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The influence of the designers' own culture on the design aspects of products [Framework]

Mohammad Razzaghi and Mariano Ramirez Jr

Abstract

The product design process in industrial design is not exclusively controlled by such known physical conditions as structural strength, material properties, or production constraints. Rather, it appears to be also influenced by unknown and hard-to-manage factors, such as the designers' own culture and values, their sense of connectedness with the product being designed, their emotions, aesthetical preferences, and other non-physical aspects. This suggests that designed products are the manifestation of variables known and unknown, controllable or uncontrollable.

This paper proposes a framework for examining the influence of the industrial designers' own culture on their works of design which, in our belief, is a prerequisite to later understanding the relationships between cultures, designers, users and products. An extensive literature search has revealed that in general such non-physical qualities of products as pleasurability, experience and emotion in design, and soul of product and culture are often overlooked or totally ignored in favor of the physical aspects of designing a product like usability, ergonomics and functionality. The authors of this paper deem that culture is one of the most important aspects of our everyday lives and argue that the designers' own cultural values play a primary role in influencing the design of the product. As far as can be determined, the examination of the impact of the designer's own cultural dimensions of values over different aspects of product design has not yet been investigated in industrial design research. This paper also submits that the integration of culture into the design process can result in the evolution of the process as well as in tangible benefits to product users.

Keywords: Industrial design, design process, culture, industrial designers, cultural values, design research, concept generation, product development

Introduction

The outcomes of product development processes are shaped by the interplay of several actors: designers, manufacturers, product users, marketers, engineers, and so on. In other words, a product design is a function of those contributors. It has been well evidenced that culture and cultural values play influential roles over almost all aspects of human life (Hofstede, 2001), and it is assumed that the realm of industrial design is not exempt from these pervading cultural effects.

Hannerz (1996) argues that all kinds of cultures learned and acquired in social life are highly integrated and act as packages of meaning and meaningful forms. Hofstede (2001) believes that this integration is largely unconscious, since no mental activities of humans can be culture free. This suggests that design activity can be unconsciously influenced by the designers' cultural values and preferences. Collins and Pinch (1982) coined the phraseology 'frame of meaning' to describe the affective role of cultural patterns on designers' actions and behaviors and preferences. Carlson (1992) calls this process as 'cultural creep', suggesting that designers intrinsically enforce on a new product their own pre-existing frames based on their past experience, rather than invent new frames.

As far as can be determined, the relationship between the designers' own culture and the designs they create has not yet been investigated within the industrial design research field. However, the necessity of integrating the culture of users into the design of products has already been widely propounded by a number of researchers, authors and designers (Holt, 1989, Banathy, 1992, Williams, 1993, Ask, 1997, Vanka, 1997, De Souza, 1999, De Souza et al., 1999, Plocher and Honold, 2000, Berg-Weitzel and Laar, 2001, Gagliardi, 2001, Powell, 2001, Rose and Zuhlke, 2001, Ellsworth et al., 2002, Kemnitzer and Grillo, 2002, Salimi, 2002, Yaveroglu and Donthu, 2002, Zec, 2002, Bell et al., 2003, Hidaka, 2003). This extensive literature supports the notion that cultural integration plays a noteworthy role in the effective design of products.

Although there are a few studies alluding to the impact of culture over certain products as well as some which look at the influence of peoples' culture on products specific to a place or nation, this research aims to investigate the influence of the industrial designer's own preferences, which are developed by his/her own culture and cultural values. How do the designers' own cultural values influence the way they design? Are there marked differences in the way that designers from various cultures approach a product design brief? If so, are there patterns in these differences?

The process of concept generation in product development is, for the most part, initiated by an industrial designer originating diverse ideas for a new product. During this stage, images and ideas, which are considered to approximate the designer's mentality or impressions, are engendered (Lloyd and Snelders, 2001).

The authors are interested in examining the possible differences in the outcomes of conceptualization stages in a typical product design cycle across diverse cultures. Doing so would enable us to observe whether designers incorporate their own conscious, subconscious and unconscious minds – as formed by their own cultures – in the development of their concepts. This paper will narrow its focus to the importance of addressing the designers' cultures in product conceptualization.

