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# The Application of Interaction Design in Urban Public Space

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***Abstract:*** *With the continuous development of China's social and economic civilization, interaction design has more and more connections with our urban space construction. As a fusion of science, technology and art, interaction design has played an important role in promoting the development of various industries in public spaces. In interaction design, space is not an empty container for everything in the world, nor is it a scientifically abstract mechanical or geometric space. The purpose of this article is to explore and study the relationship between exhibits and space visitors through the spatial expression of interactive design. This paper studies the number of accounts for users of a city construction website to learn about interaction design knowledge, and investigates the customer satisfaction survey of a construction company using interaction design in the construction of urban public spaces, and the degree of execution of interaction design methods by a certain university's technicians and scholars. Analyze and study the characteristics of interaction design and the application of spatial concepts in interaction design. Through an experimental investigation of existing interaction design, the results show that interaction design has become a concrete and practical way of creation, opening up a new perspective for traditional space design, improving the efficiency of interaction design information transmission, and making the design richer and more comprehensive. It is more interesting, logical and scientific, and aims to develop different design interaction ideas and apply them to the future urban public spaces.*

***Keywords:*** *Interactive Design, Public Space, Urban Space, Design Application*

## 1. Introduction

With the rapid development of today's society, the research of urban space design seems to stay in formalization and modeling, pay too much attention to the visual effect, and ignore the use object of landscape products - the communication and interaction between people and landscape products. This paper studies the application of interactive design concept in urban public space design, analyzes and studies the interactive design concept and facilities in urban public space, and uses various methods to achieve the characteristics of ease of use, practicability and interest of urban public space products in the use process of tourists through interactive design. Make landscape products meet people's psychological needs and enrich the functions of urban popular science and education, so that people can not only feel comfortable and pleasant in the process of interactive experience, but also fully reflect the special characteristics of urban public space.

In the field of urban space design, many experts and scholars have made some research achievements. For example, Vivant e proposed interactive design, an emerging landscape design concept integrating multiple disciplines [1]. Werfel f n offered the course of interaction design in Colleges and universities for the first time [2]. Although interaction design has maintained a good growth trend in China and achieved certain theoretical results, it has not become a complete system at present. There is still a large gap between the research depth and application breadth and the foreign level, and there is also a lack of systematic works in the field of theory compared with foreign countries. It can be said that there is still a long way to go in the theoretical research and method practice of interactive design in China [3-4].

The novelty of this paper is that it introduces the new concept of interactive design in urban public space construction for analysis and research, and promotes the new ideas and beneficial exploration of spatial expression and man-machine relationship [5]. This innovation can simply supplement the unity of modern showrooms. This research lacks outdated rigidity and has not formed a mature and reliable

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theoretical system at home and abroad. It is still in the stage of continuous exploration and progress, the extension of theoretical level and its application in the field of practice [6-7].

## 2. Application of Interaction Design in Urban Public Space

### *2.1 Definition and Development of Interaction Design*

(1) Interaction is not just a technical term, nor is it as obscure as it sounds. The word "interaction" in the dictionary is interpreted as a kind of alternation, one with the other, originally referring to the behavioral activities of humans or animals [8]. Its meaning in this field has evolved into objects that can communicate with each other and participate in two aspects. We can simply understand the interaction design of urban public spaces: interaction is the act of exchanging objects, information and services between two entities. Interaction planning is still developing, and various theoretical research and practical applications are not yet mature. On the other hand, the reason must be traced back to the origin of interaction design, which comes from the intersection of many industries, such as industrial design. The fields of technology, visual design, human-computer interaction, human factors, and user experience design are difficult to define perfectly at the intersection of many disciplines [9-10].

(2) We can now at least clearly show that the interaction takes place between two real objects. There is usually the transmission and exchange of information. The job of the interaction designer is to create convenience and simplify the path for this reciprocal behavior. In addition, there are three design methodologies in defining interaction design, namely technology-centric theory, behavior, and social interaction. The technology-centric theory holds that interaction designers mainly rely on multiple technologies, especially digital technologies, when designing easy-to-use and useful projects. To a certain extent, this is the reason for the rapid development of interaction design in the computer field: behavior-centrism believes that interaction design is a behavior that determines the environment, objects, and systems. It is believed that the key feature of interaction planning is social interaction. It is his own value to use interactive design products as a bridge and means of communication between people, so as to promote interaction between people [11-12].

