

Desert Entertainment Self-Service Rental Product Design Based on Scene Theory

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Abstract:

Through product design, discover and improve the existing services of scenic spots, and at the same time integrate with modern equipment, increase the viscosity of users in scenic spots, prolong the stay time of users, and enhance the travel experience of users. method Using the design method of scenario theory, using scenario design ideas such as iteration, primary and secondary, and subdivision, to establish objective, objective, and actual scenarios in the product design process, and through the design process decision-making, discover user needs in the scenario, derive product design decisions, and test the design process. In the process of product design, the characteristic humanistic elements of the Inner Mongolia desert are integrated to realize the product design concept of the integration of tradition and modernity. At the same time, dig deep into the pain points of users, think about the potential needs behind the pain points, adhere to the user-centered product design principle, and ensure that product design comes from users and serves users. in conclusion Through the research and analysis of users, it summarizes the various needs of users for desert tourism. Through the transformation of demand pain points into products, the service of scenic spots can be improved, tourist satisfaction can be increased, and user stickiness can be increased.

Keywords:

Scene Theory, Self-Service Rental, Demand, Tourism, Scenic Spot, Desert Sculpture

1. Introduction

With the development of social economy, modern people have more and more requirements for travel, and desert travel satisfies the modern people's mentality of daring to explore, willing to try and dare to challenge in the new era with its unique geographical scenery, regional culture, sightseeing methods and travel modes; at the same time, with the development and progress of social science and technology, the degree of machine intelligence has been greatly improved. Self-service vending machines quickly occupy a large number of markets due to their small size, small footprint, flexible delivery and high added value. At the same time, the popularization of mobile payment by mobile phone and facial recognition payment reduces the

difficulty of equipment operation and increases the user's choice of shopping, which brings convenience to the development of self-service equipment. As the level of technology continues to improve and people pay more and more attention to their own needs, the self-service sales model will become more popular; at the same time, desert tourism will gradually become a fashionable consumption method. High-tech applications represented by big data processing, cloud computing, and the Internet of Things provide new possibilities for the integrated development of self-service vending terminals and desert entertainment equipment. As for the scene theory, many works have carried out theoretical research: for example, scene interaction design thinking that provides dynamic, primary and secondary, and dismantling thinking [1]. The interactive design method of smart home in the user scenario is disassembled, analyzed and explored [2]. In product innovation design, use emotional design to build scenes to obtain the emotional design that users implicitly need [3]. Using the context analysis method, starting from the user context, according to user behavior and market development trends and user research, a user-market-oriented design guidance scheme based on context analysis is given [4]; the next step is to explore the application: for example, provide interaction for convenient drones through innovative methods of user experience [5]. The experience design of youth learning intelligent products based on the research of scene direction has brought a new perspective of thinking to the developers of similar products [6]. A demand decomposition method based on scene analysis is proposed to mine the real needs of users in product design, and it is applied to the design research on smart trash cans [7], etc.; there are also some studies that apply virtual interaction technology to product appearance to solve the problem of designers' insufficient scene use experience in product appearance design [8]. At the same time, self-service sales research is becoming more and more diverse, but its main results focus on ergonomic appearance design. At present, the research on the design of self-service machines mostly focuses on the rationality of product use, the convenience of operation and the feasibility of large-scale production. To sum up, it can be seen that the theoretical research covers a wide range, but more is its theoretical application and theoretical guidance, and there is relatively little information on the practice of product design; at the same time, there are few researches on service design, interaction design and scene theory in self-service vending machines. Based on this, based on the development of desert cultural tourism and entertainment in Inner Mongolia, use the scene theory analysis method to design desert entertainment self-service rental products, increase the viscosity of desert tourism users, increase user travel fun, reduce user entertainment pain points, and provide conditions for promoting the process of desert tourism in Inner Mongolia.

