

# Degrees of the Intangible: Indices of Emotion for Product Design

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## Abstract

Every individual uses, appraises and interacts with products on a daily basis. It is evident from current trends and theories associated with product design, that these products that are a part of our everyday lives, satisfy our needs in two ways, functionally and psychologically.

While a product's usability or the service it provides may satisfy our functional needs, it is often the case that when given a choice, we may select one product from the other, even though they are functionally alike. Why do we make these choices, and more importantly, how?

When users are satisfied with a product's performance, they seek a stronger emotional involvement with them (Lewalski, 1988). Are emotions responsible for our choices, likes and dislikes of products? What is the nature of this emotional involvement, what are these emotions, and how, if possible, can we design to generate specific emotions?

This research proposes to develop into these questions. It is an effort to formulate the underpinnings of "design for emotions" and uncover the possibilities of a design process that places "emotion" as an equally important concern for the design of objects, as functionality or aesthetic appeal.

The literature review will include a systematic study of human and product attributes, theoretical and empirical studies of emotion, and the interaction of humans and products is discussed. This project examines what product characteristics lead to an emotional experience, when people interact with them, and suggests a methodology or design guidelines that may allow designers to enhance or specifically modify the emotions experienced by people, while using the products that are a part of their everyday lives.

Keyword: People, Product, Emotion, Appraisal

### 1. Introduction:

A significant shift has occurred from inter-human relationships towards a contemporary mode of individuality fragmented over countless relationships with designed objects (Chapman, 2005). This abstract version of reality has forced us to sought empathy and meaning from everyday products. There are two kinds of user needs, functional and psychological.

Functional needs are satisfied through the performance of the product while psychological needs are related to emotional involvement of the users with the products. When users are satisfied with product's performance, they seek products that afford a stronger emotional involvement with them (Lewalski, 1988). Therefore one may assume that if there are alternatives among products

performing the same functions, users will choose products that satisfy psychological needs.

Based on these specific trends and tendencies that are observed in industrial design over the last decade it is important to note the fact that emphasis on emotion in design has emerged, and thus this research is an attempt to formulate its underpinnings.

### 2. People: Product: Appraisal:

While every person is different in their appearance, cognitive ability, perception, and all other aspects that make us human, there seem to be two main attributes of our existence – sensory perception and cognitive interaction.

Our existence is defined by what we see, hear, touch, smell and taste, and our experiences are complex combinations of these five senses. What makes us different though is the ability to think about these sensory perceptions, creating a somewhat complex vocabulary of things we have sensed (physically) during the course of our lives. This can be defined as the cognitive interaction.

People, through sensory and cognitive modalities perceive products based on its aesthetic, function and symbolic values.

The aesthetic value of the product is the first impression of the product, its appearance. The functional value depends on performance of the product, understandability, usability and its ergonomics. These two dimensions of product characteristics are about one's feelings and experiences while actually seeing or using the product, on the other hand the symbolic value extends much longer, as one remembers the past and contemplates the future. The symbolic level is very vast and covers a lot of territories. It's about message, about culture, and about the meaning of a product or its use. It's about personal memories something evokes. It is also about self-image, a message a product sends to others, about brand, exclusi

ion, to perceiving a product based on aesthetic, function and symbolic value, people have expectations from a product and appraise it in a certain way. Each one of us expects some response from a product. On the other hand appraisals mediated between products and emotions explain why people differ with respect to their emotional reaction to a given product. A product can be judged or appraised based on three major aspects of the world (Ortony, 1988). These three aspects are objects, events and agent. When we experience the product, we experience it as an object, perceive that particular product in terms of its appeal, its beauty or even for its function. A product acts as an object mainly because of its aesthetic dimension and the functional dimension. It acts as an object because of the aesthetic dimension because, in this case the product is perceived as a physical entity. One may choose to like or dislike a product because of its appearance. Here the focus is on the object itself. A product also acts as an object because of the functional category. In this case a product acts as an object only because of its understandability and ergonomic. As in the case of the aesthetic dimension, the understandability and the ergonomics are related to the product directly. The focus here too is on the physical product and not on any other feature that a product may have. A product acts as an object because of its symbolic dimension. However it is a secondary product attribute that leads a product to act as an object. In this case, it is because of memory that product acts as an object with the reason of the symbolic dimension.

