

Research on the Function and Formal Beauty of Product Interface Design

Cao Dan
HUBEI INSTITUTE OF FINE ARTS
Wuhan, P.R.China
whitehorse22@sina.com

Abstract—User Interface has a rapid development along with high-tech intervention, and the status of it is more and more obvious with its sensory beauty, formal beauty and technological beauty which draws the eyeballs of people, at the same time, the information of product has been transferred and exchanged among us during the communication process. Besides that, UI design also should follow the principle of beauty and make every step of the design excellence with its merits. In this article, we will make some simple discussions on the principle of beauty that appears in UI as well as some expression about it in ergonomics.

Key Words- User Interface design; information transfer; principle of beauty; ergonomics

I. INTRODUCTION

There are several important stages throughout the development of human society, such as the steam age, industrial age and intellectual age, which are associated with the development and application of new technologies. The rapid development of technology has injected fresh vitality to the community and more fresh terms to the people, such as networking, multimedia and more. As for as product design is concerned, there have been many new faces, such as: interface design, universal design, user research...

Today's products form has long been a departure from the traditions and rules of the Industrial Revolution, is becoming more and more mysterious, and more in terms of "black box" form. Which mostly make use of electronic operations to implement function and consumers only need the keys or information prompted by the product to complete controlling the whole process, however, this specific study call it User Interface design. It has an important significance to shape corporate image of products and successfully win the profits from consumers. Now the market has appeared many successful example of interface design, such as: iPhone 4, etc.

II. THE DEVELOPMENT AND APPLICATION OF INTERFACE DESIGN

Interface design is a wonderful flower of intelligent era, which is raised by people to meet customer needs better, and now it is more and more popular. Interface design, also called UI (User Interface), is a user experience-type working face that used to complete the transfer and exchange of information between people and products in the system that is composed by people and products along with the tech sector.

Interface design has two basic principles in product design: the degree of interface information reasonably sufficient to stimulate and the sequence. Interface design can not exist without working face; it plays an important role in the system composed of people and products. Firstly, users can enjoy a reasonable appearance of the interface. It can be linked to the users perceptual system by the button that are displayed on the screen to convey the beauty that carried by the products, including external and internal, which will have a good link between the enterprise culture and aesthetic characteristics. Secondly, Interface design acts as an intermediary to give the product simple interface that is easy for operation and user identification. The technology that is hid in the internal structure can be implemented perfectly by the interface, which allows users to experience the superiority and high quality of products. Meanwhile, there are a lot of categories of interface design, such as voice interface design, visual sensory interface design and so on.

III. THE BEAUTY OF INTERFACE DESIGN

Interface design of products contains a number of beauties. Here, we can talk about it respectively from the user's perspective and designer's angle, focusing on the sensory beauty, beauty in form, technical beauty for users and the beauty laws that designers should be followed. As shown in Figure (1) below.

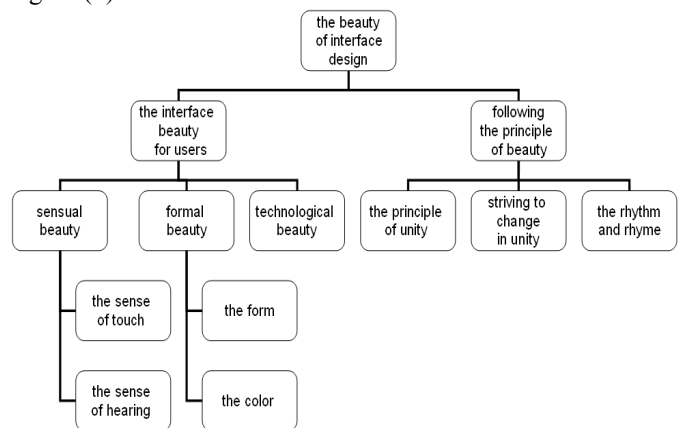


Figure.1 the brief introductions of beauty in interface design

3.1 The Beauty of Interface Design for Users

The beauty of interface design includes not only senses the beauty, but also the beauty in form and technical beauty that appears in the process of designing.

3.1.1 Sensual Beauty

Li Zhe hou, the aesthetics master, mentions that “the beauty is divided into three types, the first is that the strong form of sensual pleasure” in the “three books of aesthetics”. Sensual beauty contains the visual, auditory, the sense of smell, tactile and so on. For the interface design, we call it the basic beauty, which is related to each product of the interface design. As the high technology continues developing, more and more products become the combination of high-tech, and the traditional method has been inconsistent with the perceived trend of the times, more operations turn to the micro-environment instead of macroscopic model, in this situation, we can only use the interface design to show its inherent high-tech. Interface design provides a good platform for users to learn the basic status and function of the product by their experiences, thus the sensory beauty comes into being in the process of these experiences.

