

User Experience Design of Text Creation Products Based on Human-Computer Interaction System

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Abstract. This paper investigates the use of human-computer interaction in the user experience design of cultural and creative products. Based on human-computer interaction, a human-computer system model of user experience design is constructed, and human-computer interaction is used to clarify the relationship between "user-cultural product-cultural environment". In addition, the cultural contact points of users are identified from the cultural experience layer, and finally, the feasibility of the method is verified through design cases. With the purpose of strengthening users' cultural experience, it analyzes users' cultural experience process using human-computer interaction, defines experience points from it and then completes the design. Starting from the source of users' initial contact with culture experience, the process of cultural experience of users before contacting physical products is deeply explored, and the design points of user experience are sorted out and optimized by taking Tujia brocade cultural and creative products as an example (products include Internet products and physical products). Ultimately, the Tujia brocade cultural service website is used as a carrier to deliver the user experience design of cultural and creative products for the purpose of optimizing cultural experience.

Keywords: human-computer interaction; Experience design; Creative products.

1. Introduction

Most of the research on cultural and creative design over the years has to do with the perspective of product design and to input cultural experience to users from the product design. However, users often begin to experience and understand culture from the moment they are initially exposed to it. Such initial cultural contact even plays a decisive role in whether cultural consumption behavior is generated later. The analysis and research of the human-computer model integrating human-computer interaction and user experience can pinpoint the cultural experience layer of users in the whole set of processes from cultural cognition to cultural consumption, and it can define the cultural experience points of users out of them. Designers can input experience design to cultural experience points to better complement users' sense of cultural experience of cultural and creative products, thus improving their sense of cultural identity and ultimately achieving the purpose of cultural inheritance.

2. Human-computer interaction and user experience

2.1. Human-computer interaction

Human-computer interaction is a more widely used analysis model in the service design discipline. By analyzing the service process, human-computer interaction can completely reproduce the behavior at the user and service layers, helping users to identify key points in the blueprint for analysis and design. Human-computer interaction was proposed by American scholars Shostack and Brundage, and it is grounded on the idea of putting itself in the customer's shoes in order to fully understand the customer's point of view and ideas, describing the type of service the customer needs and representing it in the form of a flow chart.

In developing HCI strategies, it is beneficial to strategic formulation or adjustment by understanding the strengths and weaknesses among the links and identifying their core links. The United Nations Environment Programme has proposed the concept of Product Service System (PS), which emphasizes building users' loyalty to a product by enhancing the service experience of the product from the perspective of a system consisting of tangible products and intangible services,

thereby delaying the time for discarding the product and realizing the sustainability of the product. It indicates the usability of the intersection of service design discipline and experience design discipline. That is, the user analysis advantage of service design can be applied together with the processing method of the experience design model to create the maximum value of product experience for users. As a classical model of service design discipline, human-computer interaction, after years of development, research and application, can link a whole set of service process of "user layer - frontend layer - backend layer - service support layer" and reproduce the process of user experience. It is a good aid to extract the design points of experience design. Li Chun, Zhang Yuping and Sun Rui analyzed the design of a home ventilator using human-computer interaction and found a way to optimize the product. Dang Xiaoli and Xu Dong [5] mapped the human-computer interaction of online retail enterprises, from which key points, waiting points, decision points and experience points were extracted for analysis and design to optimize the online retail services.

2.2. User experience

After nearly 20 years of development in China, user experience has gained prominence in social and economic aspects, and even reached the world advanced level in some fields, and it has become an important driving force for quality brand building in China. The ISO 9241-210 standard explains user experience as follows: user experience is the overall feeling of the user before, during and after using a product or service, including emotions, beliefs, preferences, cognitive impressions, physical and mental reactions, behaviors and achievements. User Experience Design (UED) studies and analyzes the user's experience of a product and optimizes the design based on it, with the key point falling on the user's experience process and sense of experience. In the application practice, the focus is on interaction design such as web design, interface design and terminal design for the Internet. The essential feature of UED is to coordinate the dynamic relationship between the human-computer system of the context composed of "human-product-environment" and create a lifestyle with multiple harmonious structural relationships for people, and the human-computer system model of context-based user experience design is shown in Figure 2. "Human" refers to the attributes of product users, "product" refers to the attributes of objects and usage methods that are related to human beings, and "environment" refers to the physical and virtual contexts that influence the use of humans and products.

