

Research on the Development and Future Trend of Office Furniture Design

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Abstract. Technological innovation and social development have caused huge changes in people's demand for office space. The development of the Internet of things, interaction design, and experience design has played an important role in the design research of office furniture in the future. In order to adapt the future office furniture design to the theme of the development of the times, this article uses the method of Literature review to understand the development history of office furniture design, and comparatively analyses the current situation of office furniture diversification through Case study, and analyses the future trend of office furniture design.

1 Introduction

The development of information technology makes the office working a new way. Traditional furniture and way of office working can not satisfy modern office people which leads to the new office furniture design being produced. Modern office furniture design pushes two concepts to an extreme: communication and efficiency. Therefore, lots of different office furniture styles and aesthetic paradigms are developed. The future office space showing a state of high mobility, diversity and personality, that requires corresponding office furniture still further people-oriented, knowledge innovation and concept transferred to conduct variable and diverse design to satisfied different types of needs. On this account, to create a more reasonable and healthy way of working and living.

2 The development of office furniture

Office furniture was mainly produced in the early 20th century, and the previous office space was basically composed of a table. It was not until the early 20th century due to the rapid increase in office population that office furniture design, office furniture production, and office furniture use began. The design of office furniture is influenced by two trends of office art and office management, forming a modular design that balances artistic sense and facilitates management to adapt to the public. In the 20th century, Frank Lloyd Wright, one of the most influential office furniture designers in the United States, began to integrate architecture, interior and furniture. The furniture he designed for the Brockfield Building was an organic whole, even the seat is connected to the table and pulled out through the

rotary shaft on the table legs. With the continuous development of human thinking, the traditional modular and systematic office furniture has been broken. In the 1960s, the Schnell Brothers (Germany) hoped to establish a new mode of communication between the employees-random grouping of furniture, partitioning with screens, and embellishment with greenery called "landscape office". However, due to high cost, noise interference, closed vision and light space, landscape office is gradually replaced by another more flexible "unitized office form"-each employee has an office area, To achieve personalized adjustment or combine open space with unitized office.

In the 1980s, computers came to the desk of employees, and the office methods and office behaviour changed dramatically. This meant that the design of office furniture also changed accordingly. With the development of information systems, the emergence of mobile phones, the Internet and e-mail, office workers have actually become "free mover", no longer need to go to a fixed place and location for work, office furniture design also began to consider issues such as wiring, power, portability, and portability. At the same time, people began to pay more attention to the free and comfortable office environment, which is the so-called humanized office furniture design. The service object of the furniture is people, and the office furniture needs to be designed based on the humanized design concept due to its long use time, high frequency of use, and wide range. A more comfortable office environment allows office workers to have the best working conditions, achieving a proportional increase in high efficiency and happiness.

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3 Analysis of current status of office furniture design

In the 21st century today, the rapid development of experience economy and Internet technology is driving office furniture to a more intelligent and humanized way. In addition, in the Internet era of brand IP prevail, the design of office furniture will often show a diversified trend according to the needs of corporate image and corporate culture. Innovative and personalized office environment design is an important embodiment of a company's brand identity, corporate culture, and core values. Diverse office furniture is a necessary condition for creating a personalized office space, and it is also one of the main visual communication media to convey the company's brand culture.

Google, as an Internet company dedicated to innovative design, office furniture design is often based on user's needs, focusing on creating its own unique office space. This is partly because, for people who are engaged in creative and design work, they need more free space and the stimulation of new things to enhance creative inspiration and work efficiency compared with those who work in general affairs.



Figure1. The pea pod house of Google, Zurich, Switzerland.

For some enterprises with diversified affairs, to ensure the stability of the workflow, modular furniture is quite essential. Units and combinations, independence and collective, individuality and unity on the basis of humanized design for modular integration need to be considered. Some companies have put forward new ideas for such problems and have adjusted and designed the existing office space accordingly.

For example, the famous American Office Furniture Co., Ltd. Haworth, divides the entire office space into a relatively independent but interpenetrating organic whole through the reasonable configuration of walls, rooms and furniture, forming a rigorous modular work area and Two office areas with different styles in a relaxed and casual office area, in order to meet the needs of different working positions and different personality groups for the working environment.



Figure 2. Haworth Shanghai office area.

4 Future office furniture design trends

One of the most potentially influential factors for the future office is the application of artificial intelligence (AI) and big data. Intelligent office furniture that incorporates technologies such as the Internet of Things, sensors, and smart chips provides unlimited possibilities for meeting human needs in all directions.

4.1 Personalization and customization

Due to the development of new technologies, our work are becoming highly personalized and customized, and the workplace will become more diverse and integrated. This means that the design of office furniture will need to provide more personalized, professional and customized options. In 2013, Herman Miller proposed the concept of living office. It's about a shift in management, tools, and places that drives greater connectivity, creativity, productivity, and prosperity in the workplace. For

example, co-workers who want to converse will seek out an area that enables them a semi-private setting with the potential for an area to teleconference, such as a Haven. While others who want to show and tell, may seek out a Meeting Space where furniture and technology arrangement supports clear sight lines among employees with the ability to share digital content.



Figure 3. Linak DPG desk panel.

The integrated reminder function of the three DPG Desk Panel models is visualised by a light. Its colour reflects the current usage status of the desk. A colour change of the light reminds the user when it is time to change position. The reminder function thus naturally supports the user to achieve a healthy posture variation throughout the day. It is also compatible with the Desk Control app by using the integrated Bluetooth wireless technology. The app allows the user to keep track of his personal desk usage statistics on a smart device and get notifications when to stand.

4.3 Digitization and emotionalization

Big data has also been gradually applied to the field of office design. By tracking the utilization rate of office space and office furniture, collecting real-time data, rationally dividing the space and proportioning the furniture, it can help improve the effective utilization of office space and give employees a better office experience. At the same time, the data is also used to observe employee well-being. Psychological research shows that employees' physical health and well-being have a great influence on work efficiency and work motivation. The design of office furniture has always been dedicated to the exploration of ergonomics in order to provide users with healthy and comfortable products, and has also paid considerable attention to the emotional needs of users. In the era of big data, data feedback can better show the actual and potential needs of users, so the combination of office furniture and big data will inevitably become one of the key points of the future office furniture industry.

5 Conclusion

The entire development process of office furniture design is actually derived from social and technological changes.

4.2 Interactivity and intelligence

Compared with traditional office furniture, smart office furniture has established more relationships with people, which has enriched and complicated the interactive experience process between users and products. Linak released the DPG desk panel at the 2017 NeoCon Chicago Office Furniture Show.

Social changes have gradually raised people's living standards, and people's demand for spiritual levels has been continuously increased. In addition, the diversified development of society has led to the transformation of office nature from a single inherent form to diversity. The technological innovation provides a hardware foundation for the development of the entire office furniture design. In the future, user experience will play an increasingly important role in the design of office furniture. And from human-oriented design focusing on ergonomics to a combination of intelligent interaction and emotional interaction design. Office furniture will no longer be isolated furniture, space management, communication, collaboration, communication and sharing will become the main purpose of future office furniture design.

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