Research on the Combination of Architectural Design and Internal and External Environment Planning Based on Small Building Space

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Abstract. People's requirements for architectural space and function are getting higher and higher, so they need to strengthen their demands for functional technology and spatial structure in design to meet people's behavioral needs in architecture. The impact of urban planning on urban space is macroscopic, lasting and decisive, while the impact of architectural design on urban space is local and concrete. As the main structure of a city, whether its design can be in harmony with the urban space of the whole city will directly affect the perception of urban residents. Therefore, designers must consider the internal and external layout when designing the buildings in order to fully meet the requirements and feelings of users. For small buildings, due to their small floor area, in order to meet the needs of people, it is necessary to divide and use the internal space carefully to meet the high-quality requirements of residents for living conditions. In this paper, based on the sociological perspective, starting from the urban internal functional structure, this paper analyzes the architectural design of small building space and the internal and external environment planning.

1. Introduction

In recent years, China's urban population has been growing, and the demand for housing has become increasingly tense. Based on the practicality and economy of small apartment houses, it has gradually won the favor of residents and become an important part of urban housing in China [1]. According to the basic theory of planning, urban space refers to the provision and endowment of a certain structural space and activity space to the city. Its nature is not only determined by the physical size and plane position of the space, but also depends on human social activities [2]. Urban planning and construction managers and developers must also have the basic ideas of China's advanced building science and technology, China's advanced culture and art, and a sense of social responsibility to serve the majority of urban residents. The impact of urban planning on urban space is macroscopic, lasting, and decisive, while the impact of architectural design on urban space is partial and specific [3]. For small buildings, due to their small footprint, in order to meet people's needs, it is necessary to divide and use the internal space carefully to meet the high-quality requirements of satisfied residents for living conditions, and to improve the comfort and quality of residents' lives [4].

According to the basic theory of planning, urban space refers to the provision and endowment of a certain structural space and activity space to the city. Its nature is not only determined by the physical size and plane position of the space, but also depends on people's social activities [5]. The impact of urban planning on urban space is macroscopic, lasting, and decisive, while the impact of architectural design on urban space is partial and specific [6]. The overall spatial structure of the city has broken
through the original circle-layered organization and transformed into a networked structure. There are many factors that lead to the formation of urban space, with its complicated formation process and formation environment. However, urban planning and architectural design are the two main aspects that affect urban space [7]. The organization of production and its spatial relationships lead to regional differences in the division of labor, which is the result of the interaction between regional production conditions and capital reproduction requirements [8]. Based on the perspective of sociology, this article starts with the internal functional structure of the city, and analyzes the architectural design of small architectural spaces and the planning of the combination of internal and external environments.

2. Space composition and design status of small buildings

For small buildings, its space mainly includes public activity space, transportation space, and private space. In residential space, it also includes housework activity space. The reason why a city is a city is not whether it has walls or not, but because of the common interests and common goals of citizens to create a better life. The compactness of urban functional space is based on service facilities representing different functions of the city, and the theoretical occurrence of urban traffic is reflected by calculating the average service radius of urban service facilities [9]. The design concepts of modern buildings are interlinked, and the elements in the space design of small buildings are also likely to become choices in the local conception of large buildings. Therefore, new breakthroughs in the creative design process of small buildings can be applied to more architectural designs. Therefore, the creative space design of small buildings can inject new elements into modern buildings. Through creative space design, small buildings can be given different vitality, so that small buildings can form a different form of expression for art than large buildings and finally become the expression of beauty in people's hearts.

The purpose of drawing up a project schedule is to control project time and save time. One of the main features of the project is that it has strict deadlines. When the project begins to implement and progress, a reasonable and scientific project construction plan is an extremely important link. Moreover, some time procedures are estimated based on similar construction projects of the construction enterprise before. In the current construction schedule preparation process, the plan review technology estimates the time based on an 80% completion rate. The time estimation of the construction period accords with the particle swarm optimization probability function, as shown in Figure 1.

