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Article

Promoting "physical fitness" with "intelligence"—A research and discussion of intelligent sports parks under the background of national fitness program

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Abstract: The National Fitness Program Plan (2021–2025) (hereinafter referred to as the Plan) proposes to perfect the public service system for sports and fitness by 2025, make national sports and fitness more convenient, and advocate providing intelligent services for national fitness campaign. With the development of the Internet era, modern information technologies such as big data, the Internet of Things, and artificial intelligence have been introduced into sports affairs, providing technical support for the optimization of the public service system for sports and fitness. Therefore, in the context of a national fitness campaign, intelligent sports service is an important link for promoting national fitness in various regions. Relevant workers should attach importance to promoting "physical fitness" with "intelligence" in the process of advancing national fitness program, and actively creating intelligent public services for national fitness. Focusing on the integration of modern information technology and sports affairs, with the implementation of the Plan as the research background, the construction of intelligent sports parks as the starting point, this article outlines the construction plan of intelligent sports parks based on the connotation summary of national fitness program and intelligent sports. At the same time, it analyzes the issues that intelligent sports parks need to pay attention to in providing public services for national fitness, and proposes countermeasures for the high-quality development of national fitness services in intelligent sports parks.

Keywords: national fitness program; public services; intelligent sports; intelligent sports park

1. Introduction

The popularity of the Internet and Smartphone has changed the way of production and life of the public, and the way of the public movement in the information age is also gradually developing towards intelligence. The Several Opinions on Accelerating the Development of Sports Industry and Promoting Sports Consumption points out that the development of sports industry is an inevitable requirement for improving the physical fitness and health level of the Chinese nation, which is conducive to meeting the diverse needs of the people, promoting national spirit, enhancing national cohesion and cultural competitiveness (Guo, 2014). When the "national fitness program" becomes a national strategy, how to provide high-quality public service for the national fitness campaign has become a key issue that governments at all levels urgently need to solve in the process of facility construction, and also the core issue studied in this article. Based on the concept of promoting "physical fitness" with "intelligence" and the modern information technology, the intelligent sports park proposed in this article is an information-based and intelligent public place built to

make public sports activities more convenient. It can serve as a base for national fitness, and the public can receive personalized and intelligent public services in the intelligent sports park, and obtain a more comfortable, enjoyable, and convenient fitness experience.

2. National fitness program and intelligent sports

2.1. National fitness program

The ultimate goal of the national fitness program is to improve and enhance the level of public physical health, and it's crucial to guide the masses to form scientific fitness behaviors. "National Fitness" mainly refers to the public can enhance their physical strength, boost their coordination ability, and improve their body control ability regardless of age or gender differences, thus resulting in a strong body (Han and Qiao, 2022). It advocates that people across the country should be able to engage in physical fitness activities at least once a day, master at least two fitness methods, and undergo an annual physical fitness test. In the context of the national fitness campaign, building a comprehensive sports and fitness service system for the public is the goal of all regional governments. Currently, communities, parks, and other areas in various cities in China have established venues that facilitate fitness activities for the general public, and meanwhile provide the public with sports and fitness facilities. The public also participates widely in national fitness activities, and the utilization rate of various public sports and fitness venues and facilities is relatively high. A national fitness program is related to the well-being of all people. At present, it is showing a comprehensive shift from informatization and internet-powered to digitization and intelligence. The sports industry, enterprises, academia, and government are working together to promote the deep integration of new generation information technology and national fitness program. New technologies such as the Internet of Things, 5G, Cloud Computing, Big Data, AI, VR/AR, and Blockchain are widely applied to public services for sports and fitness, focusing on breaking information silos, promoting information exchange, deepening public services, and expanding application scenarios (Huang and Wang, 2021). As of 2023, there are a total of 4.5927 million sports venues of various types in China, with a current area of 4.071 billion square meters and a per capita sports venue area of 2.89 square meters, which reflects that China's sports venue resources are relatively abundant and the development level of the sports industry is relatively ideal. In addition, there are existing 1.0522 million national fitness paths, 155.5 thousand fitness centers, and 152.8 thousand fitness trails in China, with a total length of 381 thousand kilometers of fitness trails. The rapid development of China's social economy has put forward higher requirements for the overall quality of its citizens, however, the public sports awareness and physical fitness level are still unable to meet the requirements of socialist modernization. Therefore, in the context of national fitness campaign, providing more personalized public services based on the needs of national fitness is the focus of further promoting the rapid development of national fitness sports in various regions.

