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ENGINEERING EMOTIONAL USABILITY IN E-COMMERCE WEBSITE: THE KANSEI APPROACH

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Abstract

Emotion and pleasure engineering has been used in the design of products to incorporate the desirability of the product. In determining the users' experience and affective appeal, emotional usability has been introduced as a quality measure in addition to the traditional functional usability measure. Kansei Engineering has been successfully used to incorporate affective appeal in the product design. The range of products that have been engineered with affective appeal includes physical and IT artifacts such as mobile devices. With the growth of e-Commerce, there is a growing concern to improve the consumer interface of e-Commerce to improve the persuasive power of e-Commerce websites by engineering the affective appeal in the website design. This paper discusses the approach of applying Kansei in the development of e-Commerce websites. The implementation of Kansei Engineering in e-Commerce website targets to improve understanding between consumer's feeling and impression with website designers. The concept will enable the designers to embed consumer's Kansei into website design to produce Kansei e-Commerce website.

Keywords

Affect, emotion, e-Commerce, Kansei Engineering, Kansei website design

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1. INTRODUCTION

Qualities of usefulness, usability and desirability play a central role in the good design of all digital products and digital environments such as websites (Buchanan 2000). In the literature on e-Commerce website development, qualities of usability and usefulness have received the main attention of researchers which were mainly based on the work pioneered by Nielsen and his associates since mid 1990s. Since then, web designers compete to provide higher functionality and features to simulate the physical shopping environment. However as e-Commerce sites intensify the effort to provide persuasive shopping experience for their consumers, it is now necessary to look beyond usefulness and functional usability. The element of product desirability has been shown to have an important decisive role in the product selection. Product desirability can offer an emotional connectivity in e-Commerce websites to portray positive experience in the digital shopping environment. For example, in the physical world, retailing businesses concentrate on store design and layout to portray positive experience to attract consumers. It is unlikely for a potential consumer to go into a dark and messy store, to look for a product no matter how good the offered product is. Similarly for e-Commerce, businesses should stress on how to deliver the best experience at first glance to potential consumer by providing a desirable digital shopping environment. Feelings and impressions are important factors that may influence the consumer in making the product purchasing decision. Now, it seems that performance, functional usability and usefulness are secondary.

The need for emotional association design is now recognized (Desmet, 2003; Norman, 2002 ; Li, 2005; Tractinsky, 2000; Lavie, 2004; Spillers, 2004; Schütte, 2005). Emotion and pleasure engineering has been used in the design of products to incorporate the desirability of the product. In determining the users' experience and affective appeal, emotional usability has been introduced as a quality measure in addition to the traditional functional usability measure. In, e-Commerce the problem of how to deliver positive experience to potential consumer through the website design needs to be address. This may leads to the issue of evoking the consumer's feelings and impressions and the necessary quantifying method. Kansei Engineering has been successfully used to incorporate the affective appeal in the product design. It is a suitable technique to be considered to integrate subjective and unconscious consumer values in the e-Commerce website design elements. The range of products that have been engineered with affective appeal includes physical and IT artifacts such as mobile devices. With the growth of e-Commerce, there is a growing concern to improve the consumer interface of e-Commerce to improve the persuasive power of e-Commerce websites (Kim, 2003; Li, 2005) by engineering the affective appeal in the website design. In this paper, we will discuss the concept of Kansei Engineering and possible implementation in e-Commerce website highlighting the importance of inducing human feeling and judgment into the website design.

2. KANSEI ENGINEERING

Kansei Engineering is a technology that combines Kansei and engineering realms to assimilate human Kansei into product design targeting to engineer the production of goods that consumer will enjoy and satisfy with. Kansei is a Japanese term which by definition refers to sensitivity, sensibility and feeling (Nagasawa, 2004). Psychologically, Kansei means the mental state where knowledge, feeling, and sentiment are harmonized, and people with rich Kansei are people who are full with rich feelings and sentiment, adaptive, warm and responsive (Nagamachi, 2003). The term Kansei has various interpretations by different literatures. Lee et al (Lee, 2000) have classified the meaning of Kansei into five clusters and the classification is shown in Figure 1.

