CHAPTER 3

KANSEI ENGINEERING

3.1 Overview

Earlier in Chapter 2, this research has discussed the potential adoption of Kansei Engineering (K.E.) in engineering emotion in Website UID. K.E., which based upon the discipline of mathematics, statistic, psychology, marketing and engineering, was invented by Professor Mitsuo Nagamachi of Hiroshima University in 1970s, to enable the measurement of consumers' psychological impression towards a product, and link the result to product design elements (Nagamachi, 1992). Since the work of Nielsen and his associates (1990s), a variety of techniques have been developed to support user centred design including usability testing, usability engineering, design principles and participatory design. It is evident in the literature that involving users in design is important aspects that lead the development of more satisfying designs (Abras et al., 2004; Nagamachi, 1999; Norman, 2004; Preece et al., 2002). K.E. is one of consumer oriented technology that brilliantly involves users in generating design requirements to develop product that match to the users' reaction. With its methodology and the nature of Kansei, K.E. is seen to enable users' participation and contribute to the enculturation of user interface design.

Similarly in the scope of this research where Website Emotion is the centre of attention, to successfully design a website that engage emotional connectivity, involving users in determining emotional design requirement is essential. Assumptions cannot be made and scientific investigation with users involvement must be performed.

This chapter describes K.E. that is adopted as foundation into the research framework. The description begins with explanation on the concept of Kansei, followed with the subject matter, K.E, and its possibility in engineering emotion in Website UID.

3.2 The Definition of Kansei

Kansei is a Japanese term used to express one's feeling and impression towards artefact, situation or surrounding. Deeply rooted in the Japanese culture, direct translation of Kansei to other language is rather difficult. Having various interpretations by different literature, namely sensitivity, sense, sensibility, feeling, aesthetic, emotion, affection, and intuition, in many dictionaries, Kansei is referred to as sensitivity, sensibility and feeling (Harada, 1998; Ishihara et al., 1993; Nagamachi, 1992; Yoshikawa, 2000) in English. Although it is Japanese, the study of Kansei was influenced by the German philosopher, Baumgarten, which his work 'Aesthetica' in the 1750 was the first study that influenced the study of Kansei (Harada, 1998).

Psychologically, Kansei is defined as the mental state where knowledge, emotion, and sentiment are harmonized, and people with rich Kansei is people who is full with rich emotion and sentiment, adaptive, warm and responsive (Nagamachi, 2003). Nagamachi (1999) asserted that the more people try to describe Kansei in different way, the harder they can attain the true meaning, and thus today the word 'Kansei' is being used as it is. According to him the closest interpretation of Kansei is "psychological feeling" people have with a product. In its psychological school of thoughts, emotion is addressed as unconscious thoughts about things (Pettinelli, 2009), and this description is comparable to the concept of Kansei.

Kansei is usually described as a mental function, and more precisely as being a higher function of the brain (Harada 1998), and therefore it is tacit. As being tacit, Kansei process cannot be measured directly. What can be observed are actually not

Kansei but the causes and the consequences of the Kansei process (Nagasawa 2004). Therefore, Kansei can be measured only indirectly and partially, by measuring sense activities, internal factors, and psycho-physiological and behavioral responses (Harada 1998; Ishihara, 2005; Lévy, Lee & Yamanaka, 2007; Nagamachi, 2003). In the scope of Kansei studies, sense activities are measured by evaluating the impact of a specific sense stimulus on brain activity. Physiological measures are done by evaluating responses to specific external stimulations. Responses can be physiological or behavioral (measured by electromyography (EMG), heart rate, electroencephalography (EEG), event-related potential (ERP), or Functional magnetic resonance imaging (fMRI)) or expressive (body or facial expression). Psychological measures can be done by personality tests (such as Eysenck 1964), semantic differential scales method (Osgood 1957), or other questionnaires techniques (Ishihara, 2005; Lévy et al., 2007; Nagamachi, 2003). In K.E., there is a method where people will be asked to express their Kansei in words upon seeing products, or for products that they want to buy in the future. These kinds of words are called "Kansei Words" (KW) (Ishihara, 2005; Nagamachi, 2003).