Sensual beauty is a response to the beauty in the outside world by user’s subject senses. Here, we can just take a brief description of the sensory beauty in interface design by touching and hearing.

Firstly, the sense of touch: people experience the technology of products by touching screen separately, which is a tactile feeling for users themselves. Why? In the process of product design, many features are achieved through the operation of touching interface, functional links as well as the user’s understanding of the processes are step by step, and at each step of the tactile feeling, the function promotes the realization of the user's curiosity to complete all of the features of touching and exploring. On the whole, function is implemented on the user's own feelings by touching, which is the beauty of tactile sense that is mainly reflected in its drawing the curiosity of people and enjoying touching with the comfort feeling throughout the course of its operations in order to meet our spiritual need. Such as the interfacial diagram of mobile TV, as shown in Figure (2) below, this can explain this beauty very well.



Figure.2 the interfacial diagram of mobile TV

Secondly, the sense of hearing: the sound designing (including voice) in auditory system of product is a necessary step of the product design, with euphonies as a supplement to make products more easily accepted by consumers. In interfacial operation, voice from modifications of functions and the evolution among images as well as interfaces that can

bring the feelings from the sense of hearing for users. Sound is an important element of human-computer interface; it can transmit information to brain by our channel of hearing. It is worth mentioning that the sound has a direct stimulation that vision can not, which stimulates the people to pay attention to new things. The sound of Interface Design is an art with the time flowing that different frequencies of sound waves form different rhythm, as shown in Figure (3), and instill different aesthetic feelings for people, so the sound gives an unique rhythmic of beauty that keyboard buttons can not directly comparable to, besides that, it provides the convenient for users through the conversion and connection between programs, as shown in Figure (4), allowing them to do other things freely, such as CREATIVE-ZEN (player), Apple-iPhone (mobile phone), all these products account for the beauty of voice, as shown in Figure (5) below. In addition, the Interface Design of sound can be applied to design blind mobile phone, which reflects the beauty of human nature, such as Owasys22C (blind mobile phone) as shown in Figure (6) and the table (1) below.

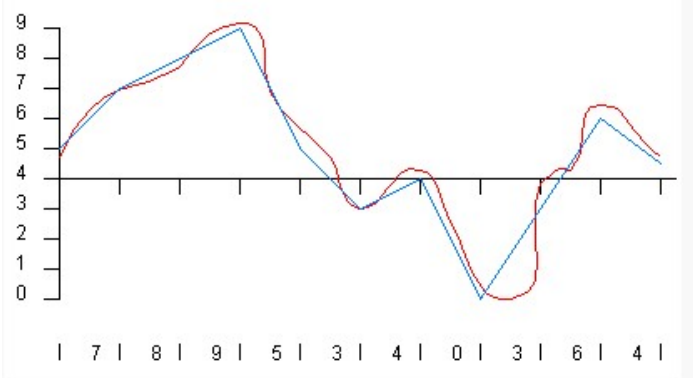


Figure.3 different frequencies of sound waves form different rhythm

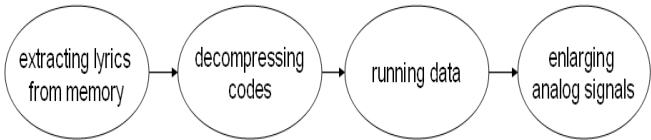


Figure.4 the principle of media player

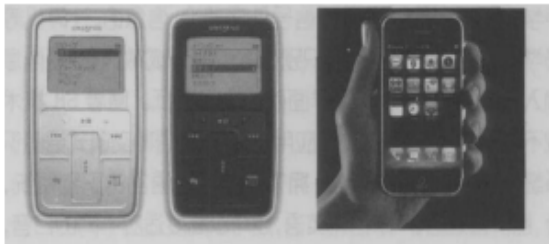


Figure.5 CREATIVE-ZEN (media player),Apple-iPhone(mobile phone)

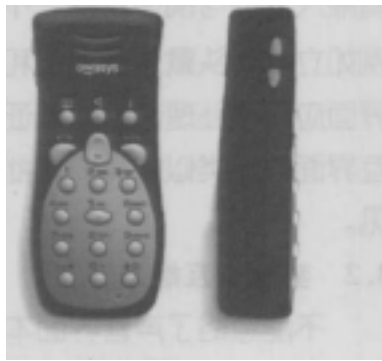


Figure.6 Owasys22C(blind mobile phone)

