

Incorporating “Kansei Engineering” Approach on Traditional Textiles - A Proposed Method for Identifying Multi-Sensorial Experiences on the Kansei Attributes of Traditional Textiles -

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Abstract

When people are asked to describe certain textiles, they frequently refer to the expressions of its properties such as attractiveness, uniqueness, shininess, robustness, comfortability, and so on. It shows how senses play an important role in it. Human employs their senses when interacting with textiles, most notably visual and tactile/haptic to absorb its expressive properties. Yet, our sensorial experiences may amplify when interacting with those of traditional textiles, such as batik, as we can entice sensations when seeing its motifs and patterns, smelling its materials, and touching its surfaces. The multi-sensorial importance of seeing, smelling, and touching in the interaction with and experience of textiles suggests that one should address senses in a systematic way when evaluating users' perception on traditional textiles. To address this issue, the paper proposes the incorporation of Kansei Engineering (KE) approach for identifying multi-sensorial experiences on the expressive properties of traditional textiles, using batik as a case of study. KE approach addresses person's psychological understanding when observing things in order to analyze and study the inherent relationship between person's perceptual knowledge and objects evaluated. This paper outlines the use of KE approach in correlating sensorial perceptions when experience with traditional textiles and ultimately expose users' preferences toward them. Background of KE approach on textiles will be explored and its application for the multi-sensorial investigation of traditional textiles will be discussed.

Keywords: Kansei Engineering(KE), multi-sensorial experiences, traditional textiles

I . Introduction

When people are asked to describe certain textiles, they frequently refer to the expressions of its properties (e.g attractiveness, uniqueness, shininess, robustness, comfortability, and so on), which shows how senses play an important role in it. Human employs their senses when interacting with textiles,

most notably visual and tactile/haptic to absorb its expressive properties. For instance, we tend to look for characteristic of a fabric through its visuals, such as colors, patterns, and graphics. The textural elements, such as the smoothness of surface, when interacting with textile. It is common to derive words of colorful, beautiful, fun, comfort, smooth, cool, etc, as the expression of the fabric. Thus, sensorial experiences of visuals and tactile/haptic

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are very much involved in the interaction with the presented textiles—most notably modern one.

Differ to the sensorial experience of modern textiles that mostly requires our visual and touch senses, those of traditional textiles (such as batiks) requires the involvement of our smelling sense. When interacting with batik—for instance—we can entice sensations when seeing its motifs and patterns, smelling its materials, and touching its surfaces. It is well known that traditional textile of batik produces certain odor as result of its production process—pattern making, waxing, and dyeing. Thus, most consumers tend to associate the expressive properties of batiks out from the interwinned aspects of visuals (patterns and colors), touch (textures and surfaces), and smell (produced materials). This gives the multi-sensorial element of seeing, smelling, and touching in the interaction with and experience of traditional textiles to be as important and should be properly considered when one needs to investigate the expressive qualities of batik.

Yet, previous researches on traditional textiles such as batiks, have—for the most part—uncovered and elaborated traditional textiles as solely artifact of arts, distancing its relation with those who use and appreciate it. As results, most of its research tends to frame traditional textiles as object of preservation (Arensberg & Susan, 1992; Fraser-Lu, 1986; Berkeley, 1984-1985; Boow, 1988; Djoemena, 1990). A very limited number of research do elaborate the context of traditional textiles as object of perception (Syarief & Sunarya, 2007).

Accordingly, this condition suggests that one need to amplify a systematic approach in elaborating the role of human senses when evaluating users’ perception on traditional textiles. To address this issue, the paper proposes the incorporation of *Kansei Engineering (KE) approach* for identifying multi-sensorial experiences on the expressive properties of traditional textiles, using Tasikmalayan’s Batik

as a case of study.

Kansei Engineering (KE) approach address person’s psychological understanding when observing things in order to analyze and study the inherent relationship between person’s perceptual knowledge and objects evaluated. This paper outlines the use of KE approach in correlating sensorial perceptions when experience with traditional textiles and ultimately expose users’ preferences toward them. The suitability of KE approach on textiles is explored and its application for the multi-sensorial investigation of traditional textiles are discussed.

II. A Review of Kansei Engineering Approach

1. Description of *Kansei*

According to Levy et al. (2007), the word of *kansei* is derived from Japanese word that possesses multi-meanings, as it may be described as (i) impression and sentivity, (ii) sensitivity of affection, (iii) human senses, feelings, and psychological reaction, and (iv) experience and emotion. Thus, Levy stated that the word of *kansei* is “*somewhat a human psycho-cognitive process related to human experience*”. *Kansei* has been popularized within design community based on the works of Mitsuo Nagamachi (on Emotional Engineering) and Kenichi Yamamoto in 1986, which later coined the term “*Kansei Engineering*”. Further study by Akira Harada (1998) resulted in a proposal of 5 (five) major dimensions of *kansei*. They are:

- (a) *Kansei* is subjective and unexplainable function
- (b) *Kansei* consists of cognitive expression of acquired knowledge and experience
- (c) *Kansei* is the interaction of intuition and intelligent activity
- (d) *Kansei* is the ability of reacting and evaluating external features intuitively
- (e) *Kansei* is a mental function (in) creating images.

