

Research on the Product Derivation Method under the Interaction Design Thinking

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Abstract

Explore the new way of product derivation by integrating the interaction design thinking into the product derivation method. It analyzes the thinking mode of interaction design, describes how to make the product provide better experience for the user, from the perspective of the four elements of people, activity, context and technology, and shows how to combine interaction thinking for product derivation through the cases. Good products in addition to the realization of the function also need to meet the needs of the user experience. Product derived can get new methods and ideas from the interaction design of systematic thinking, so that products can provide better service for users in the digital era.

Keywords

Interaction Design, Product Derivation, Design Thinking

1. Introduction

With the development of information technology, digital interactive products are playing an important role in people's life. To a certain extent, it changes the way users use the product and the requirements of the product experience. Users want the product to complete the needs and tasks at the same time have a more positive experience. Traditional physical product design cannot just stay in the "useful", "easy to use" level, but make users "want to use". Around the user and the product experience, interaction design thinking puts forward the "user-centered design", "emotional design", "experience design" and other concepts. These ideas have great value in product derivation. The study how the interaction design thinking applied to product derivation helps to provide new product ideas, and create a better product experience.

2. Interaction Design Thinking

The study of interaction design originated in the 1960s, began to appear in the form of “human-computer interaction”, and later extended to a wider range of areas. In 1984, Bill Moric, the founder of IDEO, called the new design “Soft-Face”, and later changed to “Interaction Design”. He proposed a new concept to describe the design of this interactive product system, to make people realize that this kind of design activity is the creation of product use and experience process [1]. The famous interaction design expert Cooper Alan believes that the focus of the interaction design is the traditional design disciplines never discussed: how to design behavior [2], emphasizing the key behavior in the interaction design. Terry Winograd, the author of “the art of software design”, focuses on how the user lives in the space created by the designer, emphasizing the coexistence of the user and the environment. There are also people who believe that interaction designers use new technologies to make products intelligent and emphasize the key role of technology. Donald A. Norman emphasizes the user experience, he said interaction design beyond the traditional product design is that the product has a good interactive function, namely in the use of the product the user can feel a kind of experience, that is due to the two-way exchange of information between people and products, with “a strong emotional component” [3].

Although the above viewpoints on interaction design focus are different, but can be concluded that there are four important elements in the interactive system, namely people, activity, context and technology. As the “Designing Interactive Systems” mentioned, interaction design thinking requires coordination among the various elements of the system with human-centered, using appropriate technology to support the user’s behavior and with scene behavior coordination. These four elements will be here as a starting point to explain how to derive a product from the perspective of interactive design.

3. Product Derivation

Derived, refers to evolve and produce new material obtained from the parent substance. In the design field, it refers to the use of derivative products of different design techniques on the same or a similar body to produce a differentiated product, there is a difference between the derived products, but also linked. Product derivation is an important means to product development, establish a brand image, enhance the competitiveness of the market.

In the interactive design, a good interactive interface not only can help users to achieve efficient interaction, but also allows users to generate positive emotional experience in the interactive process [4]. So here it does not refer to the simple copy on the basis of the original products, or expansion for peripheral products, but to explore new functions, provide new ways of using it and let users feel a new experience. Experience is the activity of the user, in certain scenarios, through a certain behavior, using the function of the product to achieve its purpose. Experience links people and products organically, reasonably and empathy, to achieve physical and spiritual satisfies [5]. The four elements of interaction design thinking are the key factors that need to be considered in the product derivation.

4. New Product Derivation Methods

Nowadays, with the rapid development of Internet technology, information technology and digital products affect people's daily life with unprecedented speed and scale. Users' mental models for the products also quietly changed. For example, the popularity of iPhone, iPad and other smart phones and tablet PCs allow users to have developed a habit of using the touch screen, "screen touch operation" has become widespread user's mental model. Due to the diversity of products, the application of complex contexts and the strong support of technology, the relationship between people-product-context-technology results in a more diverse form and combination [6]. Traditional physical product in the derivative process needs to adapt to the changes in the digital age, the interaction design thinking will be included among the derivative methods, from the people, activity, context, technology and other aspects to explore new product derivative method and improve product experience.

4.1. "User-Centered" Product Derivation

The core of the interaction product is "interactive", which is more deeply than the traditional product design to understand and analyze the product's user population [7]. Interaction design thinking take the user as a core role, resulting in a set of "user-centered design" concept. This design concept requires the design around the user, starting from the needs of the user to meet the user's habits, psychological feelings, and even allow users to participate in the design process. "Object oriented design" method proposed by Alan Cooper in "About Face" also stressed the designers to focus on people's goals and expectations, attitudes, talent, so they can propose both efficient and enjoyable solutions.

