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**Conference Paper**

# New Considerations on Smart Sports and Chinese Martial Art

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**Abstract:** Chinese Martial Art development five-year plan (2016-2020) point out Efforts target and direction of Chinese Martial Art development, which requires people pay attention to the new situation, new tasks and new requirements of the development of Chinese Martial Art, Comprehensive analysis new opportunities and challenges that Chinese Martial Art should confront with. In the context of the increasingly integrated technological innovation and sports development, smart sports rapidly developed. Use literature method, expert interview method and inductive deduction method, this paper analyzes the driving effect of smart sports on the development of Chinese Martial Art. In the field of national fitness, smart sport provides technical support for the diversified demand of Chinese Martial Art for the whole people's fitness, In the field of school, application of smart sports teaching facilities has positive influence on the popularization of Chinese Martial Art. The construction of smart sports information service and application platform has further contributed to the development of Chinese Martial Art in school field, Dan system and competition management. This paper suggested to study the theory and application of smart sports and explore new approaches, methods and measures for the development of Chinese Martial Art under the guidance of smart sports and aimed to provide certain reference significance for Chinese Martial Art u sustainable development.

**Keywords:** Smart Sports, Chinese Martial Art, Development, Consideration

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## 1. Introduction

Chinese Martial Art, namely Wushu, is a kind of traditional Chinese sports. It has the functions of physical fitness, self-defense and self-cultivation, which can effectively improve people's health and quality of life. With the rapid development of international and domestic politics, economy, society, science and technology, Chinese Martial Art face to its new opportunities and challenges. In 2016, National Management Center of Chinese Martial Art issued the "Five-Year Plan for the Development of Chinese Wushu (2016-2020)", which requires people to pay close attention to the new situation, new tasks and new requirements and to think deeply about new ways, new methods and new measures to develop Chinese Martial Arts. This will give full play to the important role of martial arts in implementing the national strategy of national fitness, promote the construction

of healthy China, and promote the comprehensive, coordinated and sustainable development of Chinese Martial Arts [1].

With the emerge, development and industrialization of next-generation information technologies such as the Internet and cloud computing, people are constantly exploring the application of smart wearable equipment products, the construction of healthy big data, and the application of AR/VR technology in sports. In the context of the increasing integration of technological innovation and sports development, the concept of smart sports came into being [2].

Li Xiangchen, the director of Intelligent Sports Innovation of the Sports Science Research Institute Center of the National Sports Administration, believes that the so-called smart sports should be based on big data, cloud computing and Internet of Things technologies, with the basic structure

of competitive sports, national fitness and sports industry. A relatively advanced ecosystem that integrates “sports+” resources such as education, health care, tourism, and culture [3].

Smart sports is a model of the integration of sports and technology. Its application involves all aspects of sports. Its fundamental purpose and task are to help sports play its functions and services better and let the participants enjoy sports better [4]. Today, the rapid development of China's sports industry requires a deep understanding of the role of smart sports in the development of Chinese Martial Arts, which is conducive to the application of the relevant achievements of smart sports to Chinese Martial Arts competition and training, social and national fitness, the protection of traditional martial arts, and school physical education field. This will provide support and guarantee for the sustainable development of Chinese Martial Art.

## 2. Smart Sports Provides Technical Support to Meet the Diverse Needs of Martial Arts for National Fitness

### 2.1. The Application of Virtual Simulation Technology Can Meet People's Needs for High Quality of Martial Arts Fitness Guidance

As an excellent traditional culture and sports, Chinese martial arts is an important part of national fitness and it is increasingly becoming an important choice for national fitness. The "Five-Year Plan for the Development of Chinese Wushu (2016-2020)" pointed out that it is necessary to firmly establish and implement the concept of innovation, coordination, green, openness, and sharing.

