstances there is no constant water supply.



Figure 4: Western style and Central American style sink

The way of heating your house is different from region to region. Here in Japan, the low table (also used as a dining table) incorporates a heating device inside (Figure 5). Covered with a blanket and a glass plate, people are able to sit under the blanket and experience a comfortable temperature (product suggestion: TWA Tokio).



Figure 5: Heating in Japan

3.1 ASIA VERSUS EUROPE

Another illustrative example can be presented by comparing some objects in Asia versus Europe (see figures 6, 7 and 8).ⁱ



Figure 6: Cultural differences between Europe and Asia in eating tools and appliances to wash clothes



Figure 7: Cultural differences between Europe and Asia appliances to toast bread and appliances to get massage



Figure 8: Cultural differences in tools in the restroom

At the School of Industrial Design Engineering, Delft University of Technology, the Netherlands a series of case studies have been initiated to explore cross-cultural design from the object perspective. These case-studies are meant to gather as many examples as possible as to form a coherent view on what people moves, their experiences and, above all, the needs regarding their own responsibility in creating their own favorite environment. Current design methodology apparently is based on this object view also in tackling cultural diversity in product design. Starting from existing products, for instance designed for people in a western country, any need for adaptations in other cultures will be translated into adaptations to the existing product (see the case below). Another way is to offer a number of alternatives for the same product and to test people's preference. The design of a water purifier by a western company is an example of this strategy. People in India were offered a metal and a plastic one. For typical cultural reasons they preferred the metal purifier notwithstanding the higher price.

3.2 CASE STUDY INFLUENCE OF CULTURE IN CONSUMER ELECTRONIC PRODUCTS

By this case an example of the object perspective will be presented. In this study cultural differences were studied on the basis of a comparison between two cultures, the Netherlands and South Korea on design characteristics of consumer electronic products. People are not always aware of the influence of culture on their daily life. So, survey methods alone will not reveal their values and beliefs in relation to the material world. Therefore, a new method was developed to capture these culture related preference for the design and style of a product and its user interfaces. The method, called 'Design it yourself' method ('D.I.Y. '), makes it possible for the user to design the interface of his/her preferred microwave and washing machine. While expressing their own preference during the test, it was believed that common attributes to their culture could be obtained.

The D.I.Y tool was a computer-based simulation of the microwave and the washing machine, made in Flash, with which the participant can move all separate parts (window, buttons, pictograms, and text) in order to design his/her favorite interface (see Figure 8). Participants also had to choose a sound (out of 10), which is heard when a cooking program ends. Examples of microwave designs are presented in Figure 9. Analysis of the microwave interface designs shows differences between

Dutch and Korean people on a number of aspects: shape and arrangement of buttons, and the reason for their preference. Dutch participants preferred symmetry shape of button and symmetric arrangement while these were not the case with Korean participants. Both good-looking and usability were important to Dutch subjects while only the usability was most important to the Korean group. On the other hand, there were no differences on the size of buttons, indication, type of control, complexity on arrangement, and hierarchy.

Use patterns were analyzed by looking at the displacement of the hand while operating the microwave on participant's designs. For this evaluation, a simple task was imagined, i.e. 'heating-up'. To do the task, people generally follow the sequence: watt control, time control, and start. Looking at the operation of Dutch participants three patterns, almost evenly distributed, were found: 'from top to bottom', 'going up and then down', 'going down and then up'. The patterns of the Koreans showed the distribution: 'from top to bottom', 'going up and then down', while the pattern 'going down and then up' did not appear at all. Differences were found in the choice of an 'ending' sound. Dutch participants did not show any uniform preference. Among the various reasons for their preference functionality of the sound was most frequently mentioned. Contrary the Korean group showed this uniformity. 'Nice to listen to' was the reason for this preference (Kim et al., 2006).

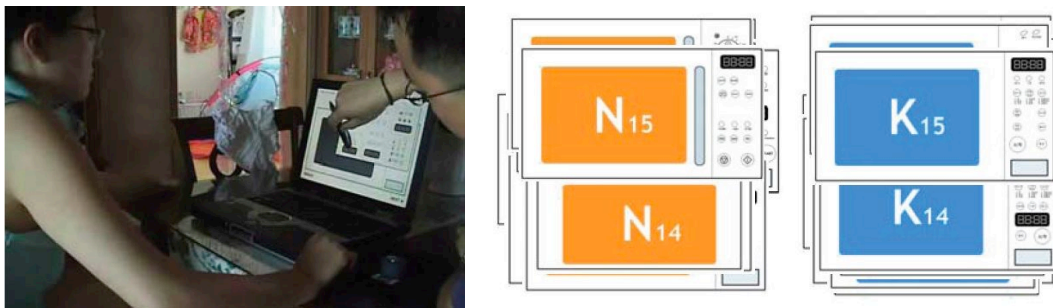


Figure 9: Participant using the Design-It-Yourself tool and the outcomes of the Dutch participants (N15) and the Korean participants (K15)