The research of user experience design can create the experience of product and manufacturer's corporate culture for users with the help of tangible products and invisible service environment. Nowadays, with the emphasis on enterprise individuality and brand effect, user experience design should not be limited to the single layer of "human-product", but should emphasize the connection and cycle between "human-environment-product". In extracting design points, designers can restore the experience scenario through contextual analysis and other methods, connect the relationship between "human-environment-product", present a complete human-computer system model of user experience design, and conduct need-based exploration, define design transformation points based on user experience, and finally output a traceable and justifiable user experience design.

3. Design method of cultural and creative product experience based on human-computer interaction

3.1. Human-computer interaction and cultural experience layer

For users who purchase and use the cultural and creative products of intangible cultural heritage, the cultural significance and cultural experience carried by the products are greater than the usage and meaning of the products themselves. In the process of cultural consumption, the cultural connotation of the product can be presented to the user in a natural and profound way, providing a good cultural experience for the user [10]. The "I know paper tape" and "Qianlong Royal Treasure paper tape" launched by the National Palace Museum in Taipei, China, sold out within a month of

hitting the shelves, and there were even cases of people selling them at a higher price. The Forbidden City's lipstick set has been receiving a lot of attention even before it hit the shelves, and it sold out as soon as it hit the shelves. Interestingly, the two official online stores certified by the Forbidden City, "Forbidden City Taobao" and "Forbidden City Museum Cultural and Creative Products Flagship Store", have put up lipsticks of different designs at the same time. It triggered a discussion between netizens about which of the two stores is of lineal descent, and reached a high level of heated conversation. Customers choose to buy these cultural and creative products because of the cultural information carried on the products, not because of the basic usage attributes of the products themselves. While satisfying consumers' cultural and aesthetic needs, the cultural and creative products also give them spiritual enjoyment and will also make them identify with the relevant traditional culture^[11]. Therefore, the driving force of consumption of cultural and creative products clearly falls on the cultural theme and cultural significance of the products. The cultural theme, as the resource base of cultural and creative products, is itself rich in resources and good visibility and reputation^[12]. Therefore, the focus of today's cultural and creative design should be on how to convey more cultural connotation and cultural experience to users through the representation of cultural themes. It is necessary to use human-computer interaction as an aid to clarify the whole process of customers from selection to purchase, to find out the cultural experience points that can reach the users, and to optimize and transform the products with design.

The experience point in human-computer interaction refers to the link where customers experience the information carried by the product during the whole process from purchase to confirmation of receipt. For cultural and creative products, it is the node that enables customers to experience the cultural information carried by cultural and creative products in the whole process from acquiring culture to purchasing to confirming receipt and use. By constructing human-computer interaction, designers can identify the cultural experience point that can be accessed between the frontend layer and the customer layer, and on this experience point, design interaction behaviors that users can experience culturally through the five senses to maximize the cultural experience value of a cultural and creative product. The cultural experience point usually appears on the external interaction line, i.e. between the customer layer and the frontend layer, and it can directly serve the customer

3.2. Designing a human-computer system model for human-computer interaction and user experience

The research of experience design for cultural and creative products focuses on clarifying the process of user exposure to culture and effectively locating the points for inputting cultural experience in this process for design. In the closed loop of the human-computer system model of user experience design, human-computer interaction can be used to analyze the connection, and it can be used effectively. Moreover, based on the advantages of users, service for users, and direct action on users, the designer's function is placed in the backend service behavior layer, and the function of cultural environment is placed in the frontend behavior layer, so as to build an analysis environment that facilitates the extraction of cultural experience design points. In the human-computer system model of user experience design, human, product and environment are defined, and "human" is the purchaser, user or those who are interested in culture, collectively referred to as "user". "Product" refers to cultural and creative products, i.e. modern products that are designed and processed, culturally integrated, and in line with the aesthetics of the new era, including physical products and Internet products. The "environment" is the cultural environment that users come into contact with during the process, including the three main environments of initial contact with culture in the early stage, understanding culture in the middle stage, and purchasing and using the cultural and creative products in the later stage. The form of such environments can be expressed in carriers such as culture-related official accounts and cultural websites. By establishing the connection between users, cultural and creative products and cultural environment using human-computer interaction, it helps designers to locate and define the nodes of users' experience for cultural and creative products and cultural

environment. Moreover, it can further confirm the tasks that should be improved in the frontend and backend layers to maximize the cultural experience of users.