In accordance with the comprehensive construction of a well-off society and promoting the construction of a healthy China, serve the national strategy of national fitness, meet the growing needs of the people's diversified sports and fitness as the starting point and the foothold, play four role of training of martial arts skills, inherit martial arts culture, spread martial arts spirit, and convey healthy living concepts, and promote the health of martial arts. Comprehensive, coordinated and sustainable development will contribute to the new goal of building a well-off society and building a healthy China [1].

Virtual simulation technology can be used not only for playing 3D games and watching movies in daily life, but also for professional fields such as medicine, transportation, architecture, aerospace, etc., and plays a huge role. For example, in 2016, China E-sports Carnival (CEC) used virtual technology and made a live broadcast of VR-ZONE-live events. In order to help players further improve their combat effectiveness, the American Major League Baseball (MLB) has tried to introduce virtual technology into the player's daily batting training.

Under the background of the country's strong support for the national fitness and sports industry, and the rapid integration of the Internet and the traditional sports industry,

internet-based sports start-up companies grow fast. Healthy Cat (Guangzhou Elephant Health Technology Co., Ltd.) is the leading representative.

In May 2016, the Elephant Sports and Key Laboratory of the Ministry of Education (Zhongshan University) established a joint VR laboratory, which was jointly created by Healthy Cat, Ali Sports and Li Lianjie (Jet Li) [5]. It is reported that the project uses virtual competition to break the space constraints of traditional combat fighting, bring real-time confrontation of off-site fighting enthusiasts come true, promote the vigorous development of fighting sports, and push forward the development and application of virtual technology use in the martial arts industry.

Early in 2015, the industrial robot MOTOMAN-MH24 and the Japanese swordsmanship five-drawing world record holder, Machisuke, conducted a human-machine competition. The robot's R&D team used the 3D technology to analyze the movements of Machisuke in advance and implanted the data information into the memory chip of MH24, so the MH24 possessed all skills of the top swordsman. Many VR/AR sports simulation applications were presented at the Smart Sports Forum in September 2017.

For example, the network virtual marathon project can make traditional fitness more interesting by loading a device on a treadmill and letting people experience running in a simulated environment. Li Haibo, president of Huayun Smart Sports Investment Management (Beijing) Co., Ltd. said: "You can even wear our wearable equipment under virtual conditions to realize that Sun Yang teaching you to swim, Liu Xiang teaching you to hurdle, and Ding Junhui teaching you to play billiards. In fact, learn from Chinese martial arts masters and Tai Chi masters have already had the technical conditions. After wearing the equipment, martial arts enthusiasts from different countries and different regions can gather in the same virtual scene, stand on the edge of the mountain snowfield or near the beach and ocean, and follow the action data of the collected martial arts masters to practice.

In 2014, the International Wushu Federation signed a contract with Snail Company to announce a global strategic cooperation and jointly build a digital martial arts platform. Both sides announced that they will integrate digital technology, the world's top 3D motion capture hardware and world martial arts events, super-premium champions and other excellent resources, collect martial arts information, build a huge global 3D digital martial arts library, and develop a series of digital martial arts products [6]. It is foreseeable that more high-level martial arts resources will appear in the future and can be applied to ordinary people. In July last year, the official daily Weibo of China Daily release a video by the famous designer Tobias, which combines the virtual technology with Chinese martial arts that fully exposed the unique artistic charm of Chinese martial arts. The use of virtual technology to achieve the simulation of martial arts, adding fun in practicing martial arts.

As General Secretary Xi Jinping pointed out, in this new era, and the main contradictions in our society have been transformed into contradictions between the people's growing

needs for a better life and the development of inadequate and unbalanced development. Under the background of the national fitness rising to the national strategy, the people's sports demand will be more diverse, the demand for information-based intelligent sports will grow rapidly, and the demand for smart sports will be more clear yearning. The rapid development of technologies such as the Internet and big data, the accelerated application of intelligent equipment and the Internet of Things, and smart sports will enable us to obtain a more personalized, scientific and intelligent sports experience, and truly realize the deep integration of national fitness and national health [4]. In view of the fact that people's demand for Chinese martial arts fitness tends to be multi-level, diversified, personalized and precise, the martial arts management department should constantly grasp the needs of people, meet the "upgraded version" and individualized needs of the masses, and constantly introduce new ideas and apply wisdom in many fields. Smart Sports technology, the formation of martial arts products with outstanding characteristics, diverse forms and rich content, promote the prosperity and development of social group and mass martial arts activities, to meet the different needs of people in various fields.