4. THE HUMAN NEED PERSPECTIVE

Talking about human product interaction the usual way to tackle this issue from a designer's point of view is the object perspective, followed by a market perspective. This view, which is taken for granted by economic rationalists, assumes that human beings are driven by a limitless craving for material possessions (Fisher, year unknown). The designed objects stemming from this way of thinking provide relatively specific, sometimes sophisticated offerings to a narrow range of people. However, in this view the human interest, needs and

believes hardly play a role. Therefore an human need perspective should also taken into account, not by giving this issue only lip-service, offering the traditional western view of Maslow's hierarchy of needs (Maslow, 1962). This hierarchy doesn't exist apart from the basic need for subsistence or survival. Designing products for society within a perspective of social and cultural responsibility and commitment, should emphasize the promotion of emancipation, sustainable development, improvement of quality of life as well as the cultural identities of individuals and social groups. The author who takes a stance in the discussion about human needs is Max-Neef. His model of human-scale development can offer a breakthrough in our way of thinking about material culture.

4.1 THE MAX-NEEF MODEL OF HUMAN-SCALE DEVELOPMENT

Max-Neef and his colleagues have developed a taxonomy of human needs. Human Scale Development is defined as "focused and based on the satisfaction of fundamental human needs, on the generation of growing levels of self-reliance, and on the construction of organic articulations of people with nature and technology, of global processes with local activity, of the personal with the social, of planning with autonomy, and of civil society with the state." (Max-Neef et al, 1987; p. 12)

Max-Neef makes an important distinction between needs and satisfiers. Human needs are seen as few, finite and classifiable (as distinct from the conventional notion that "wants" are infinite and insatiable). They are constant through all human cultures and across historical time periods. "What changes over time and between cultures is the way these needs are satisfied. It is important that human needs are understood as a system - i.e. they are interrelated and interactive " (Fisher, year unknown).

Max-Neef classifies the fundamental human needs as: subsistence, protection, affection, understanding, participation, recreation (in the sense of leisure, time to reflect, or idleness), creation, identity and freedom. Needs are also defined according to the existential categories of being, having, doing and interacting. From these dimensions, a 36 cell matrix is developed which can be filled with examples of satisfiers for those needs.

Fundamental human needs	Being(qualities)	Having (things)	Doing (actions)	Interacting (settings)
subsistence	physical and mental health	food, shelter, work	feed, clothe, rest, work	living, environment, social setting
protection	care, adaptability, autonomy	social security, health systems, work	co-operate, plan, take care of, help	social environment, dwelling
affection	respect, sense of humour, generosity, sensuality	friendships, family, relationships with nature	share, take care of, make love, express emotions	privacy, intimate spaces of togetherness
understanding	critical capacity, curiosity, intuition	literature, teachers, policies educational	analyse, study, meditate, investigate,	schools, families, universities, communities,
participation	receptiveness, dedication, sense of humour	responsibilities, duties, work, rights	cooperate, dissent, express opinions	associations, arties, churches, neighbourhoods
leisure	imagination, tranquillity, spontaneity	games, parties, peace of mind	day-dream, remember, relax, have fun	landscapes, intimate spaces, places to be alone
creation	imagination, boldness, inventiveness, curiosity	abilities, skills, work, techniques	invent, build, design, work, compose, interpret	spaces for expression, workshops, audiences
identity	sense of belonging, self-esteem, consistency	language, religions, work, customs, values, norms	get to know oneself, grow, commit oneself	places one belongs to, everyday settings
freedom	autonomy, passion, self-esteem,, open-mindedness	equal rights	dissent, choose, run risks, develop awareness	anywhere

Table 1: Taxonomy of human needs (Max-Neef, 1987)

Fisher (year unknown) writes: "Max-Neef shows that certain satisfiers, promoted as satisfying a particular need, in fact inhibit or destroy the possibility of satisfying other needs: eg. the arms race, while ostensibly satisfying the need for protection, in fact then destroys subsistence, participation, affection and freedom; formal democracy, which is supposed to meet the need for participation often disempowers and alienates; commercial television, while used to satisfy the need for recreation, interferes with understanding, creativity and identity - the examples are everywhere. Synergic satisfiers, on the other hand, not only satisfy one particular need, but also lead to satisfaction in other areas: some examples are breast-feeding; self-managed production; popular education; democratic community organisations; preventative medicine; meditation; educational games."

