The Impact and Change of Intelligence on Construction Industry in Post-epidemic Era

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Abstract: Due to the increasingly serious environment and the continuous shortage of funds, human beings have realized the importance of environmental protection and conservation. At the same time, various industries also advocate green environmental protection and sustainable development, so smart buildings are also moving towards environmental protection and conservation of the general trend and development. The application of intelligent building technology to achieve green environmental protection and conservation purposes, has its necessity and prospects.

1. Introduction

The epidemic situation has produced the enormous influence to our country each profession each kind of economic development, as our country national economy pillar's construction industry, has received the enormous influence. In the post-epidemic era, the development of intelligent buildings and the construction of green environmental protection education and sustainable development projects need good integration. We constantly use advanced technology in the design of intelligent building products, thus effectively promoting the development of intelligent building industry.

2. Building intelligence

2.1 The meaning of intelligent building

Since the 1990s, the concept of intelligent building has emerged in China, and many modern buildings, called“Intelligent buildings”, with automatic control functions to a certain extent, belong to different grades[1]. Today's developments in information technology are making smart buildings more common, as people's household appliances, vehicles, and even buildings become smarter with new technologies such as the Internet of things and artificial intelligence, after working and living more comfortable and convenient, designers have set their eyes on a broader space, a building and even an entire city.

2.2 Intelligent system integration

Real intelligent building“Intelligent Building Management System”(IBMS) features. IBMS is the core of building intelligent system, which belongs to the highest monitoring and management level of the whole building intelligent system. The building's operational information is stored in a large“Digital brain” server that connects the individual smart systems in the building. Both energy flow and energy consumption can be detected and maximized to create an efficient building that can learn on its own. This allows the building and user to learn from each other: the building can be adapted to the user, the user can also be based on personal needs to control and change the layout of the building.

3. The development and present situation of intelligent building

Intelligent building first appeared in our country, Taiwan's intelligent building development earlier, Hong Kong's intelligent building development earlier, such as the HSBC building, are relatively high degree of intelligent building. Smart Chinese mainland are a relatively late starter.

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Originated in the 1990s in recent years, the late is Beijing, Shanghai and other places in China's intelligent building development, the industry in these 20 years experienced a start-up period, standard period, the development of three stages[2]. Through these years of development, intelligent building has infiltrated the various types of buildings and some of the city's construction. At present, the market demand for building intelligence in China is mainly composed of two parts : the application of intelligent technology in new buildings and the intelligent transformation of existing buildings. At present, China 's intelligent building is still in its infancy, there are many problems, mainly for the quality of the project is not high, the level of construction is not high and a series of problems. The existence of these problems has greatly hindered the development of intelligent buildings in China, resulting in the suspension of construction in the manufacturing of intelligent buildings in China, the obstruction of technology, and finally did not play the expected results.

3.1 Lack of uniform design standards

In the design process of intelligent building, the construction standard and design standard of intelligent building have played a certain role. Intelligent building has its own unique characteristics, so it is necessary to develop a set of unified design standards. Unlike traditional architectural design standards, intelligent buildings are managed and designed separately.

3.2 Lack of innovation ability

At this stage, most of the equipment and technology used in intelligent buildings in China are mostly from abroad. Although it has greatly improved the level of intelligent buildings in China to a certain extent, there are also many disadvantages and hidden dangers for us. Therefore, relevant industries and experts should further strengthen the research and new development of intelligent buildings, and produce corresponding components and executive components of new intelligent buildings. Do not rely on foreign equipment and technology to complete China 's intelligent building.