Although Harada's descriptions on major dimensions of *Kansei* seemed a bit complex, it may serve as a complementary explanation on Nagamachi's definition of *kansei*, which he described as "*individual subjective impression from a certain artifact, environment, or situation using all the senses of sight, hearing, feeling, smell, taste, as well as recognition*" (Nagamachi & Mitsuo, 2001). Using both information as base, Levy et al. (2007) explained that *kansei* should, therefore, be understood to serve as a process (which gathers function related to emotion, sensitivity, experience, and feelings including the interaction between them), as a mean (which requires the involvement of senses—sight, hearing, taste, smell, and touch, and other expressive factors—mood, experience, and so on), and as a result (which unify subject's perception in providing qualitative meanings on object and the value of its direct environment).

Accordingly, the nature of *kansei* is still a mental process, although its consequences can be observed on a psychological, physiological, and/or behavioral level. Levy et al. stated that "*kansei studies intend to understand how kansei process work, how senses and human internal factors influence kansei, and what method can be used to evaluate kansei result*" (Levy, Lee & Yamanaka, 2007).

It shows that *kansei* may address person's psychological understanding when observing things. This, at the end, can be used to analyze and to study the inherent relationship between person's perceptual knowledge and objects evaluated. Eventually, it can be used to explore the relationship between "formal properties" and "experiential properties" of an object.

2. The acquisition of *Kansei* attributes and its measurement approach

According to Nagamachi (2001), to acquire *kansei* attributes of an object/artifact, one needs to manipulate aspects of object formal properties in order to

measure the alteration of users' responses toward the object, in order to understand the contextual use of object. This understanding is an important factor on human-object interaction, especially as it relates to the way users/consumers behave and—accordingly—their emotional responds. According to Ibrahim et al. (2010), the conceptional relation between object and users and/consumers' emotional responsiveness shows that an object/artifact may serve as instrumental, social, and aesthetic stimuli. Thus, as Schutte (2005) mentioned, the nuances of emotional impression in human-object interaction are inevitable for our complete understanding of object's *kansei*. Therefore, one must address more on the psyche aspect of an object to acquire *kansei* attributes and should not focus solely on the physiometric of object use as many have done before.

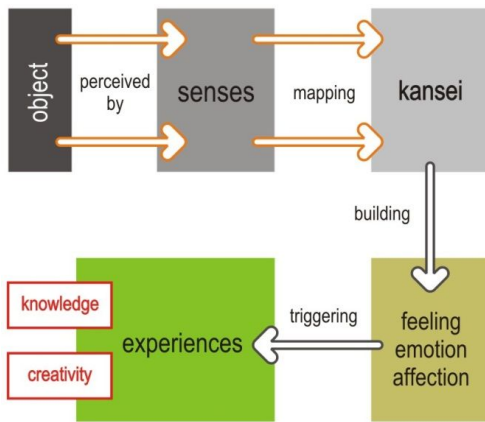
Nagasawa (2002) mentions that physiological responses of users (such as EEG, EKG, and EMG) in acquiring *kansei*—although may provide objective data of interaction—cannot be individually interpreted as it still requires semantic description of occurred interaction. Further Nagasawa states "*autonomic nerve reflections are not kansei itself, but only correspond to the kansei*". Based on Nagasawa explanation of *Kansei*, Schutte conclude that semantic exploration on users' psychological response is more subtle for acquiring *kansei* attributes of the evaluated object (Schutte, 2005).

Nowadays users/consumers more and more tend to evaluate and approach an object/artifact rather unconsciously based on subjective factor. Previous studies (Shimizu et al., 2004; Ying & Yan, 2006) found that putting feelings, emotion, or psyche into an object/artifact, may increase values of object.