A product acts as an agent mainly because of its functional and symbolic dimension. A person may choose to like or dislike a product because of the service it performs. In case of the functional dimension, the subcategories like performance and usability are the prime reasons for a particular product to act as an agent. A product may also acts as an agent because of the symbolic dimension. The sub-categories like brand, intellectual response, status symbol, associated meaning, art form, advertising, etc are the prime reasons for a product to act as an agent. A person may choose to like or dislike a particular product just because of the above-mentioned sub-categories. In this case, these subcategories are agents themselves. A product may act as an event mainly because of the symbolic dimension. Sub-categories like culture, intellectual response, and product treated, as an art form and the brand of the product in this case are the prime reasons for it to act as an event.

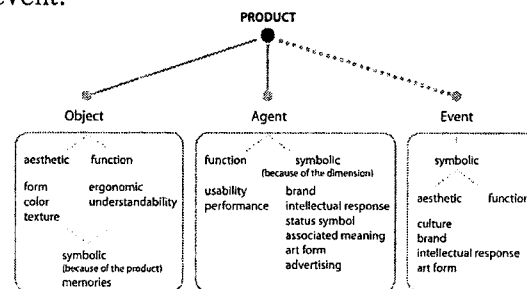


Figure 1. Break-up Product Attributes

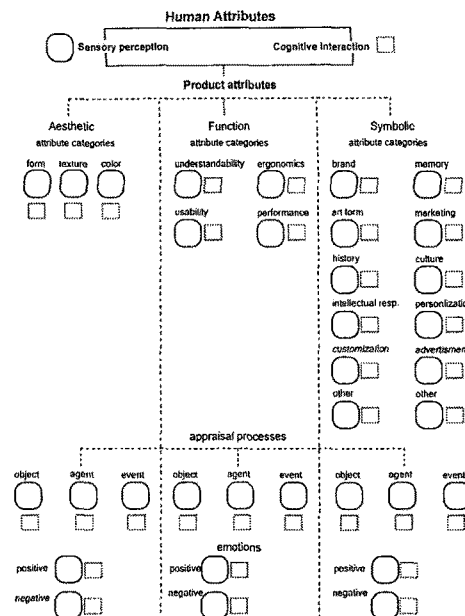
These complex interactions between people perception processes, product attributes and how a product may be appraised by different individuals lead to emotion eliciting conditions.

Based upon these concepts, emotions generated as a result of human-product interaction can be mapped to create a comprehensive matrix describing product types, the emotions that are generated in interacting with them and why these emotions are generated. Using this matrix, we can arrive at recommendations for designers, so that they may design products to allow or disallow the creation of specific emotions and emotion types, thus embodying within the product's design, a code governing the emotional responses that it will elicit

For the basis of this research, 8 people were interviewed to find what emotions they elicit when interacting with products and what leads to emotion eliciting conditions. The users were chosen based on the scale of fondness for products (minimum, maximum, and intermediate). Each individual matrix helped to categorize each of the user responses and also was a useful tool in codifying the emotional responses that the interviewees experienced for a particular product. It also helped to codify the responses that were generated through the products that were case studied and it also reinforced and verified

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Figure 2. Mapping Matrix



Analysis of the data collected through the matrix was applied to form guidelines to be applied to a product to demonstrate the research. These guidelines are established based on product attributes, perception processes, and appraisal processes. The guidelines describe methods for assigning specific emotions to a product. These guidelines would serve as recommendations to the designers in order to design products with encoded emotions.

It is not possible to apply all the guidelines to a product; designers can choose various permutation combinations of these guidelines depending on the product category that they want to design for.

### 3. Design Guidelines:

a. Apart from the form, color, texture of the product that are usually considered while judging it to have a good aesthetic appeal, other factors like how can it enhance the mood and more importantly how can a user have pride in owning that product are equally important. Hence apart from just using the aesthetic appeal to enhance the mood, a product should be able to enhance the mood of the people at any given time by conveying a personal meaning. This would create emotions like pleasure and joy.

b. Breaking up from the regular norm of designing products based on their shape or form, but not jeopardizing its function, is a good way of stirring up emotions like excitement and surprise in the person who sees the product. The product should go beyond obvious needs and expectations of the user. The product here is more likely treated as an art form, thus enhances its social identity. This would create emotions like desire and hope amongst people and an element of positive surprise.

c. A product should be designed in such a way that it transforms an everyday routine into a special experience. It should have an innovative approach, simplicity and elegance in shape and performance should create an appreciation and the desire to possess not only the object by the values that helped create it.

d. The best kind of design is what the users create for himself/herself. Designing products for a certain purpose or function but having an option for the user to add-in on the design to make a different use out of it generates positive emotions like excitement, enjoyment, surprise and happiness.

e. It is very important to design for trust when designing a product as an object because of its function. Trust is an essential ingredient in human interaction. When designing a product for this category it is very important to design in a way that the user understands its functions and how it works and the feedback that the user receives.

