Research and Analysis of User's Implicit Demand in Product Design Based on Consumer Experience

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Abstract

It is impossible for product designers to grasp all the explicit and implicit demand of consumers, which easily results in product homogenization in that many designers pay more attention to consumers’ explicit demand rather than carry out an overall research before designing a product. In fact, users’ real demands determine their habits, characteristics, mental status, inner desire and economic conditions, and should be researched on and analysed in different ways to make sure consumers can get good user experience from the product design.

Therefore, this paper gives a comprehensive overview of users’ implicit demand in product design as well as their implications and characteristics from the perspective of consumer experience, based on which puts forward a new product design conception. And at the same time, this paper also builds an evaluation model of product design on the basis of consumer experience to meet the explicit and implicit demand of users, which offers important suggestions for optimizing product design plans and best user experience.

Keywords: Consumer experience, Product design, Implicit demands, Evaluation model.

1. RESEARCH BACKGROUND

1.1 Literature review

The concept of implicit demand originated in the 1980s when different scholars had different understandings of its concept and implication and adopted different terms, such as potential demands, implicit needs and inner needs, all of which could describe the comprehensive and deep meaning of implicit demand (Xie and Luo, 2010). As is obvious, experts did a lot of research on the marketing model based on implicit demand of consumers and very little design related, especially product design related research. As a result, with the deepening of globalization, growing product homogenization in the market narrowed the differences in product function and performance of different brands and weakened their core competences, causing austere price competition among companies. While for consumers, they put more emphasis on the mental experience and satisfaction brought by products than basic needs for the functions and brands of products, hoping that their feelings, minds and ideas could be excited when using the product featuring wider social meaning and more subjective characteristics, so that they could have their own life style through consumption (Luo and Zhang, 2010). On the other hand, when users’ demands were met with the development of economy and technology, they would have higher expectations and new demands. However, the limitations in users’ cognition made it hard for them to explicitly express their real demands, which called for the designers to have enough prediction and foresight so that they could dig out the implicit demands of users to improve product design plans, enhance the comprehensive product performance and so as to meet the different demands of consumers.

1.2 Research purpose

In daily life, implicit demands include potential real demands and elusive inner demands, the former referring to obviously existing demands in life to be discovered by product designers, and the latter referring to the deeply buried demands that may take place in the future and need deep digging and investigation by designers (Li, 2013). The development of modern society not only brings about tremendous changes in one’s life style and great improvements in one’s life quality, but also gives rise to new inner problems and implicit demands. However, many competitors and even consumers are not clear about their implicit demands so that they ignore the key information resources beneficial for product design innovation. And if the companies notice that and design products that can meet consumers’ real demands and inner demands after an overall research and analysis of users’
implicit demands, they will achieve reform in ideas, push forward market economy, expand space for social consumption and improve the competence of the product to make it stand out in the market with solid and strong competitive advantages (Luo, 2012). Therefore, the research and analysis of users’ implicit demands in product design based on consumer experience helps grasp more accurate implicit demands and contributes to product design innovation and its sustainable development.

2.A COMPREHENSIVE OVERVIEW OF USERS’ IMPLICIT DEMANDS IN PRODUCT DESIGN BASED ON CONSUMER EXPERIENCE

2.1 Consumer experience

Products were the result of human demands. With the improvement of material abundance, humans paid more emphasis on life quality from survival to development to self-actualization, during which process products became the material carrier for human demands (Guo, 2013). Growing human demands directed attention to human beings themselves and brought consumers to a more and more prominent status. As a result, the pursuit of product design transferred from functional purposes to mental comforts and emotional satisfactions, also known as consumer experience, the aim of product.

2.2 The relationship between experience and demand

Both demands and experience are psychology concepts, the subjects of which are both humans, or the consumer and user of products. Demands are external expressions of consumers who tend to look for products that can meet their demands, while experience is the reflection of external stimulus in one’s heart which cannot be previously known without certain stimulus (Tang, 2011). As is the fact, different human demands bring about products, which in turn give humans experience and become the intermediate station between demands and experience. Certain human demand produces relative product which will give humans various experiences that, good or bad, stimulate human demands into higher level ones. The relationship between experience and demand is shown in Figure1.

![Figure 1. Sketch of the Relationship between Experience and Demand](image_url)

Therefore, a systematic research into product experience for an analysis of how to create good consumer experience so as to find out product demands in the stage of complete implicit demand. In fact, there is no way in putting up relevant design process to find out what brings consumers good experience (Ren, 2014). What is important is to define the key factors that designers need to take into consideration to bring users good experience. A harmonious coordination of these key factors will contribute to products of higher quality.

