

Discussion on the Intelligent and Informationalized Construction of Stadiums

Xiangrong Dong

Shandong Technology and Business University, Yantai, China

Keywords: Stadium, Intelligent, Informationalized, Functional stadium

Abstract: In recent years, intelligent technology has been widely used in many application fields of computer technology, especially in the stadium management system, it has been rapidly developed. The operation process is more simple, accurate and targeted. But it also faces certain problems and defects, so it must be improved. In the new era of vigorous development of information technology, it is of great significance to do a good job in the information construction and intelligent application of Chinese stadiums for the current development of Chinese stadiums. This paper makes a detailed analysis on the intelligent information construction of stadiums.

1. Introduction

With the promotion of the national fitness system, stadiums and gymnasiums are also being strengthened to meet the needs of national fitness. With the increase of stadiums and gymnasiums, their quality requirements are getting higher and higher. In this context, various new venues are constantly emerging, such as large stadiums, gymnasiums, swimming pools and tennis courts. These venues all have a certain scale and functional complexity, and they also need advanced technical means as support. Traditional architectural structural design often only pays attention to the function and ignores other aspects of the design, which leads to many problems in the use of venues, such as unreasonable structure and unscientific layout, etc., which need advanced technical equipment to realize its multi-function. With the popularization of computer digital network (CNN), stadiums and gymnasiums have made full use of intelligent technology to configure various facilities, which has improved the utilization rate of various application equipment in stadiums and gymnasiums.

2. The significance of information and intelligent construction of gymnasium

At present, gymnasiums show a multi-functional development trend. With the continuous increase of building area, its function is constantly improving and improving, but it still cannot meet people's requirements for building area, and people's requirements for sports are getting higher and higher. Therefore, it is necessary to build more sports buildings to meet the growing demand. With the continuous development of China's social economy and the improvement of people's living standards, the public's enthusiasm for participating in physical exercise is also rising. There is a close relationship between stadiums and digital networks. The intelligent design of stadiums and gymnasiums can remotely control each function control center of stadiums and gymnasiums to detect each functional unit in real time to avoid failure.

Functional stadiums hold all kinds of activities, and all kinds of competitions and performances are interspersed in limited stadiums, which can easily lead to the flow and crowding of people in the stadium environment. At this time, an intelligent monitoring system came into being, that is, multi-functional gymnasium. The automatic control system can monitor the operation of the whole stadium in real time, and when there is an unexpected problem, it can alarm the monitoring center in time and conduct remote command. Multi-functional gymnasium is one of the important components of large-scale comprehensive sports events, and it is also a complex and huge comprehensive building complex with many functions and large scale. In order to facilitate management, it is necessary to adopt intelligent design and make the stadium into a public leisure and entertainment place based on efficient and high-quality management.

In addition to hosting sports events and entertainment performances, the multi-functional

gymnasium is also a comprehensive large-scale building complex integrating sports, commerce, catering and tourism. In order to facilitate management, it is necessary to use intelligent design and build the stadium into a large leisure and entertainment place based on efficient and high-quality management. There are many kinds of facilities in the venue and they are interrelated, which brings a lot of inconvenience to the daily maintenance work, so it is necessary to effectively monitor and manage these buildings. With the rapid development of computer technology and network communication technology, PLC control is gradually widely used. Relying on computer network, data signal transmission speed is fast and resource consumption is greatly reduced^[1].

Construction for multi-functional stadiums is called intelligent building. Based on modern information technology and communication technology, it is a new type of building or group of buildings, which is formed by comprehensively using various advanced scientific and technological means and combining traditional architectural design methods. It is still in its infancy in China. The so-called intelligent building refers to a building with a certain scale and function designed and built according to Chinese national standards, which is composed of one or more independent network system platforms and corresponding computer digital networks. On this basis, some functional buildings and sports venues have been designed and built. The core of all kinds of competitive training and sports events is intelligent service, and the intelligent management system is used for optimal and efficient management.