The term "Kansei" used in K.E. refers to an organized state of mind which has emotions and images held in the mind towards objects such as products or environment. For example, "luxury", "elegant", "flashy", "young" and alike as in the "that dress looks luxury and elegant", or "that car looks flashy and for youth" are all Kansei words describing feelings to certain product. Although in most cases Kansei is used the form of adjective, nouns as well as short sentences can also be employed (Nagamachi, 2003).

Among the Kansei terms used in K.E., there are Kansei that reflect the era and change occasionally such as trend-related Kansei, and ones that practically do not change such as fundamental Kansei (colours, etc.). Furthermore, differences of culture and social behaviour between individual and countries may cause different in the Kansei itself (Ishihara, Ishihara & Nagamachi, 1999; Matsubara, Wilson & Nagamachi, 1999; Nagamachi, 2003) and there are Kansei that are almost similar, but different in terms of the expressed Kansei words. Therefore, issues such as

culture and timeliness are some of the delicate matter need to be considered when applying K.E. internationally.

3.3 The Emergence of K.E.

K.E. is a technology that unites Kansei to engineering realms. It is the field where the development of product that pleases and satisfies human is carried out technologically. This is done by analysing human's Kansei and incorporating them into product design.

In every part of the world, many industrial products have been designed with implementation of K.E. While in the academic field, many academic researchers pays interest and conducted research in K.E. According to Nagamachi (2003), even though K.E. is a technology that was born in Japan, it seems that the neighbouring South Korea have put stronger interest. The South Korean government has shouted an order to the South Korean companies to introduce the "K.E. Technology" by the 21st century, promoting product developments using this technology, and overtake the Japanese industry.

The idea of K.E. nurtured in the 1970s as a result from the evolution of consumer's role in the market. Based on previous literature regarding the evolution of quality product (Akao, 1990; Childs et al., 2003; Green & Srinivasan, 1978; Ishihara et al., 2005; Nagamachi, 2003), this research summarizes the emergence of Kansei product according to its chronological order, describing the evolution of product design based on consumer maturity over time, as shown in Figure 3.1.

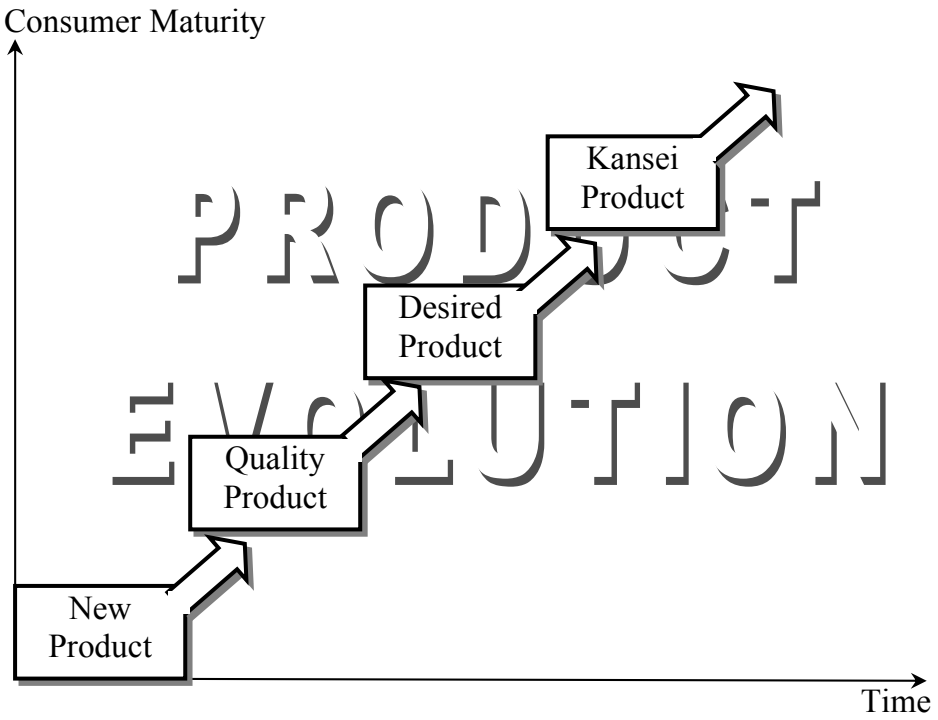

Figure 3.1: Product Evolution by Consumer Maturity over Time.