4. The influence and enlightenment of the epidemic situation to our country's construction industry

The epidemic situation has produced the enormous influence to our country each profession each kind of economic development, as our country national economy pillar's construction industry, has received the enormous influence. According to the construction industry association, the number of 2021 construction workers was 52,829,400, down 1.56 percent from the end of last year and 1.11 percent lower in 2020 than at the end of 2019. In January of the same year, a total of 31 provinces and municipalities launched the first-level response to major public safety and health incidents (especially major level) , january 24,2020, is considered the starting point for the full start of the covid-19 pandemic in our country[3]. A week later, World Health Organization announced that the covid-19 pandemic had been placed under the international spotlight of Public Health Emergencies. The epidemic situation lasted for three years has had a great impact on all walks of life in our country. As a pillar of our economy, the construction industry has been affected in many ways. The impact of the epidemic on the construction industry has temporary and phased characteristics. In such a context, the construction industry is facing a new external environment, the performance of the current trend.

4.1 The basic situation of our country's construction industry during the epidemic

The notice of the Ministry of Housing and Construction requires all regions to pay attention to the epidemic prevention and control work in engineering, and orderly promote the start and resumption of construction enterprises. Affected by the epidemic, some construction units have difficulty in capital turnover, which will not only affect the construction of new projects, but also some old projects. The construction industry has thus come to a standstill. Some companies have

closed down because they are overwhelmed. Some companies can even maintain their livelihoods and reduce employee income.

4.2 Enlightenment of COVID-19 on the Development of Construction Industry

4.2.1 Vigorously develop prefabricated buildings

The prefabricated building began to show, during the Wuhan fight against the epidemic, “Huoshenshan” 10 days, “Raytheon” 12 days to build, so that people have a deeper understanding of the benefits and advantages of assembly housing. The prefabricated building has gradually become the preferred technology for modern construction, characterized by standardization, industrialization, digitalization and accuracy Product diversification, customization trend in the continuous development of innovation in more and more obvious[4]. This gives people a deeper understanding of the benefits and advantages of assembly. Even though our country supports the development of prefabricated building in the construction industry, there are still many problems, such as the difficulty of the middle-aged and old to accept new things, the lack of trust in our professionals, and the lack of maturity in technology, there are great differences between regions. The continuous improvement of government policies and the development of the construction industry have laid the foundation for the further development of the prefabricated building industry. It can be predicted that the prefabricated building work targets of the CPC Central Committee will be further implemented, in the future, the construction industry will face new prefabricated building and opportunities to optimize and upgrade its technological system, promote the transformation and development of the construction industry, and lead by example.

4.2.2 Promoting digitization and informationization

However, in recent years, with the continuous development and application of digital technologies such as BIM, cloud computing, Internet of Things, mobile Internet, artificial intelligence, etc., it has become more and more towards the digital age. Many construction companies are using these platforms and software to connect the project and office staff, so that they can understand all aspects of the project at any time without leaving the office. At present, BIM technology still remains in single-level applications such as design, calculation, and modeling, and lacks an overall joint linkage mechanism. At present, China 's data development is unbalanced. For the balanced development of the construction industry in the region, it is imperative to promote BIM technology in the future, improve the overall planning ability of design and construction, stimulate the initiative of construction enterprises, guide the continuous rational layout of the construction industry, and enhance the ability of participants in various links.

4.2.3 We will gradually promote healthy buildings

Green and intelligent building is a new technology, which can not only protect people 's body, but also improve people 's living environment, and can also achieve the purpose of ' four provinces and one environmental protection '. In addition, because 3D printing technology has the advantages of fast, safe and environmental protection, in the future, 3D printing technology will have a huge impact on the traditional construction methods. Green building is not only refers to the green environmental protection in the construction process, but also refers to the use of the entire building cycle to minimize the impact on the environment and save resources as much as possible. The green building industry will also be divided into upstream, midstream and downstream[5]. The upstream is the green building technology service industry, mainly for the planning, design and planning of green buildings, the research and development of new building materials, the research of new technologies and the certification services of building materials. The middle reaches are green building manufacturing industry, including green building materials, green equipment manufacturing, green building construction and so on. The downstream is the supporting service industry of green building, including green building water saving, energy saving, reducing energy consumption, reducing pollution of green operation and management services. With the development concept of green building circular economy, a complete industrial chain is formed.