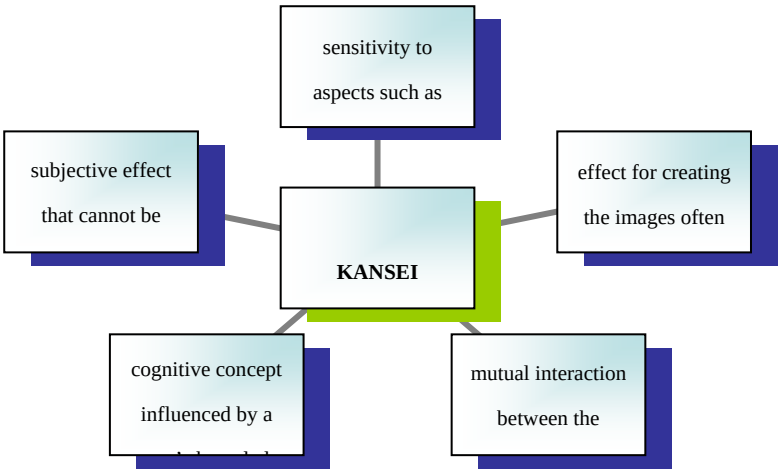

Figure 1 : Cluster of Kansei as adopted from Lee et al, 2000

Kansei Engineering which is pioneered by Professor Mitsuo Nagamachi of Hiroshima is a method to design and develop products that can fulfill consumer's feelings and desire in an effort to sustain business. Kansei Engineering targets to improve human well-being by looking into physiological and psychological aspects. Products that were developed by using Kansei Engineering are called 'Kansei products'. These are products that assimilate human feelings and desire into the design elements such as shape, color or feature. Kansei Engineering is designed to capture these subjective consumer insights, synthesize them with the actual product design element. In other words, the technology maps Kansei to the associated element, so that the new product design embeds the consumer insights. This will then trigger the consumers' connection to the product which leads to the consumer inclination to buy the product.

The product evolution towards kansei product based on consumer maturity over time is shown in figure 2. This gives an implication that as consumers becomes more sophisticated the demand for kansei product will grow.