Using intelligent system to control stadiums and gymnasiums can realize the social value of stadiums and gymnasiums, and the commercial value is based on the social value. Safe and comfortable services can meet a variety of sports and commercial activities. In addition to meeting the needs of activities, all the functions of stadiums and gymnasiums are convenient for people to watch and entertain, and at the same time, they can provide standardized fitness places for people. With the rapid development of China's economy, people's living standards are constantly improving, and there is a higher demand for sports. The construction of intelligent stadiums will solve these problems. There are many problems in the operation of multi-functional stadiums. Therefore, only by building a scientific and standardized management system and using intelligent technology can we better serve the users of sports venues.

3. Characteristics of intelligent engineering of stadiums and gymnasiums

Intelligent building is the combination of computer technology and modern architectural design art. Intelligent building is a new building equipment, network and communication system and office automation system developed on the basis of traditional building technology, which provides a comfortable, safe and convenient construction environment for human life. Building intelligent system is the product of the application of modern technology in architecture, and its core technology is based on electronic information technology. It is not only used in intelligent building systems, but also widely used in other fields.

Gymnasium project and intelligent building project involve many contents, many territories, complicated projects, etc. At the same time, it also has the characteristics of modern building construction management and information engineering. The construction of modernization and intelligent engineering of stadiums and gymnasiums usually goes through five stages: systematic planning, deepening design, construction, testing, training and operation control. In these five stages, the output of the previous stage is the input of the latter stage, and the latter stage is the test of the previous stage. Because the main engineering tasks in each stage are different, the main engineering work plans and results in each stage are independent of each other. However, because all these five stages are the goals of serving the key projects of national stadiums and gymnasiums, it requires the joint participation of many units and specialized technicians, and its complexity is relatively high.

Intelligent system involves many new technologies and a wide range of fields. To overcome the technical problems in traditional construction, we must master high-tech and products in many fields such as information electronics. In the project implementation stage, it is necessary not only to control the quality, time and capital investment, but also to arrange, dispatch and integrate a large number of equipment, and the intelligent management system of stadiums is usually composed of several

independent and complete subsystems. Because these subsystems and equipment cannot be simply stacked together, they need to be improved and adjusted as a whole. The modernization project of stadiums and gymnasiums involves many units, and these units are often closely related to the project and need close cooperation. Compared with ordinary construction projects, the modernization project of modern stadiums needs more advanced scientific technology, and its system construction also needs to meet the requirements of training, competition and operation at the same time, as well as meet the international technical requirements.

4. The social role of information and intelligent construction of stadiums and gymnasiums

The construction of stadiums and gymnasiums has gradually developed from serving sports events to marketization. With the continuous improvement of people's living standards, the demand for physical fitness is increasing. Under this trend, the construction of stadiums and gymnasiums has developed rapidly, and its functions and functions have become more diversified and comprehensive, so that it can meet the needs of different groups of people. With the development of economy and the progress of social clubs, people have higher and higher requirements for stadiums and gymnasiums, especially for the openness of stadiums and gymnasiums. It is precisely because of this that stadiums and gymnasiums have become an important place for people to relax and exercise all over the country.

For the construction of multi-functional stadiums, it is called intelligent building. From the perspective of building structure and building function, it mainly includes systematic management, computer network communication system, electrical equipment, office environment and related facilities, etc., which are planned and built in order to realize the efficient operation of the whole system. At present, most stadiums in China have no real concept of "intelligence", and traditional management mode is still adopted in hardware and equipment. Although this model has certain advantages, it cannot meet the requirements of modern people for health, comfort and entertainment. Ventilation and heating system is one of the most important components of the whole service system, and it is also the focus of its intelligent transformation. All kinds of competition, training and sports events are centered on intelligent service, and intelligent management system is used for optimization and efficient management.

Using intelligent system to control stadiums and gymnasiums can realize the social value of stadiums and gymnasiums, and the commercial value is based on social value. Safe and comfortable service can satisfy a variety of sports business activities. In addition to meeting the needs of activities, almost all the functions of stadiums and gymnasiums are convenient for people to watch and entertain. With the rapid development of China's economy today, the sports industry has become one of the fastest growing industries in the national economy, and the construction of multi-functional stadiums has promoted the further development of the sports industry. The increasing number of sports venues puts forward higher requirements for management. Multifunctional stadiums and gymnasiums are gradually integrated into the society, which promotes the economic development of the surrounding areas. Therefore, only by building a scientific and standardized management system and using intelligent technology can we better serve the users of stadiums and gymnasiums^[2].