2. Design Method Based on Scene Theory

The so-called "scenario" is people-centered and consists of five basic elements: people, things, time, place, and connection methods to form the connection between experience and details [9]. Product design scenario research mainly refers to deconstructing product design usage scenarios by dividing product design scenarios into units, and then realizing the construction of product target scenarios. Applying scenario theory to the field of product design means systematically analyzing various factors in product design scenarios such as environment, users, time relations, products, and behaviors, and through iterative, primary, and subdivided scenario design thinking, constructing the entire design process from three aspects: objective scenarios, target scenarios, and actual scenarios, exploring the needs of users in the scenario, producing product design solutions, and evaluating and verifying product

design [10]. At the same time, the basic structure of new scenario design is established on the basis of traditional scenario classification, and scenarios are divided into four types: problem scenario, activity scenario, information scenario and interaction scenario. Stage 1 - Requirement stage: Decompose user needs mainly through problem scenarios; Stage 2 - Design stage: Rely on information technology and human-computer interaction theory, complete the design work by establishing activities, information and interaction scenarios, and continuously re-decompose feasible units; Stage 3 - Evaluation stage: Implement feasibility experiments, and iteratively upgrade the model based on user results. The scenario-based design framework fully considers the whole process from demand analysis to design feasibility assessment, takes actual needs as the starting point, and avoids the frequent occurrence of invalid design schemes in design. It is an effective product design process.

2.1. Objective scene construction of self-service rental products

The objective scene can also be called the problem scene, which describes the most realistic scene in the user's environment. Designers learn about target users through objective analysis of these scenarios. The creation of objective scenarios is to more effectively meet user needs and improve user satisfaction, and conduct research on user psychology to collect information. Creating and analyzing objective scenarios can use user surveys to identify problem areas at the early stage of design, collect user data, create user portraits, and accurately understand and communicate user needs.

2.2. Design principles and strategies of self-service rental products

Based on objective scenario requirements, determine priorities through cluster analysis, solve user needs, and guide product design according to relevant design rules and plans, such as activity scenarios (change from problem scenarios to design function scenarios), information scenarios (the way users perceive and understand information), and interaction scenarios (development and realization of goals and requirements), in order to obtain original ideas for product design.

2.3. Product design practice and evaluation of self-service leasing

Designers use real-world conditions to test product usability and ease of use, and iteratively optimize designs based on user testing results. The actual scenario is to conduct a comprehensive evaluation and analysis of the product design system and production, and provide the necessary scenario verification for product marketing [11].

3. Objective Scene Construction of Desert Entertainment Self-Service Rental Products

3.1. Objective scene construction of self-service rental products

The research process is divided into the following four stages. The first and second stages are the exploration stage. In the first stage, desktop research is carried out to understand the types and prices of desert tourism entertainment products, as well as the acquisition methods and usage scenarios in desert tourism. The second stage is to conduct research and comparison of similar products, analyze the material, ergonomic design, interaction mode, operation mode, etc. of the same type of products, and find out the advantages and disadvantages of the same type of products for redesign. The

third stage is the definition stage. It is necessary to use natural observation, in-depth interviews, desktop research and other research methods to observe issues such as user services, usage and experience of desert tourism and entertainment products through field research, user in-depth interviews and questionnaire surveys. In the process of desert tourism, from the demand for entertainment products to the end of use, psychological changes in various scenarios, as well as their needs and pain points. Quantitative research methods are used to design and issue questionnaires according to the problems of desert entertainment products found in qualitative research, and the final quantitative data is used to verify the demand obtained from qualitative research. The fourth stage is the generation stage, through the combining of the interview results and the cross-analysis of the questionnaire data, the potential experience needs and expectations of desert tourism for entertainment products are concluded [12] .

3.2. Research and Implementation of Objective Scenarios

In the first stage, through desktop pre-research on various channels such as Weibo travel bloggers, Internet articles, official account articles, HowNet articles, etc., we learned about the characteristic tourism projects in desert tourism and the tools used in each project, the way to obtain the tools and the pain points. For example, the price gap between the purchase or rental of amusement equipment in the off-peak season is too large, and the human factors are too obvious; the labor costs of the shops are too high, and tourists gather together obviously, resulting in the problem of insufficient manpower in the peak season and excess manpower in the off-season; the increase in human factors has led to increased difficulty in the management of scenic spots. The above questions provide key points and important references for subsequent field research, interviews and questionnaires, and point out the direction for the research.