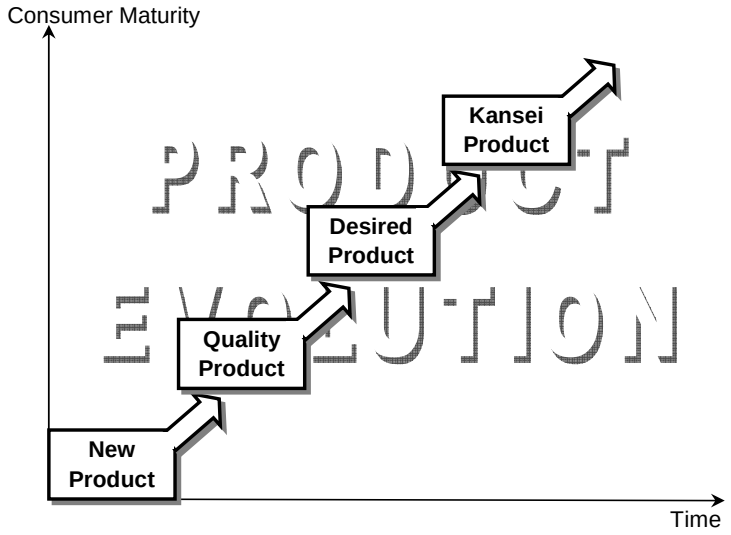

Figure 2 : Product evolution based on consumer maturity over time

3. APPLICATION OF KANSEI ENGINEERING

In principal, the process of performing Kansei Engineering begins with the domain selection and branches out into the process of Kansei measurement to capture consumers' internal sensation and the process of determining specific product attributes according to design features such as color, size, shape, functionality and so forth. The key ingredient to design and develop a successful Kansei product is to integrate consumer's physiological and psychological responses to product design characteristic. When both Kansei measurements and product attributes are obtained, a synthesis process needs to be carried out to integrate consumer's physiological and psychological responses to product design characteristic. The main purpose of this synthesis process is to derive which consumer's Kansei is highly associated to which product attribute so that the design element of each Kansei can be determined. Here, the data internal organization from Kansei measurement process and the relationship with the identified product design elements will be analyzed and translated into new design elements. A Kansei product is a product that resulted from the Kansei Engineering implementation. It is the product that assimilates human Kansei responses into its design element such as shape, size or color. The process involved in Kansei Engineering is illustrated in Figure 3.

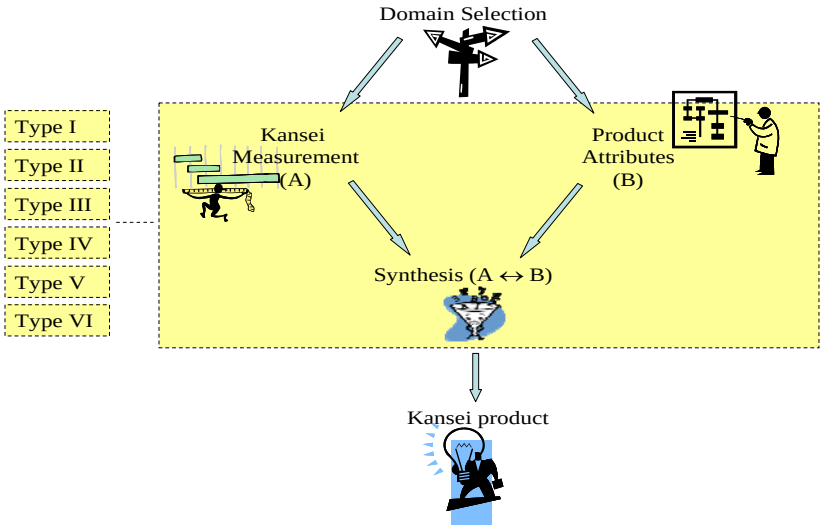

Figure 3 : Engineering Kansei in Product Design

Kansei Engineering can be performed at any point in the product development cycle as long as there is a sensible flexibility in making design decisions of the product. Techniques in Kansei Engineering allow for designers to either begin the design from nothing to produce a new product based on the targeted concept or begin by reengineering an established product.

Even though most of the Kansei engineered product developments are undertaken by Japanese based company, there seems to be an emergence of interest in Kansei Engineering in the other part of the world among business practitioners and academic researchers (Childs, 2003; Guerin, 2004; Bouchard, 2003; Schütte, 2005; Camurri, 2002). Application of Kansei Engineering were initially in electronic home appliances, computer systems, automobile industries, cosmetic products, apparel product, community design and so forth (Childs, 2003). However due to its cultural and indigenous characteristics, it seems likely that Kansei Engineering can be applied to other applications that require the incorporation of affective appeal to reflect or increase element of product desirability.

4. EMPLOYING KANSEI ENGINEERING INTO E-COMMERCE

As we have mention in the earlier section of this paper, current e-Commerce websites have relied heavily on aspects of functionality and usability but have ignored aspects of desirability. Little work has been paid into the emotional impact of the website visitors or potential consumers. In trying to draw the attention of consumers, the design of e-Commerce website was mainly drawn towards conventional marketing strategies through the use of information design such as blinking text or multimedia. Aspect that has been overlooked is on the incorporation of emotionally inspired elements in the design of websites. Studies have proven that Kansei Engineering has worked well with physical product (Ishihara et al 2005; Nagasawa 2004). The next question will now be: can Kansei Engineering

be applied in the design of e-Commerce websites? To explore the possibility of this, we will now discuss issues that highlight the potential of applying Kansei Engineering to achieve emotional usability in e-Commerce web design.