Many non-physical aspects of designing a product are ignored or overlooked in most product development processes. These often-disregarded non-physical characteristics include, among others, the pleasurability of objects, the experience and emotion in design, the sense of connectedness with product, and the soul of product and culture. Designers and engineers, obsessed with the physical and functional constraints of products, often

consider the superiority of goodness-of-fit to the bodily needs of users over and above their non-physical desires.

Even so, industrial designers the world over are being challenged and encouraged by the International Council of Societies of Industrial Design to foster cultural diversity in the face of world globalization (ICSID, 2002). Thus, industrial designers are exhorted to implement the cultural wants, preferences and attributes of people into the products that they create, in order to make them culturally suitable and pleasurable for use by all potential users. Samuels (2002) also suggested the necessity of redefining industrial design in order to subsume 'culture' in the definition of industrial design as a goal for optimizing the lives of individual users.

In general, industrial designers are not educated to understand and overcome their own culture in favor of incorporating the cultural requirements of the potential user's group. Consequently users, coming from a culture different from that of the designers, can hardly expect to purchase a product matched to their cultural needs and wants, and often they have to somehow adjust their needs to the products that are available to them.

Products can be regarded as the amalgamation, association and manifestation of a set of physical and nonphysical codes, by which designers can communicate items of their own desires and that of their users. Obviously, these codes should be in common so as to enable communication.

It should be noted that whilst there is a myriad of definitions for culture, there is little agreement of what culture is across disciplines (Roberts and Boyacigiller, 1984). The American Heritage Dictionary of the English Language (2000) defines culture as "the totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought" encompassing "patterns, traits, and products considered as the expression of a particular period, class, community, or population". Brett et al. (1997) recognize artefacts as one of the manifestations of culture and define culture as "a latent hypothetical construct knowable through patterns in its manifestations such as symbols, artifacts, modes of communication, values, behaviors, institutions, and social systems shared among group members". Herskovits (1948) defines culture as the human-made portion of the environment. These definitions convinced us that culture is being integrated into products as a formed and forming part of our cultures.

Causes

Various literature in industrial design and cultural theory point to the existence of at least five main causes for the negligence of culture in the product design process:

- The additional costs that may be involved in the research and development of products that are culturally oriented or customized for a specific user group or region (Trompenaars and Hampden-Turner, 1997)
- The lack of industrial designers' know-how in cultural integration, stemming from a gap in their education (Reese, 2002)
- The globalization of products and services (ICSID, 2002)
- Technology-focused designers and engineers, as well as market-oriented manufacturers, who prefer to innovate on technological grounds rather than addressing cultural fitness (Holt, 1989)
- The customization of products being viewed as contrary to the nature of mass-manufactured industrial production (De Souza, 1999).

Globalization

Cultural neglect in the product design process is considered so as to be one of the consequences of globalization (McBurnie and Clutterbuck, 1987, Bond, 1991, Nickles, 2002).

Globalization, accentuated from 1947 when the General Agreement on Tariffs and Trade [GATT] was signed, is the main opposing force facing the localization (and assumedly, cultural fitness) of products. Zec (2002) observed that globalization aims to provide greater similarity of perception and lifestyle as well as greater uniformity of product culture. This phenomenon has tended to make everything alike and converged into one single taste, whereas diversity is a natural want of human beings. Globalization advocates – for instance Levitt (1983) who believed that a single worldwide market is the only way to go – have intended to homogenize and converge consumers' needs and tastes in order to create an infrastructure for unified marketing and for the selling of standardized products (1998). By doing so, the diversity of culture can be obliterated in favor of uniform products.

Plocher and Honold (2000) presented the advantages of globally-distributed products: lower cost of mass production and easier design process, among others. They also outlined that the homogeneity of global culture, the similarity in everyone's way of thinking, and the costliness of designing the nuances of foreign cultures into products as being the main causes for the spread and preponderance of globally-oriented mass-produced goods.

ICSID (2002) views globalization as a 'must-be-opposed' reality and states that supporting cultural diversity in spite of the globalization or internationalization of the world is a task for design practitioners the world over to be taken up. Localization of products can act as a counter-balancing force for the maintenance and durability of national cultures facing globalization as well as its potential capacity for holding, preserving and presenting cultural values to the respective product users.

