

# KANSEI ENGINEERING AS AN ERGONOMIC AND TECHNOLOGICAL CONCEPT DERIVED FROM CUSTOMER'S PREFERENCE ABOUT A PRODUCT CASE STUDY IRANIAN HANDICRAFT

Mahshid Karimi <sup>\*a</sup>, Yasamin RokniFard<sup>a</sup>, Seyed Javad Zafarmand<sup>b</sup>

<sup>a</sup> *Industrial Design Department, Fine Arts Faculty, University of Tebran, Iran.*

<sup>b</sup> *Design Science Div, Graduate School of Engineering, Chiba University, Japan.*

## ABSTRACT

Kansei is in fact the technology that translates customer's emotions and imaginations to different elements of product design. Iranian handcrafting, as an independent and local industry, is believed to be one of the most prominent examples of Applied Arts and is one of the three main poles of global handicrafts industry with the most diverse sub branches compared to other countries. Customer's behavior is under the influence of many factors such as cultural, social, personal and psychological elements. Customer's behavior is a process that involves three stages of: pre-purchase, during purchase and post-purchase phases.

In this research, we intend to use Kansei and its focus on spiritual and mental needs alongside personal tastes to study the art of Ghalam Zani (Chasing) in Isfahan. We use terms familiar to or provided by customers in order to reach the connections between patterns of Chasing crafts and customer's emotions, and its important role in traditional handicraft marketing improvement. This analysis will delve into the reasons behind the relationships between the shapes and patterns used and the tastes of customers and tourists. We have made a survey in traditional Bazaar of Isfahan and finally we analyzed the results, discovering what makes a traditional handicraft best seller.

**Keywords:** *Kansei, Customer behavior, Impression, Traditional handicraft*

# 1. BACKGROUND

## 1.1. Kansei, Culture and Customer Psychology

In recent years, a greater tendency to design emotional products has emerged amongst designers. However, even though the same product is designed for a group of consumers, the differences in their specific circumstances such as age, place of living, education level, social manners and experiences would result in various emotional impressions of the same product. Hence, it's important to study the differences in social factors as products constitute a component of these factors.

Nowadays, a designer's success will depend on how he can establish the balance between the facts and intuitions. Designing based on the Kansei factors is a new achievement which attempts to establish this balance. We can contend that a major contrast will come about when we're trying to compare the traditional context of design in Isfahan's art of Ghalam Zani (Chasing) and concepts of design based on Kansei engineering. However, we believe that this contrast itself can result in a harmonic interaction between the two. In addition, a special attention to the psychological aspects of the product is one of the necessities as well. The interest in the emotional quality of products has risen considerably in the last years perhaps because there is a greater awareness on how powerful emotions are in changing the way we think [1].

In designing based on the Kansei method, pleasure and satisfaction of the user are considered in order to create the relationship between the form and function of the products. In addition to forms, other factors such as colors, materials and etc also constitute what we know as a product's physical appearance. The functional aspects involve the experiences a consumer has with a product or the emotions the consumer feels when using a product. Such emotions can be expressed in form of a consumer's impression of the product and also the way of using the product and etc. What is important in Kansei-based design is that the qualitative data that is obtained through observations and interviews to be translated to quantitative data. In this process, the first step is to recognize the users' interests, prior experiences and emotions. In Kansei engineering the terminology and choice of words are useful tools in discovering and recognizing the consumer's psyche. Emotions can be expressed by the psychological or physiological functions like the individual s' manners, facial expression and body language. Also words can represent the concepts of Kansei [2].

Professor Nagamachi explains the four aspects of Kansei as follows [3]:

- 1) The state of users' emotions through ergonomics of the product and psychological emotions.
- 2) The state of giving identity to a product.
- 3) The state of constructing Kansei engineering as an ergonomic technology.
- 4) The state of adjusting product design with social innovations and user's preferences.

