

# Application of green plant elements in office space

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**Abstract:** "green plant elements" visualization of modern office space design is the "green plant space" design development process. The transformation from "green plant element" to "green plant space" is the main expression of interior design in recent years. Explore the green plant elements in modern office space innovation. Green plants in the building has good ecological performance, light weight, easy to shape, has become an indispensable material in modern architecture and interior decoration materials. With the help of natural green plants, green relaxation, fresh and other elements, to create a new modern office environment.

## 1 Preface

According to the shape of green plant elements, the sense of gradation can affect indoor or even outdoor environmental relations, and its combination with spatial environment and layout will affect indoor and outdoor space design. Green plant elements can divide the enclosed environment, but also the open environment can be separated, making the whole space more hierarchical.

With the development of the times, people pay more attention to the topic of health and environmental protection. The high pace and frequency of modern life make people have less energy to take the extra time out to feel the charm of nature and enjoy the feeling of green plants. With the improvement of people's living standards, people's demands for daily work are also increasing gradually. People no longer limit themselves to the standardized and unified office space, but introduce the elements of the outside world into the interior, so that people can feel the breath of the outside world and even see and touch the green plants in the nature while working.

## 2 Summary of office space

### 2.1 Emergence of various types of office space

The root cause of the current crisis of office space is that the office environment is single, the visual experience is dull, the lack of humanistic care. In many traditional spaces, people crouch in a narrow space, separated by a simple low partition, the space is simple and single, and there is no corresponding rest, leisure, entertainment,

dining areas, resulting in employees in such a working environment can not be physically and mentally satisfied.

The Larkin Building, designed by Wright in 1904, was revolutionary in the history of the workplace. This is the first skyscraper in history. (Figure 1)

Office from 1940 to 1950 advocates open, uninterrupted office space. (Figure 2)

Bob Propst's cubicle office, which he launched in 1967, has long been criticized for using modular and lattice-shaped design to achieve effective and sound management. (Figure 3)

Entering the 21st century, the open and cooperative office has left the cubicle, broken through the hierarchical structure between the boss and ordinary employees, and created an equal, cooperative and innovative working atmosphere. (Figure 4)



Fig.1 Larkin Tower

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**Fig.2** 1960s Landscape Office



**Fig.3** The interior of the Larkin Building



**Fig.4** Landscape Office of the 1960s

## 2.2 Classification of office space

### 2.2.1 Development of office space abroad

Early office spaces developed from residential spaces and later evolved into deliberative office spaces. By the end of the 19th century, due to the Industrial Revolution in the West, people pursued high efficiency and high profits, and office space began to appear independently. Since the beginning of the 21st century, work has gradually become the focus of people's lives, people begin to spend more time in office, the development of office space to keep pace with the pace of society, began to appear a variety of office models to stimulate functional space in the form of shared space <sup>[1]</sup>.

With the development of the three industrial revolutions, the city continues to develop, various types of design styles continue to appear, a variety of office equipment constantly updated, so that office space is also constantly improving. From the beginning of the living room office space to today's intelligent, human nature, human and cultural office space, office space gradually mature.

There are seven stages of office space abroad: white-collar factory in the early 20th century, open office

space in the 1950s, landscape office space in the 1960s, experimental office space in the 1970s, electronic office space in the 1980s and virtual office space in the 1990s <sup>[2]</sup>.(Figure 5, Figure 6)



**Fig.5** Union Carbonized Building



**Fig.6** Office Building, Bishop Center, Netherlands

### 2.2.2 Development of domestic office space

Compared with foreign countries, the economic development of our country in the early stage is slow, and the development of office space is relatively slow. Our country's office space design is generally based on the interior office design of foreign countries.