2.2. Intelligent sports

2.2.1. Intelligence

As the noun form of "intelligent", "intelligence" in this article mainly refers to computer intelligence and artificial intelligence, which are methods and technologies applied in the field of computer science to simulate, extend, and expand human intelligence. Computer intelligence and artificial intelligence can enable machines or systems to think like human, generate human intelligent behaviors, and assist human in efficiently handling various problems.

2.2.2. Intelligent sports

There is currently no unified definition of the concept of "intelligent sports" in the domestic academia. In essence, as early as the 1990s, theoretical research on intelligent sports venues had already emerged in China (Liu et al., 2022). With the widespread application of modern information technology in the sports industry, the keyword "intelligent sports" has also attracted more scholars' attention. "Intelligent sports" mainly refers to sports activities carried out by relying on modern information technologies such as the Internet, Big Data, Internet of Things, AI, etc. Intelligent sports can break the shackles of time and space, provide intelligent services for the public to carry out sports and fitness activities, and meet the personalized sports and fitness needs of the public. Intelligent sports are a derivative of the integration of modern information technology and sports industry and a key path for the rapid development of the contemporary sports industry. The implementation of intelligent sports in the development of sports industry is conducive to improving the public sports services quality and governance level, and vigorously promoting the development of intelligent sports is in line with the current situation of domestic sports industry development. In recent years, around the concept of "intelligent sports", various regions in China have introduced a large number of equipment and actively built sports venues, providing a basic guarantee for the public to carry out sports activities and achieve the goal of national fitness.

3. Construction of intelligent sports park under the background of a national fitness program

Table 1. Construction plan for intelligent sports parks.

	Service programs	**Basic contents**
Construction plan for intelligent sports park	Public fitness data.	People counter system, Intelligent working station, Intelligent multifunctional column.
	Information index.	Weather stations and signage, Intelligent sports signage, Intelligent interactive screen.
	Intelligent venues and equipment.	Intelligent fitness equipment, Venue reservation system, Intelligent fitness trail.
	Intelligent physical fitness testing station.	Intelligent testing of balance, grip strength, weight, height, etc.
	Big data platform.	Display platform, Management service platform.

In order to further optimize the public service system for sports and fitness, based on the concept of "promoting 'physical fitness' with 'intelligence'", this article

presents a construction plan of organically combining "intelligence" with national fitness program, and applying computer intelligence and artificial intelligence technology to build intelligent sports parks in five aspects: public fitness data, information index, intelligent venue and equipment, intelligent physical fitness testing station, and big data platform, as shown in **Table 1**.

3.1. Basic data statistics

3.1.1. People counter system

Under the background of the national fitness campaign, the number of the public participating in sports and fitness activities is gradually increasing, therefore, the construction of intelligent sports parks needs to consider the real-time public number (Liu and Zhang, 2023). Based on this construction demand, technicians can research and develop people counter system, as shown in **Figure 1** below. Based on accurate analysis of the real-time public number in the intelligent sports park, a large data set of public numbers and scale statistics is established with the assistance of the Internet and big data, to ensure the orderly movement of the public on the fitness trails or other fitness venues in the park and to provide real-time information services for the public who want to go to the park to carry out sports and fitness activities.

