Research on User Experience Design Consistency of Internet Products Based on User Experience

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Abstract. In recent years, with the continuous development of network technology, our daily life has been inseparable from the Internet. The increasing popularity of various terminal devices has brought about a variety of system and screen sizes. How to maintain the consistency of user experience among a large number of device terminals has attracted more and more attention. As a bridge between human beings and Internet products, whether the interface design is satisfactory to users fundamentally affects the use of products, which is also a hot research topic at home and abroad. Based on the research of multi-screen interactive design, combined with the consistency theory and the construction method of consistent experience, this paper proposes to construct multi-screen interactive consistent experience by seeking commonness from the micro level and emphasizing the use of scenes from the macro level.

1. Introduction
With the rapid development of modern science and technology and the rapid rise of the Internet industry, various Internet products, represented by websites and software products, have entered people's vision. People's needs no longer rest on using products, but begin to pursue better experience [1]. With the development of information technology and science and technology, people have entered an era of rapid development of mobile Internet. Mobile terminal products such as smart phones and tablet computers have become more and more important in people's lives. People have also shifted from functional requirements for physical products to service requirements for virtual products. In daily life, more and more people are beginning to rely on various Internet products [2]. How to reduce the learning cost of users when using different devices and how to enable users to have seamless operation experience in cross-screen behavior are important issues designers need to face in multi-screen interactive design. Related researches emerge one after another, and various Internet enterprises also begin to flaunt the importance of user experience [3]. Studying the characteristics of Internet products is helpful to understand the importance and pertinence of user experience in this field.

Based on user experience, this paper explores the relationship between user experience and product design, and analyzes the design factors that affect Internet products. Technology is no longer the core competitiveness of products, but more the competition of user experience. Mobile devices are limited by screen size, which brings many challenges to user experience design.
2. Internet Products and User Experience

2.1. Internet products
What exactly is an Internet product, Baidu Encyclopedia defines it as follows: the concept of Internet product is an extension of the traditional sense of "product", a product produced in the Internet field and used for operation, and it is an invisible carrier to meet the needs and desires of Internet users. When users use mobile products, due to the complexity of the scene or the limitations of mobile devices, they will have extremely low application tolerance for poor user experience. People almost always seek balance, harmony, identity, no conflict and predictability. Any inconsistency will be regarded as psychological discomfort [4]. Interactivity is a basic characteristic that users need to put forward their demands and then meet them. In fact, for many products, interactivity can enhance the user experience, but this is not necessary in the field of traditional products. Put the user experience in the first place in the design, take the user's needs as the starting point, and integrate their own usage habits into the design of new products, thus assisting designers to design products that more conform to the public expectations and usage habits [5]. Since the development of user interface design, from the initial consideration of the operation control and operation process of the equipment to the consideration of the emotional needs of people, a "people-centered" user experience design concept has been formed.

2.2. User experience
User experience refers to people's cognitive impression and response to products, systems or services that they use or expect to use. It is an innovation in which users participate. It is based on the view that users are supreme. It is a purely subjective psychological feeling established during the process of users using a product (service). Mobile Internet is a user-centered design. As a designer, understanding the user's behavior goals and allowing users to have foresight in operation during the use of products can reduce the cognitive difference between designers and users [6]. In the field of Internet, whether the interaction between people and products or the interaction between people and others through products is an integral part of user experience. As the basis for judging a product's design level, the concept of "user experience" pays more attention to the degree of recognition of users in the process of product use. Considering its use scene, its own screen and input characteristics, it has been greatly reduced in size, leaving only a few main functions that can meet the needs of mobile scenes. In order to ensure that the products meet the needs of users and avoid the occurrence of users adapting to the products, the design of product application scenes is carried out in combination with practical psychology, computer technology, art and sociology and other disciplines.

3. User Experience Design of Internet Product

3.1. Consistency of user experience

3.1.1. Consistency. In an Internet product, content refers to the needs of users and the functions of the product. An excellent Internet product needs to be consistent in terms of function and wording. It can be clearly seen from China's 2012 mobile internet trend report that mobile internet users have been surfing the internet 24 hours a day, from 7: 00 a.m. to 10: 00 a.m. and from 9: 00 p.m. to 12: 00 p.m., mobile internet has become the internet surfing method of choice for most users. According to the consistency theory, in multi-screen interaction, especially sequential cross-screen behavior, if the user has a good impression of both the webpage end and the mobile phone end, the two terminals can interact well during cross-screen use [7].

The macro level in the user experience shows that the value expectation of product design can conform to the user's cognition, mainly corresponding to the strategic level and scope level; The microscopic layer corresponds to the structural layer, the frame layer and the presentation layer, and the corresponding relationship between user experience elements and mental models is shown in fig. 1.
As a designer, understanding the relationship between the user's mental model and the user's experience can obtain a method of consistent experience design in multi-screen interactive design.