![Figure 1 Estimated probability distribution of process duration](image)

At present, in the space design of small buildings, the problem that must be dealt with is the limitation of space, such as how to change from small to smart. However, the existing space design of small buildings focuses on the visual effect of increasing the area, and the design lacks innovation. The creative design of small buildings lies in constantly exploring and displaying richer contents in limited space, which beautifies small buildings to a great extent. Therefore, the space creative design of small buildings is conducive to attracting people's appreciation of small buildings and expanding
the development space and market of small buildings. Most urban public spaces exist in a spatial system to satisfy certain functions, and are composed of various elements in cities. Each element restricts and envelops each other, forming texture and structure, showing multi-level organization mode in the process of urban development. If the city fails to transform in time before the recession stage arrives, it will cultivate new core power and improve the city function. Creative design of small building space becomes inevitable, so it is necessary to inject new elements into modern buildings, find new breakthroughs and visions, fully consider the characteristics of small buildings, organically combine the various components of buildings, integrate the surrounding environment, and reflect the sense of the times of small building space.

3. Architectural design and internal and external environment planning

3.1. Indoor environment

The extreme lack of urban space makes the construction of buildings more and more dense. Although the density of such buildings promotes the development of commercial trade to a certain extent, it brings great pressure on the life of urban residents. The privacy of living behavior can make occupants feel a sense of psychological security. Increasing the privacy of indoor and personal space is an important content of humanized design. People often can't accept that the furnishings and activities in the living room are completely seen by strangers or occasional visitors, hoping to have a space to isolate or slow down the interference from outdoor sight and noise. Today's big cities are gradually developing from single-center urban structure to multi-center urban structure. In the public communication space, entrance is an important factor connecting the two spaces, and it is the transformation between different space fields [10]. When a person enters another space from one space, the entrance plays different roles according to different psychological needs. Space design of small buildings should fully consider the use requirements, household scale, basic human activities, psychological satisfaction and so on. A complete space can often be endowed with certain functions by us. For example, the transition space at the entrance of a bedroom can be given the functions of display and viewing because of its integrity design. The integrity of space includes the integrity of space shape and the integrity of use function. Being in a complete functional space will make people feel comfortable, relaxed and satisfied.

3.2. Outdoor environment

The research on outdoor environment design of small building space is mainly based on the characteristics and physiological and psychological requirements of people's behavior activities in small building space, especially the factors directly related to people's psychological feelings and behavior activities in small building space, and seek solutions. In the space design of small buildings, functional compounding is an important means to ensure the maximization of the use area, the flexible use of space, and the improvement of the use area coefficient. Compared with large buildings, the competitive advantage of small buildings is not obvious, so the audience must be considered in the space creative design. If architectural style wants to gain a wider range of influence, it must integrate a variety of factors at all times and in all over the world. Only in this way can it have a wider audience [11]. People's behavior in space is affected by many conditions, which presents an uncertain, random and complex phenomenon, which has both regularity and great contingency. If people wander and linger in the same space, they will naturally lead to various social activities. This means that as long as the conditions of necessary and spontaneous activities in public space are improved, social activities will be promoted indirectly.

Designers should pay attention to the potential use of public space in small building space design. For example, the arrangement of green space in small building space should consider its accessibility, affinity and functionality. Design concept is the sum of the principles and methods that guide designers in the design process. Design concept is related to the quality of the whole design results and even the quality level of designers. At the beginning of human development, people distinguish their
own place from other places. Because people come from different cultural backgrounds, there are various kinds of buildings in different places. This unique personality comes from the regional differences of culture. In the process of space creative design, we should fully consider the characteristics of small buildings, so as to achieve the overall coordination and perfection.

4. Conclusions

In the space design of small buildings, the coordination between people and space should be considered according to different behaviors and activities of people and different environments, and the space should be designed creatively. There are many aspects to be considered in the design of urban space architecture, such as the coordination between architecture and urban space, and the development of supporting urban planning and layout around the building. A slight carelessness will easily lead to traffic congestion around the building. The development of space creative design for small buildings is the main direction of future development in the field of architecture, and it will also bring more architectural visual feasts to people. For small buildings, the space mainly includes public activity space, traffic space and private space, and in residential space, it also includes housework activity space, etc. Creative design of small building space becomes inevitable, so it is necessary to inject new elements into modern buildings, find new breakthroughs and visions, and fully consider the characteristics of small buildings. The space creative design of small building itself is a part of the whole small building, which serves the whole style of small building. Therefore, in the process of space creative design, we should fully consider the characteristics of small buildings and realize the overall coordination and perfection.

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