The descriptions of stages shown in Figure 3.1 are as follows:

i) **New Product**, where a new type of product enters a market. In this stage, product is designed based solely on designer's inspiration, and consumers are fascinated with the newly introduced product. At this time, when there were fewer types of products filling the market, producers had followed their intuition in designing the new products. Consumers then were naïve and bought the new inventions without questions.

ii) **Quality Product**, when product is designed with excellent functionality and usability. After sometime, when various kinds of products flooded the market, consumers started to look for quality when selecting a product. Recognizing that consumers are becoming central focus of their businesses, producers battled to improve their product quality. They concentrated on consumer's satisfaction and produced good quality product. Businesses at this point implemented techniques such as the

Total Quality Management (TQM) (Deming, 1986) and the wide use of ISO9000 systems (Psyshogios & Priporas, 2007), Quality function Deployment (QFD) (Akao, 1990), and to ensure the production of good quality product.

iii) **Desired Product**, when consumer's voice is included in customising a product. The production of good quality product had lead to longer lifetime and caused the buying activity to slow down. There emerged the need to look for another dimension of product quality targeting to motivate consumer's buying activity. This scenario had required businesses to improvise product development method to enable them to produce product that consumer will buy. Businesses then had realized the importance to produce goods that is desired by consumer, e.g. customized product. This was the era when product design movement had entered a new horizon, the consumer oriented design. The modern QFD (Mazur, 1996) and the 4Ps marketing mix model (McCarthy, 1966), are examples of formal approach in this era.

iv) **Kansei Product**, when emotion is embedded into product design. Professor Mitsuo Nagamachi of Hiroshima University was inspired at that time that most products' development methods just did not reveal enough understanding about consumers' feelings that enables their emotional needs to be satisfied. He pioneered a new method to design and develop product that can fulfil consumer's feelings and desire. According to him, businesses will not sustain if they do not make products that are sensitive to the diverse consumer feelings (Nagamachi, 2003). Inspired by this idea, he developed a technology that enables the incorporation of consumer's feeling and emotion into product design, named Kansei Engineering (K.E.). This technology is targeted to improve human well-being by looking into emotional engagement. 'Kansei product' is a product that is developed to assimilate human feelings and emotion into its physical traits such as shape and colour by the implementation of K.E.

Even though most of product development process employing methods of K.E. is by Japan based company, there are dynamic movement in another part of the world. Businesses, academic researchers and practitioners have shown interest in the technique to design automobile product, household product, interior designs and many more (Bouchard et al., 2003; Camurri, Hashimoto, Ricchetti, Suzuki, Trocca, & Volpe, 1999; Childs et al., 2003; Guerin, 2004; Nagamachi, 1999; Schütte, 2002).

Implementation of K.E. until today has been seen in various field such as electronic home appliances, computer systems, automobile industries, cosmetic products, apparel product, community design and so forth (Childs et al., 2003; Ishihara, 2005; Nagamachi, 2003). It is not too much to say that K.E. can be adopted in every part of the world with possible issues such as culture and indigenous characteristic to be addressed.

3.4 The Usefulness of K.E.

Over the years, businesses have arrived to the stage which require them to produce good quality product and consumer-oriented product. There are several product quality schemes that centralised users in its analysis to improve the quality of the product. Tools such as QFD, Conjoint Analysis and SMB (described in Chapter 2) are of the most popular method that can be used, but none of them are especially designed for handling product emotion. Although these schemes are used to look at voice of customer, none of them is also especially designed to include the customer's voice in the generation of design requirements. This problem was noticed by Professor Nagamachi in 1970's in which lead to the invention of K.E. It offers a method that is especially designed to capture implicit consumer insights, associate them with the product design elements, and enable the design of a new product that embeds these consumer insights. The product, called Kansei product, is called an intelligent product that predicts consumer's emotional responses in its design. When

consumer sees this kind of product, they will get emotionally connected and persuaded to purchase (Nagamachi, 2003).