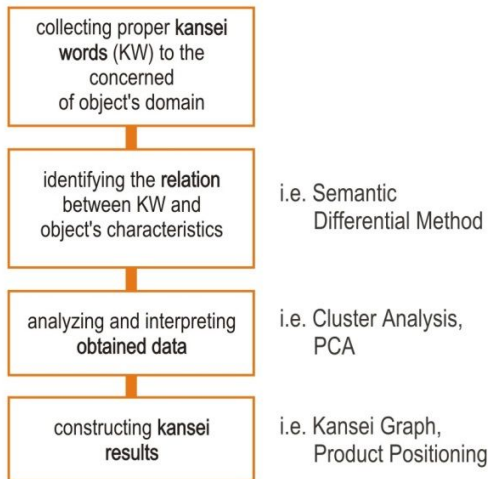
Users/consumers interact with an object/artifact which makes them feel 'better' without able to explain why. Schutte asserts that it would be advantageous if one can identify and/or observe the unexpressed or unconscious aspect of human response toward object, as it may provide valuable infor-

mation on how properties of object/artifact are perceived and psychologically suited users/consumer’ needs (Schutte, 2005). In other words, the acquisition of psyche-aspect of kansei attributes is significantly relates to the values of the evaluated objects/artifacts. The relation can be systematically diagrammed as follow (Fig. 1).

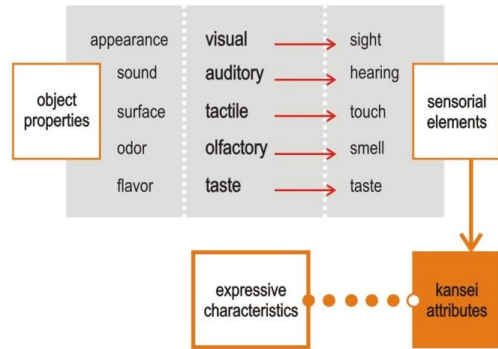
According to Schutte (2004)—based on Nagamachi’s work—the basic structure of kansei measurement contains 4 (four) important steps (Fig. 2).



<Fig. 1> Model of Kansei acquisition. (Adapted from Schutte, 2005: 43)



<Fig. 2> Four steps of Kansei measurement. (Adapted from Schutte, 2004: 215)



<Fig. 3> Multi-sensorial identification on object.

Based on previous explanation on kansei process and steps of measurement (Fig. 1 & 2), it is possible to address the kansei attributes of an object/artifact by intervening users’ responses on object properties through series of identification on sensorial experiences. Thus, the description of object’s kansei attributes may serve for explaining its expressive characteristics as well.

According to this premise, one may explore multi-sensorial experiences of users when interacting with an object or artifact to determine its expressive characteristics. The approach can be explained as follow (Fig. 3).

III. The Contextual Application of KE Approach for Identifying Multi-sensorial Experimental Textiles

In the 2010 online edition of Webster’s Dictionary, the term ‘traditional’ may be defined as “an inherited, established, or customary pattern/thought/behavior” that can be handed down and/or conformed to. Following this definition, we may look traditional textile as pieces of fabric/clothes that are made in conforming to the inherited and customary pattern, making-process, and pre-determined meanings of certain tradition.

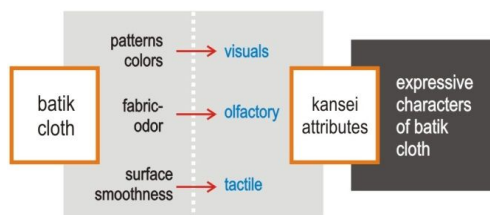
There are many traditional textiles of Indonesia that one may look at. The most famous one is

batik, one of many cultural elements peculiar to Indonesia as it has been present in the midst of its people, growing and developing for centuries and represents the cultural legacy of the Indonesian people. Much can be learned from *batik* design---the cultural background, beliefs, customs, the characteristics of people and their way of life, natural environment, spiritual values, etc. (Syarif & Sunarya, 2007).

For Indonesians, to deal with batik is not only interacting with a piece of fabric or cloth, moreover it is interacting with tradition, identity, and senses. When interacting with batik—for instance—one may entice different sensations that require our multi-senses to react.

The original process of batik-making not only produces visual appealing patterns and certain sensation on fabric-surface when it is touched, but also produce certain odor as result of its waxing and dyeing process. Thus, to deal with batik is to sense the inter-winned aspects of visuals (patterns and colors), touch (textures and surfaces), and smell (of produced materials).

As previously explained, sensorial experiences are complex structure, thus the proposed method need to define semantic exploration in the process of acquiring kansei attributes for the evaluated object. Following a scheme of multi-sensorial identification on object (see Fig. 3) of KE approach and previous notion that traditional textile of batik entices multi-sensorial experiences of visuals-tactile-



<Fig. 4> Systematic approach for identifying multi-sensorial experiences on traditional textile of batik.

olfactory when interact with, a proposed systematic approach for identification can be explained through 3 (three) sensorial elements: visual (pattern, color), olfactorial (fabric-odor), and tactical (surface smoothness); which can be diagrammed as follow (Fig. 4).

