



The relative effects of different dimensions of traditional cultural elements on customer product satisfaction



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ABSTRACT

It is increasingly important to account for cognizance of local cultural elements during the product design process. The relationship between traditional cultural elements and customer satisfaction was explored in this study. A Continuous Fuzzy Kano Model was used to analyze the effects of different cultural elements on user satisfaction. And a design practice was carried out to verify the results. Twenty-four cultural product cases were identified and investigated. We developed a scale questionnaire to examine the cases, and identified and categorized the relevant cultural elements. This study identifies the importance for product designers of individual cultural elements, and ascertains which dimension of cultural elements better satisfies user requirements.

Relevance to industry: This information is very relevant for designers and developers as it helps them to identify important cultural elements and estimate their effects on the user's satisfaction of products.

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1. Introduction

With intense competition in the global product market, the connections between culture and design have become increasingly important (Shin et al., 2011). Product design based on traditional culture increases the customer demand for the product and promotes the speed of product innovation. Hence, there is a gradual tendency towards “localization” in the design process (Lin et al., 2007a). Including traditional elements can augment a product's core value and products which successfully integrate traditional design elements drive cultural development (Lin, 2007). An appropriate cultural fit is essential to a product's success. It is the starting point, not the end point, of development (Portugal, 1997).

Culture, in particular, has a strong influence on product evaluation (Seva and Helander, 2009; Rau et al., 2004; Luximon et al., 2001; Fang and Rau, 2003). A consumer's purchase process includes cultural recognition, emotional needs, and social value pursuit. Appropriate cultural elements should be included in product design in conjunction with basic product function. Hence, the product should not only include physical functions but also perceptual elements, particularly cultural elements. As product design is a process of rethinking or reviewing cultural factors,

designers redefine the product to fit society needs and to satisfy consumer desires (Ho et al., 1996).

Applying traditional cultural elements to product design and improvement is increasingly prevalent. Cultural insights become important as corporations seek to create products and brands that have functional, cultural, mythical, symbolic, and ethical global meanings (Gagliardi, 2001). Applying traditional cultural elements to product design can directly affect customer satisfaction.

Culture should be taken into consideration during the entire design process. The product design models based on the traditional culture are various. But the present articles specifically for cultural elements are rare. The elements of traditional culture proposed by this article were filtered out through cultural hierarchy theory which refers to the Outer “tangible” level, Mid “behavioral” level and Inner “intangible” level, such as color, texture, technology, functionality, aesthetics, content and other aspects of cultural decomposition fragments. Making the cultural elements as an innovation factor to match products better, then making product obtain higher satisfaction during the proceeding of product design with culture as the core value. For example, R. Moalosi et al. (2010) put forward that culture is a catalyst for product innovation design when he was studying the cultural product design of Botswana. The design model proposed by him achieved cognitive experience through coding and transforming the cultural factors of Botswana which embodied in the product performance and characteristics. The model, which is called culture oriented design (COD) model, is

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divided into three related stages: the classification of social and cultural factors (user domain), integration (designer domain) and culture oriented products (product domain). It is fully covered the cultural features, values and the integration and transformation of traditional idea during the product design.

Cultural hierarchy theory (from the field of cultural research) was used in this study as a method of categorizing cultural elements. This theory recognizes three culture levels. The study used a quality attribute evaluation system, based on the Continuous Fuzzy Kano Model (C-FKM), to evaluate the priorities of the individual cultural elements.

1.1. Cultural hierarchy theory

De Souza and Dejean (1998) put forward that product design is not only depending on product cognition and imagination by designers, but also comes from understanding about the lifestyle of consumers and the cultural background of the product delivered. Cultural attributes of products should not be regarded as additional properties of a product simply. They are indispensable attributes of a product under the specific and broad consumption environment. The meaning of culture is complex and multi-dimensional. Kroeber and Kluckhohn (1952) had carried on the overall classification for more than 160 kinds of cultural connotation. There are a lot of criterions to classify culture, such as geography, time, religion, production tools and the way of human control the world. This paper studied the impact of cultural elements of different dimensions on product satisfaction. So we chose the base of design to classify culture. To classify the culture was very important because it made us to understand different kinds of traditional culture elements more profoundly.

Yang (1998) considered that there were three levels of cultural hierarchy: physical level (objects with visible forms), mid-level (systems within which people communicate and interact) and metaphysical level (thinking activities and languages). Many studies followed this classification. It was of great reference value in category but confusing slightly in content. Leong and Clark (2003) commented that cultural elements could be divided into three levels: outer “tangible” level, mid “behavioral” level, and inner “intangible” level in the study of cultural objects. According to the study of Leong, Lin (2007) Showed different design of the three cultural levels. They extracted original meaning of indigenous culture and image information and carried on corresponding expressions of different dimensions of indigenous culture. Then the design of the products could cater to tide and meet the needs of consumers and the market.