Lack of promotion and the ability of consumers to accept new things is slow, especially for some middle-aged and elderly people. Although the development of healthy buildings is still in its infancy, with the economic level and people 's continuous pursuit of high-quality life, healthy buildings will be the only way for future architectural development.

5. The impact of intelligence on the construction industry

5.1 Artificial intelligence optimization has improved the entire construction industry

Artificial intelligence has the characteristics of large storage capacity, strong computing power, objective theory, and is not affected by subjective factors. It is a huge breakthrough in the field of science and engineering. The use of artificial intelligence to realize the digital and information management of buildings, in which building intelligence has fundamentally changed the behavior mode and working mode of human beings. It not only makes the construction site more effectively managed, improves the efficiency and quality of the project, but also makes the operation of the building more efficient and intelligent, and provides a comfortable living environment for the residents. Due to the rapid development of computer technology, modern communication technology and automatic control technology, the future residential buildings can be intelligent. Intelligent building refers to optimizing the structure, equipment, service and management of buildings according to the needs of users, so as to provide users with an efficient, comfortable and convenient humanized building environment. Intelligent building has emerged in China for only more than ten years, and its development momentum is in the ascendant.

5.2 Building life cycle changes

In architectural design, the use of artificial intelligence technology can not only assist the digital simulation of design, procurement, construction, production and other links, but also analyze different user needs to achieve personalized design. In the process of building, the use of artificial intelligence can accurately detect human movement routes and identify safety risks, and accelerate the construction of buildings on the premise of ensuring safety. In addition, artificial intelligence can also help in building management, such as automatic recording of data. In the industrial field, artificial intelligence can automatically generate corresponding solutions and products after analyzing, modeling, and predicting data and images. It can not only complete the work, but also help enterprises save costs and time.

5.3 Achieve energy conservation and environmental protection

Sustainability is a key concern for any industry in any field. Artificial intelligence can save energy and reduce emissions in buildings, integrate more streamlined systems to provide security solutions, and provide security teams with the opportunity to implement integration, not only can enhance the function of the security system, but also can realize the energy-saving function. The artificial intelligence technology can monitor the building energy consumption status in real time, and can make the corresponding adjustment according to the energy-saving goal. Saving energy or other resources can often save money and help protect the planet's overall ecology[6]. Property management companies may have altruistic motives, but it helps if they are also closely linked to other drivers. Occupancy sensors allow smart buildings to turn off heating, cooling and lighting, thereby reducing the building's carbon emissions. This is basic, but many smart buildings are now equipped with renewable energy generation and storage (such as solar panels and batteries) , and even rainwater harvesting systems. Smart buildings can now preserve and share our planet's precious resources with other buildings.

5.4 The impact of artificial intelligence on the entire construction industry

Artificial intelligence will gradually replace humans in most of the repetitive, cumbersome and simple low-end work, including more repetitive, complex R & D design, manufacturing, etc. , so the traditional way of working will change. AI can be used to complete a project design with simple

actions, and people who are not engaged in design work can also use AI to do so, although this reduces the labor costs, but has greatly affected the employment of the entire construction industry.

6. Development trend of intelligent building

6.1 Mutual penetration of multi-field and multi-technology

By using virtual reality, a new generation of artificial intelligence, life and computer engineering technology, bionic chemistry, environmental science and other high-tech, intelligent building design has new functional characteristics.

6.2 Cross-integration of multiple systems

The three systems of the smart building can be integrated into a whole system soon. With the development of market economy and the modernization of society, the term ' intelligent building ' has gradually become popular in the construction industry. People need to have a complete, comprehensive and profound understanding of intelligent buildings, which is very critical for designers, users and developers. The development of intelligent building is an evolution process from control to management, and it is also the evolution history of building equipment management.

7. Conclusion

To sum up, the design of building intelligent engineering can ensure the use effect of the building, and effectively improve the performance of the building, so as to make our work and life more comfortable in peacetime. Therefore, we continue to use advanced scientific and technological means in the design of building intelligent products, thus effectively promoting the development of building intelligence.

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