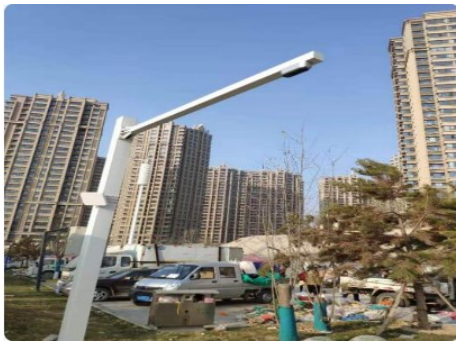

Figure 1. People counter system.

3.1.2. Intelligent workstation

The venue area of an intelligent sports park ranges from 100 acres to 500 acres. To meet the public's demand for sports monitoring data collection within the sports park, the construction of an intelligent sports park needs to consider the limitations of the public's data collection conditions and provide convenience for collecting real-time sports monitoring data. Based on this construction requirement, technicians can set up intelligent workstations at a certain distance in the fitness trail, and the public can use Smartphone devices to view sports monitoring data at any time during sports and fitness activities.

3.1.3. Intelligent multifunctional columns

In recent years, facial recognition has been widely applied in various fields, providing significant convenience for people's lives (Lu and Chen, 2018). If facial recognition technology can be applied in intelligent sports parks, the public can quickly obtain sports data through facial recognition. Intelligent sports parks can also assist the public in health management, thus providing intelligent services for public

sports and fitness activities. Based on this idea, related technicians can set up intelligent multifunctional columns in intelligent sports parks, collect public sports data based on facial recognition, and synchronize and visualize the sports data on users' smartphones. At the same time, it comes with a one-click call function to provide emergency support for sports and fitness for the public in the intelligent sports parks, the public can also click when they need the help of management personnel to communicate with the staff on time. Therefore, the public service level of the intelligent sports park can be improved.

3.2. Information index

3.2.1. Weather stations and signage

Weather has a direct impact on public sports and fitness activities, so real-time transmission of weather information to the public should also be considered in the construction of intelligent sports parks (NDRC, 2021). Technicians can set up multifunctional weather stations and signage in the fitness trails, as shown in **Figure 2**. On the one hand, they can monitor the real-time wind speed, wind direction, rainfall, and air temperature and humidity information of the sports park all day long; On the other hand, they can display the weather conditions to the public through interactive screens and utilize big data technology to analyze and display the outdoor fitness suitability index for the public, whether it is suitable to carry out sports and fitness activities, thereby providing real-time weather reminders to the public, providing personalized public fitness services.

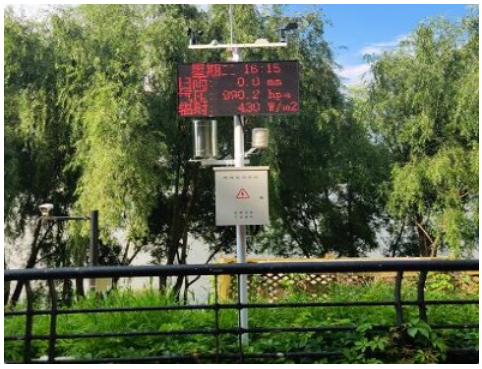

Figure 2. Weather station and signage.

3.2.2. Intelligent sports signage

In ordinary sports parks, the public needs to check their exercise status rely on smartphones or smartwatches when carrying out sports and fitness activities. If intelligent sports signage is set up in intelligent sports parks, the signage will display and report the public's exercise status when they pass by the signs, such as "run 900 m", "jump 300 times", etc., so that the public can focus on the exercise itself and concentrate on fitness training. Based on this, related technicians can set up intelligent sports signage during the construction of an intelligent sports park, providing data monitoring services to the public through facial recognition. If the intelligent sports parks possess the function of sports data monitoring, facial recognition will be performed when the public stands in front of the signage. As soon as the signage starts

broadcasting, the public will start their fitness activities. After the fitness is over, the public can query sports data on any intelligent signage in the sports park.

