Research on Space Optimization of Service-Oriented Public Facilities Based on Interaction Design

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Abstract. This paper aims to discuss the relationship between service-oriented public facilities and interaction design, analyze relevant cases, and discuss how to improve the user experience of service-oriented public facilities from the perspective of interaction design. Service public facilities refer to the infrastructure that provides services to the public, such as bus stations, airports, hospitals, etc. In service-oriented public facilities, interaction design has become an important part, which can improve user experience and efficiency, so as to bring better services to the public. In summary, interaction design plays an important role in service-oriented utilities, which can improve user experience, increase efficiency, and enhance accessibility. In actual cases, designers also bring better service experience to the public through continuous innovation and practice. Finally, it needs to start from the perspective of interaction design, pay attention to user needs and ease of use, provide more humanized interaction design for service-oriented public facilities, and bring a better service experience to the public.

Keywords: Urban planning; architecture; interaction design.

1. Introduction

With the development of the social economy and the acceleration of the urbanization process, the importance of urban public facilities construction has become increasingly prominent. At the same time, under the background of the digital age, the service function of public facilities has gradually changed to the service type. Service-oriented public facilities not only provide basic services for urban residents, but also meet the diversified and personalized needs of people, and improve the efficiency of urban management [1].

As a design method, interaction design focuses on the interaction process between users and products or services and is committed to optimizing user experience and improving the use effect of products or services. Therefore, there is a close relationship between service-oriented public facilities and interaction design. Through reasonable interaction design, the service level and user satisfaction of service-oriented public facilities can be improved, and good interaction between humans and machines can be realized.

2. The Relationship between Service-Oriented Public Facilities and Interaction Design

2.1. Concept of Interaction Design

Service public facilities are closely related to interaction design. Interaction design refers to the design of a product or system that considers the way users interact with the product in order to enhance user experience and convenience [2]. Service-oriented public facilities refer to facilities that provide various services and convenience to the public, such as public transportation, medical institutions, libraries, etc.

Interaction design can improve the user experience of public facilities [1]. Taking the airport as an example, the designer designed a convenient and smooth self-service system, such as self-service check-in and self-service security check, through the study of the airport service process and user behavior. These systems not only simplify the process and reduce the user's waiting time but also

provide more personalized services, such as choosing seats, meals, etc., thus increasing user satisfaction.

Designers need to think about how to improve the user experience of service-oriented public facilities from the perspective of interaction design [3]. First of all, designers need to deeply understand the needs and habits of users, and extract the core needs of users through research and data analysis, so as to design the interaction mode and interface design that meet the habits of users. Secondly, designers need to pay attention to the usability and usability of the design, reduce the user's operation steps and redundant information as much as possible, and improve the efficiency and simplicity of the operation. Finally, consider the needs of special people and provide better services for them.

2.2. Overview of Service Public Facilities

Service-oriented public facilities refer to the facilities established by the government or non-governmental organizations to provide public services. Interaction design is a process in which designers design interfaces and systems that are easy to use, easy to learn, easy to remember, easy to make mistakes, expressive, and controllable by understanding user needs, behaviors, psychology, physiology, and other factors. The purpose of interactive design of service-oriented public facilities is to improve the efficiency of facility use, and user satisfaction, reduce operating costs and maintenance costs, and improve service quality and efficiency [4].

There is a close relationship between service-oriented public facilities and interaction design. Interaction design determines the use effect of service-oriented public facilities, while service-oriented public facilities provide the basis for application scenarios and demand analysis for interaction design [5]. In interaction design, designers need to consider the use scenarios and user needs of service-oriented public facilities and design different interfaces and interaction ways for different user groups to achieve better user experience and service effects.

In service-oriented public facilities, interaction design plays a key role. Through reasonable interaction design, a convenient service process can be provided, user waiting time and tedious operation can be reduced, and service efficiency and user satisfaction can be improved. For example, in the bus station ticket machine, a good interaction design can allow users to quickly select the ticket type and payment method, and quickly get the required ticket, which is convenient for users to travel [6].

At the same time, service-oriented public facilities also put forward special requirements for interaction design. Because public facilities are open to the public and users have different backgrounds and needs, interaction design needs to take into account the characteristics and needs of different users. In addition, the use environment of public facilities is complex and changeable, and the interaction design needs to take into account the characteristics of the environment to ensure availability and reliability under various complex conditions.

