Web User Experience Model Based on Universal Psychological Stratification Theory

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Abstract

This paper first introduces the concept of user experience; secondly, builds a web user experience model based on universal psychological stratification theory and proposes the user experience design can not only meet the usability design but also focus on integrating with the user's psychological and emotional research methods at the same time;finally, discusses the principles, techniques, and related technologies for Web user experience design from the user goals, usability design and psychology-based user research methods.

Keywords

User experience,User psychology,Experience design.

1. Introduction

The user experience has received more and more attention with the advent of the experience economy [1]. However, the academic circle has not formed a unified understanding of the concept of user experience [2]. The typical definitions include: Alben believes that the user experience covers all aspects of user interaction with the product, including user perception, understanding of the product, achievement of the target, and the adaptability of the product and environment [3]. The Nielsen-Norman Group considers that the user experience covers all aspects of the interaction between users and businesses and their products or services [4]. Mäkelä & Fulton Suri defines the user experience as a result of individual motivations that result from specific motives [5]. Hassenzahl & Tractinsky deems that the user experience is the product of the interaction of natural user states, system characteristics, and particular situations [6].

In summary, the user experience occurs in the interactive process, and the interaction object includes the user, product, and system [7]. We define the user experience as a whole experience resulting from the interaction with the product or system driven by certain user needs and motivations. The extension extends from the traditional product or business service experience to the user experience supported by the Web service platform. The endotoxin gradually goes from simple usability design to the study of user psychology and emotional factors in the interaction process

2. Web User Experience Model Based on User Psychology Research

2.1 From Usability Design to User Psychological Research

Researchers proposed cognitive research as the theoretical basis for user research and demonstrated the critical influence of user cognition and emotional characteristics on their web search behavior after the 1970s. The developers apply the cognitive rules of human to web interaction design to realize the isomorphism of the user's cognitive model with the User-Centered Design, and the concept of usability design matures [8]. However, its primary research direction focuses on the user's conscious cognitive ability's influence on their behavior, and the essence is to study the usability of the product or website design, evaluates the design results through usability testing, user feedback, and on-site observation at the same time.

User psychology includes both cognitive and emotional aspects. User cognition reflects the understanding of the relationship between specific things and their related things, and the user's emotions are more of an emotional preference or disgust, emotional closeness or alienation. The user mental model mainly presents an abstract concept from both cognitive and psychological perspectives. From a design perspective, it is more like a "diagram" or "knowledge concept map," from which the user-centered mutuality is revealed. The connected thing or concept. If these things or concepts are regarded as one point, when one of the points is activated, other relevant aspects are quickly activated. Only when these points and their activation relationships meet the user's cognitive structure and emotional needs can the user understand the things or concepts and gain a positive user experience.

The user experience design based on user psychology research focuses on combining the cognitive structure and emotional characteristics of different users, constructing a reasonable user mental model.It is the main way that is going deep into the understanding of user goals and behavioral motivation, and mining and predicting user attitudes, expectations and behavior. And promoting the knowledge of information and enhance user loyalty by establishing a homogeneous Web information space.