In the human-computer system model of user experience design based on human-computer interaction, the cultural environment placed at the frontend behavior layer plays a key role in linking the experience of cultural and creative products. It is the cultural environment where users can perceive cultural forms, receive cultural connotations, and learn as much as possible about the cultural architecture behind the cultural and creative products. In this paper, we will focus on the cultural environment as the design object and complete the user experience design with the cultural website as the carrier.

3.3. Steps of user experience design based on human-computer interaction

In the hierarchical relationship of human-computer interaction, the designer often plays the role for the backend service. The construction of HCI allows designers in the backend layer to go deep into the user layer and extract the key points of close contact between users and service providers in a concrete way. Then, through the linkage of the frontend service layer, the backend service layer is penetrated as a channel to understand users in order to better serve customers with design. Before starting the design, the designer can first define the service scenario and confirm the users in the scenario. Second, designers can use human-computer interaction to list user processes, locate user experience points based on user behavior, and analyze experience content. Third, the designer can further design the content of the experience based on the attributes of the product and the information carried by the product. Finally, the designer can output a complete set of service process that is optimized based on experience. .

4. Design practices

4.1. Human-computer interaction construction of Tujia brocade cultural and creative products

Regional traditional culture is a representative cultural resource ^[13]. Tujia brocade, also known as Xi Lan Ka Pu, is distributed in the regions populated by Tujia people in western Hunan, and is considered to be the visual symbol of Tujia people. Tujia brocade integrates the aesthetic concepts, living habits, cultural customs, religious beliefs and other cultural traits of Tujia people, and has a unique ethnic style of Tujia ^[14]. In this paper, the UED based on human-computer interaction is studied from the service of cultural and creative products, and the cultural experience design of Tujia brocade is used as an example for design verification. The human-computer interaction construction for cultural and creative products must uphold the concept of customer cultural experience as the core, and define the experience points that can be designed at the experience level. Related research shows that the building of a user portrait model can help to better understand user needs and realize personalized and accurate information services ^[15]. In this paper, we selected a scenario in which the cultural and creative products of Tujia brocade were sold online, selected suitable user samples, drew user portraits, tracked customer behavior, and constructed the human-computer interaction for online sales. The user portrait information is collected in Table 1, and the human-computer interaction structure for online sales of cultural and creative products.

Table 1. User portrait information collected

	Gender	Occupation	Have you ever purchased any cultural and creative items made of Tujia brocade?	Remarks
User A	Female	College student	Yes	This user bought a Tujia brocade mouse pad online and continued to use the product after purchase
User B	Male	Human Resource Manager	Yes	The user bought a brocade tapestry during a trip to western Hunan and left it unused
User C	Male	Engineer	No	The user read about Tujia brocade from an official account on the Internet, but did not get to know more about it.
User D	Female	Designer	No	The user pays attention to the information of Tujia brocade and other cultural and creative markets, but has never purchased
User E	Female	Freelancer	Yes	The user is a big fan of the Forbidden City's cultural and creative items and bought some brocade hangings

Designers can look for experience points on the external interaction line between the customer level and the frontend service level and define key experience points where cultural information can be input from the customer's five senses experience. In this paper, four experience points are defined as follows. Experience point 1: the point of audio-visual sensory experience of cultural information. Users acquire preliminary cultural information from media, such as websites, official account platforms, microblogging platforms, etc. Most of the information is presented in the form of patterns, documentaries and tweets of Tujia brocade. The cultural information at this experience point is gathered in visual information and visual and auditory information.

Experience point 2: the point of visual sensory experience of cultural and creative products. It is the point where users first come into contact with the products and decide whether to know more about them. When choosing from a wide range of cultural and creative products of Tujia brocade, users are more likely to choose based on which product is more appealing to their eyes. User A said bluntly, "Good-looking appearance is the only criterion for me to judge whether or not I may purchase it."

Experience point 3: the point of cultural connotation experience of cultural and creative products. When the user comes to this experience point, he or she will get more information from the product details page of the cultural and creative products, such as the functional properties of the products, the cultural information implied in the design, and the cultural elements they represent. From the product details page, users can have a better knowledge of the cultural connotation of the cultural and creative products in more dimensions and develop a more intuitive and comprehensive cognitive impression of the culture.