## 1.2. History of Handcrafting Industry and Ghalam Zani (Chasing) in Iran

Handicrafts, without the need for advanced technologies, are mostly reliant on traditional and ethnical skills and expertise. Hand crafted products are pure results of handcrafters' thoughts, innovation, creativity and execution. Handcrafting is an eternal phenomenon since it is a dialogue that reveals the tangible and intangible aspects of a nation's culture, arts, beliefs and civilization. It is also considered a critical factor in shaping national identity in the global arena. As an effect many have called it an Art-Industry.

Persian art and handicrafts consist of thousands and thousands of various artifacts that have been created in this vast land since the prehistoric era. The antique silver, gold and bronze-cast crockery found in the ancient city of Shoosh were often built in the shape of animals or birds representing the phenomenal technical finesse of the artists in that era. The techniques used by those artists encompassed chasing gold, engraving, relief and enameling (Figure 1). The forms often consist of divine or mythical figures such as Ahooramazda, Anahita (God of water in ancient Iran), Mitra, etc [4]. This mythology that is inspired by the legends, tales and folklore narratives, plays an important role in Iranian culture. It is fair to believe that the Persian mythology reflects the perspective of the society in ancient times. Use and representation of such creatures as dragons, peacocks and unicorns in chasing and metal work of Isfahan shows the great interest of eastern artists in supernaturalism.



Figure 1: Figure 1: figure of art of Chasing

## 1.3. Purpose of This Research

In this research the analysis will delve into the reasons behind the relationships between the shapes, colors and forms used in Isfahan's art of Ghalam Zani (Chasing) and their impact on customers and tourists. Specifically, we try to focus on the following targets:

- I) The study of verbal expressions and the role of the words' in communicating the customer's emotions with emphasis on the psychological elements.
- II) Using Kansei as an appropriate way for finding the relation between the costumers' emotions and product traits and its important role on the handicraft market.

This research has only focused on the visual traits of the products by examining the two dimensional pictures. Therefore only the visual manifestations of users' emotions were studied.

## 2. METHODOLOGY

First, we specified certain categories for the product based on the geographical market, target customer group and finally product features. Then we gathered the Kansei terms about traditional handicraft and the related information in order to structure our analysis on the basis of Kansei engineering approach. In this research all the appropriate and pertaining terms about Chasing patterns were gathered from various sources such as magazines, books and internet in order to find more words about Iranian culture, tradition and ancient myths [5, 6, and 7]. Then, with pay much attention to semantic scale and visual factors words were classified in a way to best describe the product in order to find out connection between customers' emotion and visual factors influencing on Chasing crafts marketing. Here finding out this connection were critically important and applied to recognize why some specific patterns and products are best seller. The main method used in this research was gathering information through interviewing people by asking them to choose the conventional Chasing patterns and related terms.

In total, 102 terms about the most important visual element of Chasing patterns were gathered from interviews and published sources. After gathering all the words about Chasing patterns which customer use to describe emotions evoked by conventional Chasing designs, six conventional Chasing designs were chosen and different visual properties were categorized. Three design samples representing combinations of these properties were scaled on semantic scales with Kansei terms. Five students participated in this survey and finally one term was chosen as the representative of the familiar terms. It eventually left us with 20 Kansei terms.

A questionnaire-base survey and interviewing were conducted to explore customers' emotion about the 3 chosen patterns. Our study involved randomly interviewing 103 customers consisting of 61 females and 42 males in the age range of 25 and above (of whom, 20 were tourists visiting Isfahan for a limited time). The main location of the survey was at the traditional Bazaar of Isfahan (Naghsh-e Jahan Sq.) in August 2009 and the final part was at traditional Bazaar of Tehran in December 2009. Customer interpretation of design character was assessed using Kansei terms. The use of selected Kansei terms enabled the structured assessment of perceived character. Exposure time was not considered to be critical importance. So no limit was imposed on response time. The Kansei terms were presented on response sheet, using the same size and type of font (Times New Roman), both in English and Persian. Each participant was asked to read aloud the terms and determine which sample is most representative of each term. A final question in the survey asked whether, if the person had to buy a product with the three chosen pattern, which pattern they would prefer.