2.2 Web User Experience Model Based on Universal Psychological Stratification Theory

Norman believes that the process of understanding and experiencing things need to through the Visceral, Behavioral and Reflective processing [9]. And this theory reflects the essential rules of people's opinion and feeling of universal things. It also similarly applies to the website construction and user experience design under the Web environment. As the user profoundly understands and interacts with the website, the user's psychology also shows the perception-based visceral, the interaction-based behavioral, and the reflective based on the utility and experience in the process of Web services, as shown in Figure 1.
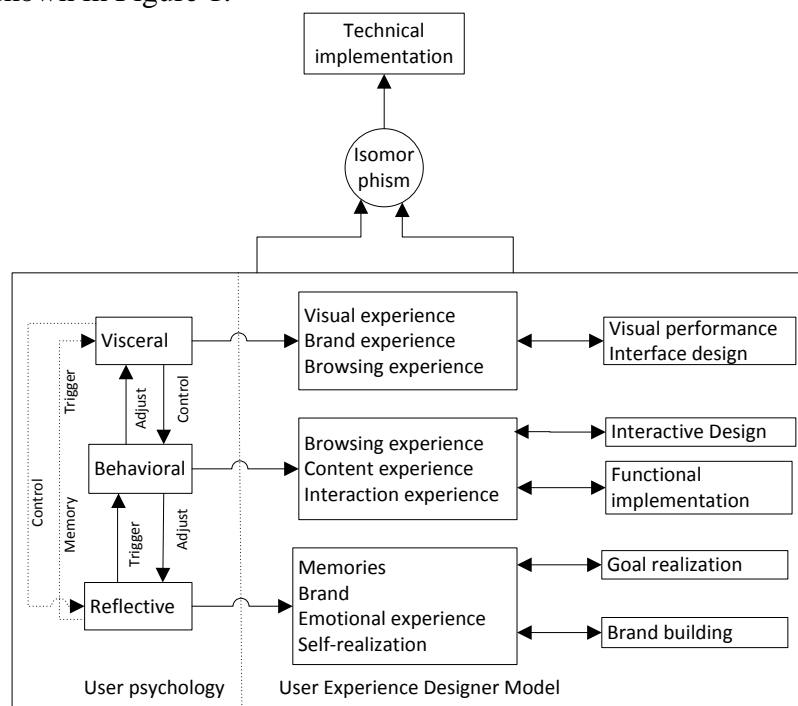

Fig 1. User Experience Model Based on User Psychology Research

The user experience of the visceral layer is associated with the sensory system, which is the most real part of the user's experience. Therefore, it is associated with the visual design and interface design of the website's surface. The user experience of the behavioral layer is related to the interaction design and functional design of the website and is represented by a series of user behaviors driven by the user's goal. The user experience of the reflection layer is at the highest layer of the model and does not directly receive direct control of the information input or implementation behavior of the body-aware

system, but it is stable over an extended period. It is the accumulation of similar experiences in the past, and it is often difficult to change because of an interactive experience.

2.2.1 The Visceral Layer Design of Web User Experience

According to the analysis of proximity to users, visual performance and interface design are directly linked to the user's visceral layer, focusing on appearance and creating a good initial impression on the user. The experiences related to the visceral layer mainly include (1) Visual experience: Visual design may attract users in a short period and inspire further information behavior. The factors include the color, font, picture, and button used by the website. (2) Brand experience: including the user's first feeling whether he likes the name of the website, whether the name is easy to remember, whether the concept conveyed by the brand design can give users a deep impression and so on; (3) Browsing experience: The user's browsing experience is related to the interface design, including page layout, logo settings, and frame design.

2.2.2 The Behavioral Layer Design of Web User Experience

The interaction between a user and a website is related to a behavioral layer experience. The behavioral layer experience is mainly determined by the user's skill level, similar experience, and associated memory, but does not need to think too much, just as the user will naturally click on the top left of the page to return to the homepage, or find contact information at the bottom of the page. The user experience design of the behavior layer includes (1) Web function experience: It mainly aims at providing application-based websites, such as marketing websites and game websites, and pays attention to availability, usability, and serviceability. (2) Web content experience: aiming to satisfy information requirements of different user groups through personalized information navigation, information recommendation, and information customization services to avoid user confusion, frustration, and loss caused by extensive information. It's mainly for websites that provide information resources and information services, including digital libraries, information websites, and so on. (3) Behavior layer browsing experience: Its design is established personalized navigation design based on user interest mining and behavior pattern analysis, including path guidance and personalization recommendations, contextual links and so on. The purpose is to create an individual information space that can be understood by users. (4) Web interaction experience: Its design is expressed in the form of information interaction supported by the system, including user interaction with external systems, systems and external systems, and interacts with users and users.

2.2.3 The Reflective Layer Design of Web User Experience

The reflective layer design shows the highest pursuit of the web user experience and achieves user goals. Achieving the user goals includes two aspects: (1) The realization of usability goals: that is to say the website can effectively meet the needs of users or fulfill the task of user delivery; (2) The realization of value goals: the formation of the value impression is the common result of the user experience design of the visceral layer, behavior layer, and reflective layer.

The user experience design of the reflective layer is closely related to different users' social culture, experience, knowledge structure and individual characteristics, and on the basis of a series of "current feelings" generated by the visceral layer and behavior layer, the user is further explored and thought; At the same time, the existing perceptions and emotions of users on similar websites or systems will also influence and control their behavioral and visceral layer experiences. In this sense, the design of the reflective layer goes beyond the scope of usability design and penetrates into the field of user psychology and emotion research.