In the second stage, the comparison of the functions, appearance, human-computer interaction and other content of the existing similar products and the use experience of relevant personnel were investigated. The survey results show that the functions of existing self-service machines are divided into two categories: sale and lease. For sale, such as automatic beverage vending machines, automatic retail vending machines, and some claw machines, etc., it is impossible to use the machine for after-sales processing; for lease, such as self-service charging treasures, automatic umbrellas, etc., are billed according to the length of use and returned after use. The appearance of products for sale is generally the same, and it is more convenient to convert different products for sale; the appearance and function of rental products are different, resulting in different appearances of rental self-service products, and it is difficult to convert different types of products. Finally, according to the relevant theories of ergonomics and the interviews and surveys of relevant users, the problems about ergonomics in the existing machines and the problems in the process of people's use are obtained. For example: the shopping process in some shopping systems is chaotic, which is contrary to the actual process; the error tolerance rate during use is low; it is not friendly enough for first-time users and elderly users, and the learning cost is too high.

In the third stage, by summarizing the content of the first and second stages, and conducting qualitative and quantitative investigations, we can find out various problems that users have in the actual use process and find out the design needs. Through on-the-spot research and interviews with many different types of tourists, the whole process of the user from the beginning of looking for the sale and lease of the product - getting the product - using the product - the end of use, found that the user is

very concerned about price changes, product carrying and the return aspect is more concerned than others, and it is also an important factor that affects the user's travel mood and repeated play. According to the relevant questions obtained from qualitative research, questionnaires were distributed to users, and quantitative research analysis was carried out.

3.3. Summary and analysis of research results

3.3.1. Analysis of crowd characteristics

Determining the target user is the first step in the scenario analysis. A full study of the user is conducive to the control of the principles of product design and the smooth development of the design. Through the use of desktop research, field research interviews and questionnaires and other research and analysis, through the research and analysis of occupation, age, income, education level, price psychological expectations, etc., it is concluded that the target group is the “new middle class” group.

In the traditional sense, the “middle class” refers to people with high social status who have high professional ability, and use their work to obtain a large amount of income, people between the rich and the poor. The “new middle class” is a continuation of the “traditional middle class”, and the monthly net income is generally around 100,000-200,000. I have a more positive attitude towards life and a more open view of consumption. I also retain my special self-worth and always have a strong desire to explore new things. Under the background of income increase and “new middle class” consumption upgrade, their consumption level and consumption behavior will have a significant impact, and even determine the direction of China's economic development [13]. With the growing population of the “new middle class”, the focus of society has shifted from consumption to psychological needs, and it is more inclined to pay for psychological needs. They have curiosity and a desire to explore new things, pursue a high-quality life, and are willing to put a relaxed, effective and comfortable life attitude throughout their daily life and use high-tech products to reduce the burden of life. The life attitude of the “new middle class” makes them more inclined to lease in the selection of infrequently used products. Compared with direct purchase, leasing is more in line with the “new middle class”'s use plan for assets. The advantages of convenience, cheapness, and greatly reduced subsequent use are also a major aspect of their preference for leasing.

3.3.2. Analysis of crowd needs

Product design should not only consider the needs of users, but also consider problems that are difficult for users to find. Considering that users have staged aggregation behavior, a corresponding design scheme should be given to reduce the user's operation time and waiting time. The positive change that satisfies the user's psychological state is directly proportional to the occurrence of satisfying the user's psychological consumption behavior. On the one hand, people's psychological conditions and psychological needs need to be met. On the other hand, we need to mobilize the positive emotions of consumers. Commodities must meet the needs of users in terms of shape, shape, color, packaging, name, etc., and bring positive psychological hints to users by adjusting the overall state and atmosphere in the shopping scene.