2.3 The meaning of implicit demand

As for product design, explicit demand refers to the conscious intrinsic requirement for clear abstraction or specific satisfaction that one can clearly express, while implicit demand refers to the unconscious and obscure intrinsic requirement without clear abstraction or specific satisfaction, an intermediate state between basic needs and desire satisfaction. Implicit demand is a combination of cognitive and emotional factors about which users sometimes have no idea (Mu, 2012).
2.4 Major features of implicit demand

First of all, it is hierarchical. The user’s implicit demand of can be divided into objective layer, consciousness layer, cognitive layer and expression layer, as is shown in Figure 2.

![Hierarchical Model of User's Implicit Demand](image)

**Figure 2.** Hierarchical Model of User's Implicit Demand

The objective layer refers to the original status of implicit demand, which is spontaneously, objectively and unconsciously forming during the purchase of the product and is beyond the consumer’s control. The consciousness layer mainly focuses on a subconscious need produced during the purchase of the product when the consumer is uncomfortable and dissatisfied yet unclear about what product he needs or how to get it (Song, 2015). In this layer, the consumer has both the motive to get what he lacks and an obscure idea about what that is. The cognitive layer is the sublimation of implicit demand when the consumer, based on the consumption scene as well as accumulated knowledge and experience, forms a general impression about his demands and starts to pay attention to certain object of his demand. The expression layer is the manifestation of implicit demand when the consumer already has a clear knowledge of his demand target (He, 2013) and tries to bring it into manifestation after a weighing of the pros and cons of its value.

Next, it is transformable. The user’s implicit demand and explicit demand are interdependent and interactive and can transform into each other in certain circumstance. The transformation model in Figure 3 shows the process of the transformation between different demands of users.

![Transformation Model for Different Demands of Users](image)

**Figure 3.** Transformation Model for Different Demands of Users

The first stage of demands transformation is manifestation when the user’s implicit demand is transforms into explicit demand after it is known by the user. The second stage of demands transformation is latentiation when the consumer’s explicit demand gradually becomes latent as his expectation for demands increases after his explicit demand is met and his mental deficiency is eliminated (Wang, 2011). The latentiation of explicit demand is in fact
the subject’s continuous imagination and inspiration, which can derive new implicit demands in different aspects and domains. The second stage of demands transformation is re-manifestation when the implicit demand of potential value transforms into new explicit demand as increasing consumption behaviour improves the consumer’s cognition and capability with the development of economy and technology. The last stage of demands transformation is re-latentiation when the demand becomes latent again after it is re-manifested. The fact is that the consumer’s explicit demand is usually controlled, transformed, degraded and latentiated due to limits in technology, resource monopoly and cognition.

3. THE DESIGN CONCEPTION OF USER’S IMPLICIT DEMAND BASED ON CONSUMER EXPERIENCE

3.1 Product design in favour of implicit demand

Designing demand means the design can impel consumers to have strong demands, and in this sense, designers should try to stimulate the obscure information demand in consumers, or to provide new consumer experience. Only by producing good consumer experience can products meet consumers’ real intrinsic needs or even their implicit demands. So collective culture research method should be applied to analysing the implicit demand of the representative consumer group so as to observe their reflections and attitudes towards science and technology, product appearance, which helps designers make an accurate estimation about consumers’ preferences, get to know their intrinsic requirements of product appearance and finally complete the design plan to lay a solid foundation for production (Wang, 2015). The collective culture science includes observation, follow-up survey, lifestyle interview and visual story, etc. The observation method requires researchers to stay on the spot or to make recording or videos for analysis and the result of observation is interpreted according to the materials collected. The interview method is applied to different kinds of users, and it not only interviews the lifestyle and target experience of the user, but also deeply interviews all the elements related to him. Visual story, also known as video story, is the video made by the user to provide understandings about typical activities of certain lifestyle, from which clues for innovation and implicit demand can be found to confirm the user model and then provide reference for later design.

3.2 Good consumer experience product design

Consumer experience design is only new in recent years, which puts more emphasis on the bonds and interactions between products and external environment, rather than the way that the product works. Since experience is the subjective feelings of users, product designers should be aware enough of that and improve details of products in consumers’ perspective to feature the humanity of design as well as the theme and comfort of products, while at the same time, enrich product functions if product safety is guaranteed (Ma, 2017). First, it is important to do better in the basic experience of a product to make it a more convenient, more helpful and more useful tool beyond user’s satisfaction about basic demands. Second, users can be invited in some parts of product making to finish the functions and forms design, which will bring users spiritual pleasure with individual marks on the product. At last, customize products with users guiding the design direction through dialogues with designers. This kind of design relies on technology and designer’s rich imagination, and also depends on user’s inspirations and beliefs, which allows them to create their personal space (Hu, 2015).