The office space of our country can be divided into three stages: before the reform and opening -up, the economic development of our country was slow, all kinds of economic development were backward, only the government and relevant units have the office space, can only meet the most basic office needs, all kinds of office space in the 1980s. -- With the rapid progress brought about by the reform and opening up, China's urbanization and industrialization have developed rapidly, and people's ideas and cognition have been greatly updated. Various kinds of information have poured into people's lives. People begin to pursue the needs of office space in all aspects, not limited to the satisfaction of basic functions. Landscape, open and humanistic office forms are all applied to office space <sup>[3]</sup>.(Figure 7, Figure 8)



**Fig.7** World Trade Center Shenzhen



**Fig8** Guangzhou World Trade Center

### 2.3 Status of office space

At present, the office environment in our country is weak in office cognition, and the research on office space in our country is relatively late compared with that in foreign countries. Many offices in our country are still limited to the office areas with cells, and do not pay attention to the division of office environment. In order to improve the office rhythm and efficiency, the material and spiritual needs of employees are ignored [4].

Most offices in our country are still attached to fixed cells, such as manager's room, reception room and staff area. The division of office space is too complicated, which breaks down the fluidity, continuity and communication of the office.

The lack of humanistic spirit in the office. At present, the design of the office is limited by the development of social economy and culture. At present, there is no distinct design with its own style.

### 2.4 Green plant concept

Green plants are non-unicellular plants containing chlorophyll, which can absorb carbon dioxide and water and at the same time convert to sugar and release carbon dioxide and water as a renewable raw ecological materials. Green plants light weight, easy processing, low price and easy molding, has become an indispensable part of building materials and interior decoration materials.

And the use of green plants in the indoor environment can play a regulatory role in beautifying the environment, purifying the air and regulating indoor water balance. Green plants are recyclable renewable resources. Using green plants as design materials can make people feel completely back to nature, leaving no architectural pollution, which is in line with green sustainable design principle.

Today, the speed of social progress is proportional to the environmental pollution, and the consumption of resources is going up in a straight line, so we should use recycled materials in building and interior space.

#### 2.4.1 Development of Green Plants in Foreign Countries

In foreign countries, the use of green plants in space design has become a hot topic. Designers have not only carried green plants directly to use, but according to the

needs of space design, give green plants more appropriate shape, through combination, pruning to achieve the desired effect, and the use of plants with the local environment, the real integration of architecture and nature.

For example, the GLEM office of MP design uses bamboo as the main structure connecting ceiling and ground in the interior. The design of this office just uses the green plant elements. Even if the original space changes will not produce material waste, the original building left behind by the bamboo material can also be decorated or re-use. There are many foreign green plants will be outdoor elements into the office space, through the design means and space division, the real realization of the "harmony between man and nature." (Figure 9)



**Fig.9** Stereo Greening of Singapore "Garden City"

#### 2.4.2 Development of domestic green plants

At home, the application of green plants in the space is not as good as abroad, there is a quite understanding of green plants can only be planted as a cultivation plant in the space, or even directly transfer green plants, the effect is not satisfactory.

Currently in the domestic green plant elements into the building and indoor examples or very few, most will be green plants as a three-dimensional green use, are directly green plants as the exterior decoration. Green plant elements, as renewable materials, produce less harmful substances than decorative materials with the same properties in the process of construction. With the continuous progress of science and technology and the continuous development of new technologies, Green plant elements have brought more advanced design forms and means for the development of interior design and architectural development [5].

## 3 Application of green plant elements in modern office space

### 3.1 Application of green plant elements in modern office space

With the development of the times, the pattern of the office space has developed from the simplification and systematization to the diversification, and the diversification of the office space has also promoted the staff to work more and more onerous, in the modern office, the work rhythm is speeding up the atmosphere, the staff's work request is also more and more strict, the work efficiency must enhance, under such environment,

should pay attention to people's physical and mental health. The environment of office space is relatively closed, the use of green plants can adjust the air quality in the office space. When the green plant elements are introduced into the office, people will feel close to nature and yearn for nature, so that people's tension and pressure are reduced. In today's workplace, people's mental pressure is increasing, more green plants to create a quiet office atmosphere and reserved planting space, employees can plant their own, enjoy the process of greening conservation and management, to create a quiet space within their own, office space needs green plants with such a variety of functions as "air purifier" [6].