Overall, the user experience design model based on user psychology not only surpasses traditional user behavior mining and pattern analysis based on usability engineering but also emphasizes user perception and experience at different levels. It not only pays attention to the smooth transfer of information content. Pay attention to what information receivers see, think, and feel to maximize the overall value of Web systems and user services, including brand value, user loyalty, service credibility, and persuasiveness. Its purpose is to transform the abstract concept of user experience into

practical, quantifiable and specific development processes such as actual requirements analysis, content organization, structural design, interaction design, interface design, and visual optimization.

3. Principles of Web User Experience Design Based on User Psychology

Although the user experience has a broader scope than usability, the ultimate goal of users visits a website or system is to complete a task or achieve an information requirement. Therefore, user experience design must first comply with the norms and principles of usability design, but its scope has been extended to the design and measurement of user behavior and psychological availability.

3.1 Driven by User Goals

The user's goal that has long time stability is the power of the user to access the website or information system. It represents the user's expectations, intentions, motivations, and higher than the user's demand. Being driven by goals means that developers must go beyond specific task design details in the process of designing web user experience, focus on higher-level user goals, and understand the true motivation of users.

3.2 Based on Usability Design Method

Web user experience design needs to follow usability design methods, emphasizing simplicity and ease-using. The assurance information can be presented to the user in a reasonable and easy-to-understand manner and remove the interference of redundant information as much as possible around the user's goal in the design process. General usability research methods include direct observation methods, user interviews, questionnaire surveys, and automatic system feedback. The focus is on the combination of qualitative research and quantitative research methods to ensure that the actual situation of users is reflected as thoroughly as possible.

3.3 Research Method Combined with User Psychology

The interaction between a user and a website or information system is not just a matter of mechanically performing a series of tasks to achieve goals, but is instead mingled with complex emotional and psychological activities and expressed through expressions or actions. Research method combined with user psychology is mainly to capture the user's psychological changes through specific apparatus and equipment. Conventional research methods include: (1) Expression capture: recording of user's facial expression changes by camera; (2) Eye tracking: accomplishing through a dedicated eye tracking device, which is a typical user research method in the past two years; (3) Pupillary reaction: studies have shown that pupillary contraction and expansion are associated with physical effort, interest, and emotional responses during user manipulation or interaction; (4) Skin conduction and heart rate tests can monitor the user's psychological pressure changes. All of the above research methods need to be completed with the corresponding equipment, but these methods can help designers to study user psychology and user emotions through scientific measurement methods.

4. Conclusion

User experience design based on user psychological research try to coordinate design models, development models and user psychological models as much as possible to improve and optimize the psychological experience and experience of users at different levels of experience by applying research methods related to user cognition and user emotions to the entire design and development process of a website or information system. Although research on user psychology is not yet mature, studying website design and system development from the perspective of user subjective acceptance and comprehension is a true user-centered development practice, and it is the hot topics in the field of Web information construction and user experience design.

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References

[1] Li Fuqing. Positioning and Design of Experience Consumption [J]. Business research, 2005(1):78-79.

[2] Luo Jiang. Evaluation of User Experience in Social Commerce [J]. Knowledge Economy, 2016(6):64-64.

[3] Kadlec. Responsive Web Design Practice [M]. Posts and Telecom Press, 2013.

[4] Li Xiaoqing. User Experience Design Based on User Psychology Research[J]. Information Science, 2010(5):763-767.

[5] Mäkelä A, Fulton Suri J. Supporting users' creativity: Design to induce pleasurable experiences[C]//Proceedings of the International Conference on Affective Human Factors Design. 2001: 387-394.

[6] Hassenzahl M, Tractinsky N. User experience-a research agenda[J]. Behaviour & information technology, 2006, 25(2): 91-97.

[7] Chen Jing, Xiao Liping. An Overview of Interactive User Experience Design in Products[J]. Design, 2014(a06):13-14.

[8] Fan Lingxiu. Research and application of image modeling design of cultural products based on user cognitive thinking [D]. Guizhou University, 2017.

[9] Gavin Allingwood, Peter Bill, Gavin Allanwood, et al. International Classical Interactive Design Tutorial: User Experience Design [M]. Publishing house of electronics industry, 2015.