2.3. The Common Relationship between the Two People

Service utilities and interaction design are directly related to people. The purpose of the existence of service-oriented public facilities is to meet people's needs and provide convenience and convenience, while interaction design is to allow people to better interact with and use the facilities. The relationship between the two is mutually promoting. Good interaction design can improve the user experience of service-oriented public facilities, and the understanding of and demand for service-oriented public facilities can also guide the practice of interaction design.

2.4. The Relationship between the City and Environment

Finally, service-oriented public facilities and interaction design are also closely related to the city and environment [7]. As the main carrier of service-oriented public facilities, cities need to consider the integrity of urban planning and development, and rationally distribute public facilities to meet people's needs. Interaction design also needs to take into account the characteristics of the city and

the environment and design interactive ways and interfaces that meet the needs of the environment in order to better integrate into urban life.

3. Case Analysis of Service-Oriented Public Facilities and Interaction Design

3.1. Brief Introduction of the Space of the Public Facility

Sam's supermarket is committed to providing customers with a good shopping experience and convenient services. As a well-known large supermarket, Sam's supermarket also has its own unique interactive facilities to provide more convenient services. For example, member service desk, self-checkout, e-payment, free trial and demonstration, online and mobile applications, etc. The supermarket is committed to providing members with a better shopping experience and meeting their needs by providing convenient service and public facilities and interacting with customers. The establishment of supermarkets is to serve people. As a famous large supermarket, Sam's supermarket must have its own methods to attract customers and make customers more willing to buy things from them. Therefore, they will interview customers to find out what they need to improve.

3.2. Citizens' Views on the Interactive Design of the Public Facility

First of all, this research learned about the overall customer evaluation of Sam's Supermarket and learned that people have positive and negative evaluations of Sam's Supermarket. Secondly, this research compared Sam's supermarket with other supermarkets, so as to know what advantages Sam's supermarket has compared with sales.

Citizens may have different views on the interactive design of public facilities, so the author made a questionnaire and conducted an online survey among 163 customers. The following is an analysis of some of the survey results:

In the age distribution of buyers, young people, and middle-aged people occupy the most important part, which is reflected in the fact that minors and elderly people go to Sam's supermarket less frequently, mostly less than once a month or once or twice a month, while people aged 48-67 go to Sam's supermarket more frequently, mostly 3-4 times, which may be caused by the long leisure time of some retired people.

Most of the customers are satisfied with the shopping environment of Sam's supermarket and give an evaluation of five points. For the large-capacity packaging of Sam's supermarket, different customers give different evaluations. Some customers think that the capacity of the packaging bag is improved on the basis of affordable prices, which improves the cost performance of the goods in disguise. Some customers who gave low marks said the large package made it difficult for them to use it within the shelf lifetime, and the higher price compared to the smaller package also bothered them.

Customers are also relatively satisfied with the service attitude of Sam's supermarket staff, and the trial function of Sam's supermarket has become one of the most important reasons why customers often go to Sam's supermarket to shop. Many customers think that the trial can let them better understand the use of the product, taste better understand the taste of the product so that they can better judge whether the taste of the food is more in line with their appetite. Other customers cite "free snacks" as a reason to visit Sam's frequently, in order to get a quick fix.

Sam's business hours are also well received by the majority of customers. However, different customers have different opinions about online and offline shopping choices. Some customers think that online shopping is more convenient, and they can get the goods they want without leaving home, which brings great convenience to many customers who are busy with work. While another part of customers think that offline shopping is the best choice. This group is mostly elderly people, and online shopping is a complicated thing for them because they do not use electronic devices well. At the same time, compared with middle-aged people with jobs, retirees have more free time, so offline shopping becomes a better choice.

4. Optimize the Interaction Design of Service-Oriented Public Facilities

4.1. Convenience Brought by Interaction Design

Good interaction design can provide a more convenient and efficient user experience so that users can more easily complete the operation. For example, in public transportation, interaction design can make it more convenient for passengers to purchase tickets, query train numbers, adjust seats, etc., through a simple and clear interface and operation process [8]. In self-service facilities in public places, interaction design can provide faster and barrier-free self-service through intuitive and understandable interfaces and operations [9].