### **3.2 Influence of Green Plant Elements on Working Atmosphere**

#### *3.2.1 Psychological impact*

Now the rapid development of society, social atmosphere impetuous make people's mentality is gradually impetuous, office environment atmosphere can directly affect people's mood and working state. Comfortable, harmonious, natural, fresh working environment, can make people happy, positive, improve work efficiency, on the contrary, dirty, irritable, cold working environment makes people depressed, inefficient. Frankly speaking, office space is to serve people, to provide people with a comfortable, stable office environment, in the office space, the center of space, but also the main space, the use of people is essential. In the process of evolution, people still retain the original idea of yearning for nature and expecting to return to nature. In the design of this office space, the introduction of green plant elements can make people mentally comforted and satisfy. In the office space, the introduction of green plants has a positive impact on people's mental health, makes people feel full of nature, innocence, simplicity and sunshine, imperceptibly affects people's psychology and mentality, and has a positive impact on people's work and life.

In the design, we can use a lot of green plants on the walls and in the center of the space, so that people can feel the encirclement of the green plants at any time and in any place.

#### *3.2.2 Physical influence*

The adaptability of people in the environment is very strong, and the impact of the environment on people is also very strong, people and the environment is interdependent and symbiotic, people work in the indoor air does not circulate, the degree of air turbidity will become more serious, people can not get access to fresh oxygen, work efficiency will be greatly reduced, the introduction of green plant elements in the indoor, under the photosynthesis of green plants, absorb the carbon dioxide inside the office space and then convert it into oxygen, for indoor air environment regulation has a great role, people always exposed to fresh oxygen, will greatly improve work efficiency. In today's office environment,

people use computers and mobile phones in a large proportion, and the introduction of green plant elements in the indoor office environment, in people's visual fatigue, can effectively alleviate fatigue, has a great role in people's health.

### **3.3 Cultural extension of green plant elements in indoor office space**

In the design of space, each element has its corresponding meaning. In the design of space, we should not only consider the rationality and comfort of space, but also the meaning of space expression and cultural heritage. In the continuous development of society, many elements are given different meanings.

Since ancient times, the elements of green plants have been endowed with many meanings by us. For example, bamboo has been endowed with perseverance, the gentleman has a high moral integrity, and lotus has been endowed with self-restraint, not drifting with the tide, and so on. The use of green plant elements in office space can also be used as a reminder to warn people to stick to themselves and keep their original minds undisturbed by the surroundings in today's social life and work..

### **3.4 Relationship between green plant elements in indoor office space and outdoor environment**

Green plant elements play an important role in the interior and exterior. It is a hinge connecting the interior and exterior. It can be a unique scene in a corner of the interior or a wall in the exterior. The use of green plant elements in the space can not only enhance the vitality of the interior, break the original pattern of rigidity, indifference, and can make indoor and outdoor contact, so that the relationship between the two spaces more closely, so that indoor people feel outdoor scenery and sense of belonging [7].

No matter which kind of indoor space is complementary to the surrounding outdoor space environment, indoor space without outdoor space can not be called indoor space, outdoor space without indoor space can not be called outdoor environment, the two are always combined, and the use of green plant elements is to make the relationship between the two closer, so that the two blend, in the indoor space if green plant elements can not only make the indoor space more comfortable, natural can also make the two more closely integrated, truly achieve "harmony between man and nature."

## **4 Conclusion**

Through the green plants in the design to create a unique understanding of the design, a more close to the green design, the unique elements of China into the design, so that today's design is not only reference to Western architecture, more Chinese characteristics, the introduction of green plants in the building elements, the building and indoor and outdoor space and green plants

elements better integrated together, but also better integrated with people and nature.

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