In K.E., the knowledge is sought through direct interaction with the users and the object, and through this direct interaction the reality of product design is constructed. K.E. enables the study of how users perceive the product emotionally, and integrate the knowledge with what users perceived about the product visually, which directly involve users in deriving product design requirements.

Numerous implementation of K.E. have been seen in the development of tangible products, such as automobiles, home appliances, kitchen cabinet design, virtual community design, airplane interior design, and the list moves on (Camurri et al., 1999; Childs et al., 2003; Guerin, 2004; Ishihara, Ishihara & Nagamachi, 2007; Nagamachi, 1999; Schütte, 2005; Takama, Kawabe and Hirota, 2001; Yamada, Nagai, Onishi & Kishimoto, 1999). In the implementation, K.E. has been used at different point of the product development cycle where sensible flexibility exists in making decisions concerning any design aspects of the product. There is a technique in K.E. where producers can start from nothing, and begin to design a new product based on a target concept. Another technique enables designers/producers to reengineer an established product, and also recurring techniques in the product development cycle.

3.5 The K.E. Methodology

Evident from the literature that the description of method in K.E. is largely narrative, and most available details on K.E. are in Japanese (Nagamachi, 2003, Ishihara, 2005). Few attempts have been made by academic researchers to describe the method into English literature. To extend the available literature of K.E. methodology, this research presents the principle in performing K.E. as in Figure 3.2. The figure outlines the principle of K.E. implementation that is possible in all development cycle for different kinds of product.

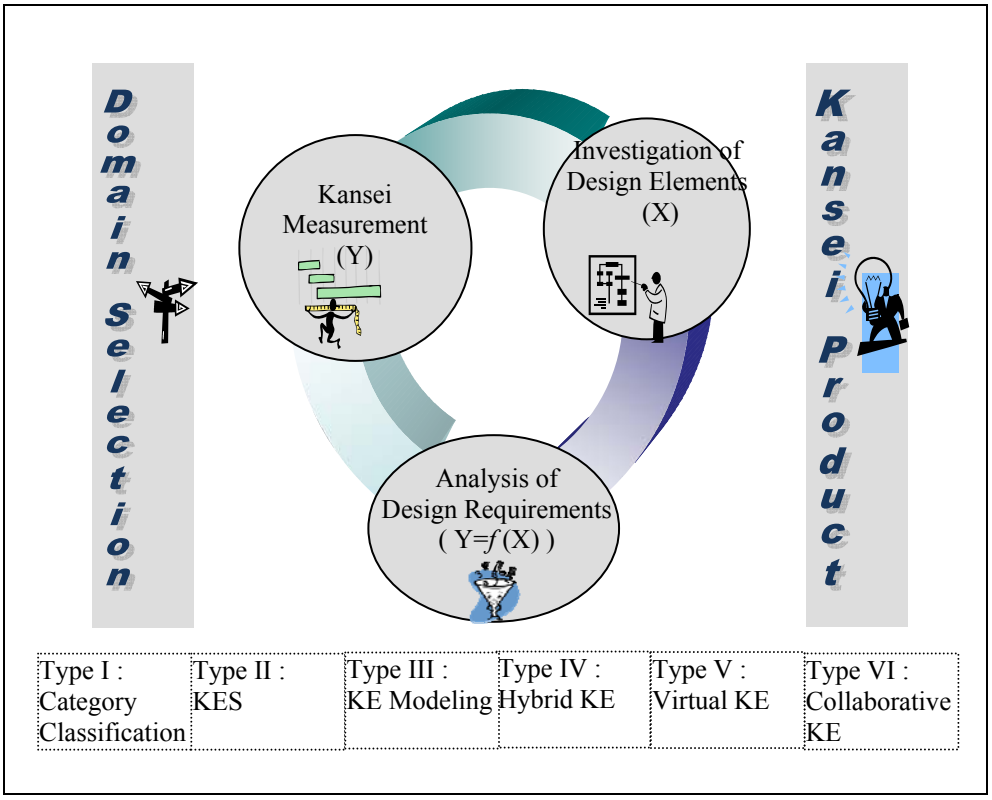

Figure 3.2: Principle of K.E.

