

A Study of Emotional Sustainability Between Industrial Products and Users

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ABSTRACT

This study takes sustainable design and emotional design as its theoretical foundations, focusing on the core issue in the current product design field—the disconnection between "functionality-oriented design" and "users' emotional needs". By systematically exploring the forms of emotional connection between users and products in daily interactions (such as the sense of pleasure in usage scenarios and the sense of identity after long-term use), this study conducts an in-depth analysis of the essential connotation and development laws of emotional sustainability between products and users. The study attempts to take emotion as the core link to resolve, at the psychological level, the problems of users' excessive dependence on products and frequent product replacement caused by "rapid functional iteration" and "weak emotional connection". Throughout the entire product usage cycle, it also aims to cultivate users' empathy towards products (e.g., understanding the humanistic care behind product design) and nostalgic emotions (e.g., preserving exclusive memories during usage) through design guidance, thereby extending the product life cycle. By sorting out existing research results and practical cases, this study focuses on identifying key emotional triggers that can enhance long-term interaction between users and products (for instance, product usability reduces the threshold for use, aesthetic experience enhances emotional identification, and memory association strengthens exclusive emotional connections), and analyzes how these factors influence users' emotional retention towards products and usage intention through multi-dimensional effects. On this basis, this study intends to construct a theoretical framework for emotional sustainability design. This framework can not only reduce resource consumption and environmental impact caused by excessive product replacement by extending the product life cycle, but also improve users' product satisfaction and long-term psychological sense of belonging by meeting their in-depth emotional needs, thereby enhancing users' mental health. Furthermore, the findings of this study are expected to provide multi-dimensional practical guidance for the product design industry: on the one hand, it helps designers integrate the concept of emotional sustainability into the conceptual design stage, balancing functional practicality and emotional value; on the other hand, it provides implementable emotional design strategies for product categories closely related to users' daily lives, such as home appliances, digital products, and furniture. Ultimately, this will contribute to the development of sustainable products that not only conform to the current needs of green ecological development, but also deeply align with human emotional demands.

KEYWORDS

Product; User; Sustainable design; Emotionalization

1 Introduction

In the field of Chinese industrial design, the two tenets of "people-oriented design" and "design for economic benefit enhancement" have long been well-recognized core principles, whose influence has permeated decades of design practice and educational systems. The former focuses on meeting users' physical and psychological needs, emphasizing that design should align with human usage habits and emotional preferences; the latter, closely tied to industrial development goals, regards design as a key driver for promoting corporate profitability and stimulating market growth. During the phase of rapid industrialization, these two tenets indeed provided a clear direction for the standardized and market-oriented development of Chinese industrial design. They facilitated the transformation of numerous industries from "manufacturing" to "intelligent manufacturing" and gradually brought design from the background to the forefront, making it one of the core elements of product competitiveness.

However, as social development enters a stage of high-quality growth, an increasing number of scholars in the design field have begun to reflect on and question the "completeness" of these two tenets: Is the mission of industrial design limited solely to the two dimensions of "satisfying humans" and "enhancing benefits"? From their perspective, without the guidance of noble spiritual values, the connotation of "people-oriented design" is prone to narrowing. When design focuses merely on stimulating individuals' immediate needs, it may induce the unlimited expansion of human desires, ultimately trapping users in a consumption cycle of "constantly possessing yet never being satisfied." On the other hand, the one-sided emphasis on "enhancing economic benefits" may reduce design to a tool for short-term interests. To cut costs and accelerate product iteration, some enterprises neglect the environmental friendliness of materials and the recyclability of products, and even deliberately design product structures with "planned obsolescence." Eventually, this leads to ruthless damage to the environment, and the shadow of such design orientations can be seen behind many environmental issues. Therefore, under the current dual demands of ecological civilization construction and spiritual civilization promotion, conveying the spirit of the times and practicing the concept of harmonious development through

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industrial design has become a core issue that urgently requires attention in the design field. This is not only a supplement and elevation to traditional design tenets but also an inevitable choice for the design industry to respond to practical social problems.