The key to converting a prospect web visitor to a consumer is to provide positive experiences across all interactions between the visitor and the website. Since today consumers satisfaction is mainly based on emotional performance of products (Norman, 2002; Bouchard, 2003), inducing appropriate emotion into homepages is becoming more important in practice (Kim, 2003). This is because emotions were found to influence both users' memories of products and their decision processes when they purchased products (Kim, 1998). However, little studies have focused on the emotional aspects of websites, and a systematic guideline on how to produce websites that embeds emotional aspects is in almost no existence. Despite many studies conducted in addressing website design, the study on emotion design tends to look at minimizing irrelevant emotions related to usability such as confusion, anger, anxiety and frustration (Norman, 2002). Major focus have been given to usability test (van Welie, 1999; McGillis, 2001; Bevan, 1991), looking at only functionality aspects addressing for instance accuracy, speed and portability (Dix, 1999; Egger, 2001), and has been ignoring the intangible aspect of user experience, such as fun and enjoyment.

The identification of elements or characteristics in a website design that have an impact on consumer's emotion is necessary. The communication of consumers' feelings towards particular e-Commerce website that can provide understanding between website designer and consumer is foreseen to be possible through Kansei Engineering. By analyzing the emotional responses to business website, web designers can devise strategies to enrich user experience and ensure that the target consumers' emotional desires are addressed as emotions influence decisions. One important thing that cannot be neglected is that human emotions are subjective and has the element of individuality. Therefore, methods of handling this subjectivity are greatly essential. Kansei Engineering is an engineering discipline to incorporate human emotion into the design of new product (Nagamachi, 1999; Ishihara, 2005). The idea is to elicit diverse emotion towards a product, and induce it into the product design factors. This engineering technique is targeting to translate subjective feelings, impressions and emotions into product design elements (Yoshikawa, 2000).

We propose the concept of Kansei Engineering for e-Commerce website and the description is illustrated in Figure 4.

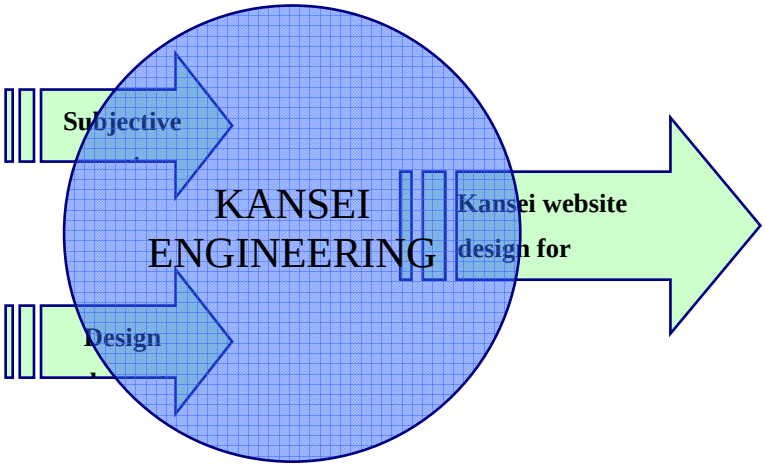

Figure 4 Kansei Engineering Concept for e-Commerce Website

The concept is derived from Kansei Engineering technique to quantify subjective emotion and classification of e-Commerce website design elements. Through the implementation of Kansei Engineering, consumer emotional responses to a website can be quantified and by reflecting them to the website design elements, consumer needs and desire can be embedded into an objective Kansei e-Commerce website design.

To perform Kansei Engineering in e-Commerce website, one should begin with selecting a specific evaluation domain. It is important to control the evaluation subject because different domain will induce different Kansei respectively. Failing which will lead to confusion during measurement and classification of design element. This will cause an invalid result. The domain addressed in Kansei Engineering does not refer to a particular industrial field, such as car or electronic appliance, but a more specific group of product that have same design viewpoint (Nagamachi, 2003). Similarly for websites, one must carefully control and narrow down their investigation to a specific field.