3.3.3. Analysis of environmental requirements

While considering the psychological needs of the crowd, the desert entertainment self-service rental machine must also ensure that it is positive and beneficial to the environment, rather than being abrupt and unreasonable. The location of delivery affects the design of self-service rental machines to a certain extent, and the existence of self-service rental machines will also affect the environmental characteristics of the location to a certain extent. At the same time, the availability of various resources in the delivery scenario, as well as the number of users and the degree of user aggregation at each stage of the delivery location should also be taken into consideration. On the other hand, the average purchase time of users must be considered. The average time to purchase determines how rental machines interact. The size of the delivery space determines the size and layout of the rental machine, and the space function affects the product form and semantics of the rental machine to a certain extent. The environment has an overall impact on the design of the rental machine.

3.3.4. Service demand analysis

On the one hand, consumers' trust in self-service rental machines is reflected in their trust in pre-sales services, and on the other hand, they are reflected in their service responsibilities. Pre-sales are mainly reflected in product appearance, service functions, etc., in order to increase consumers' trust and satisfaction with leasing services. After-sales service is specifically reflected in the introduction of services to consumers and efficient problem response. Establish a self-service rental service system with linkage feedback to effectively respond to the rental status of rental products, deal with consumer feedback, make adjustments to leased products, ensure consumer experience and establish a timely and effective problem response platform [14].

4. Product Design Principles and Strategies of Desert Amusement Self-service Rental Products

Analyze and summarize based on requirements, and summarize the design strategy based on the on-site simulation procurement process and operation and maintenance process.

Purchase items: Most of the customer groups are the "new middle class", who are very familiar with electronic products and use similar products more often. For this group of people, the focus of consideration should be on the user's psychological satisfaction. For the color, you can choose a large area of white as the main color, and choose blue, gold and a small amount of black for decoration. In terms of external shape, the yurt can be used as a reference for the design shape, and at the same time, it can be integrated with the characteristics of modern machinery industry style to form a beautiful form of common development of modernity and tradition. Since the distribution of user groups includes not only the "new middle class" but also older people, the requirements for this group of people should be more practical. Considering that the elderly are not very familiar with the use of electronic products, the purchase interface should be simple and meet the basic operation requirements while reducing all unnecessary designs. For example, there are only two options of leasing and return on the initial interface.

Items to be used: When taking out the rental items after purchase, it is necessary for the user to grab them easily, and set a grab handle. The leased desert sculpture toolbox

needs to be equipped with various tools suitable for desert sculpture, such as various carving knives, stamping hammers, purified water, environmentally friendly glue, various molds, etc., and it is necessary to ensure that the items cannot cause effective damage to the human body during use. After the user is finished using it, use glue to fix it, and the model can be brought back, which can not only increase the user experience, prolong the user's stay time, increase user stickiness, but also promote the scenic spot and increase the exposure of the scenic spot.

Returning items: After use, it is necessary to ensure that all items are sorted and sorted conveniently, and the location of the items is easy to identify, so as to ensure that users will not be unable to return due to missing items and cause economic losses. When the user returns the product, the machine is connected through the metal contacts in each part of the box to detect whether the item is damaged or lost. After confirming that it is correct, the internal buckle of the machine is locked, the cabinet door is closed, and the transaction is completed. Otherwise, the return is refused and the user is guided to contact the after-sales service to solve the problem.

Faults: When users encounter various problems that cannot be handled by the machine during use, they need to communicate with customer service quickly to solve the problem. The speed of problem resolution is related to the user's sense of experience, trust and evaluation of scenic spots. Therefore, it is necessary to build a fast contact channel, quickly carry out feedback and processing of problems, and solve user problems.

In terms of operation and maintenance: in terms of operation and maintenance, it is necessary to obtain quick feedback from users. The storage capacity in the machine exceeds the standard and cannot be returned, the product is damaged and needs to be replaced, and the one-time product needs to be replenished.

5. Design Practice and Evaluation of Desert Entertainment Self-Service Rental Products

According to the design process of desert entertainment self-service rental machines confirmed in the third chapter, the detailed design is carried out, and various problems that occur in the user's use process are taken as the starting point, and virtual user scenarios are constructed to deepen the understanding of the problem and solve the pain points of the user's needs.