### *2.2 The Creativity of Urban Display Design*

(1) At present, people's spirit and material are becoming more and more abundant, and the richness of spiritual life is particularly important. Gradually, people pay more attention to the emotional experience of participating in the exhibition. Interactive screen design is actually an interactive participation process. Freely convey website information in terms of volume, vision, sensory, color, etc. He is determined to understand the behavior and psychological changes of visitors during the interaction, and hopes that the information you receive during your visit and the sights you see will make them feel real, interesting and impressive. This requires curators to incorporate more innovative ideas into traditional screen design. Known as "taking objects as inspiration", designers can turn any visitor into an actor and give him an experience. The role allows each visitor to enter the storyline, allows the visitor to truly appreciate the cultural color of the exhibits, and allows the visitor to take the initiative to grasp the information. Turn visitors into the owners of the exhibition, let them experience the sense of substitution and pleasure in the interactive entertainment of participating in the screen design, and have a deep understanding and strong interest in the exhibits on display.

(2) In todays high-pressure environment, it is a very enjoyable thing to have fun in free orLeisure time. In the interactive screen design, visitors are an important element that can flow. An interesting interactive display game can make visitors want to explore the game. "Watching while playing", participating in games, looking for excitement and happiness in interaction, can bring a better sense of pleasure, satisfaction and relaxation. As a group of tourists, the information generated in interactive leisure activities influences each other, because people are mobile, and the mobile crowd forms the basis of interactive communication. We can use it to create an interesting and interactive viewing environment to attract tourists. Great interactive screen design projects have a characteristic, that is, this project should immerse people in it and enhance people's emotional experience, such as pleasure, excitement and even pain. Some great design projects often provide people with entertainment, joy and happiness.

(3) New technology has brought new creativity to people’s public space. The construction of modern urban public space has greatly changed the appearance of the space. It presents the designer’s wisdom and unconstrained ideas, giving people a unique vision. Feel the exclamation of high-level

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design. Technology, aesthetics, and environment are beautifully combined, and the methods, means, and appearance of internal display have also changed accordingly. The implementation of new technologies and concepts such as dynamic display, digital media, photoacoustic and electrical auxiliary display, audience participation and operation, etc. Connect people and things closely. This is a revolutionary change in the development of modern display design. The application of new technology has fundamentally changed the appearance of co-space, using projection to present differentiation, making the designed artwork more logical and scientific.

(4) During the interactive display experience, it is necessary to ensure that every visitor will get a psychological and physical entertainment experience. In the process of display interaction design, it is necessary to pay attention to the design of the later service, and provide the visitors with a stimulating, novel, and knowledgeable galaxy experience through the later service. The essence is an experience economy. Exhibitors who want to gain the recognition of visitors and win their trust and goodwill, in addition to effective product display programs, they must also pay attention to later promotion. After several or dozens of exchanges, a systematic communication service process is formed. In order to obtain a significant display effect, interactive display design is very important. It is necessary to communicate with visitors in every detail, so as to provide perfect information services.

## 3. The Construction of Interactive Design in Urban Public Space

### *3.1 Experimental Background*

With the continuous development of high and new technology, interactive technology will become more mature. In the future, interactive design will bring multi-dimensional sensory experience to the audience through richer interactive methods. The design method combined with exhibition design will also become the trend of the development of exhibition space in the future. Through the observation of website download learning of urban public space design, this paper investigates the account number of users learning interactive design knowledge.

### *3.2 Test Method*

It is necessary to investigate the accounts of users learning interactive design knowledge, to better understand the real needs and ideas of users of interactive design in urban public space, and to improve relevant urban public space design web marketing strategies. This questionnaire survey is very necessary. According to big data collection, count the number of official accounts of users who have learned the knowledge of interaction design, and search the Internet for relevant accounts of official urban public space design through keyword search. After removing the blank accounts and overlapping accounts, the current official website separately checked the specific statistics of account retrieval for learning interaction design knowledge.

