

Engineering Kansei In E-Commerce Web Design

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Abstract. In the literature of e-Commerce website development, qualities of usability and usefulness have received the main attention of researchers. However, with the rapid growth of e-Commerce, there is a growing concern to improve e-Commerce interface by engineering the affective appeal in the website design. Kansei Engineering is a translating technology of a consumer's feeling and image for a product into design elements and has been successfully used to incorporate the affective appeal in the product design. This paper presents results of research on the use of Kansei Engineering as a method in formulating affective quality website. Kansei evaluations on e-Commerce websites were done, where subjects evaluate e-Commerce websites and rank their impression on a 5-point SD-scale pair of Kansei Words (KW). Principal Component Analyses were used to identify semantic space of KW and discover the implicit relations among Kansei and website's design elements.

Keywords: Affective quality, e-Commerce, emotion, Kansei Engineering, online clothing, web design

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 of 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.

However, as technology advances and e-Commerce rapidly matures, most e-Commerce websites are demonstrating equally good design features in terms of functionality and usability. Consequently, with all other factors being equal, what may allow an e-Commerce to stand out is its ability to engender favorable consumer experiences and affect (Li & Zhang, 2005). Moreover, due to the luxury they get in cyberspace, today's e-Commerce websites users have become sophisticated and skeptical. They are now looking for emotional connectivity in everything they see. Norman (Norman, 2002) and Desmet (Desmet & Hekkert, 2002) have also supported that it has now become more and more important to include experiential and emotional quality in designs. Therefore, e-Commerce websites should induce

desirable consumer experience and affect that influences its user's perception of the website. This is ultimately seen to enhance the success and outreach potential of their online business.

Discussing the context of consumer's feelings and emotion, the term that refers to them in Japanese is Kansei. Realizing the importance of Kansei in new product development technologies, *Kansei Engineering (KE)* was established as a method of designing new product that enables the assimilation of human feeling and emotion into product (Nagamachi, 2003). The paper suggested that inducing human feelings and emotion into product design enables emotional connectivity between consumer and the product. KE 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 (Anitawati & Nor Laila, 2006; Nagamachi, 2003).

The objectives of the study are; i) To evaluate human affective judgment to the samples, ii) To identify semantic space of KW in relation to web design, iii) To discover the implicit relations between human emotions and web design. This is ultimately aimed to enable the incorporation of human emotion into the design of affective quality website.

2 Methods

35 specimens were selected from existing clothing e-Commerce website following a set of rules. 10 subjects were recruited for the Kansei evaluation. The subjects were 25-30 years of age, have previous online experience, and consist of 4 males, and 6 females. A checklist consisting of 40 Kansei Words (KW), which represents human emotion, was organized in 5-point Semantic Differential (SD) scale. KW were chosen from frequently appeared adjective words on web design guidebooks, websites, research papers and journals added with general KW which are considered relative to describe website. Specimens were shown to all subjects in a systematic and controlled manner. They were asked to rate their feelings into the checklist according to the given scale.

3 Results & Discussions

We performed Principal Component (PC) Analysis using the averaged value between subjects from the evaluation results of each specimen (sample website). This is to compress information to a smaller number of synthesized variables, which contains most of the information in the original data set, and for finding axes of semantic space. This greatly simplifies the task of understanding the structure of Kansei Words, since it is much easier to interpret two or three uncorrelated KW than 40 KW that may have correlations to each other.

Figure 1 shows the eigenvector plot to help identify how many components to retain. From the eigenvector plot, we can read from the left according to y-axis, the first, second, third, ..., fortieth eigenvector. We can see that the trends before and

after the second eigenvector varies significantly. Therefore, we can conclude that the first two eigenvectors should provide an adequate representation of the KWs. Furthermore, the third and subsequent components have relatively similar eigenvalues, which means they each explain a similar but small proportion of the total variance. Figure 2 and 3 show PC score and PC loadings for both components. The PC loadings show how much the evaluation on a Kansei affects variables, which we use to obtain structure of KW.

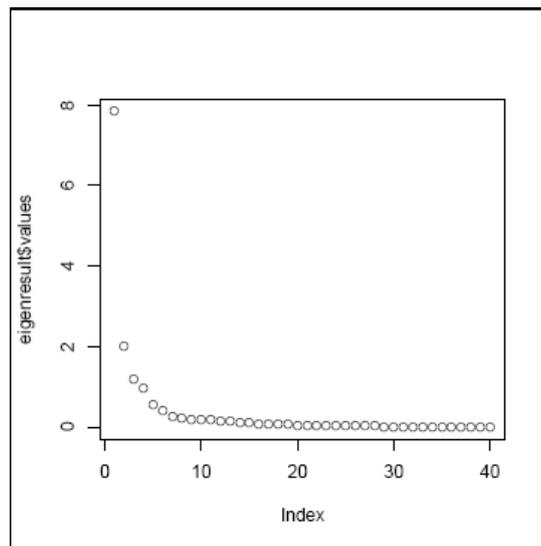


Fig. 1. Eigenvector plot.