Experience point 4: Experience point 4: the point of visual, auditory and tactile experience of cultural and creative products. At this experience point, users have already been exposed to the product entity and can fully experience the cultural and creative products from multiple senses. Users who come to this point have already had a preliminary understanding and experience of culture from the first three experience points. The cultural experience at this point is more focused on the product itself, which can convey intuitive cultural information to users through the product, product packaging and product usage.

4.2. Design of cultural experience points for cultural and creative products of Tujia brocade

Taking the Tujia brocade culture as an example, this paper explores the service design process based on cultural experience by using the website as a service platform.

Through the above analysis of user experience points within human-computer interaction and combined with the website architecture, the relevant experience contents that need to be designed can be determined as follows.

Experience point 1: the point of audio-visual sensory experience of cultural information, the home page information layer. Unlike most cultural websites with lengthy introductory text, the information layer on the home page should be designed to make the cultural information content intended to be conveyed visually and audibly accessible. Providers of cultural and creative products for Tujia brocade need to design content here that can convey cultural information based on audio-visual perception. For example, they can introduce the cultural background of Tujia brocade, make videos of Tujia brocade weaving techniques, or simply the sound of a loom with movements of horizontal and vertical weaving, so as to stimulate the viewer's sympathy for the culture.

Experience point 2: the visual sensory experience point of cultural and creative products, product listing layer. It is the visual display part of all product collections. A large number of pictures with highly saturated colors and a strong sense of ethnicity stacked on top of each other can give the viewer a strong visual impact and enhance the maximum experience at the level of visual information reception. The experience design of cultural and creative products should not follow a minimalist and aloof premium style, but rather use visual advantages such as cultural and ethnic colors and patterns to intuitively give the audience maximum perception about the cultural content. It can be done by displaying a large number of pictures with visual impact of ethnic characteristics, including but not limited to the main picture of the product. The designer can boldly apply the strong Tujia ethnic colors to reproduce the thick and rich color characteristics of the brocade, and then supplement the representation with the geometric patterns and styles of the traditional Tujia brocade. Moreover, the designer can use the visual features of the Tujia brocade to control the strength of the visual output, thus enhancing the user's cultural visual experience at this point. Experience point 3: the cultural connotation experience point of the cultural and creative products, the product details layer. The carrier of cultural experience in this experience point lies in the product details page of physical cultural and creative products. The product details page of cultural and creative products is different from that of other e-commerce products. It is required to strengthen the visual impression of users on cultural perception on the product details page of cultural and creative products, including the inspiration source of product design, the traceability of cultural symbols, the introduction of traditional patterns and colors, and other cultural information. The design contents that can be made include: short videos introducing the products, product images (views from various angles, scenario images, etc.), and background images of national culture. The design of this point focuses on how to convey the cultural information carried by the product through graphic information, and the design technique of information visualization is particularly important here. At this point, the cultural design logic behind the cultural and creative products needs to be dealt with through information visualization, especially in the aspect of cultural expression.

Experience point 4: the point of visual, auditory and tactile experience of cultural and creative products. The design content of this point is assigned to the cultural and creative product design. After being implicitly influenced by the first three experience points, users will know more about the cultural content and implication of the product when they receive it, instead of staying at the functional experience of the product. The experience design studied in this paper focuses on how to optimize the user's sense of experience throughout the process, and the final product is defined only as the last experience point that serves the customer.

5. Conclusion

For cultural and creative disciplines, cultural experience is an essential and vital part. To study the user experience design of cultural and creative products, we can jump out from the product level and look at the whole process of users' exposure to culture to locate the points where experience should be optimized and thus make design. In the face of the ever-changing times and the upgrading of user needs in the industry and the market, the analysis and study of cultural and creative product experience design using human-computer interaction can help to locate the cultural experience points in a more straightforward and comprehensive way and facilitate the later design. In this paper, the human-computer system model of user experience design based on human-computer interaction was defined through the process approach of human-computer interaction. By connecting the links of "user - cultural product - cultural environment", we explored the user experience layer, defined the user cultural experience points, and optimized the design by taking the experience of cultural and creative products of Tujia brocade as an example. Finally, the user experience design of cultural and creative products based on human-computer interaction was developed by using the website as a carrier, thus changing the design of cultural and creative products that stay at the product level, which can provide certain reference to the researchers and designers concerned.

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