![Diagram of mental models](image)

**Figure 1.** Correspondence between user experience elements and mental models.

Wording such as product interface language, operation feedback prompt, help language, etc. also need unified language to describe. At the same time, the copy and wording should also conform to the style and emotion of the product, such as an Internet product designed for children. "Interface" is a platform for human-computer interaction. The design of product interface (including soft and hard interfaces) should be able to quickly and accurately convey information between users and designers so as to synchronize information [8]. After a behavior is generated, users with feedback do not know whether the goal has been reached, so the feedback provided by Internet products and the way of feedback directly affect the experience.

### 3.1.2. Consistency of behavior

Behavior is the interaction and interaction process between users and products. For example, the process of picking up a mobile phone to make a call: we need to unlock the mobile phone first, find the target phone number, call the number, and end the call by some means (address book search, finding the nearest contact, etc.). This also means that information should be correctly recognized and understood by users in the interactive process, forming communication between users and designers about specific functions and forms of products [9]. Of course, people cannot do without social network applications. Through social software, they can interact and socialize with friends anytime and anywhere. The most important thing is the dissemination of information. A good user experience can increase users, and conversely, it will also reduce users exponentially. For example, Tencent's PSplay software can preview the design of computer Photoshop in real time on terminal products and can share the design across terminals through computers and mobile terminals in a WiFi environment. At this time, the user uses the service on the computer screen, and then moves to the mobile phone screen to continue the same task, which is a sequential cross-screen use behavior. As mentioned above, a kind of feedback and interaction is very important to affect the experience. Timeliness is often related to whether the feedback and interaction are fast enough. If the interaction is completed with the user immediately, a part of the pleasant experience will be completed.

The operation modes of different terminals have their own characteristics. Different operation modes will affect the design of man-machine communication interfaces of different terminals. See Table 1 for common terminal operation modes.

| Control mode | Mouse+keyboard | Touch control | Somatosensory manipulation |
|--------------|----------------|---------------|---------------------------|
| Control action | Mouse click, mouse hover, keyboard input | Click, slide, drag, rotate, double click, long press | Hand waving, leg lifting, etc |

**Table 1.** Common terminal control methods
The user's operation should be consistent in the process. For example, after the process of shopping on the PC side is applied to the Phone side, from adding to the shopping cart to submitting the order to payment, the whole process should be consistent with the PC side and respect the user's experience. Therefore, a successful Internet product needs consistency in function and wording. It is necessary to ensure that the products maintain the unity of main functions in different mobile devices such as smartphones and tablet computers, and to set their functions according to different usage scenarios. When a user has a preconceived perception of PSplay on the computer side, and if there is a cognitive conflict with the user on another device, the user will have cognitive dissonance. Different platforms and different devices have different navigation methods, input methods and gestures, which leads to a variety of user operation methods. In terms of operation methods, try to keep consistent with platform specifications. Therefore, invisible Internet products have more uncertainties for designers and users. Designers and user researchers need to have more accurate prediction and deeper understanding of user experience.

3.1.3. Formal consistency. Form consistency is mainly reflected in the interface style, layout, color matching, fonts and other aspects. Interface style: Interface style is the style of the product. It should conform to the positioning of the product and try to cater to the preferences of the target users. The whole process is based on the idea of user experience, and a series of product design activities are carried out along with the Internet product cycle, mainly including: requirements research, requirements planning, requirements consensus, requirements management, information architecture, UI design, prototype design, testing, development, iteration, etc. For example, when buying things on mobile phone Taobao, the whole process should be consistent with that of the PC side, from the retrieval of the goods to adding them to the shopping cart, and then submitting the order and payment. Strong buildings will also be destroyed and disappear in natural disasters, but even if users' computers are broken, they can log on Facebook to obtain information and data from any device as long as they have an account. When designing interfaces for different terminals, it is necessary to make the same product keep the same interface style on different terminals to provide users with a "familiar feeling". Layout: Layout mainly refers to the distribution of different controls and different functional modules in the page. The size and resolution of PC, Pad and Phone terminals are different and varied, so it is unlikely to maintain exactly the same layout on different terminal devices. Today's Internet products are no longer purely technology-oriented or content-oriented, but advocate man-machine interaction based on "user experience", and winning the favor of users and the market is the top priority. Different platforms and devices have different navigation and input methods and mobile phones, which easily lead to a variety of user operation methods. A perfect color scheme should be able to integrate the colors in it so that it can be applied to a wide range. Color matching should pay attention to "contrast" and "consistency" of colors. It is best not to exceed 3-4 colors in the same product, and all colors should be consistent in lightness or saturation as far as possible. It can present perfect and rich content on large screens such as computers, while for some smaller screens such as mobile phones, due to space constraints, the content and mode of presentation are very limited. Designers need to design solid products, starting with color, shape, materials and other aspects. Designers can predict how users will use it. Users who use a platform system will adapt to the standard fonts of the platform. In order to make users use the product effortlessly, without extra thinking and natural reading, font selection will depend on the platform system as much as possible.