The method involves the phases of Kansei Measurement, Investigation of Design Elements and Analysis of Design Requirements, in a specific domain targeting to produce Kansei product. Several types of K.E. are organized at the bottom to show different kinds of K.E. techniques. Although there are six types of techniques in the illustration, the number increases as the implementation evolves. At the time this thesis is written, at least two new types of K.E. are being introduced, including Rough Set K.E. and Concurrent K.E. The following sub-sections describe details of each component from the principle.

3.5.1 Domain Selection

This is the process of identifying specific domain to be investigated using K.E. methodology. K.E. highlighted the importance of limiting a study to a specific domain since Kansei response is unique with different product (Nagamachi, 2003).

There are six types of K.E. (Nagamachi, 2003; Ishihara, 2005), as illustrated in the principle:

K.E. Type I: Category Classification

Category classification is a break down technique from a targeted concept for a new product to the associated design elements.

K.E. Type II: K.E. System

This is Computer Aided K.E. System (KES). The KES comprises databases and inference engine to support a computerized system that handles process of interpreting consumer's feeling and emotion to perceptual design element.

K.E. Type III: K.E. Modelling

This type of K.E. utilizes mathematical modelling as logic in a computerized system. This is mainly used to handle fuzzy logic to form machine intelligence.

K.E. Type IV: Hybrid K.E.

This is a type of K.E. System (KES) by Forward KES and Backward KES to form Hybrid KES. This type of K.E. enables iterative process from design element to consumer's emotion.

K.E. Type V: Virtual K.E.

Virtual K.E. incorporates K.E. techniques into Virtual Reality, and enable consumer to examine Kansei product in a virtual world.

K.E. Type VI: Collaborative K.E.

In this type of K.E., designers / consumers in different places utilize a mutual Kansei database and collaborate through a network to develop a new product design.

The decision of the type of K.E. to employ depends on company or Kansei Engineer's strategies in performing all phases.

3.5.2 Kansei Measurement

Kansei Measurement is the process of capturing consumer's internal sensation. Since Kansei is subjective, ambiguous and unstructured, it is impossible to measure it directly. Therefore, we need to devise indirect measurement methods by using alternative expression approach (Ishihara et al., 2005).

Kansei Measurement is classified to physiological measures and psychological measures. Physiological measure targets to capture consumer behaviours, response and body expressions. This can be done by means of analysis of brain waves by electroencephalogram (EEG), muscular loads measurement by electromyography (EMG), eye movement and so on.

On the other hand, a psychological measure deals with human mental state such as consumer behaviour, expression, action, and impression. This can be measured using self reporting system such as Different Emotional Scale (DES), Semantic Differential (SD) scale or free labelling system.

In the evaluation experiment there are three ways in suggested in K.E. to demonstrate the specimen to subjects during the study:

1. Arrange the actual products, and examine while touching the specimen.

2. Show the specimen on a slideshow, and evaluate based on what subject see on slideshow.

3. For large-sized products, prepare miniatures and evaluate based on the miniature

The best method is performing evaluation while looking and touching the actual products (Ishihara et al., 2005; Nagamachi, 2003). Should there be no special constraint, it is much recommended to perform evaluation experiment using the actual products. For example, the constraints and difficulties in arranging big objects such as houses, buildings, bridges and towns. Even for these kinds of objects, evaluation can be performed by determining the location and actually go down there to see the actual objects. However, there might be some difficult cases which may involve cost should we need to employ a big number of participants. In such cases, it is suggested to use a slideshow using carefully taken photos to approximate the actual object.

3.5.3 Investigation of Design Elements

Investigation of Design Elements is the process of investigating specific design elements such as colour, size, and shape of the product. The design elements need to be classified into its values from consumer point of view.

3.5.4 Analysis of Design Requirement

The key ingredient to design and develop a successful Kansei product is to integrate consumer's physiological or psychological responses to product design elements. This process investigates which Kansei is highly associated to which product design elements so that the design requirements to develop product that embeds the target Kansei can be determined. The following denotes some of the analysis procedure commonly performed to analyse the associations.

A. Investigating Similarities Between Variables

Evaluation of Kansei gives opportunity for one study to investigate similar meanings in consumer Kansei responses. These responses differ in different domain, thus identification of similarities discover more objective Kansei reflecting the domain study. In K.E., Correlation Coefficient Analysis (CCA) is widely used as a measure of the strength of the association between variables. It is commonly used to measure correlation between KWs. The correlations enable the investigation of similarity between Kansei, and thus highly correlated Kansei can be summarized. The result will give idea on the general structure of Kansei, and can be used as a guide in measuring more objective Kansei.