1. Visual experiences on patterns and colors.

For the measurement of sensorial experiences of visual, one may look to describe the following kansei attributes:

- (i) Behavioral-related items, such as suitability, visual-comfort, like-dislike, etc.
- (ii) Appearance-related items, such as, attractiveness, pureness, coolness, beautifulness, light, etc.

2. Olfactorial experiences on fabric-odor

For the measurement of sensorial experiences of olfactory, one may look to describe the following kansei attributes:

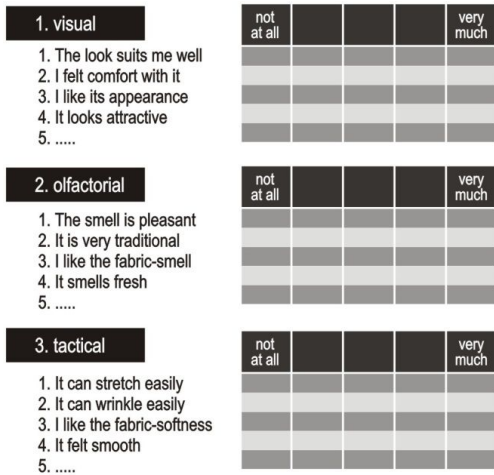
- (i) Behavioral-related items, such as favorable, pleasantness, associative-ness, etc.
- (ii) Odoral-related items, such sweetness, aromatic, fragrant, freshness, etc

3. Tactical experiences on surface smoothness

For the measurement of sensorial experiences of tactile, one may look to describe the following kanse attributes:

- (i) Behavioral-related items, such as ease-to-fold, ease-to-roll, wrinkle-ability, ease-to-strech, etc.
- (ii) Textural-related items, such as softness, slipperiness, thickness, smoothness, coolness, etc.

The following sample of 5-scales SD (Semantic Differential) enlisted kansei attributes of the 3 (three) sensorial experiences (Fig. 5).

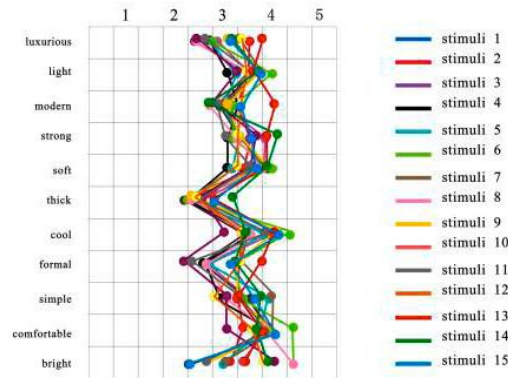


<Fig. 5> Sample of SD lists of Kansei attributes.

Accordingly, to assure the objectiveness of users’ responses on SD lists of kansei attributes on traditional textiles, the proposed method requires one to enable subjects with:

- (i) The ability to look at the presented stimuli before providing response on visuals.
- (ii) The ability to smell the evaluated stimuli before providing response on odor.
- (iii) The ability to touch and sense the evaluated stimuli before providing response on texture.

The composite results of subjects’ responses on the evaluated stimuli is a list of mean values that can be analyzed further using quantitative analysis methods, such as cluster analysis and principal component analysis. The relationship between 3 (three) identified variables of kansei attributes can be analyzed using pearson’s r correlation analysis and multiple linear regression. Eventually, the composite quantitative analysis on subjects’ responses (such as a combination of cluster analysis and multiple linear regression analysis) might be used to determine the expressive characteristic of traditional textile that serve as the evaluated stimulus.



<Fig. 6> Computational graph as results of the identification of colors and patterns on Tasikmalayan batik designs. (Adapted from Syarief et al, 2007: 323)



<Fig. 7> Image chart as results of the identification of colors and patterns on Tasikmalayan batik designs. (Adapted from Syarief et al., 2007: 326)

The following graphs are a sample results of SD lists on kansei attributes of visual experiences on traditional textile, using Tasikmalayan’s batik as stimuli.

IV. Conclusions

This paper outlines the use of KE approach in correlating sensorial perceptions when experience traditional textiles. Based on the explanation of kansei attributes of object which can measure

multi-sensorial evaluation of visuals-olfactory-tactile experiences, the paper propose a systematic approach suitable for the identification of expressive characteristics of traditional textiles.

Although it provides already a useful and systematic overview of kansei approach on traditional textiles (such as batik), this research contend that the proposed approach need to be carefully implemented as subjective responses of users might hinder objective assesment along the process.

Nevertheless, the paper presented a different views and new approach in evaluating traditional textiles, one that might provide logical explanation on the evaluation of object that involving multi-sensorial experiences in their interactions. Discussions on the possibility of applying the proposed approach on varieties of traditional textiles (such as ikat and other notable techniques) are certainly welcome, thus further studies are in needed to make it subtle.

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