This model forms the basis of an explanation of many of the problems arising from a dependence on mechanistic economics, and contributes to understandings that are necessary for a paradigm shift that incorporates systemic principles. Max-Neef and his

colleagues have found that this methodology "allows for the achievement of in-depth insight into the key problems that impede the actualisation of fundamental human needs in the society, community or institution being studied" (Max-Neef et al, 1987:40). This model provides a useful approach that meets the requirements of small group, community-based processes that have the effect of allowing deep reflection about one's individual and community situation, leading to critical awareness and, possibly, action at the local economic level.

5. WHAT DOES IT MEAN FOR PRODUCT DESIGN?

Creating products for people requires the understanding of the needs and context of the people within it. In this situation it is clear that researchers and designers should engage with cultures directly in order to better understand local people. A unique set of design and business tools and practices adapted from social anthropology, ethnography and Participatory Rural Appraisal (PRA) to build what we call an MNC's "native capability" are being used. This native capability consists of the ability to:

- Engage in deep listening and mutual dialogue with income-poor communities.
- Co-discover and co-create new product design opportunities and business models embedded in the local cultural infrastructure.
- Co-design and launch products that generate mutual value for all partners.

Researchers from the Faculty of Industrial Design Engineering at Delft University have experimented with these approaches and adopted them to the context of product design in this kind of situations. Another paper at this conference gives an overview of this research (Diehl and Christiaans, 2007).

On the other hand there is the dilemma that a real understanding of the needs and wishes of people in whatever community could result in the conclusion that there is no need for new products or services at all; that there is already an abundance of needless products; that sustainable living should get rid of many devices; that (new) products have a negative influence on the community's culture. These issues have to be addressed in both design education and research on design thinking.

6. CONCLUSIONS

Studying the consequences of cultural diversity for product design we are used to give priority to an object perspective: how can we adapt products designed and manufactured in the western world to a global market; how can we increase product selling to a bigger population; what marketing strategies are effective? Even in the current research practice new terms are 'invented', such as 'research through design', which give the impression that researchers and designers only have an eye for this kind of reasoning. This perspective leads to a reproduction of particular values, thereby maintaining the status quo and neglecting the real needs and satisfiers hold by people from different cultures. Therefore, another perspective is badly needed, one that emphasize the creativity of people in contributing to their satisfiers, the promotion of emancipation, sustainable development, improvement of quality of life as well as the cultural identities of individuals and social groups.

REFERENCES

- Christensen, C.M., Baumann, H., Ruggles, R. and Sadtler, T.M., (2006). Disruptive Innovation for Social Change. Harvard Business Review • hbr.org • december (2006).
- Christiaans H. and Diehl, J.C., (2006). The importance of studying cultural diversity regarding product usability. In: R.N. Pikaar, E.A.P. Koningsveld, and P.J.M. Settels, eds. Proceedings IEA2006 Congress. Elsevier Ltd. (2006).
- Diehl, J. C. and H. H. C. M. Christiaans (2007). The first learning experiences of Design for the BoP. ISADR 07 Hong Kong.
- Fisher, K. year unknown. Max-Neef on Human Needs and Human-scale Development. <http://www.rainforestinfo.org.au/background/maxneef.htm> (consulted 20-12-2006)
- Foucault, B.E. and Russell, R.S., (2004). Techniques researching and designing global products in an unstable world: a case study. In: Dykstra-Erickson, E. and Tscheligi, M., eds. Proceedings of ACM CHI (2004) Conference on Human Factors in Computing Systems, Vienna, Austria.
- Hofstede, G., (1991). Cultures and organizations: software of the mind. London: McGraw-Hill.
- Kim, C.J., Christiaans, H.H.C.M. and Diehl, J.C., (2006). Exploring the influence of culture in consumer electronic products. In: R.N. Pikaar, E.A.P. Koningsveld, and P.J.M. Settels, eds. Proceedings IEA2006 Congress. Amsterdam: Elsevier Ltd. (2006).
- Laroche, L., (2003). Managing successfully across cultures. Boston, Butterworth-Heinemann.
- Lowe, S.M. (1988). Cultural Aspects of Design: An introduction to the field. *Arch. & Comport./Arch. Behavior*, 4 (3), 187-190.
- Mooij, M. de, (2004). Consumer behavior and culture. Consequences for global marketing and advertising. London: Sage Publications.
- Maslow, A., (1962). Towards a psychology of being. New York: Van Nostrand.
- Max-Neef, M., Elizalde, A. and Hopenhayn, M., (1987). Human scale development: Conception, application and further reflections. New York: Apex Press.
- Ono, M.M. (2005). Cultural diversity as a strategic source for designing pleasurable and competitive products, within the globalisation context. *Journal of Design Research*, 5 (1), 3-15.

Trompenaars, F. and Hampden-Turner, C., (2002). *Riding the waves of culture*. 2nd ed. London : Nicholas Brealey Publishing.
WORLD BANK, (2005). *Global Economic Prospects 2005: Trade, Regionalism, and Development*. Washington, World Bank.