B. Deriving Principal Components

In K.E. studies, it is believed that there is some redundancy in variables. In this case, redundancy means that some of the variables are correlated with one another, possibly because they are measuring the same construct. Because of this redundancy, it is believed that it should be possible to reduce the observed variables into a smaller number of principal components (artificial variables) that will account for most of the variance in the observed variables.

Principal Component Analysis (PCA) is a data reduction technique used to identify a small set of variables that account for a large proportion of the total variance in the original variables. Components can be calculated from the correlation matrix (the default) or the covariance matrix. Output consists of the eigenvalues (i.e., the variances of the principal components), the proportion and cumulative proportion of the total variance explained by each principal component, and the coefficients for each principal component.

In K.E. PCA is commonly used to find relationship between Kansei and specimens, and Kansei strategy can be identified with PC Vector plot. Kansei strategy is important and used for businesses to strategise a brand new concept of product, and the competitive product example. The Plot of PC loadings show how much the evaluation on a Kansei affects variables, which can be used to obtain structure of Kansei. The plot of PC Score shows what kind of Kansei has strong relations with specimens. The plot shows which specimens hold strong Kansei, i.e. those located towards the edge of the corresponding space have stronger meanings.

C. Finding the Structure of Kansei

Factor analysis (FA) is used to study the patterns of relationship among many dependent variables, with the goal of discovering something about the nature of the independent variables that affect them, even though those independent variables were not calculated directly. Thus, answers obtained by factor analysis are necessarily more hypothetical and tentative than is true when independent variables are observed directly. FA is a statistical data reduction technique used to explain variability among observed random variables in terms of fewer unobserved random variables called factors.

FA assumes that all the rating data on different attributes can be reduced down to a few important dimensions. This reduction is possible because the attributes are related. The rating given to any one attribute is partially the result of the influence of other attributes.

FA is commonly used to find psychological structure of Kansei, and detail result on weighted axes. It is also useful to verify the result obtained from PCA.

D. Investigating Relations Between Kansei and Design Elements

In K.E., relations between Kansei and design elements have widely been analysed with Quantification Theory type I (QT1). QT1 was created by Japanese statistician Chikio Hayashi in 1950s. In the calculation of relations, evaluation values on a KWs are assigned to y (dependent) variable and design elements are assigned to x (independent) variables with dummy variables. Introducing dummy variables in K.E. requires special attention, since design elements are classified into two levels: the design elements called 'Item', and the variation of each elements called 'Category'. For instance, the colour of car corresponds to 'Item' and each variation of colour (e.g. red, black, silver) corresponds to 'Category'.

It should be noted that in general multiple regression model (compare Everitt (2005)),

$$Y_i = \alpha + \beta_i X_i \quad (i = 1, 2, 3, \ldots, n)$$

the aim of multiple regression is to arrive at a set of values for the regression coefficients that makes the values of the response variable predicted from the model as close as possible to the observed value. In the model, Y_i is the observed value of the dependent variable. β_i the unknown parameters representing the coefficient of the dummy variable. X_i, indicating the relation of the dummy variable and the rated dependant variable Y_i, when all other variables are assumed constant.

In K.E. where interaction between variables exist, and classified into two levels, the dummy variable becomes complex. To include the classified design elements in the regression model, dummy variables are extended as in the following (compare Ishihara et al. (2005)):

$$X_{i(jk)} = \begin{cases} 1 : \textit{when sample i corresponds to item j in category k} \\ 0 : \textit{otherwise} \end{cases}$$

Where,

$i = 1,\ldots, n$ (n = number of specimens)

$j = 1,\ldots, R$ (R = number of items)

$k = 1,\ldots, C_j$ (C_j = number of categories for item j)

Therefore, the resulting linear regression model for the category variable becomes,

$$Y_i = \sum_{j=1}^{R} \sum_{k=1}^{Cj} \beta_{jk} X_{i(jk)}$$

Y_i represents the semantic differential evaluation value of Kansei. β_{jk} is called the coefficient value of the dummy variable X, indicating the relation of the design elements X and the rated Kansei Y_i. Other variables are held constant.