3.2.3. Intelligent interactive screens

The "conformity effect" theory suggests that individuals will be influenced by the group to change their own ideas and behaviors, and will change towards the same direction as the vast majority of people (Tang et al., 2022). Under the background of a national fitness campaign, influenced by individual differences, there are certain differences in fitness data, physical fitness, and exercise methods mastered by each member of the public. If the differences can be utilized, not only can it motivate some members of the public to participate more actively in sports and fitness activities, but also encourage the public to learn more diverse forms of exercise activities. Based on this theoretical viewpoint, intelligent interactive screens can be set up during the construction of intelligent sports parks, as shown in **Figure 3**. Each member of the public has their own unique nickname in the intelligent sports park. The public can use the intelligent interactive screen to obtain data information such as exercise time, exercise distance, exercise speed, and energy consumption. They can also view the park ranking list to understand the exercise time, exercise methods, age, and historical number of other people in the park, or obtain the explanation, historical origins and cultural connotations of other sports activities based on QR code scanning. For example, taking Tai Chi as an example, after scanning the QR code, the public can learn about the dialectical concept of yin-yang of Tai Chi, as well as obtain teaching videos of the basic 24 movements of Tai Chi.

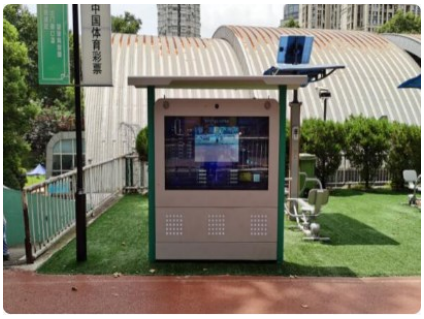

Figure 3. Intelligent interactive screen.

3.3. Intelligent venues and facilities

3.3.1. Intelligent fitness equipment

In the construction process of intelligent sports parks, modern information technology can be applied to fitness equipment. The public can view data such as exercise frequency and calorie consumption through the built-in digital display during their fitness process by using intelligent equipment, making it easy for the public to grasp exercise data in real-time.

3.3.2. Venue reservation system

The target audience of the intelligent sports park service is the entire public within a certain area. To reasonably schedule the public's fitness and sports venues and improve the utilization rate of the park's fitness venues, a venue reservation system can be developed based on modern information technology during the construction of

the intelligent sports park. The public can use this system to view the idle venues in the park and carry out sports and fitness activities at the venues after entering the park. The system can also be used by the public to display reserved venues based on the occupancy time of the venues in the park, set the approximate time of venue occupancy, and reasonably arrange their time for sports and fitness activities.

3.3.3. Intelligent fitness trails

The intelligent fitness trail is an important facility in the intelligent sports park. Technicians can set up dazzling music on the fitness trail, and when the public steps on both sides of the trail, colorful lights can be displayed, as shown in **Figure 4**. In addition, the fitness trail is mainly equipped with weather stations and signage, intelligent sports signage, and intelligent interactive screens.

Figure 4. Intelligent music fitness trail.

3.3.4. Intelligent fitness cabinets

The public may need auxiliary fitness equipment during sports and fitness activities, such as cordless weight counting skipping ropes, automatic rebound abdominal wheels, fitness anti-slip pads, arm strength devices, dumbbells, etc. (Wen and Wang, 2020). However, when the public purchases fitness equipment without mastering the application method of certain fitness equipment, it invisibly increases the cost of carrying out sports and fitness activities for the public. For this consideration, in the process of constructing an intelligent sports park, intelligent fitness cabinets can be set up following the example of intelligent vending machines. Intelligent fitness cabinets can provide small sports and fitness equipment to the public through leasing, which not only saves the public's fitness costs but also creates favorable conditions for them to experience various fitness equipment.