4. STRUCTURING OF PRODUCT DESIGN EVALUATION MODEL

4.1 An overview of fuzzy evaluation

This paper makes a scientific evaluation on product design by means of fuzzy comprehensive evaluation (FCE) method which introduces mathematical models to product plan, builds an evaluation index system and then sets reference value for evaluation factors, weight and evaluation membership according to user experience theory and data materials (Lei, 2014). FCE works beyond the logic and language of precise mathematics and emphasizes the factor of fuzziness which describes the objective nature of the subject.

4.2 Specific evaluation process

First, determine evaluation factors. Set the factor aggregate of all the influential elements of evaluation target as $W_1 = \{W_{11}, W_{12}, \ldots, W_{1n}\}$, and the sub-aggregates of all the factors as $W_2 = \{W_{21}, W_{22}, \ldots, W_{2m}\}$, $(m=1, 2, 3 \ldots)$. Second, establish evaluation assemblies for evaluation index. In fact, people tend to make different evaluations on the same
product design, and in fuzzy evaluation set the evaluation assembles $S = \{S_1, S_2, \ldots, S_l\}$, and then determine the weight sets of all the factors as

$$C = \{C_1, C_2, C_3, \ldots, C_m\}, \quad C_j = \{c_{1j}, c_{2j}, \ldots, c_{mj}\}, \quad (m = 1, 2, 3, \ldots)$$  \hspace{1cm} (1)

The widely used formula for evaluation weights is $\vartheta_j = \sum_{i=1}^{n} G_{ia}$, in which $\vartheta_j$ refers to the summation of scores given to $C_j$ by experts. $k$ refers to the number of evaluators, $G_{ia}$ refers to the evaluation of the $i^{th}$ expert on $C_a$, and then make normalization of $\vartheta_j = \{\vartheta_{j1}, \vartheta_{j2}, \ldots, \vartheta_{jn}\}$

$$c_j = \sum_{i=1}^{n} \vartheta_j/n, \quad c_j \text{ is the weight of } W_j.$$  

Then, compose evaluation matrix $G$. The judgement matrix $G$ of the lower layer of factors relative to the higher layer ones can be determined according to FCE and the grading principle of the importance of the index elements as follows:

$$G = (g_{ij})_{nm} = \begin{bmatrix} g_{11} & g_{12} & g_{13} & \cdots & g_{1m} \\ g_{21} & g_{22} & g_{23} & \cdots & g_{2m} \\ g_{31} & g_{32} & g_{33} & \cdots & g_{3m} \\ \vdots & \vdots & \vdots & \cdots & \vdots \\ g_{n1} & g_{n2} & g_{n3} & \cdots & g_{nm} \end{bmatrix}$$  \hspace{1cm} (2)

$g_{ij}$ refers to the normalization value of the number of those whose evaluation index is $S_i$. Judgement matrix $G$ with single factor and weight set $C$ compose comprehensive judgement matrix $D$:

$$D = C \cdot G = (c_1, c_2, c_3, \ldots, c_m) \cdot \begin{bmatrix} g_{11} & g_{12} & g_{13} & \cdots & g_{1m} \\ g_{21} & g_{22} & g_{23} & \cdots & g_{2m} \\ g_{31} & g_{32} & g_{33} & \cdots & g_{3m} \\ \vdots & \vdots & \vdots & \cdots & \vdots \\ g_{n1} & g_{n2} & g_{n3} & \cdots & g_{nm} \end{bmatrix} = (d_{11}, d_{22}, d_{33}, \ldots, d_{bb})$$  \hspace{1cm} (3)

This is one of the fuzzy subsets of $G$, $d_j = \sum_{i=1}^{m} c_i \cdot g_{ij}, \quad (j = 1, 2, 3, \ldots, b)$. The comprehensive judgement over a system should take several factors into consideration, with each factor including several sub-factors that can still be divided further, thus calling for evaluations of different layers. Therefore, the basic model of fuzzy evaluation can derive into FCE of several layers to solve complex problems.

5. CONCLUSION

Product design should take consumers’ demands into full consideration and focus on meeting consumers’ implicit demand and bringing good experience. To achieve that, it is necessary to carry out an overall research into consumers’ implicit demand to know their real experience and evaluation, a clear understanding of the relationship between the two offers important references for improving and optimizing product design plan. In addition, to improve the efficiency and quality of product design, this paper structures an evaluation model to help designers pay more attention to details so as to meet users’ implicit demand with the best experience.

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