As in multiple regression model, the task is to find a value for β_{jk} such that the difference between actual observation Y_i and prediction Y^* is as close as possible. In K.E. multiple regression model is used to accurately predict the influence of the design elements, i.e. the items and categories, on the consumer Kansei. This is achieved with the help of the least square method, which minimizes the squared prediction error ε (compare Ishihara (2001)). In least square method, the partial differentiation has to be solved for each β_{jk} and for each Kansei word separately. The mathematical calculations are performed with the help of standard statistical software tools, and thus the details of the computational method will not be given here. For further details, see Everitt (2005).

In QT 1, weights to the categories will be calculated with multiple regression model by solving (number of all categories – 1) simultaneous equations (Hayashi, 1952). QT 1 is deterministic because it is a variation of multiple regression model, and it uses least square method as solving method (Ishihara, Nagamachi & Ishihara, 2007). The regression model enables quantification of the relationship between Kansei and design elements.

Other than the above mentioned analysis methods, there are several tools that can be used to analyse the data depending on the objectives. Among others are Rough-Set Analysis (Nishino et al. 2001), Neural Networks (Ishihara et al. 1996), Fuzzy Logics (Shimizu & Jindo 1995) and Genetic Algorithm (Nishino et al. 1999).

3.5.5 Kansei Product

Kansei product is a product resulted from the K.E. implementation. It is a product that assimilates human Kansei responses into its design element. More description on Kansei product can be found in section 3.3.

3.6 Placing K.E. in the Study

Previous adoption of K.E. have shown its successful and potential implementation in various artefacts (Camurri et al., 1999; Childs et al., 2003; Enomoto, Nagamachi, Nomura & Sawada, 1993; Guerin, 2004; Hirasago, Jindo & Nagamachi, 1994; Ishihara et al., 2007; Ishihara, Ishihara, Nagamachi & Matsubara, 1997; Nagamachi, 1999; Schütte, 2005; Takama et al., 2001; Tanoue, Ishizaki & Nagamachi, 1997; Ueda, Matsubara & Nagamachi, 1996; Yamada et al., 1999). The method enables quantification of user's multidimensional affective responses and links them with design attributes. Even though most of product development by K.E. is Japan based company, the movement to another part of the world has also emerged. Other country's based businesses, academic researchers and practitioners have also shown

interest in the methodology (Bouchard, 2003; ; Camurri et al., 1999; Childs, 2003; Guerin, 2004; Schütte, 2002).

Industries mainly in Japan have implemented K.E. successfully into their product designs aiming to capture consumer's attention emotionally. The designed product by K. E. implementation has yielded big success in the market. Some noted examples are, drinking product (Asahi breweries), cosmetic product casing (Shiseido), hair salons product (Milbon), can design (Toppan printing), automobile (Mazda Miata) and many more (Childs et al., 2003; Nagamachi, 2003).

Similarly in academic research, the adoption of K.E. is gaining attention. Baker (1999) had adopted K.E. in the investigation of Kansei responses to textile fabrics, Bouchard et al. (1997) and Guerin (2004) adopted K.E. in identifying the interior design of airplane that match customer's feeling, Ishihara et al. (1997) investigated the appearance design of instant coffee can, Nishikawa et al. (1998) investigated the design of bathroom that match customer's Kansei, Schütte (2005) adopted K.E. to design industrial lift truck, Ishihara et al. (1996) studied designs of women's suite, Nagamachi & Nishino (1999) studied house designs, Ichitsubo et al. (1998) studied bridge design, Yamada et al. (199) studied sofa design, Higashitani et al. (1999) studied door handle design, Ishihara et al. (1995), studied wrist watch design, and many more. All of these research have focused either evaluation of user's emotion or deriving associations of design specification to design product that engage user's emotion.