Innovative design is not only to design a beautiful shape, sometimes the concept of innovation can be achieved by changing the relationship between the user and the product [8]. In the derivative product design, it is not simply to change of the appearance, but should really consider the needs, goal, habit and psychology of the users, so that the new products can serve the users better. Users' feedback of the product has a high reference value for the derivation. By analyzing user feedback of the existing product, designers can improve the characteristics of the target user groups, create user models, and build up new usage scenarios.

4.2. Design New Interaction Behavior

Interaction behavior refers to the behavior of the user in the process of using the product. Interaction behavior is common in everyday life. By using a computer to send an e-mail, using a mobile phone to make a phone call, running on a treadmill, etc., we are interacting with the product. Interactive behavior is a vital part of the whole process, through the behavior, the user and the product establish contact with each other. The quality of interactions has a direct impact on the user experience of the product.

An interaction behavior includes "action" and "reaction" [9] (refer with **Figure 1**). In the derivative product design, we should rethink the "action" and "reaction" from the perspective of improving the user experience. iPod is an landmark product in the his-

tory of Apple, which caused a sensation in the market, not only because of its unique appearance, but also thanks to its unique user-friendly operation. The “scroll-wheel” on iPod just need an thumb to complete the operation. The new interaction behavior makes iPod seems unique among other MP3 players. It is a successful product derivation.

4.3. Establish Better Product Usage Context

The product is dependent on usage context. Bill Buxton put forward a theory “design for the wildness”. He believes designers are designing for the reality, for the wildness, not limited to independent objects. Design depends on the system, including material factors, emotional factors, social factors and experience factors [10]. Product is not an independent existence, a good product must be coordinated with the context. How to establish a better product usage context is an important problem to be solved in the process of product derivation.

The information age is the era of a “link”, from individual computer to computer network, from a single product to the Internet of things, ubiquitous computing urges people to understand the service and value of the product in a larger space, to understand the user experience and the contained significance in a connection situation [11]. In addition to making the function and operation of the product more in line with the context, the Internet era provides an idea for product derivation: to build a platform. In the field of digital products, the enterprise with the platform is always competitive, and its products are more vitality relying on the advantages of the platform, such as Microsoft, Apple, Google and other international giants.

The development of the Internet of things technology and the trend of intelligent products make it possible to build the platform of solid products. Many companies that produce smart products have been gradually put into practice the idea of platform. By cooperating with some traditional home appliances manufacturer, MI is gradually building m MI smart home platform. MI now has a router as a smart appliance control and a mobile phone as remote control. The next step it will continue to launch intelligent household items, and it has MIUI software advantage, MI company will build a smart home platform as an important direction of development. On the one hand convenience of the platform is beneficial to provide users with a complete and unified use of experience, on the other hand the collaboration between the product helps to create a harmony context. Platform of products is an important concept of its development and derivation.

4.4. Promote Product Derivation through New Technologies

Technology has been the key factor to promote the product derivation, the new method of interaction and the new interaction scenario is relying on the new technology. The technology of eye tracking, speech recognition and motion recognition enable people to interact with the product through the sight, sound, touch, movement and other methods. The multiple senses of human being are mobilized, and the interaction process is more abundant (refer with: **Table 1**).

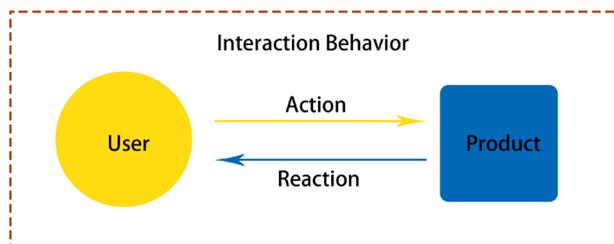


Figure 1. Interaction behavior.

Table 1. Products with new technology

Product	Company	Launch Date	Technology	Interaction
HoloLens	Microsoft	01/22/2015	Virtual Reality	Gestures and Voice
Siri (for iOS 10)	Apple	06/13/2016	Computational Knowledge and speech recognition	Voice
iPhone 6s	Apple	09/10/2015	3D Touch	Press
Tobii Pro Glasses2	Tobii	11/10/2015	Eye-tracking	Eye Movement

General Electric Company released a smart lighting, it is achieved by GE’s new technology Ge align. By controlling the composition of the spectrum, it regulates the body’s natural sleep cycle. During the day, Align technology can simulate the sun to inhibit the production of melatonin, while in the night, it can promote the production of melatonin the by reducing the blue light. Through a certain technological innovation, the traditional products become intelligent. It is an important way of product derivation.

5. Summary

Digital products are popular in the Internet era, the traditional products not only need to solve problems and achieve intended funtions, but also need to provide good experience for the users. Interaction design thinking provides important ideas and methods for the traditional product derivation. An interaction system of good experience need coordination of people, activity, context and technology. There are four important methods of product derivation: “user-centered”, “design new interaction behavior”, “establish better product usage context” and “promote product derivation through new technologies”. The interaction design thinking helps to enhance the experience of derived products.

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