Citizens generally expect the interaction design of public facilities to be simple and easy to use, without requiring too many steps or complex instructions. At the same time, the interaction design of public facilities should take into account the needs of various groups, including the elderly and the disabled. Therefore, the interactive design of public facilities can intuitively convey information and reduce the time for users to learn and think. Symbols and ICONS should be easy to understand and correspond to the actual operation.

Interaction design brings convenience in various ways: Interaction design aims to make tasks and processes simpler and more intuitive. By providing clear and logical user interfaces, users can easily navigate and complete tasks without confusion or frustration. Well-designed interactions can streamline processes and reduce the time it takes for users to accomplish their goals [10]. For example, autocomplete suggestions or predictive text can speed up data entry, and quick access buttons or shortcuts can provide easy access to frequently used features. Interaction design focuses on creating positive and enjoyable user experiences. By understanding users' needs, goals, and preferences, designers can create interfaces that are visually appealing, engaging, and responsive, leading to a more satisfying user experience. Improves accessibility: Interaction design considers the needs of diverse users, including those with disabilities. By implementing inclusive design principles, interaction designers ensure that everyone, regardless of their abilities, can access and use digital products or services conveniently. Provides feedback and guidance: Well-designed interactions provide users with feedback and guidance throughout their interactions [11].

4.2. Integration of Interaction Design and Environment

Interaction design can integrate service-oriented public facilities with the surrounding environment so that it can better adapt to the user's use scenario. For example, in the automatic ticketing machine of public transportation stations, the interaction design can consider the needs of users in the process of waiting for the vehicle, and provide functions such as information push and entertainment interaction to make the waiting time of users more pleasant. In a park or shopping mall navigation facility, interaction design can combine environmental maps and navigation functions to provide more accurate and intuitive navigation guidance to help users better understand their surroundings.

By optimizing interaction design, service-oriented public facilities can better meet the needs of users, provide a more convenient and comfortable experience, and integrate with the surrounding environment to enhance users' satisfaction and dependence on public facilities.

These views are only a subset of the public's views on interactive design for public facilities, and specific views and requirements may vary by region, culture, and user group. Therefore, in the interaction design of public facilities, it is necessary to conduct user research, understand the needs and feedback of users, and optimize the design according to the actual situation.

5. Conclusion

Based on the perspective of interaction design, this paper studies the optimization of service-oriented public facility space. Through the comprehensive analysis of relevant literature and field research, this research draws the following conclusions: Interaction design plays an important role in the optimization of service-oriented public facility space. Through reasonable interaction design, user

experience can be improved, service efficiency can be improved, and the utilization rate of public facilities can be enhanced. In the spatial layout of service-oriented public facilities, it is key to take user's needs and behavior habits into account. For example, reasonable arrangement of the location and space size of facilities, providing clear navigation and signage systems, and providing convenient service means. Interactive design can also provide personalized services to meet the needs of different users through the application of digital technology. For example, through tools such as smartphone apps, users can query facility usage in real-time, book services, and provide feedback, thereby enhancing user experience and engagement.

This study has important influence and significance for the optimization of service-oriented public facilities space: Through the optimization of interaction design, users' satisfaction and experience of public facilities can be improved, the utilization rate of public facilities can be increased, and the utilization efficiency of social resources can be improved. More effective service-oriented public facilities can enhance the overall image and attractiveness of the city, thus promoting urban development and increasing economic benefits. This study provides theoretical support and practical guidance for the design and management of service-oriented public facility space, which is helpful to improve the existing facility layout and service mode and improve the efficiency and social benefits of public facilities. In future research, further research can be carried out from the following aspects: further study of user needs and behavior habits, exploring more suitable for users of service-oriented public facilities space design. More accurate user data can be obtained through user research, behavior observation, and other methods to provide more targeted suggestions for design. Explore the application of digital technology in service-oriented public facility space. It is possible to study the application of intelligent equipment and Internet of Things technology, such as intelligent navigation systems, intelligent reservation systems, etc., to further improve the effect of interaction design and user experience. This paper studies the spatial optimization strategies of service-oriented public facilities in different cities and scenarios. Different cities and scenarios may have different needs and characteristics, and optimization strategies and practical experience under different cities and scenarios can be explored through comparative research.

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