Globalization has, to a certain extent, already been able to homogenize the outer layers of users' cultures. While Kemnitzer and Grillo (2002) acknowledged some benefits of globalization, they believed that it has brought on problems which have already started to show their negative effects. Trompenaars and Hampden-Turner (1997) also believed that standardized industrial products – undifferentiated, homogenized, mass-produced products that have resulted from globalization – are disfigured from the onset by an unending downward cost-price spiral. The imposition of products under the light of globalization can also be considered as a source of environmental and cultural degradation (De Souza et al., 1999). De Mooij (2002) identified that the inner layers of people's core cultures, values and attitudes, are deeply maintained and will continue to remain over time despite the preponderance of globally-marketed products and globalization.

Overall, the dissatisfaction of consumers, who use products to satisfy their various needs and wants, can be viewed as linked to the globalization concept. Bjorkman (2002b, 2002a) and Aula et al. (2003) adduced examples showing that the globalization process has started to compromise and soften its approach towards the standardization of products and services, and that the consideration of diverse users' spiritual necessities and particular wants, including cultural requirements, has become more significant. Aula et al. (2003) noticed the continuous fragmentation of a market which shows that the demand for individuality, user's needs and expectations is increasingly growing and becoming the important factors for creating successful products.

Recontextualized vocabularies have arisen in the literature versus globalization: terms such as localization, segmentation, privatization, colonization, and regionalism now all express the opposing forces to globalization and describe the tendency of humans to keep and promote their own cultures, territories and values within their societies.

Attempts, impacts and benefits

Several research efforts have been made to address and identify the relationship between culture and various aspects of design, such as the impact of culture on products and the impact of products over the culture, and how the integration of culture could be implemented in the product design process. These works suggest that, within the field of industrial design, the topic of culture and design has already been noticed although not at the same angle which we looked at in this study. The issue with culture and product design has also been the subject of some investigations from different angles like context of use, pleasurability, interculturality, sustainability, usability, user-centered design, spiritual aspects of products, or even ergonomics. However, as far as we could determine, no research has been undertaken to examine the effects of the industrial designers' own cultural values over the design aspects of products.

Many studies have also been undertaken in the fields of marketing, business, psychology, management, politics, and other social sciences, addressing the issue of culture and its varied influences over these disciplines. Following the same track of investigation as above, cultural impacts on design have also been examined in architecture, industrial design, interior design, packaging design, and interaction design.

This paper will argue that non-culturally adapted products offer weaker interaction qualities with their potential users. Conversely, culturally oriented products create stronger bonds with users. If product users find products culturally closer and meaningful to them, the following results can be expected as a consequence:

1. Culture can sell. Fincham and Rhodes (1994) and Portigal (1997) insinuated that the integration of culture into products promotes success. Culture was also regarded as a new dimension of competitiveness (De Souza, 1999). Berg-Weitzel and Laar (2001) examined the relationship between culture and communication in packaging design and recommended that the most effective advertising is the one that has an adaptation of advertisements for the local scene; they elucidated on the necessity of finding the relationship between the country's cultural profile and packaging.

2. Culture can be a means for users' satisfaction. McGregor (2003) reported that most companies spent at least 85 to 95 percent of their design effort time on fitness to standard and fitness to use. While it is important for products to perform well, it must be recognized that the pleasurability of products cannot be achieved and satisfied merely by dealing with functionality. Industrial designers consciously or unconsciously integrate their own codes of design messages and these codes have to be decoded and appreciated by product users. Ellsworth et al. (2002) investigated the effects of culture on the design of 'refrigerator' in the US, Japan and Europe. Their findings suggest that the same idea of 'keeping things cool' can be manifested as an array of differently designed refrigerators, and this was attributed to the differences among the users' expectations, wants and preferences in the different cultures.