Meanwhile, driven by the accelerated iteration of technology and changes in consumer culture, the replacement cycle of products has been shortening at a visible rate. Many product categories have fallen into a cycle of "fast consumption and fast obsolescence" due to the trend of "fast fashion" and "fast design." Behind this high-frequency replacement lies enormous resource waste and continuous pressure on the ecological environment. According to relevant industry reports, among the waste materials generated annually from product obsolescence in some industries, a large amount of recyclable resources are discarded directly due to the lack of reasonable treatment mechanisms. In addition, to pursue trendy designs, the proportion of newly added unsold products in some industries remains persistently high each year, and these underused products eventually become waste that occupies land resources. What is more noteworthy is that the phenomenon of uncontrolled consumption patterns and waste of natural resources has become extremely prevalent in contemporary society. On one hand, some designs blindly pursue "product replacement," overemphasizing the redundant addition of functions and frequent innovation of appearances while ignoring users' actual usage scenarios. These redundant functions not only increase production costs but also become "idle designs" because users are unfamiliar with their operations. On the other hand, the "excessive durability" of materials in some products conflicts with the "short-term timeliness" of designs, resulting in the underutilization of material durability and further exacerbating resource waste.

Delving into the underlying causes, users' wasteful behaviors are not inherent but the result of the combined effect of multiple factors. Firstly, useless design forms break the emotional connection between users and products. Some designs prioritize visual impact while neglecting ergonomic principles and usability, making it difficult for users to develop long-term usage habits. Secondly, design functions that deviate from reality reduce products to carriers where "gimmicks outweigh practicality." Some functions are disconnected from users' daily needs and eventually become "decorations." Thirdly, the penetration of fast-fashion consumer culture further accelerates product obsolescence. Driven by various marketing strategies, users gradually form a consumption habit of "chasing new products and abandoning old ones," regarding products as "short-term fashion symbols" rather than "long-term usage companions." The superposition of these factors determines that products are destined to have a short life cycle from the very beginning of design: the design stage fails to consider emotional value, the production stage focuses on short-term benefits, and the consumption stage is driven by trends. Ultimately, this prevents users from developing sustained pleasure and recognition towards products, let alone emotional dependence and usage stickiness. When a product can neither meet practical needs nor carry emotional memories, obsolescence becomes inevitable—and this is precisely the core pain point that needs to be addressed urgently in the current design field.

Against this practical background, this study takes the "emotional connection between users and products" as the core entry point to explore in depth the internal logic and implementation path of the sustainable development of emotions between products and users. Different from traditional design studies that focus on "functional optimization" or "appearance innovation," this study places greater emphasis on the core role of "emotion" in extending product life cycles and alleviating resource waste. It attempts to take emotion as the "baseband" to build a long-term connection between users and products. On one hand, by exploring users' potential emotional needs during usage (such as the pursuit of "sense of stability," "sense of exclusivity," and "sense of memory"), design is transformed into a carrier for emotional transmission. This not only satisfies users' demand for personalization but also reduces product replacement caused by "functional obsolescence." On the other hand, by guiding users to develop "empathy needs" and "nostalgic feelings" during product usage, products are converted from "tools" to "emotional companions." When users can associate a product with specific scenarios, shared moments, or perceive the humanistic care behind its design, they will naturally extend their willingness to use the product. This further reduces the blind pursuit of "new products" at the psychological level, ultimately achieving the dual alignment of "emotional sustainability" and "ecological sustainability."

2 Background to the study of sustainable emotionalization

The theoretical basis of this study comes from the theory of sustainable design and emotional design, through the study of the user in the process of using the product and the product in the sensibility of the emotional connection established on the basis, and seeks to explore the sustainable emotional change stage has been to solve the timeliness of product design. Is the product can reach the user's empathic needs and nostalgic episodes. 21st century today, the deep public value has shifted to become a nomadic individual superficial fast food, as well as excessive material culture persistence of social migration phenomenon. Relationships have also been transformed from real inner human feelings into modernized fragments of separation and planned and designed material experiences. As a result, in this day and age, empathy is less likely to occur between people, and more likely to be found in the objects that we are rapidly replacing.

Sustainable design opposes the waste of resources and emphasizes the recyclable use of resources and the use of renewable energy. Based on the principle of emotional sustainability research, this study solves the waste of product resources from the root, establishes the emotional integration between the user and the product in the process of long-term contact, so that people and objects can live in harmony with each other, and even rise to become a kind of life partnership with emotional dependence.