3.4. Intelligent physical fitness testing stations

The Plan advocates that each person should undergo physical fitness testing at least once a year, but the vast majority of the public does not have the opportunity for physical fitness testing. Therefore, in the process of constructing intelligent sports parks, 2–5 intelligent physical fitness testing stations should be set up in the parks, as shown in **Figure 5**. The number of stations should be determined according to the specific venue area of the park. The intelligent physical fitness testing station should possess the following functions: First, it can measure the body shape of the public, mainly including their height, weight, and BWH; Secondly, it can test the physical functions of the public, mainly including heart rate, blood pressure, lung capacity, etc. Thirdly, it can evaluate the physical fitness of the public, mainly including grip

strength, back strength, vertical jumps, push-ups, and one-minute sit-ups; Fourthly, it can measure the public's sports and fitness ability, mainly including running, jumping, and throwing. In traditional physical exercise, the public cannot intuitively perceive the positive impact of physical exercise on physical fitness. The vast majority of the public cannot persist in physical exercise, and the lack of exercise and high calorie dietary have become the key factors affecting the physical health of the contemporary public. Intelligent physical fitness testing stations can present a passing standard line for the public to clarify whether their physical fitness level has reached the standard level. The public can utilize Smartphone apps to obtain physical fitness statistics in recent years or a period and compare the differences in physical fitness before and after participating in physical fitness exercise, thus motivating the public to persist in physical exercise.

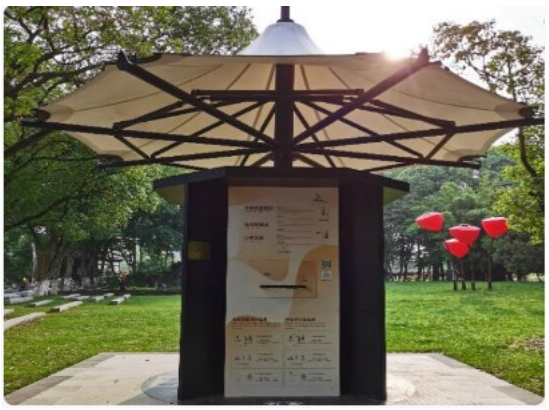

Figure 5. Intelligent physical fitness testing station.

3.5. Big data platform

3.5.1. Big data display platform

Each intelligent sports park should be equipped with a big data display platform that can realize the interconnection and intercommunication of various systems and equipment within the park, and intuitively display the fitness situation of all the public in the intelligent sports park relying on big data technology. On the one hand, it provides data support for promoting a national fitness campaign in the region, and on the other hand, it facilitates the adjustment and configuration of fitness venues and equipment within the sports park, thereby optimizing the public service level of the intelligent sports park for sports and fitness.

3.5.2. Sports health management service platform

Each intelligent sports park should be equipped with a sports health management service platform, which facilitates information release and management, such as reporting sports events, connecting with related industry fields, and driving the development of sports-related industries in the region. For example, precise promotion of sports and fitness can be carried out, so that every member of the public can find the most suitable sports and fitness methods on the sports health management service platform. The platform automatically recommends suitable sports projects and exercise duration based on the age, occupation, and physical fitness of the public through statistical analysis of public information. For example, for middle-aged and

elderly people and those with weaker physical fitness, the platform will automatically recommend sports projects such as Tai Chi and brisk walking, and remind them of the exercise time.

4. The problems of intelligent sports parks in national fitness program services

The Guiding Opinions on Promoting the Construction of Sports Parks clearly state that about 1000 intelligent sports parks will be newly built or renovated nationwide by the end of 2025, and a diverse and widely applicable intelligent sports park system is gradually forming (Liu and Zhang, 2023; Xiang et al., 2022). Although the intelligent sports park construction plan proposed in the above paragraphs from the aspects of data statistics, information index, sports venues, and equipment system can effectively improve the public service level of national fitness and implement the guidance for sports park construction, the construction of intelligent sports parks and their application in national fitness services should still pay attention to the following issues:

4.1. Lack of intelligent functions

Compared with ordinary sports parks, the most significant advantage of intelligent sports parks is their intelligent functions. Therefore, in the construction and application of intelligent sports parks, attention should be paid to whether the various intelligent functions of the park are missing. For example, office workers from Monday to Friday, after work, they may consider doing fitness activities in the nearby sports park. If there are too many people in the sports park or all the fitness venues in the park are occupied, it will not be able to meet their fitness needs. From this, it can be seen that the "people counter system" function in the park has a direct impact on the service level of intelligent sports parks. In addition, public sports and fitness data is extremely important to the public, the public can get an exact understanding of their fitness achievements through real-time fitness data, such as calorie consumption, exercise distance, changes in heart rate, and lung capacity, etc., and then adjust and formulate new plans for sports and fitness. Therefore, it can be seen that the "information index" function of the park also has a direct impact on the service level of intelligent sports parks. Due to the insufficient population mobility, the data information entered by various devices in the park is limited and cannot be effectively compared. Therefore, it can be concluded that there is currently a lack of functions in the intelligent sports park in the process of serving the national fitness program.

4.2. The problem of the imbalanced relationship between supply and demand

In the process of constructing and applying intelligent sports parks, it is necessary to pay attention to whether the supply of park intelligent services is balanced with the public's demand. At present, in the intelligent sports parks that have been built and put into utilization in various regions of China, the number of devices installed such as people counter systems, intelligent multifunctional columns, and intelligent interactive screens is relatively small. There is an imbalance between supply and

demand in the aspect of intelligent services of sports parks. Taking Jiangsu Province as a representative example, researchers investigated the public's demand for intelligent services in 15 intelligent sports parks within Jiangsu Province (Xu, 2023), as shown in **Table 2** below:

Table 2. Public demand for intelligent service supply in sports parks.

Intelligent Services	Average Value	Standard Deviation
People counter statistics	2.070	1.166
Weather monitoring and signage	1.940	1.111
Equipment utilization and management	2.000	0.966
Physical fitness testing	1.810	1.064
Sports equipment supply	1.930	1.145

As shown in **Table 1** above, the public has a high demand for intelligent service supply in sports parks. However, among the 15 intelligent sports parks in the province, only 3 parks are equipped with a people counter system, 2 parks possess weather stations and signage, 6 parks to fulfill intelligent physical fitness testing stations, and there are no parks that possess intelligent fitness equipment and cabinets. From this, it can be seen that the supply of intelligent services in sports parks is not balanced with the public's demand for sports and fitness. At the same time, it also reflects that the vast majority of intelligent sports parks in China have not yet fully achieved their goals.

4.3. Public sports and fitness experience

In the construction and application of intelligent sports parks, attention should also be paid to the public's sports and fitness experience. In the context of the national fitness campaign, the intelligent fitness services provided by sports parks are aimed at the general public of different ages and genders. However, the population who can proficiently use the intelligent fitness equipment in the park and obtain the advanced fitness services provided by the park is mainly concentrated in the youth and middle-aged groups. The fitness experience of the teenagers and elderly public groups is poor, most of these groups are unable to proficiently operate Smartphone devices and apply APPs, therefore, they cannot enjoy the intelligent sports and fitness services provided by the intelligent sports parks (Zhang, 2021). At the same time, not everyone can experience intelligent sports and fitness functions and equipment. The uneven economic and information technology development in different regions will directly impact on the public rights of experiencing intelligent sports and fitness in some regions. As we all know, the construction of intelligent sports parks is based on modern information technologies such as Big Data, the Internet of Things, and AI. The uneven distribution of intelligent sports facilities in sports parks in various regions in China will hinder the public's participation in sports and fitness activities. Currently, intelligent sports parks have been preliminarily built-in economically and technologically advanced areas such as Zhejiang Province, Jiangsu Province, and Guangdong Province, which can provide intelligent sports and fitness services for the public and ensure the intelligent fitness experience of the public within the provinces

mentioned above. However, the public in other provinces still cannot access intelligent fitness experiences in a short period.