Table 1 the function and characteristics of Owasys 22C

1. size	118X49X27mm
2. weight	125 grams
3. function(without LCD display screens,all the functions are made completion by voice prompt. Through the voice prompt, users can know there are calls, text messages, or fails to mention telephone calls and such news. And users can know the various states, such as cell phone battery power situation, etc. In addition, users can edit text messages, and to send SMS text messages through phonetics check.)	GSM Bi-frequency(900/1800MHz) GPRS Built-in antenna design microphone state-of-the-art calls vibration serial port and headphones mobile phone stores 250 contacts senior phone stores the contact details special h-f buttons SMS messages, the telephone and alarm large capacity of 1500 mAh lithium batteries supporting the most 200 hours- standby time supporting for up to eight hours- talk time

3.1.2 Formal Beauty

The ultimate expression of beauty in form of product design is that overall shapes of the product must comply with the generally rule that people can accept and we call it the law of beauty, Interface Design is no exception. As Gorky put it “the law of beauty in form provides a way to affect the emotional and rational mode, which is a kind of power.” The aesthetic principles provide the extended space for UI, allowing the products to be recognized by the people as much as possible during the identification and operation and make it easy for the user in a natural state to complete the whole process. In addition, the various combinations of product shape, color, texture and other design elements also reflect the same beauty in form. Here, we only explore it from two aspects: form and color.

Firstly, the form: designers will considerate chiefly the appearance of the interface when they begin to carry out designing, disposing precisely the relationship between point, line, and other form of interface design to make an overall assurance, besides that, they focus on the general direction of the shape, so that users can be attracted by the most direct and important information of the product at first glance. As an important aspect of a product, the form always maps the beauty that is mainly reflected in the use of techniques and laws of art in interface design, especially in the configuration of layout, the appearance of buttons, the innovation of icons and so on, such as the interface design of Apple software,

there are many characteristic icons that exude the charm of Apple, as shown in Figure (7), here, we discuss the beauty on the form of the interface design of Apple software, such as form (2) below. Those beauties are embodied in this software generate a sense of pleasure and happiness in order to meet the various needs of people.

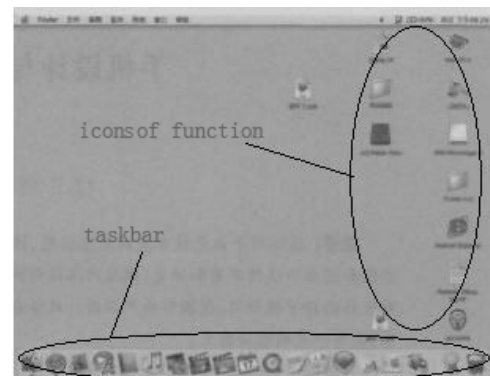


Figure.7 the interface design of Apple software

Table 2 the beauty on the form of the interface design of Apple software

the beauty of form	the interface of Apple software
1. from package to icon of interface	glamorous
2. the standardization of various elements	such as control, menus, column, each element contains standardization, according with the ergonomics requirements
3. interface appearance and the color of icons	using 32-bit colour
4. the whole shape of interface	designing by Interface Builder
5. the interface of programming	the latest programming, such as Quartz, Cocoa

Secondly, the color: there will have a direct relationship between visual experience and psychological emotion whether designers make good use of color or not. Excellent UI must have an infective sense of color and your own style. For the interface design, the choice of using color should be associated with the concept of corporate culture and product features and applications; what is more, we must choose the color that the user will feel comfortable. Before doing it, designers should understand the different colors have different emotional features that would have caused different effects, and carefully analyze the user's personality and find common points to satisfy the user's psychological expectations. For example, the target population of products focus on the traditional and the stable, according to this situation, designers should choose to use brown as main color, and apply the unified principle of an overall harmony of color, and sometimes by adjusting the brightness and saturation for the rich and complementary to the screen. The above each process reflects the color status and beauty including the unity of Color collocation, the characters of color performance and the

perception of corporate culture and so on in the interface design.