The research that was performed with the adoption of K.E. have widely focused to tangible and industrial product. Although some literature have touched the aspect of intangible product such as computer systems, they focused on the emotional response of artefact that is demonstrated by the system, such as web branding (Yoon & Lee, 2003) and image retrieval loading (Bianchi et al., 1997). Little attention has been found to evaluate emotional response to web design (Okada & Tejima, 2003) with K.E. adoptions. No research has been found to derive design requirements based on users' emotional responses in e-Commerce website, which is seen to boost the

success in convincing its visitors. In web design field, the point of interaction falls upon the interface design of the website. Previous literature, as heavily discussed in Chapter 3, have indicated that in order to draw visitor's attention, emotional engagement needs to be addressed. This is truthful in current scenario of e-Commerce website, where online businesses need to compete to win visitor's attention, so that it will enhance stickiness to their website in the effort to persuade visitors to go to further actions and judgments including purchase decision (Griffith, 2002; Kim et al., 2003; Zhang et al., 1999).

This research argues that, over the Internet where users have vast choices of e-stores to purchase product, an e-Commerce website need to offer interface design that elicits positive emotional experience. Mahlke & Thüring (2007) asserted that emotion plays an important role in user's experience with interactive systems, and highlighted the importance to consider emotional aspects in the design process. While stating that emotion cannot be designed, they assert the importance of deriving a method for recognizing user's emotion from emotional evaluation procedures. Thus, this research is performed to evaluate emotional responses in Website UID, and engineer them into the knowledge of how the combinations of design elements influence emotion. With the dispositions of the aforementioned literature, K.E. is seen as a potential method to achieve the research objectives. Figure 3.3 shows the concept of K.E. in website design.

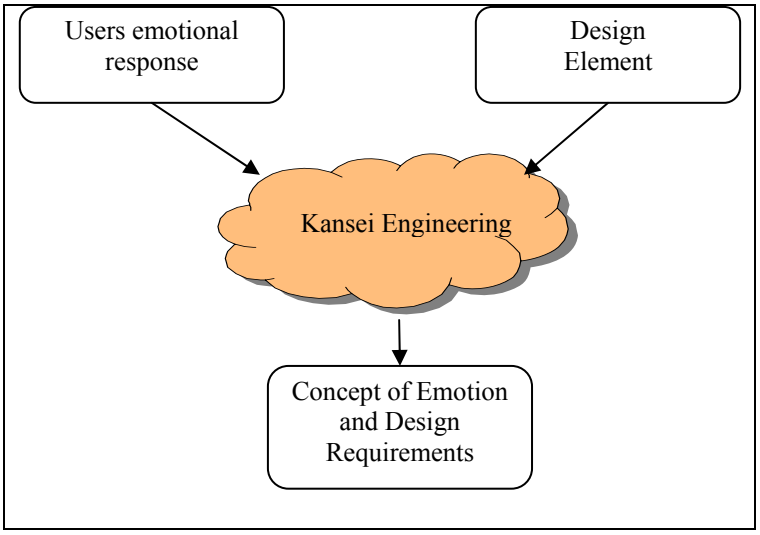

Figure 3.3: Concept of K.E. in Website Design.

While most of the available design requirements for website design heavily focused on cognitive functionality and usability (Garret, 2003; Lederer et al., 1998; Lee et al., 2003; Li & Zhang, 2005; Marcus & Gould, 2001; Nielsen, 2000; Powell, 2002; van Welie et al., 1999; Veen, 2001; Zhang et al., 1999), this research is performed to systematically investigate user's emotional responses and the associated design elements in Website UID, and the influence and consequences of the design elements to the emotional user experience. With the adoption of K.E., the research attempts to produce design requirements for website that embeds target emotion. Such website is targeted to capture visitor's attention in order to enhance stickiness in the effort to promote consumer conversions and retentions.

3.7 Summary

This chapter has given insights to understand the term Kansei used in the study. To give insights of the emergence of Kansei product, as a result from the evolution of product quality, illustration of product evolution based on consumer maturity over time is presented. The chapter also described in detail the procedure of K.E., providing the principal of K.E., which is used as basis in the development of the research framework employed by this research. This chapter has also discussed the adoptions of K.E. in academic research, and the successful implementation in the industry. With the disposition of the discussions, this chapter concluded that the adoption of K.E. methodology is seen as best possibility to achieve the research objectives. Also, the term Kansei is used as instantiation of emotion that the research addresses.