### *3.3 Experimental Data Collection*

This article carried out the following planning and research to screen and analyze the information of the basic research population. The first category is interesting and can make full use of official mobile phone numbers and the Internet: the second category is staff related to urban public space designers, and the third category is interaction design enthusiasts who only pay attention to urban public spaces based on their own interests construction. The questionnaire is sent in the form of a link or two codes to open the questionnaire. After completing and submitting the questionnaire, you can randomly participate in the lottery. The maximum prize amount is 20 yuan, and once the coupon is sent, the effect exceeds expectations. A total of 1574 answers were collected, of which 1395 were valid questionnaires.

## 4. Investigation and Analysis of the Application Experiment of Interaction Design in Urban Public Space

### *4.1 A Statistical Table of the Number of Accounts for Users of a City Construction Website to Learn Interactive Design Knowledge*

The following is a statistical table of the number of accounts for users of a city construction website to learn interactive design knowledge (as of August 26, 2020). The experimental data is shown in Table 1.

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*Table 1: Statistics on the number of accounts for users to learn interactive design knowledge*

| option | men | female |
|---|---|---|
| Users often learn about interaction design | 75 | 138 |
| Users occasionally learn about interaction design | 31 | 11 |
| Users only browses the interactive design knowledge webpage | 132 | 34 |

It can be seen from the table that users of a city construction website often learn interactive design knowledge and occasionally learn interactive design knowledge and the number of accounts that only browse interactive design knowledge web pages. There are 75 accounts that male users often learn about interaction design knowledge, 31 accounts that occasionally learn interaction design knowledge, and 132 accounts that only browse interactive design knowledge web pages, while female users on urban construction websites often learn interaction design knowledge. There are 138 accounts, 11 accounts occasionally learning interactive design knowledge, and 34 accounts only browsing the interactive design knowledge webpage. It shows that compared with male users, female users have more people who often learn the knowledge of interaction design and only browse the web, while male users are the opposite. It reflects that the construction of interactive design in urban public spaces is very common.

### *4.2 A Customer Satisfaction Survey Statistical Chart of a Construction Company Using Cross-Design in the Construction of Urban Public Spaces.*

As shown in Figure 1, according to a field survey of a construction company using cross-design in the construction of urban public space customer satisfaction survey statistical chart.

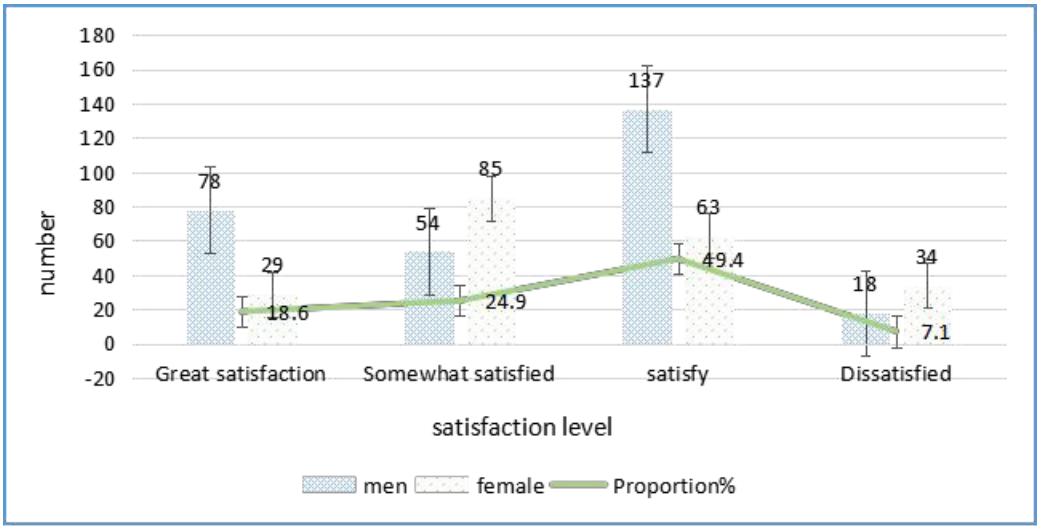


*Figure 1: Cross-over design used in urban space customer satisfaction survey chart Figure 1 is a field survey of customer satisfaction survey statistics of a construction company*