5. Stadiums and gymnasiums information intelligent system construction

First of all, from the perspective of the layout of the whole intelligent system, in order to realize intelligent management, it is necessary to set up the layout of stadiums and gymnasiums reasonably and make overall arrangements from the whole aspect, so that all facilities of stadiums and gymnasiums can be managed as a whole. In order to reduce the construction cost and facilitate the operation under the condition of improving the safety effect, the wiring structure should be improved. In the actual wiring scheme design, appropriate power supply and wiring space must be reserved, so as to lay a foundation for the future development and construction of network equipment. Secondly, from the information and intelligent design of the special network system, this network system is mainly used to realize the functions of sports venues in competitions, news reports, live broadcasts, etc. Therefore, in order to ensure the audience to see better results, it is necessary to strengthen the

design of the special system. The special system design of stadiums and gymnasiums mainly includes the central control system, the display and control system of the competition screen, the system for recording the field achievements, the lighting system, the voice control system and so on.

6. Information-based intelligent functional layout of stadiums and gymnasiums

6.1 Meet the requirements of compound function

The intelligent functional layout of stadiums and gymnasiums should meet the requirements of compound functions.

First of all, modern stadiums have been transformed into multi-functional venues, and the sports events held have expanded from a single form to multiple functions, and their utilization rate is getting higher and higher. Therefore, only the higher the complex function of stadiums and gymnasiums, can they provide relatively high-frequency use value, and the greater the comprehensive benefits they produce.

Secondly, stadiums and gymnasiums themselves should have the function of safety guarantee. The development of sports activities can not be separated from the support of the opening environment and facilities, so effective protection and management of sports venues is one of the most important tasks. On the one hand, it is necessary to consider whether the stadium can realize information and intelligence, so as to ensure the stability, safety factor and tolerance of the whole system; On the other hand, the utilization of the multi-function of stadiums and gymnasiums needs to be grasped to a certain extent. If the function distribution is unreasonable, the functionality will be weakened, and the functions will interfere with each other, which will greatly reduce its main function. At present, the accidents caused by the collapse of some stadiums and gymnasiums are mainly due to the high frequency of use of stadiums and gymnasiums and overcrowding, which leads to the obstruction of evacuation passages and eventually leads to accidents. It can be seen that the application of information and intelligent management methods is to ensure that users can get the necessary security while enjoying the services of sports venues^[3].

6.2 Adhere to the principle of compatibility

The function of sports venues should adhere to the principle of compatibility. The functions of stadiums and gymnasiums are mainly sports, cultural performances, enterprise leasing, etc. Therefore, the internal design of stadiums and gymnasiums should be compatible with the use of various functions, so as to improve the utilization efficiency of stadiums and gymnasiums and increase their benefits. In the process of venue construction, we should fully consider the influence of various factors, such as venue conditions and personnel structure, so as to maximize its role. Attention should be paid to the informatization and intelligent transformation of sports venues. As one of the important carriers of social services, the functional design of stadiums and gymnasiums should meet the attributes of public services, so that stadiums and gymnasiums can truly become perfect public places and meet people's growing demands for various functions. Therefore, the information and intelligent design of stadiums and gymnasiums should optimize the combination of resources from the aspects of system design and computer manipulation, and change from closed management method to open management method to maximize the public attributes of stadiums and gymnasiums.

7. The application of information and intelligence in gymnasium

7.1 Establishment of Gymnasium Management and Control Software

The internal management software of sports institutes is the basic guarantee for the design and application development of sports venues in the future. It includes the comprehensive management of stadiums and gymnasiums, which can not only communicate the rich and colorful information involved in charge management, intelligent billing management of school stadiums, membership control, education and training management, but also effectively show the strict control and real situation of the school on the internal management level of sports venues. It is a special control

software tailored for the operation needs of school stadiums at home and abroad, and it also represents a trend of the management and automation application of school stadiums at home and abroad in the future.

7.2 Application of Radio Frequency Identification Technology

At present, with the deepening and expansion of the scope of different modern stadium management, many advanced equipment of intelligent systems have been widely used, and the management and control of modern stadium management have been gradually integrated into the content of contemporary scientific management. Among them, people's exploration and application of radio frequency technology has become increasingly obvious, and the extensive use of these information technologies has also provided unprecedented innovation for the intelligent control of stadiums at this stage.