3.1.3 Technological Beauty

Interface design comes into being along with the development of high technology, and its high-tech occupies the central position of interface design, without technology as support, interface design will not be realized. Implementation of touching technique, implantation of sound (including voice) technology, the introduction of the Windows operating system and the memory technology, which are put in the interface design bag, at the same time, the interface, will have a further and perfect adjustment. High technology is the most unique and most attractive aspects for the interface design; every detail permeates the power of technology: the operating system is the soul of product, interface touch is the best channel between the user and products, technology makes a stronger sense of color easier to express the theme With the rapid development of computer-aided design, the final effect of interface is more colorful, and the integrated trinity of sound, pictures, portable devices appears, which can make people have immersive feelings and more incarnate the technology beauty of products. Such as the interface design of Nokia's E series of bar phones, as shown in Figure (8) below, the enterprise utilizes high-tech to give a special recognition factor that contains a unique patented technology of Nokia escaping from the strangeness, as shown in Figure (9) and form(3),the overall design conforms to the principle of ergonomic size, as shown in Figure (10), and it is more likely to hold and carry, which promotes users to master their functions without unnecessary over-learning as well as boost the development of local knowledge and experience to other situations.



Figure.8 Nokia's E series of bar phones

Table 3 the reflection of technology beauty about interface of Nokia's E series of bar phones

The technology beauty	Nokia's E series of bar phones
1. operating system	The operating system of Symbian9.2 and S60 FP1 software platform
2. network function	GSM850/900/1800/1900MHz network and GPRS/EDGE, CDMA, 3.5G network
3. the speed of network	HSDPA and 3.6Mbps
4. the resolution of mobile phone screen	QVGA resolution
5. video format of file	MP3/AAC/MPEG-4/H.263.etc.
6. bluetooth	A2DP bluetooth

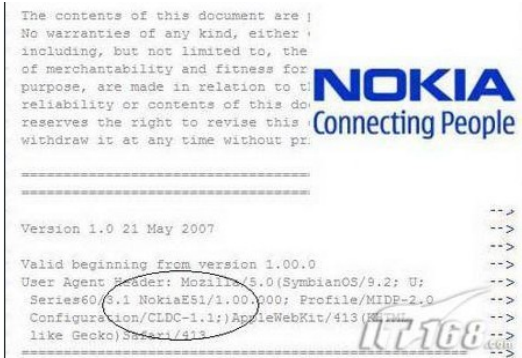


Figure.9 the principle of interface of Nokia's E series of bar phones

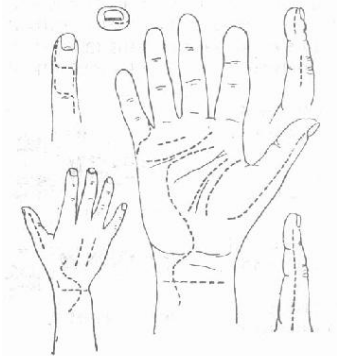


Figure.10 the physiological figure in hand of ergonomics

3.2 Following the Principle of Beauty

For the design, this is a platitude; interface design should also follow the laws of beauty. When we begin to do it, we should always bear in mind the following principles.

Firstly, the most important is to follow the principle of unity. The concepts of the interface mode and the way of displaying should be consistent with the same sequence of operations in the same or similar circumstances. For example, some functions are realized by producing the same terms or voice prompts in menus and help or in different application systems with a similar interface in appearance, layout, methods and the cross-information and so on.

Secondly, we must strive in unity to change. For example, the color issue mentioned above, we should make the choice of colors depending on the target to choose different colors and schemes, but the most important thing is to choose the right colors and set clear the primary of them instead of a color throughout the entire operating system and to seek changes in color that you can use complementary colors, gradient colors or the brightness adjustment.

Thirdly, we should grasp the rhythm and rhyme in the process of design. Sound (including voice) must have a certain rhythm, which can be controlled and mediated by the time. The arrangement of the screen should focus on the distribution of proportion and rhythm and modestly change the strength of the screen that you can sometimes be hurried, be slow and turbulent, besides that, the image converting should have a reasonable allocation of time. When we deal

with a single screen, if the rhythm appears to oppression, you can choose the layout of the golden section ratio to improve the overall picture impressions.

III. CONCLUSION

The digital products are appeared in large numbers in the information age, which makes the interface design has been received wide attention, more and more people not only experience the communications of information easily that are provided by this unique design, but also understand the newest and self-evident aesthetics of interface design, which uses the laws of beauty, High-tech's unique strength to bring our sense of great satisfaction and curiosity to explore the product. We believe that, in the future, the interface design will give us a finer sense of excitement and new experiences at a higher level, at the same time; it will develop more perfectly and just right rather than deviating from the basic laws of the beauty.

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