f. To allow the scope of customization of a particular product, where a user can personalize his/her products according to the context, mood or other aspects that he/she considers important or worthwhile.

g. The use of certain materials that would reflect the experience of the owner. Using materials that would age gracefully, show the dents and markings of use, but in a way that is pleasant and that would transform a store-bought, mass-produced item into a personal one.

h. A product should be designed to tell a story. Anyone who owns a particular product has to show it off, to explain it or even demonstrate it

Its aesthetic or function should be such that could start a conversation. This would lead to a long-term relationship with the product and in turn generates positive emotions.

i. Approaches that invite the user to explore the product's usability and that provide the possibility for playful interaction should be supported. In this case excessive demands should not be placed on the user.

j. When a product acts as an agent because of its function, the function that this product performs generates positive or negative emotions in us and it is not the product. The designer could have an option of personalizing each of such products for different users when they make a purchase decision.

k. When designing a product that acts as an agent because of the symbolic dimension, the designer should design in a way that the designed product not only functions well, but also serves as an effective advertising tool for a brand or a company and enhances the self image of the user.

For the basis of this research, these guidelines were further applied to an existing product, to demonstrate the research.

#### 4. Conclusion:

The purpose of this research, design for the intangibles was, firstly, to understand if any emotions are generated when individuals interact with products on a daily basis. The aim was also to understand the kind of emotions that are generated because of product people interaction. Through the study of people, their perception process, emotions and corresponding eliciting conditions, it is clear that people experience certain emotions while interacting with products that they may or may not realize. Most of the emotions that are generated because of people product interaction overlap with inter-human emotions as describe by Ortony and Turner (1988). Positive as well as negative emotions are elicited on interaction with products. However, surprise is the only emotion that can be positive as well as negative. An individual can be positively surprised or negatively surprised because of a particular product. Apart from pure emotions, products also create experiences on interaction. These experience-related emotions are usually secondary and tertiary emotions. Positive emotions like love, happy, joy, pride and negative emotions like sad, hate, annoyance, disgust, and anger are repeated frequently by people. The experience driven emotions elicited are interest, excitement, content, satisfaction, impressed, success, frustration, irritation, etc. These emotions generated are because of the product attributes, the sensory perception of people and the way in which an individual judges a particular product. All these factors play a major role in determining what emotions could be generated. The aesthetic, function and the symbolic attribute of the product and the way in which a particular

product is appraised depending on the product attribute determines which emotion could be elicited on interaction. The designed matrix for analysis of the data collected was a helpful tool in plotting all the information about the product attributes, people perception and appraisal processes. It was also helpful in mapping the relation between the above-mentioned categories.

The research showed that in order to create an appropriate emotional response it is very important for a designer to study in detail the various product attributes, and have a deep understanding about the possible ways in which a user may appraise a particular product. The relation between the two, the product attributes and the appraisal processes is the key factor in determining which emotion could be elicited on interaction with a product. Various products were studied and mapped in the matrix, and the relationship between the two led to generate both positive and negative emotions. This relationship between the two main characteristics was also important in deriving guidelines in order to enhance the emotional content of a product. This was done with the help of the design matrix and numerous diagrams. Thus this matrix/model was established to facilitate the creation of acceptable solutions for the design of emotionally demanding products, in order to guarantee their longevity. The guidelines could also serve as recommendation to the designers in order to create emotionally enhancing products and guarantee the longevity of such products.

#### 5. Future Implications:

In combination with the existing design processes, this model of design for emotions may further be applied to other design problems, to codify within products design, the emotions that it may evoke in people who interact with it. This would allow the user to enjoy the product for a long time and also guarantee the longevity of the product. Further this research (emotional design matrix) can serve as a catalogue for product emotions and become a tool to facilitate emotional design.

#### References:

- [1] Ortony, A., & Turner, T.J, What's basic about basic emotions? Psychological Review, 1990
- [2] Ortony, A., Clore, G.L. and Collins, A., The Cognitive Structure of Emotions, Cambridge University, 1988
- [3] Cacioppo, J.T. and Gardner, W.L, Emotion, Annu. Rev. Psychol., 1999
- [4] Cskiszentmihalyi, M, & Halton. R, E, The meaning of things-domestic symbols and the self.chicago, Cambridge University, 1981
- [5] Derbaix, C. and Vanhamme, J., Inducing Word-of-Mouth by Eliciting Surprise-A Pilot Investigation. Journal of Economic Psychology, 2003
- [6] Desmet, P.M.A, Design emotion, 2002
- [7] Frijda, N.H., The emotions. Cambridge, Cambridge University, 1986