3. Culture can be a reflector of users' identity. Human beings intrinsically seek their identity in order to bring meaning to their lives. The fact that culture is doubtlessly a part of one's personality is most widely quoted. Lambourne et al. (1997) contended that in the current era, people are looking for their own identity more than in any previous historical age and doing this in their own cultural way. Accordingly, culturally adapted products

can help people to locate something in common and in harmony with their own culture and lifestyle. Siu (2003) utilized the model of 'spatial and temporal dimensions of culture' to conduct a case study with Hong Kong public rubbish bins. His study identified the need for industrial designers to understand and more importantly respect the particular cultures of the community in which the users are living.

4. Culture can be a resource for design innovation and inspiration. Taking culture into account during design activities can pave the way to the diversification of ideas for user needs satisfaction, consequently leading to innovation. De Souza (1999) emphasized the necessity of diversity to humankind based on cultural differences and maintains that culture can generate this required diversity. She regards culture as one of the fundamental issues in understanding design polymorphism, which is the theory that a single product can assume several distinct forms. Lloyd and Snelders (2001) study of Philippe Starck's design process in creating the Juicy Salif citrus squeezer demonstrated how a simple design could be profoundly rooted in the inner layers of a designer's personality and perception. They confirmed the importance of the designers' preferences in design and found that every product is influenced by two different designing variables; the designer's individual process of designing and the broader contextual design factors in culture and society.

5. Culture can play a role in the intuitive use of products. In a sense, human intuition relates to our conception of things, which has been already built up within our own cultural contexts. This can be demonstrated, for instance, by the opposite ways of turning a light on in different countries, which is by flipping the switch either upward or downward (Powell, 2001).

6. Culture can be a balancing force versus globalization. As mentioned earlier, this approach has been announced by ICSID as a 'must-be-opposed' reality of our industrial era. Plocher and Honold (2000) advise of a growing sensitivity among major manufacturers towards appreciating the importance of cultural incorporation by localizing their products and services. Powell (2001) highlights the importance of both globalization and cultural values to be acknowledged in an era of worldwide communication, economy and awareness. Ono (2002) reports that the globally marketed products of Electrolux and Whirlpool show sensitivity to certain cultural specifics, demonstrating an understanding of the cultural diversity of their global markets.

7. Culture can set trends and fashions. Alexander (1979) recognized that users from different cultures are influenced by the design of products in different ways. Product aesthetics comprised of color, materials, and shapes may achieve desirability in one culture and still be unappealing to consumers in another. The attractiveness and unattractiveness of products across nations implies relativity in preferences and connotes that some cultural variables may be in charge. In this sense, designers may also be regarded as cultural gatekeepers.

For all the above reasons, the integration of culture into products can be viewed as being very advantageous and beneficial to the industrial design discipline and to product users from many angles. However it should be admitted that it is not a straightforward and sterilized task to be undertaken by industrial designers, but an exercise hard-to-manage as there exists a huge number of variables at different layers of this amalgamation, making it even more intricate. Recognizing and extracting values from cultures and later, the interpretation of those values into some meaningful aspects of product concepts requires extensive knowledge of the fields of industrial design, culture, sociology, anthropology, psychology, and others. Further to this, values are non-physical and most of them unconsciously influence the designer, and as a result, are intangible and potentially ambiguous to understand.

As previously stated, this paper is concerned with condensing the importance of the impact of the designers' culture on the design aspects of products as well as introducing a framework in order to investigate the issue. An appropriate framework has to be set up and narrowed down from various aspects and levels in order to address the question. Our developed approach is based on Hofstede's model of cultural dimensions of values as explained below.

Our approach

Jordan (2002) discloses that the hierarchy of consumer requirements starts from the functionality of products and it passes through usability and then towards seeking pleasure in both aesthetical and functional aspects of products. Since the very concept of pleasurable is rooted in culture (Norman, 2002), pleasurable can mainly be achieved when users' cultural wants and attributes are seriously taken into account in the design process. Norman (2002) suggests four constraints as the sources of precise users' behavior: cultural, natural, physical and social. R  se (2002) explains product design as a message by which the designer is able to convey to the user the usability of the product in a self-explanatory way. However to achieve this goal, the cultural backgrounds of both designer and user should be considered as influencing variables.