Since Kansei is the state of consumer internal sensation, the measurement process can be very challenging. Kansei Engineering provides methods to measure consumer's emotion mainly by using words that describe the emotional expression. Correspondingly, emotional responses to e-Commerce website can be determined by synthesizing expressions that are highly associated with the design of the website. In Kansei Engineering, these expressions are called Kansei Word (KW) (Ishihara, 2005). Possible sources of KW can be of any or all but not restricted to; Web developer / designer, pertinent literature, experienced website user, related study, technical magazine / journal.

Once the KWs are ready and the design elements are compiled, investigation can be performed to find association between the KW and design elements. The expected result will not be as one to one association, but most probably one KW is associated with few design elements. For example, the word elegant may be associated with the background color, typography, and image size. The synthesized result will provide guidelines of how a Kansei evocative website should be designed. For the quantification of subjective consumer's emotion, the Osgood Semantic Differential scale is mainly used. To enable interpretation of Kansei responses, one need to identify the e-Commerce web design element. Compilation of these design elements can be done through self-investigation guided by again the above-mentioned sources.

We propose a model of Kansei Engineering in e-Commerce as shown Figure 5.

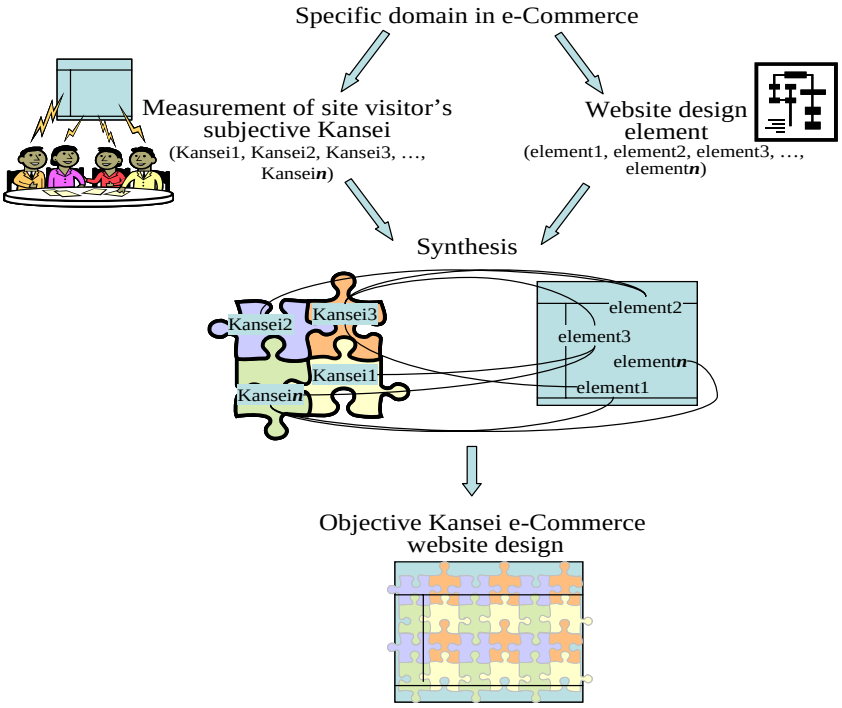

Figure 5 : Model of Kansei Engineering in e-Commerce website

5. CONCLUSION

Many studies have proven that Kansei Engineering works very well in the engineering field. However, in the webspace, Kansei Engineering is still in its infancy. Isolated work has shown the possibility of incorporating emotional usability in the design of websites which draws on the new paradigm of producing desirable websites as opposed to common concentration on website functional usability and

performance. There is now a need to explore the implementation of Kansei Engineering in websites design. In e-Commerce, the relevance of incorporating Kansei arises from the needs of e-Commerce retailers to induce human emotion in order to persuade and influence consumers in their purchasing decision making to achieve increase consumer conversions and retentions. In this paper, we have presented the concept and model of engineering Kansei into e-Commerce websites based on previous studies involving Kansei Engineering. However, we perceive that the adoption of Kansei Engineering is not risk free. Since Kansei is highly dependent on the indigenous characteristics of the cultural race, engineering Kansei into e-Commerce websites may not produce globally accepted features. Consideration on the universal and localized Kansei features will be considered in our future work.

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