1.2. Continuous Fuzzy Kano model theory

The Kano model (Kano et al., 1984) stresses the two-dimensional quality of user satisfaction, amending the previous linear hypothesis (that the users' satisfaction with a quality, and the strength of the quality, has a decreasing linear relationship). The Kano model has proved effective in quality attribute measurement and in exploring the relationship between product quality attributes and user satisfaction. Four of Kano's identified qualities (from the most to the least important) are Must-be qualities, One-dimensional qualities, Attractive qualities and Indifferent qualities (CQM, 1993). The fifth identified attribute is Reversal qualities. Attractive qualities have the greatest effect on user satisfaction. The relationship between Kano's five quality attributes and user satisfaction is shown in Fig. 1.

L.A. Zadeh (1965) proposed a fuzzy set theory that was further extended to investigate the vague relationship between user satisfaction and quality attributes. Park and Han (2004) proposed a

fuzzy rule-based approach to building models relating product design variables to affective user satisfaction. Lin et al. (2007b) presented a new fuzzy logic method to determining the best combination of mobile phone form elements for matching a given product image. A FKM (Fuzzy Kano's Model) reflecting the uncertainty and vagueness of the relationship was proposed by Lee and Huang (2009). Wu and Wang (2012) put forward the C-FKM, which focuses on the user product needs. In their researches, user requirements were continuously recognized. The randomness and complexity of quality attribute evaluation problems encountered in traditional FKM quality bidirectional questionnaires were partly resolved. Traditional FKM judgment on two-way questionnaire can be only from five product quality attributes, while C-FKM can make continuous judgments. We can choose between Must-be qualities and One-dimensional qualities. C-FKM also focuses on user needs for property. It can make evaluation of importance ratings on the property requirements.

There is a body of research evaluating user satisfaction based on the Kano model and the fuzzy Kano model (Matzler and Hinterhuber, 1998; Hartono and Chuan, 2011; Lin, 2014). Llinares and Page (2011) applied Kano's model and used information from the company Kansei Engineering to evaluate the subjective comments of real estate consumers in relation to real estate needs, desires and preferences. In this study they mainly evaluated the weight of each emotional attribute in the purchase decision. The results are said to also help designers to improve their designs based on these attributes. Yeh and Chen (2014) discussed service quality in nursing homes and the factors that affect service quality in Taiwan in a way that benefits the management of these organizations through refined Kano model analysis. Yadav et al. (2013) combined Fuzzy Kano Modeling with Quality Function Deployment (QFD) to study priorities in the esthetic attributes of cars. They transformed the emotional evaluations and requirements of customers into available design data, and showed how these were finally implemented in car design. However, the study of user satisfaction using an application of C-FKM is relatively rare.

1.3. C-FKM quality attribute recognition

Attribute recognition is conventionally undertaken using a group of bidirectional questions. Two bidirectional questions and an importance evaluation question are set for each quality. The bidirectional questions investigate user satisfaction when the particular quality is presented as being functional or dysfunctional. In the light of Kano's model, the 25 combinations in the Kano evaluation table contribute different values to the evaluation of user satisfaction (Berger et al., 1993). Kano's evaluation table (Table 1) shows that these qualities can be classified into five attributes (Matzler and Hinterhuber, 1998). Tan and Shen (2000) and Chen and Ko (2008) suggest that a proportion of the impacts of ‘must-be’, ‘one-dimensional’, and ‘attractive’ attributes of a product could be ‘2’, ‘1’, and ‘0.5’, respectively. According to the studies of Tan and Chen et al., and Wu and Wang (2012) it is proposed that when the element to be evaluated is ‘functional’ and participants' evaluation is ‘neutral’, and when the element is ‘dysfunctional’ and participants' evaluation is ‘dislike’, the quality of ‘must-be’ can be seen as a pure quality. Therefore, the value of pure ‘must-be’ can be defined as 2. Similarly, when the element to be evaluated is ‘functional’ and participants' evaluation is ‘enjoy’, and when the element is ‘dysfunctional’ and participants' evaluation is ‘dislike’, the value of pure ‘One-dimensional’ can be defined as 1. When the element to be evaluated is ‘functional’ and participants' evaluation is ‘enjoy’, and when the element is ‘dysfunctional’ and participant evaluation is ‘neutral’, the value of pure ‘attractive’ can be defined as 0.5. In each situation the values of pure ‘enjoy’, pure ‘expect’, pure

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