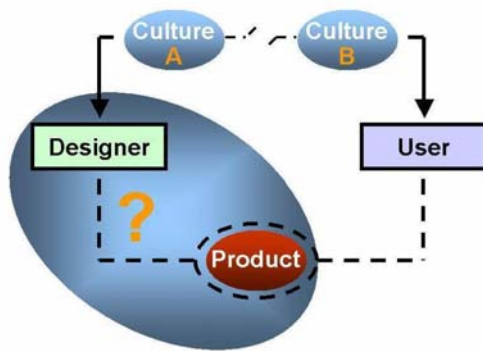


Figure 1: Area of investigation in this study

The target area of this research, as illustrated in Figure 1, is the designer-product relationship in terms of generating concepts for a given product. The drawing depicts a scenario where the designers' culture is different from the users' culture and there is no nexus [or perhaps a weak one] among their main cultural dimensions. Under these conditions of designer-user cultural dissimilarity, the way that designers' culture comes to play a role in generating a concept is deemed more significant to study than in a situation where both users' and designer's culture are similar or the same.

All aspects of human life are profoundly influenced by culture (Schwartz, 1997, Zhan, 1999, Hofstede, 2001, Salimi, 2002, UNESCO, 2002, Yaveroglu and Donthu, 2002), and design activity, being an aspect of human life, therefore cannot be culture free. The hierarchy of influencing culture on the process of designing a product starts from designers through implementing their own preferences into products.

Obviously there are hundreds or possibly thousands of values within each culture at the level of society, excluding organizational and individual values. For this reason a reference model is required to enable examination of the multitudinous influences of designers' cultural values on product design at the societal level. This system would organize values into a limited number of cultural dimensions and facilitate a comparison of the designers'

impacts across cultures. We found Hofstede's cultural model as one of the more appropriate reference models for our study. Although we are fully aware of the contemporary criticisms on this model, we noted the comprehensiveness and proven validity (De Mooij, 2002) of Hofstede's representation of cultural principles into four dimensions as being apt to our investigation.

Reference Model

Hofstede (2001) argues that every person carries within himself or herself patterns of thinking, feeling, and potential acting, which were learned throughout their lifetime. Hofstede itemizes the main manifestations of cultures, as values, rituals, heroes and symbols, indicating that symbols express the most superficial while values comprise the deepest layer of culture. His 'onion diagram' (Figure 2) illustrates the concept of cultural layers.

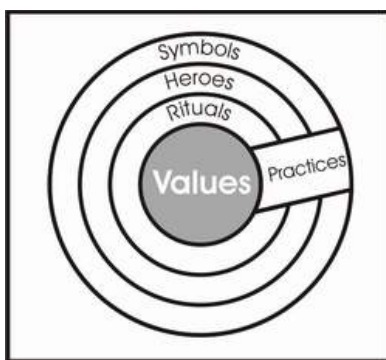


Figure 2: Different levels of cultural manifestations [Adapted from Hofstede, 2001]

Symbols could be words, gestures, pictures or objects that carry a specific meaning within a culture. Those who share the culture may be the only ones who can recognize the meaning of a particular symbol. Heroes are persons alive or dead, real or imaginary, who possess attributes, which are highly regarded within a culture, where they are seen as role models for behavior. Rituals are collective activities, which are socially required within a culture for achieving desired goals. Values are the core of culture and are broad tendencies to prefer certain states of affairs to others. Values are feelings with a plus and minus side, and deal with evil vs. good, dirty vs. clean, ugly vs. beautiful, etc. Values are among the first things children learn, not consciously, but implicitly.

Hofstede recognized symbols, heroes and rituals as being manifested or practiced by members of a society and therefore can be seen by outside observers. Cultural values on the other hand cannot be observed but can only be felt, as they are settled within the innermost layer of one's beliefs and mind.

Hofstede empirically identified four common dimensions of values for national cultures. Dimension is a characteristic of a culture that can be compared across cultures. He studied responses of approximately 117,000 employees of the IBM Company, acquired between 1967 and 1973 from 50 countries and three regions, to questions that he later interpreted as a reflection of each of the four-value dimensions. Hofstede's four cultural dimensions of values are as follows:

- Power Distance Index [PDI];
- Individualism versus Collectivism [IDV];
- Masculinity versus Femininity [MAS]; and

- Uncertainty Avoidance Index [UAI].