3.2. Personalization of user experience design

3.2.1. Consider specifically the product movement scenario. The most important feature of mobile devices is that people can use them all the time, so designers need to focus on the experience of users in mobile situations. Mobile scenario refers to the environment and user status in which users use Internet products, that is, external factors that affect users' use of mobile devices. In the past, the solution of providing different web pages for different devices guaranteed the effect, but it was more
troublesome and required several versions to be maintained at the same time, which also increased the cost accordingly.

On the premise that the usage scenarios of different terminals tend to be the same or similar, the intersection of each screen at the presentation layer, frame layer and structure layer should be taken as the main design point, and then the differences caused by different screen characteristics should be merged. See Figure 2 for the consistent construction method of microscopic mental models.

![Figure 2](image_url)

*Figure 2. Consistency construction method of micro mental model*

Internet products have no physical load and are unpredictable. Designers don't even know how users will operate. Designers hoped users could complete a task through several steps, but they may not achieve results. The external environment will change continuously and rapidly. More consideration should be given when designing the user experience. According to the problem of the user's inattention, gesture operation, power consumption and flow control, a reasonable interaction mode should be designed. Interaction requirements focus on whether the interaction process is smooth and whether users can simply complete their tasks.

3.2.2. **Improve usability of products.** The usability of Internet product user experience is that a specific user can use the product efficiently and satisfactorily in a specific scene and achieve a specific goal. The desktop device is usually controlled interactively by using a mouse and keyboard, and can also be controlled by other external devices such as software systems and screen objects. People have achieved their goals more quickly through the Internet. It is precisely because its instant Internet products have impacted or even replaced traditional products in many fields. The usability of the product can comprehensively measure whether the product can meet the user's goals in the use scenario. Successful user experience design of Internet products can simplify complex problems, improve the user's use efficiency, smoothly understand and recognize the product, and quickly complete tasks with minimum time and cost [10]. Modern product design should change the image that was not close to the people in the past. It should not only create perfect artistic form, form aesthetic value and display spiritual function, but also pay attention to the design of experience and the feedback of consumers, so as to continuously improve the current design defects of products.

3.2.3. **Sufficient trust.** Creating friendship links enables users to evaluate this product and similar products. If only some unknown small stations are linked, the users' evaluation on them will not be too high. It should also be noted that the number of friendship links should not be too large, but at the same time they should show their strength. Although touch input is rarely applied to desktop devices, its application on mobile terminals and notebook computers is mature. On the touch screen, you can use your fingers to get different control results according to different forces and directions. Of course,
in this case, the user experience becomes particularly important. For example, someone needs to buy drinks on weekends, and there is a shabby grocery store near his home, which sells more expensive and may not have all kinds. It can be seen that the reason why a product is excellent is that it can provide users with pleasant sensory experience.

3.2.4. Appropriate user assistance and feedback. Any Internet product, the operation of its interactive process, has a certain learning cost for new users. Successful products should consider introducing the product quickly when users enter the home page of the product and familiarizing users with the basic operation methods of the product. Mobile scenes mainly include public transportation environment and open air environment. Handheld terminals and wearable terminals are usually used in mobile scenes. Typical stable scenes include family scenes and office scenes. Internet products are often first introduced with an imperfect version, which is continuously improved and corrected in the process of user use and feedback. The success and decline of Internet products are very fast, and they can be achieved or defeated overnight. The first step in the interface design should be to analyze the interface, user characteristics, tasks and other aspects in combination with the multimedia application system, record relevant terms and concepts, and finally form a systematic user analysis report. On the premise of not disturbing the fluency of the user experience, timely and friendly feedback is provided for the user, thus improving the user's favorable impression on the product.

4. Summary

Internet products are entering an era of vigorous development. User experience design is the core and soul of products, and focusing on the interaction between products and users can reflect the value of products. How to effectively improve the user experience of the interface has become an urgent problem to be solved. User experience, as an important factor determining the success or failure of product interface design, continuously guides products and services to a more humane direction. At present, many experienced design teams will write design specifications during the design process, including standard controls, annotation legends, gestures, text wording, color schemes, etc., which will maintain the consistency of products, improve efficiency and reduce costs. Based on the relationship between mental model and user experience elements, this paper explores how to maintain the consistency of designer model and user model in multi-screen interactive design, designs products that meet user expectations, and constructs a good cross-screen experience for users.

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