In terms of appearance: the appearance of the product is designed in a way that integrates the characteristics of the yurt and the modern mechanical industry style . It adopts the classic double-dome yurt shape, and the hidden fan and the heat dissipation behind the product form a two-way heat dissipation design (Figure 1), which avoids the problem of excessive product loss under the one-way circulation of hot air .

In terms of color: the product color adopts the classic blue and white color matching of yurts, embellished with the vast desert, eye-catching but not too gorgeous, the blue and white color matching gives people psychological warmth, like an oasis in the vast desert giving people spiritual comfort, so that tourists can eliminate their worries when they play, and better appreciate the beauty contained in the desert. On the basis of blue and white, add a small area of gold and black for embellishment, so that the product color is full of layers and more rhythmic (Figure 2).

In terms of operation: users operate through the display screen on the rental machine. In order to avoid operating errors, the interface only retains the most basic

rental return button (Figure 3). In order to solve the inconvenience of some people using smart devices, a multi-channel payment method (Figure 4) has been added to ensure the use of all users. After the purchase is completed, the cabinet door pops open, and the user grabs the handle to carry it (Figure 5). The rental box contains a variety of carving knives, stamping hammers, molds, glue and purified water. At the same time, in order to ensure the safety of users, the carving knives are made of wood to prevent accidental injury to the maximum extent (Figure 6). After the user is finished carving, he can use the glue to shape it and bring it back as a souvenir. In order to ensure that the user will not miss anything when returning, each item contains metal contacts. If the metal contacts cannot be connected when returning, it cannot be returned. At the same time, the user is reminded to find out the reason or contact customer service to solve the problem.

In terms of operation and maintenance: operation and maintenance needs to keep abreast of the user's rental situation to ensure that the items in the rental machine will not be full or out of stock, and at the same time ensure that problems such as machine failures during the use of the machine can be resolved in a timely manner, maintain user experience, and increase user brand trust.



Figure 1. Invisible fan.



Figure 2. Color matching and shape.



Figure 3. User interface.

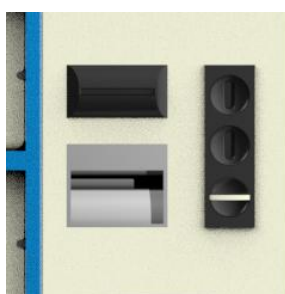


Figure 4. Payment.



Figure 5. Sculpture Toolbox 1.

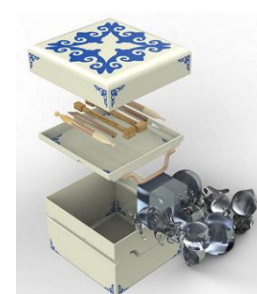


Figure 6. Sculpture Toolbox 2.

6. Conclusions

Aiming at the design and research process of desert entertainment self-service rental equipment, the following conclusions are obtained:

Scenario theory integrates real and theoretical scenarios, builds different virtual scenarios for reference at each stage of the design, divides the design process into stages, and guides the smooth progress of the design. The design process of the product design method based on scenario theory includes three links: preliminary research, mid-term summary and transformation, and later design and development. Each link needs to study user psychology and propose corresponding solutions.

Scenario theory is mainly to construct objective scenarios, conduct research and analysis in objective scenarios, so as to get closer to the ideas in the minds of users, and the transition from objective scenarios to target scenario requirements emphasizes the need to adhere to the principles of user-oriented product design.

The design requirements for desert entertainment self-service rental equipment come from the improvement needs of the service environment and modernization in the scenic area, and at the same time increase the user viscosity of the scenic area and enhance the user experience of the scenic area.

The high integration of self-service rental products and desert scenic spots can also provide some reference suggestions for the integration of other scenic spots and modern development.

In the follow-up research, when the scenario theory method is applied to this product or similar products, it will further study the guiding role of scenario theory in each stage of product design and the feasibility verification method of product design, so as to provide more comprehensive and scientific theoretical support for product design.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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