Power distance is the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally.

Individualism describes societies in which the ties between individuals are loose. Collectivism, in contrast, relates to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty.

Masculinity values achievement, heroism, assertiveness and material success, whereas femininity values relationship, modesty, caring for the weak and interpersonal harmony. In masculine societies, the social aspect of gender role is clearly distinct, whereas in feminine societies the social aspect of gender role is indistinct. Both men and women are supposed to be modest, tender, and concerned with the quality of life.

Uncertainty avoidance is the extent to which the members of a culture feel threatened by uncertain or unknown situations.

Our research framework

Cultural values form part of the causes of people's behavior, deeds and words. Hofstede (2001) asserted that no part of humans' lives can be exempt from the influence of culture. Press and Cooper (2003) point out that the works of designers are influenced by their own culture.

Our research hypothesizes that: "Designers' own cultural values influence their design values". By this we imply that, in general, designers from a certain culture would concentrate on a particular aspect of a product's design – on features that are deemed important by their own cultural values – whereas designers from a culture on the other end of the cultural dimension spectrum would probably not focus on the same aspects while working on the same product, since their cultural values tend to be directed on some other aspects of design characteristics.

We argue that this investigation has to be, in the first place, carried out during the concept generation stage, which is in the initial phase of the product design process. Concept generation [also known as concept design or design conceptualization] involves the origination of diverse ideas for a product and afterwards evaluating the available alternatives against the specifications. Ulrich and Eppinger (2000) articulated that the aim of conceptualization is to see all the possible product aspects that may relate to the customer needs and requirements. During this stage the first dribbles of the purest designer's idea starts forming and later emerging on paper. Press and Cooper (2003) contend that for a product design to be effective, designers need a thorough understanding of the context in which the product is supposed to be used; however, in the early stages of concept generation, designers usually rely on their own innate creative skill and intuitive knowledge. Further down the design process, more physical and manufacturing criteria are applied and this causes a reduction in the novelty of the designers' initial ideas. In other words, during the early phases of the design process designers are challenged and allowed to be most divergent, creative and innovative; during the middle and final phases, the design activity is more convergent, boxing and leading designers towards the physical constraints of manufacturing and marketing. This explains the choice of the design conceptualization stage as the phase for investigation for this study, rather than the design finalization stage.

Hofstede's model will be used as a paradigm for examining the designers' attitudes [design values] towards designing a product. Even though literature suggests quite a few categorizations of product and aspects of design, however none of them served our purpose alone, but collectively and selectively. It was decided to focus on the five main design aspects – relationships – of products. The considered aspects of product to be investigated in the concept development stage are as follows:

- Functionality aspects of products
- Manufacturability aspects of products
- Usability aspects of products
- Creativity aspects considered in products
- Aesthetic and style aspects of products

Extrapolating from these five aspects of product concepts, five different relationships between a concept and peripheral aspects of design (Figure 3), can be envisaged for the investigation, as follows:

- **Concept-Function Relationship [CFR]**. This refers to the link between the intended functions of the product and the product itself. For instance, the intended function of a computer printer is to produce hard-copy prints; however different printers print out in different ways.
- **Concept-Manufacturer Relationship [CMR]**. This connection is associated with the production constraints or the wills imposed by the manufacturers on a product. For instance, material selection or the level of quality expected for products may be manufacturer-controlled. Organizational culture has a great bearing on this aspect.
- **Concept-User Relationship [CUR]**. This concept refers to the usability of products through potential users' interactions, expectations and satisfactions acquired from the use of products. This aspect is related to the stereotypical image of a potential user in the mind of the designer.
- **Concept-Designer Relationship [CDR]**. This determines the specific role of designers in the creation of a product, of which innovation [inbuilt product uniqueness] is often regarded as most important.
- **Concept-Context Relationship [CCR]**. This refers to harmony of the product with the time and the setting or environment of the use. It is concerned with the link between products and their aesthetic qualities, and what evokes product observers to express their interpretation about a product as being luxurious, heavy, fabulous, fantastic, banal, weird, extraordinary, and so on.