Using cross-design in urban public space construction (doing only and May 24, 2021). It can be seen from the figure that boys are using interactive design in urban public spaces. There are 78 people who are very satisfied with the space, 54 people are relatively satisfied, 137 people are satisfied, and 18 people are dissatisfied; while girls are very satisfied with the use of interactive design in urban public spaces. Of the 29 people, 85 people are relatively satisfied, 63 people are satisfied, and 34 people are dissatisfied. It can be seen from the figure that customers are generally satisfied with the use of interactive design in the construction of urban public spaces, and it is also necessary.

### *4.3 Analysis of the Degree of Execution of Interaction Design Methods by Technical Staff and Scholars in a Certain University*

As shown in Figure 2, according to the field survey of the method of interaction design between college technicians and scholars (recognizing and understanding objects, grasping the object's modality, information feedback), the executable degree type analysis diagram.

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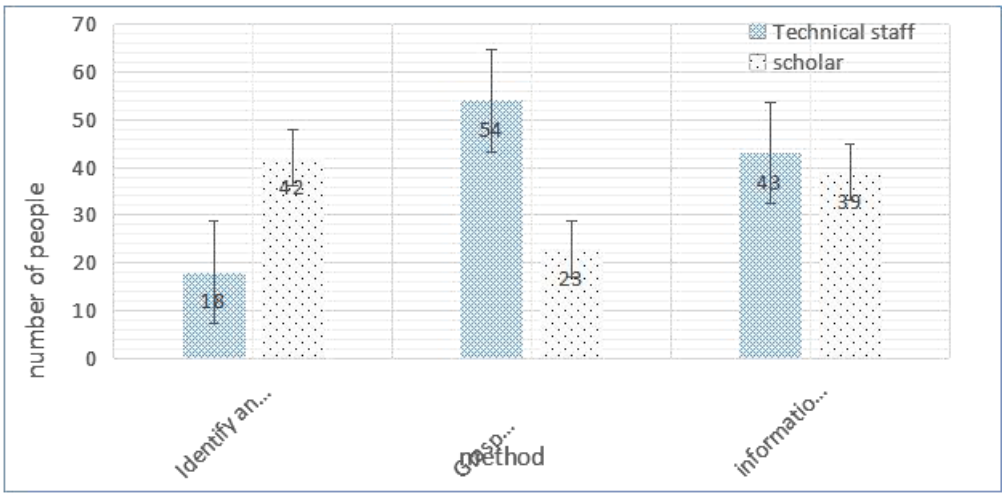


*Figure 2: An analysis diagram of the degree of execution of the interactive design method in a university*

Figure 2 is an analysis diagram of the executable degree type based on the field survey of the method of interaction design between college technicians and scholars. It can be seen that the experts believe that the executable degree of identifying and understanding the object is 18 people, the executable degree of grasping the modality of the object is 54 people, and the executable degree of information feedback is 43 people; while the scholars in colleges and universities believe that the executable degree of recognizing and understanding the object is 54 people. The executable degree was 42 persons, the executable degree of grasping the target's modality was 23 persons, and the executable degree of information feedback was 39 persons. It shows that scholars and technicians in a university believe that information feedback is more enforceable; scholars believe that it is less enforceable to identify and understand objects, while experts are on the contrary, and experts are less enforceable to grasp the modality of objects.

## 5. Conclusions

With the progress of society and economic development, people's material and spiritual level has been improved, and the proportion of commercial public space in urban construction is also increasing. People are no longer satisfied with the original spatial functional characteristics, and need to introduce solutions to improve the current situation. Introduce interactive design into commercial public space, optimize the space environment, meet the current social needs, and integrate the concept of environmental art into user space. The art research of commercial public space with interactive design is a relatively rare research on space art optimization technology. The interactive design method proposed in this paper has certain popularization value and guiding significance for the current methods of designing and improving the spatial characteristics of urban commercial public space. It explores the new commercial development direction in the future, realizes the artistic and intelligent space environment of the commercial public entrance space in the human-computer interaction system, and fully reflects the artistic vitality and great artistic charm of the space environment.

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