From figure 2, the KW that produced large negative first PC loadings (x-axis) are “Gorgeous”, “Impressive” and “Appealing”. KW that produced large positive PC loadings are “Boring” and “Old-fashioned”. We can represent this PC as the axis of “Attractiveness”. We can expect that websites with a lower score on this component is likely to have higher sense of attraction and conversely. In the second PC loadings (y-axis), KW that have positive large loadings are “Crowded”, and KW that have negative PC loadings are “Light” and “Simple”. We can represent this PC as the axis of “Complexity”. We can expect that websites with a high score on this component will tend to portray complex feeling and conversely. We can conclude that Kansei structure on website design has two components, which are *attractive* and *complex*. In addition, blending and balancing these two components are determinants of new website design.

Figure 3 shows PC score of each websites. PC score shows what kind of Kansei has relation with websites samples. From the figure, we can see which websites holds strong Kansei. Those located at the edge of the corresponding Kansei space, have strong meanings. For example, we can conclude that BK Sales website which is located at the very right edge, indicates very much “not attractive”; BrandName Clothes, at the upper-right, is “not attractive” and “complex”. Boss and D&G are at

the left edge, which indicates very “attractive”; BCBG MaxAzaria and DKNY, at the bottom-left, are “attractive” and “not complex”.

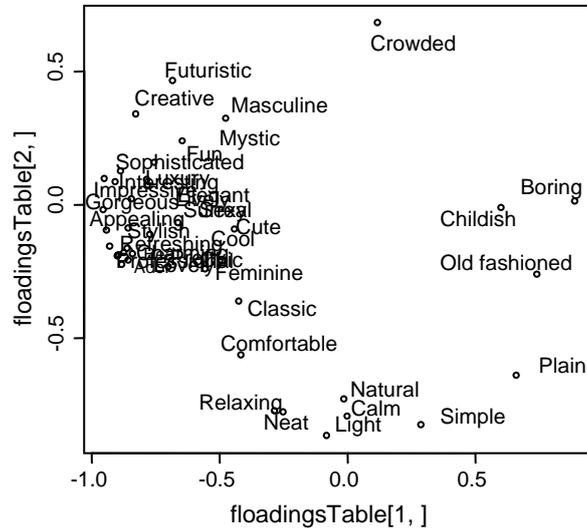


Fig. 2. PC Loadings for first and second PC.

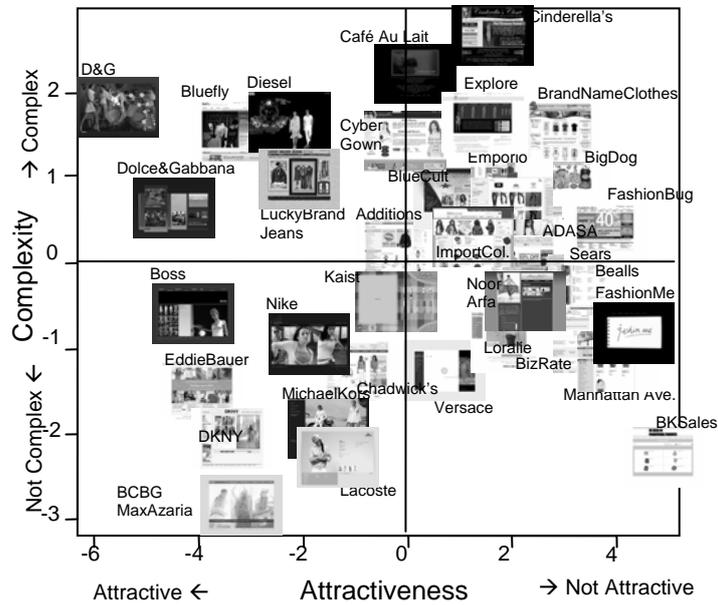


Fig. 3. PC Score for each websites.

Websites in “not attractive” category, for instance BK Sales seems to have small size pictures, consist of more text, observable empty spaces, and no modelling on

clothing. On the contrary, website like Boss and D&G are having large size picture, very less empty space, less text and model is used to demonstrate clothing. Websites with darker backgrounds are mostly considered as “attractive” but “complex”.

4 Conclusions & Future Works

The study presents initial result of Kansei structure, which were analysed by Principal Component Analysis. Results of the study have identified semantic space of KW representing human Kansei responses to websites. The relations of Kansei and website designs were also visible. Further evaluations and analysis will be strategize targeting for more precise result, as to find associations between these Kansei Words and detail website designs. The study have used KE to investigate detail design elements and evaluate human emotion towards website design. Results has shown possible adoption of KE in as a valid method to evaluate affective appeal and formulate guideline to the design of affective quality website.

The implementation of Kansei Engineering in the affective evaluation of e-Commerce website will provide insights of visitor’s feeling and emotion, and enables to find the association with website design elements and attributes. The translation of Kansei words as representative of visitors feelings and emotions, to the design elements will enable e-retailers, researchers, web designers and other stakeholders to understand which design element elicits what kind of affective responses from the website users. Thus enable them to devise strategies to improve website affective qualities, whereby positive affective qualities are proven to influence visitor’s affective and eventually cognitive judgment.

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