The derived data were one way analyzed using SAS9 Software. The means of design cases were compared using Duncan test. Finally to find out the relationships among the Kansei terms in the context of the selected design samples, the responses data were processed by using cluster analysis ward method. With this method it would clearly identify the Euclidean distance between selected keywords for each specific design. The three chosen patterns with final list of the Kansei terms were studied together in turn to recognize the mental influences of the patterns and shapes expressed through the terms. All the other factors such as color

were similar for every design and the only differentiating factor were the patterns. The chasing design samples under study are shown respectively in Figures 2, 3 and 4.



**Figure 2:** Design sample 1



**Figure 3:** Design sample 2



**Figure 4:** Design sample 3

### 3. RESULTS

After the survey was completed, the data were analyzed by the statistical software SAS, the analysis of Variance and Mean were applied to check the difference between the 3 design samples and Kansei terms in customer perception of a specific pattern. Also to recognize which visual elements in different patterns would make a Chasing product beloved and best seller.

The analysis of variance applied to find out if there is a significant difference between 3 chosen design samples or not (Table 1). The results showed that there is a significant difference.

**Table 1:** Table of Analysis of variance

Source	DF	SS	MS	F Value	Pr > F
Response	2	2414.35	1207.18	6.52	0.00
Error	57	10550.07	185.09		
Total	59	12964.42			

This step was done also by considering the target group properties. The final selected Kansei terms are presented in Table 2.

**Table 2:** Table of Kansei terms (Mean± Standard error)

Designs Words	Nom.1	Nom.2	Nom.3	Sum.
Memories	13.9%	59.6%	26.5%	100%
Impression	26.6%	37.2%	40.2%	100%
Belief	3%	41%	56%	100%
Effectiveness	40.5%	23.1%	36.4%	100%
Identity	18%	57%	25%	100%
Supernatural	22.8%	50.2%	27%	100%
Power	25.5%	59%	15.5%	100%
Magnificence	25.4%	52.1%	22.5%	100%
Culture	13.2%	59.5%	27.3%	100%
Tradition	10.1%	3.2%	50.7%	100%
Companionship	12.9%	53%	34.1%	100%
Attraction	15.6%	49%	35.4%	100%

<b>Pleasure</b>	40%	37%	23%	100%
<b>Balance</b>	50.1%	11.9%	38%	100%
<b>Uniqueness</b>	30.2%	45.2%	24.6%	100%
<b>Eagerness</b>	46.3%	16.7%	37%	100%
<b>Glory</b>	11.9%	56%	32.1%	100%
<b>Beauty</b>	45.6%	30.2%	24.2%	100%
<b>Mobility</b>	34%	44.5%	20.5%	100%
<b>Harmony</b>	55%	19.5%	25.5%	100%
<b>Mean</b>	<b>27.03±3.38</b>	<b>42.04±3.36</b>	<b>31.07±2.24</b>	

Table 2 gives an indication of the factors that affected peoples' emotion for the Ghalam zanis' designs, showing the percentage of different Kansei terms regarding the chosen patterns' elements in order to reach the emotional connections.

Sample one seems to have attracted the highest mean in the categories of Harmony, Beauty, Balance, Eagerness, Pleasure and Effectiveness. Also between them Harmony seems to play a much stronger role in perception of customers about the pattern (55%) than Effectiveness (40.5%).

In the factors of Glory, Attraction, Magnificence, Power, Supernatural, Identity, Memories, Uniqueness, Mobility (44.5%), Culture (59.5%) and Accompaniment (i.e. expressing such thought as: "I like a product with such a design to be mine"), the design number two got the highest percentages.

And finally, in the factors of Belief, Tradition and Impression, the third design had the highest score. And here the factor Belief has the highest percentage (56%). We shouldn't forget that during the interview in addition to surveying the participants the changes in their facial expression and their reaction when they were checking the designs were assessed as well.

Among the reasons why design sample one has attracted more points with the participants, when it comes to the factors of Harmony, Beauty, Balance, Eagerness, Pleasure and Effectiveness, they pointed out to the such design elements as existence of harmonic curved lines and also the rhythmic movement of lines along the margins of the design. The symmetry of the design has added more to its balance as well.