3 Main phases of the study

The stages in which a user establishes an emotion with a product can be divided into four main stages:

Phase 1: Trial and error phase;

Phase 2: Developing Inertia Phase;

Stage 3: Inertia operation stage;

Phase 4: Feedback information phase.

In these four stages of emotional establishment, the emotional establishment between the user and the product will go through the four levels of contact, cultivation, habit, and feedback, and at the same time, these four levels are also progressive and sublimation. Therefore, through the theory of emotional sustainability in the various stages of product design to help users have a good cognitive way between the first stage and the product, can be conducive to the cultivation of the latter stage. In the latter stage of cultivating inertia and inertia formation stage, that is, the second and third stage, it is necessary to cultivate the user's emotional dependence on the product, so that the user produces emotional dependence on the product. In the fourth stage, which is the feedback stage, user-led, enhanced interactive performance, which allows users to produce emotional dependence on the product, targeted feedback, personalized design, so that the product is more in line with the user's own establishment of the emotional vision.

4 Research implications for sustainable emotionalization

Emotional sustainability between products and users studied in this paper focuses on enhancing the sustainability of the product and the connection between the user and the product so as to achieve

Initial perspectives of this study:

Design is a way to solve problems. And many problems are not grand social issues, but small details that happen practically around us. Emotional sustainability theory is human-centered, observing the problems that may occur when users use a product, and trying to change the nature of use from an emotional perspective.

Products are created due to human creation, then the emotional sustainability of products is also based on the users themselves. It is only through the full interpretation of the user that the emotionally sustainable design thinking that is inherent in the product itself can reach the user's goals.

Emotional sustainability is a theory that essentially changes the relationship between users and products. Its formation mechanism is to change the design thinking mode, user-centered; it is a methodology that generates a perceptual cognitive relationship between the product and the user, thus forming the user's habitual use pattern, so that the user and the product can form a two-way positive interaction, enhance the use of the product, and then form the recyclable use of resources.

Emotionally sustainable development cannot be separated from the user's context of use. Therefore, fully understanding the user's context of use is also a very important step. If you can fully consider the user's context of use in the design, targeted design, to establish a sense of dependence on the product in different scenarios, to enhance the frequency and efficiency of use, and more to enhance the user's emotions, to achieve emotional interaction between the user and the product.

Emotionally sustainable design thinking from the user's perspective can grasp the essential needs of the user, enhance the emotional communication between the product and the user, and get the most realistic feedback from the user. In the current era of big data, user feedback data can be used as a very important reference for the replacement of new generation products. Personalized customization service can update some functions or accessories on the basis of the original product to meet the current stage of the user's emotional and rational needs.

Through the emotionally sustainable design of living products, it can enhance the efficiency and happiness of users in using the products in their lives. If the essence of design is to help make human life more convenient, then in the era of industrial design and the rapid development of modern technology, the essence of design is to enhance the happiness of human life.

5 Summarize

The first of this study is a discussion of emotional design theory research. At present, the more in-depth part of the domestic research on emotion is the outstanding achievements in the discipline of cognitive psychology, domestic scholars and experts in foreign countries on the basis of existing research to carry out more in-depth discussion and research. Domestic design psychology content currently studied is more inclined to study the impact of emotion on consumers, where the emotion is not derived from the concept of cognitive psychology, not to mention the in-depth combination of psychological factors to analyze and study, so that there will be more limitations. Can only see the appearance of the problem, such as: the development of product appearance, the development of product features, product structure, etc., not able to find out the core of the current development of domestic product design, the core should be a combination of potential factors analyzed.

Secondly, sustainable design theory research has been discussed. At present, the main part of the domestic sustainable design theory for products lies in the sustainable design process in the commercialization stage of products. It explores the relationship between the product life cycle and related stakeholders and sustainable system design, extracts the relevant elements in the product life cycle, and carries out in-depth research on the strategies, methods, tools and processes of service design through the concept of sustainable design. It does not explore from the perspective of human cognition, from the perspective of cognitive psychology, the sustainable design of products is even more emotionally sustainable, and emotionally sustainable can also fundamentally solve the problem of resource waste.

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