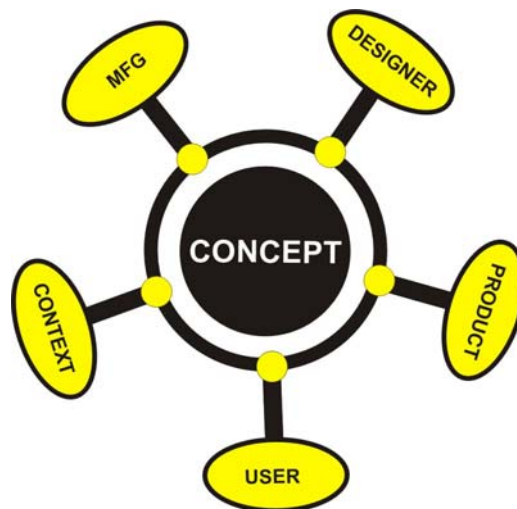


Figure 3: Culture-Design Relationship

A blending, or triangulation, of qualitative and quantitative methods will be used to determine the underlying constructs from the multiple data sources. This will allow us to capture a more comprehensive and insightful picture of the design-and-culture relationships, by finding more complementary pieces of the puzzle.

For the quantitative part of the investigation, a survey will be disseminated via the Internet among designers from two dissimilar cultures: Australia and Iran, which are poles apart based on the country scores in Hofstede's study. The country scores of Australia and Iran on the four cultural dimensions are reasonably far from each other to make the study theoretically possible for the comparison. The questionnaire will inquire into designers' attitudes towards the five design aspects of products. The collected survey data will be exposed to quantitative methods and statistical analysis. The outcomes of the survey will test our hypotheses and lead the second stage of the study towards the point where the qualitative approach can be initiated.

The survey phase requires a significant pool of respondents: we aim for as many responses for each category as possible. The target population will be professional industrial designers from two countries. Demographic details of respondents will be requested for the statistical analysis, including their gender, age bracket, country of origin.

For the qualitative stage of the study, the deeds and words of designers from either Australia or Iran will be examined. A preliminary plan for the qualitative approach is administering a series of design experiments wherein industrial design practitioners will be recruited. These participants will be handed out a simple design brief and will be asked to generate simple annotated concept sketches. The experiment will then be followed with a short interview through open-ended questions asking the designers' to rationalize their own choices and preferences on the five design aspects of products. The content of the interviews will then be transcribed into text and subjected to the qualitative method of content analysis. The sketches will be used as a backup for the interviewees' statements. The aim of this stage is to explain how designers incorporate their own cultural constructs to accommodate design briefs.

While the quantitative phase of this study inquires into designers' general attitudes towards the five product design aspects in order to extract their preferences in as broad a spectrum as possible, the qualitative phase looks in depth at the ways designers interpret and integrate their own preferences into products. In other words the first stage is more concerned with finding support or opposition for our hypotheses, whereas the second stage is about the 'HOW' questions.

Conclusion

This study is based on the notion that designers' cultural values have an effect on the formation of the product concept during the early stages of design process. It was discussed that this influence is unconscious or at most subconscious. This suggests that a designers' cultural preference is an uncontrollable and unknown element of design or, as Press and Cooper (2003) explain, a possible element of risk. As a result, this study should be regarded as peregrinating the unknown pavement so as to uncover more of the influential factors on the design process, resulting in the minimization of design risks. Thus the product design process is also manipulated by other uncontrollable variables like designers' own culture and values, sense of connectedness with the product being designed, emotions, aesthetical inclinations, and so on. The impact of designers' own cultural preferences and values on the design aspects of products, particularly during the concept generation stage, were emphasized as significant to be addressed. We also argued

that the integration of culture is beneficial to both the industrial design discipline and to the users of the products created by designers.

A triangulated framework, comprising of two complementary methodologies, was manipulated from two different angles in order to test our hypothesis that designers' own cultural values influence their design values. The amalgamation of the qualitative and quantitative techniques as a research strategy should facilitate enough knowledge required to model these effects. The results of the proposed phases of the study will be presented as separate papers further along the way as the research progresses.

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