Among the reasons why the design sample two has attracted some participants ,when considering the factors of Glory, Attraction, Dignity, Power, Mobility, Supernatural, Identity, Memories, Uniqueness and Accompaniment, we can refer to the fact that this design includes a number of vertical lines and also of vivid pictures of the Kings and mythological figures. This pattern related to the Sassanids' pattern; the king (Sasan) hunting a mythical creature [5].

Sample three which has received the highest percentage in relation to the factors of Belief, Tradition and Culture, has got some religious features that shows a new manifestation of Iran these days.

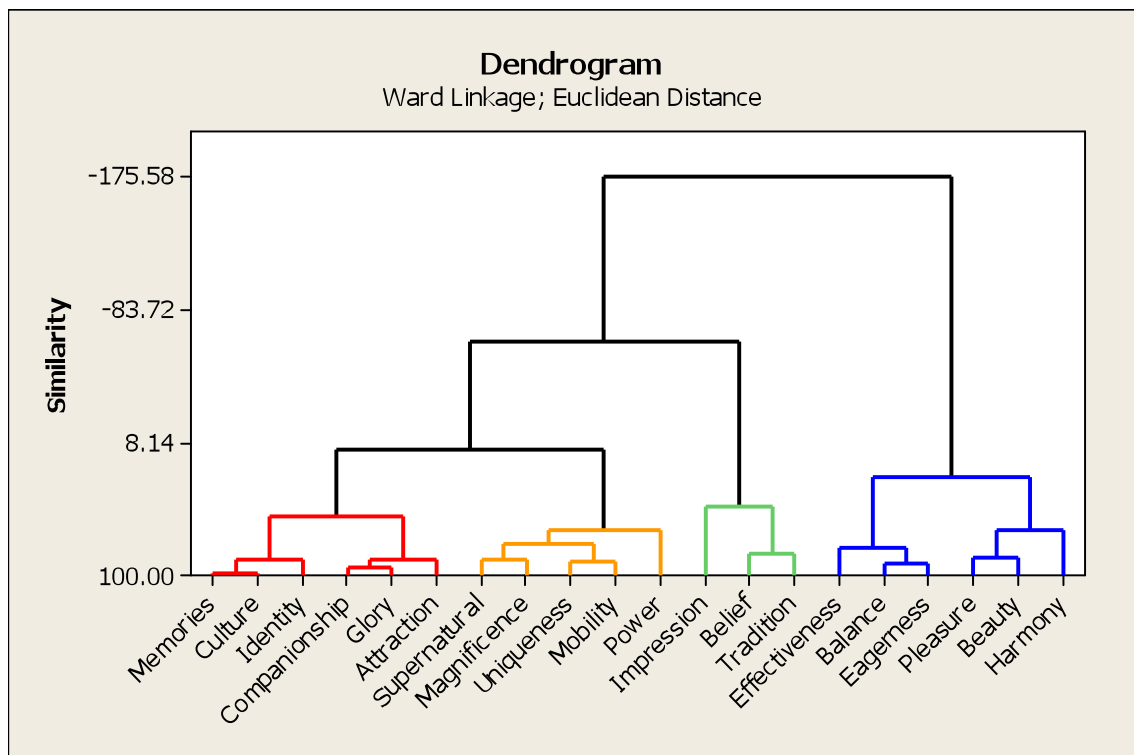
**Table 3:** Comparison among 3 Nom.

Design	Mean
Nom.1	27.030 b
Nom.2	42.045 a
Nom.3	31.075 b

\* The means of Nom. Followed by same letters had no differences with Duncan test.

Among all the other important points, we can refer to point that sample two wins customers' heart over design number one by having the highest score in the Accompaniment factor (Table 3). This can be interpreted that even though most of the participants find the first design more attractive and beautiful, they prefer to pay more attention to other factors such as Power, Identity, Glory and Uniqueness when making the final choice. The presence of Iranian ancient culture and pattern in customers' minds is a motivator in handicraft industry and marketing and it is presented in pattern number two clearly.