5. Strategies for high-quality development of national fitness program services in intelligent sports parks

5.1. Optimizing public services

5.1.1. Ensuring the supply of intelligent functions

To promote the high-quality development of national fitness services in intelligent sports parks, relevant personnel need to first consider the budget management according to the construction plan of the sports park project during the construction process. The implementation of all intelligent functions should be included in the budget scope, and the intelligent services of the sports park should be optimized to the maximum extent under limited construction funds, thereby avoiding lacking intelligent functions in the sports park. Secondly, it is necessary to verify the application status of various intelligent equipment in the sports park, in addition to the initial installation, attention should be paid to the daily management of various intelligent devices to ensure that the sports park can effectively provide public services for national sports and fitness activities around the clock.

5.1.2. Building a big data platform for physical health intervention

The core purpose of the national fitness campaign is to enhance public physical fitness. However, the development of the big data platform in the construction plan of the intelligent sports park mentioned above mainly focuses on the management of various intelligent functions of the intelligent sports park and the collection of public data, it is not yet possible to directly intervene in the public physical health. Therefore, in the process of optimizing the quality of public fitness services in intelligent sports parks, a big data platform should also be built from the perspective of public physical health. Based on the collected public physical fitness testing data, the platform is expected to design and develop a database to set a normal range of physical fitness tests for different age groups and genders. The database can automatically compare the physical fitness situation of the public promptly, then the public can know their physical fitness level. In the process of building a big data platform for physical fitness and health intervention, a combination of physical fitness and medical intervention can also be used, as shown in **Table 3**:

Table 3. Collaborative intervention mechanism between intelligent sports parks and hospitals.

Subjects	Process	Processing method
Intelligent sports park	Intelligent function → Physical fitness database → Physiological data and exercise data → Comparison → Whether it is within the normal range.	If not, the hospital will provide exercise prescriptions for physical fitness intervention.
Hospital	Physical fitness database → Physiological data and exercise data → Comparison → Whether it is within the normal range.	

Relying on big data technology and mobile communication technology and combining physiological and exercise data of the public, health instructors in the networked hospitals can establish an effective interaction mechanism with the public and provide suitable "exercise prescriptions" for them, reminding the public to exercise scientifically and providing personalized guidance on physical fitness from age structure, exercise preferences, exercise habits, and other aspects. For example, providing lipid-lowering and plasticity-based exercise and fitness advice for teenagers and young adults based on "body shape" information; providing health information and exercise health guidance for the elderly groups based on "physical functions" information. In this way, the public's exercise behaviors can be scientifically guided and their physical fitness can also be improved.

5.2. Meeting public demand

The rapid development of the social economy has led to changes in public lifestyle, and the public's health awareness has been improved. More and more people are paying attention to their physical health, joining fitness centers, or participating in outdoor sports and fitness activities. However, the application of intelligent sports parks in various regions of China is still in the period of initial development. To avoid the problem of the imbalanced supply-demand relationship of national fitness services and achieve high-quality development of intelligent sports parks, further optimization can be made in the following aspects: Firstly, a people counter system can be installed at the entrance and exit of intelligent sports parks to collect and analyze the real-time flow data of people entering and leaving the park, ensuring the supply of population diversion services guided by intelligent sports parks. Secondly, at least one weather station and signage should be set up within the sports park to obtain and present real-time weather information, ensuring the supply of suitable sports and fitness environment analysis services in the intelligent sports park. Thirdly, at least one intelligent physical fitness testing station should be set up within the sports park to provide physical fitness testing services to the public around the clock. Fourthly, at least one intelligent sports cabinet should be installed in the sports park, and small-scale or free rental methods should be adopted to ensure the supply of fitness equipment services in the sports park, thereby meeting the personalized sports and fitness needs of the public.