Radio frequency identification (RFID) technology refers to a comprehensive application-oriented technical means that combines hardware and software closely to detect and manage stadiums and gymnasiums according to the movement status of individuals or related key items. This signal can realize the comprehensive management of the monitored parts and can track the moving objects that need to be located by wire. It carries out continuous information communication with all base stations in the area, and displays the changes of the area along with the joint operation between the target tag and all base stations. In order to strengthen the efficient coordination of the rescue work in the event of an emergency, the relevant personnel of the stadium must also be equipped with special and portable radio frequency identification equipment, which can issue alarm information so as to better cope with emergencies^[4].

7.3 Application of monitoring system

With the development of information technology and the increasing concern of human society for the safety management of sports events, at present, the stadium management system has abandoned the previous monitoring equipment and effectively introduced the intelligent building management system with obvious modern characteristics. It fully integrates the diversified functions and overall design of power facilities, fire monitoring system, etc., and uses the overall control system to efficiently realize the functions of lighting, fire fighting and so on. It not only has excellent science and efficiency, but also can greatly improve the control and management level of the internal system of the venue. First of all, the distribution price management system in the electrification system is to dynamically manage all the lighting systems of the whole stadium through centralized control means and communication terminal equipment. The status of all lighting devices can be managed in real time, which ensures the lighting stability and operation safety in the whole stadium, reduces the work pressure of the management department to a great extent, and enhances the effectiveness of the management work, thus achieving deeper maintenance and control of the lighting management system. At the same time, it is also very important to establish the automation and intelligent system of fire monitoring and early warning in venues. The system can supervise the fire failures within the scope. If there is a sudden fire safety accident, the fire monitoring and early warning system can ensure the early warning data transmission in the first time.

7.4 Application of LED display system

With the continuous development of many major national sports events and social activities, the construction technology of stadiums and gymnasiums has also made more comprehensive progress, and many technical equipment and equipment have begun to appear in stadiums and gymnasiums one after another, which highlights the characteristics that China's future stadiums and gymnasiums will be more and more diversified. The LED display screen system is conducive to a higher level of sports activities. The main cores of the system are LED chip and driver chip, which ensure the smooth operation of LED screen and can realize live high-definition broadcast more effectively.

7.5 Application of WLAN

The relatively huge stadiums and gymnasiums can not only complete sports events that occupy a

relatively large volume in traditional stadiums and gymnasiums such as football and basketball, but also undertake major cultural performances and other social activities. For the software link, its operation and management must involve electronic monitoring, cable TV, security and fire fighting, score entry and management systems. The cost and investment of the configuration and use of these systems are often relatively high, and the technical requirements are relatively complicated. As far as the network link is concerned, if the wired network is replaced by wireless LAN, the cost will be greatly reduced, and the system is simple to operate, which can also effectively improve the comprehensive operation performance of stadiums and gymnasiums, thus better improving the holding effect of daily sports events, cultural performances and other activities .

8. Conclusion

To sum up, by analyzing the current application situation of stadium informatization and intelligent technology, we can know more clearly its future application trend in the stadium, and also make people know more about sports buildings and related facilities, so as to promote the better development of sports in China. At present, in the construction of stadiums and gymnasiums in China, it is necessary to continuously strengthen the professional and technical level of intelligence and informatization, so that stadiums and gymnasiums can be more intelligent and informationized, integrate scientific and technological attributes with humanistic attributes, and better serve people.

References

- [1] Xin Huang, Liu Cong, Jin Lei. Thoughts on the intelligent information construction of stadiums [J]. Science and Information Technology, 2020(30):23.
- [2] Chen Lieqiang. Application of building intelligent system in stadiums [J]. Building Materials World, 2021,42(5):98-102.
- [3] Wei Wenlai. Discussion on information construction strategy in the management and operation of stadiums and gymnasiums [J]. Consumer Guide, 2021(33):268-269.
- [4] Jiang Ping, Wei Bowei, Huo Haonan. Analysis of intelligent project management model of stadiums [J]. Science and Information Technology, 2020(30):174.