In Cluster Analysis, the Kansei terms are clustered followed by their mean on the context of the three design samples. On the basis of the result of cluster analysis, the selected 20 kansei terms can be clustered into four main groups highlighted by different colored lines in Figure 5. These groups can be named respectively 'Affection', 'Charm', 'Context' and 'Form'.



**Figure 5:** Dendrogram of cluster analysis among of 20 Terms



Finally 64 respondents claimed that they would buy the product with design sample two (Figure 3), 27 respondents would buy a product with design number one (Figure 2) and 12 respondents would buy design sample three (Figure 4). This shows that in general a large number of respondents felt positively about the handicraft with sample two. Typical comments were: 'I would like to have a handicraft with a specific pattern that shows Iranian ancient culture' and 'Normally I would like to have a handicraft that shows identity and uniqueness of its culture in a glance'. Interestingly factors such as identity and culture in traditional handicraft pattern are equally important while many of participants mentioned that.

#### 4. CONCLUSION

Considering the importance of emotional design and the necessity of using organized and systematic analytical approaches in the present era, Kansei Engineering was used as one of the efficient ways in finding the customers' emotional and intellectual connections with the designs and patterns of Isfahan's art of Ghalam Zani (Chasing). Kansei Engineering implements more conventional methods like factor analyzes and semantic mapping. But what makes it unique is that it can give a statistically link between emotions expressed through words and product features.

As a methodology Kansei engineering is a very flexible tool which invites the Ghalam Zani's artists to consider emotional aspects and their relations to a design's attributes to create best sellers handicrafts. From my point of view this method would play an important role in Iranian traditional handicraft marketing. It shows clearly how a specific design influences on customer perception to make a traditional handicraft best seller.

If we consider the results of the conducted survey, the design which displays vivid pictures of the Ancient Kings and Iranian mythological figures, attracts a greater number of customers and tourists. Such patterns have been used across the history to highlight the dignity, power and glory of the Iranian Kings and stem from deep cultural and traditional identity of the Persian art.

The patterns and shapes in Isfahan's Ghalam Zani (Chasing) products, are manifestations of human experiences and symbolize the mystical and spiritual values of the Iranian culture. As like any other society, Iran strives to preserves its unique and identifying art, as it is critical in maintaining the culture and shaping an eternal civilization.

For the same reason, centuries have passed and still such patterns and images are displayed without any perceptible changes and still manage to attract many purchasers. The purchasers of Isfahan's Ghalam Zani products, in addition to considering the beauty of such products, are mostly motivated to purchase these products with the purpose of valuing the ancient Iranian culture. We don't have pleasure from an object or pattern just because it performs its function as all design and emotion paradigm states. What please us are the semiological meanings carried by the objects mostly by these aspects of objects related with their cultural value.

## REFERENCES

1. Norman, D., *Emotional design: why we love (or hate) everyday things*, Published on <[www.portal.acm.org](http://www.portal.acm.org)>, 2004.
2. Grimsaeth, Kjetil, *Kansei Engineering*, <<http://www.ivt.ntnu.no>>, Norwegian, 2005.
3. Schutte, Simon, *Designing feelings into products*, M.s, Linkoping University, Sweden, 2002.
4. Anasori, Jaber, *Noblemen and local culture of Iran*, Qomri Press printing, Marand, 1995.
5. Hinnells, John, R., *Persian Mythology*, the Hamlyn Publishing Group, London, 1975.
6. Curtis, Veste, *Persian Myths*, University of Texas Press printing, 2005.
7. Iranian Handicrafts Center, <[www.ichto.ir](http://www.ichto.ir)>, 2009 [Accessed 2009 August 16].
8. Sattari, Jalal, *National and Cultural Identity*, Markaz Press printing, Tehran, 2004.
9. Cayol, A. and Bonhoure, Prospective design oriented towards customer pleasure, In:McDonagh,D., Hekkert, P., Erp,P. and Gyi,D. *Design and Emotion*, Taylor and Francis press, London,pp.104-109, 2004.
10. Bagli, Humanur, Cyclic to Linear: The Dynamic and Ideologies of Objects as Records of Time, *in the proceeding of the Design and Emotion Conference*, Turkey, 2004.