5.3. Enhancing public sports and fitness experience

In the process of providing high-quality services for national fitness under the background of a national fitness program, intelligent sports parks should also pay attention to improving the public's sports and fitness experience (Zheng and Xu, 2019). For the problem of teenagers and the elderly groups being unable to proficiently operate intelligent fitness equipment and Smartphone APPs, on the one hand, guiding the guidance of fitness machinery applications can help these groups master the operating methods, thus fully utilizing the advantages of exercise monitoring of intelligent fitness machinery; On the other hand, related WeChat Mini Programs can be developed and the operation steps of intelligent sports park mobile terminals can be simplified, making it more convenient for teenagers and the elderly groups to

experience various intelligent services. For the problem of the general public in other regions being unable to access intelligent sports and fitness experiences, relevant departments should actively promote the intelligent development of sports parks, implement the guidance of the Plan, accelerate the deployment speed of intelligent sports and fitness facilities, thus enabling the general public in various regions to experience intelligent exercise services as soon as possible. At the same time, to optimize the fitness experience of children, AR interactive screens can be added, as shown in **Figure 6** below. Children can engage in gamified sports and fitness activities such as running and jumping based on human-computer interaction through the AR interactive screens.

Figure 6. AR interactive screen.

In addition, in the process of optimizing the public sports and fitness experience, the temperature and humidity control of various venues such as basketball courts and table tennis courts in intelligent sports parks should also be considered to ensure the comfort of sports events and public sports and fitness activities. As shown in **Table 4** below, during the temperature and humidity regulation process of the intelligent sports venues, the temperature and humidity data are first collected and uploaded to the big data system of the intelligent sports park. The platform management terminal combines the data to determine whether cooling or dehumidification equipment inside the venue needs to be activated. After the temperature and humidity reach a certain set value, the platform management terminal issues an instruction to stop the operation of the relevant equipment, thereby achieving temperature and humidity regulation based on electrical energy conservation.

Table 4. Intelligent temperature and humidity regulation process for sports venues.

Regulation process	Basic contents
Start	Initialization → Detecting environmental temperature and humidity → Displaying environmental temperature and humidity → Waiting for selection of working mode.
Users' selection	Manually → Regulate the equipment according to the users' selection Automatically→ Analyze whether it is lower than the critical value: Yes → standby; No→ regulate equipment combined with the current temperature and humidity data.

5.4. Transforming fitness programs

In the context of national fitness campaign, upgrading and transforming sports and fitness programs is an essential path for the high-quality development of national fitness services in intelligent sports parks (Zhou, 2022). At present, public sports and fitness activities mainly focus on relatively simple methods such as running, hiking, square dancing, and cycling. Although these exercises can have a fitness effect, the fun needs to be improved. Therefore, if intelligent sports parks want to provide high-quality services for national fitness campaign, they should also focus on upgrading and transforming fitness programs. For example, some emerging technologies such as VR, 5G communication, and holographic projection should be applied to integrate diverse sports and fitness programs, building virtual sports environments for sports activities such as golf, tennis, skiing, kayaking, etc., breaking the limitations of venues and seasons, allowing the public to have a nearly real fitness experience. It can also be available to combine sports courses and stress relief courses with application interactive processors and projectors to create intelligent interactive sports spaces for the public, making intelligent sports parks an important base for reducing pressure and improving physical health for the public.

6. Conclusion

In conclusion, it's significantly possible to advance the development of national fitness program by promoting "physical fitness" with "intelligence". Based on the background of the national fitness campaign, this article outlines the construction plan of intelligent sports parks, and proposes that the construction and application of intelligent sports parks need to pay attention to the issues of whether intelligent functions are missing, whether supply and demand are balanced, and analyzes the experience of public fitness. Intelligent sports parks are not only important places for the public to carry out sports and fitness activities but also supply places for public services for sports fitness. Therefore, intelligent sports parks can provide high-quality services for national fitness campaign from four aspects: optimizing public services, meeting public needs, improving the fitness experience, and transforming fitness programs. Overall, in the rapid development of the domestic sports industry, the integration of modern information technology and sports affairs has become an inevitable trend, and "intelligent sports" will play an important role in national fitness program.

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