## ***2.2. Develop and Build a Shared Wisdom Chinese Martial Arts Fitness Terminal Equipment to Improve the Convenience of Chinese Martial Arts Fitness***

In the past year, we have seen a glass house that looks like a telephone booth but integrates functions such as singing, listening to songs, recording songs, and sharing and disseminating online. The mini-singing KTV has quietly expanded from Fujian to Guangdong, to the whole national even overseas. Since the second half of 2016, Mini KTV has quickly occupied public areas with large traffic, such as shopping malls, cinemas, and game halls. In 2017, the size of China's offline mini-KTV market is expected to reach 3.18 billion yuan, an increase of 92.7% year-on-year [7].

This year, we saw the emergence of a running warehouse. The shared running warehouse released in September 2017 integrates air purification and intelligent analysis of sports data. It looks like a space capsule with a stylish appearance. Built-in smart treadmill, mobile phone scan code can be used, 24-hour medical grade air net, negative ion Real-time replenishment, real-time upload and analysis of sports data, and built-in self-timer printing, friend circle mileage ranking and other functions [8]. The Pure Run project has already cooperated with domestic well-known brand companies such as Vanke, Evergrande and Greentown. It plans to launch 1,000 units in Peking, Shanghai, Guangzhou and Shenzhen at the end of 2017 to promote the running warehouse in hundreds of communities and business districts across the country. The rapid landing of the area, perfect access to the "last mile" of the community, in the provision of caring services for high-quality living people, while bringing a geometric growth to the profitability of partners [8].

When the karaoke that once was popular all over the country was replaced by the mini-singer at the entrance of

shopping malls, we should be soberly aware that a convenient and independent small fitness space will appear, and at the same time bring new changes in various large gymnasiums. The Chinese martial arts fitness space will also be reformed. It is conceivable that there will be a small space device in the future, which is in the vicinity of the community. It has various functions and rich contents. The user can choose different style of Chinese martial arts, with weapon or not. This equipment can not only allow the user to follow the master's guide, but also can adjust the changes of body indicators at any time.

This kind of Chinese martial arts fitness terminal equipment can become a choice for people's fitness. At home, its convenience is conducive to people managing their own fragmentation time and building a new era of smart sports lifestyle. We live in the Internet era where the world is the global village. We are now more confident, more technical, more qualified, and more likely to realize smart sports life than any period in history. Through develop more intelligent Chinese martial arts fitness equipment, it has become the most convenient choice for people to practice Chinese martial art. It can effectively solve the problem of insufficient fitness venues in China, and continuously play an important role in promoting the construction of "Healthy China" and accelerate the martial arts be accepted by more social field and accelerate construction of the national fitness project.

## **3. The Use of Intelligent Sports Teaching Facilities Has a Positive Impact on Martial Arts Education in School**

### ***3.1. Somatosensory Games Enter School Will Provide a New Auxiliary Form for Chinese Martial Arts Teaching***

Somatosensory game system combines the movement of the human body with the electronic game by means of the human body motion sensing device, so that the exerciser participates in the training of physical fitness, physical education and even competitive sports in the form of electronic games. Since the advent of somatosensory games, the sports-type games that have been developed have gradually joined the family of fitness. As early as 2010, Microsoft's somatosensory peripheral Kinect launched the sports fitness game "Your Shape: Fitness Evolved", which has two fitness items, Tai Chi and Kick Boxing. The game will directly project the player's body shape on the screen and use skeleton detection to track whether the player's action [9].

In Tai Chi, the player needs to follow the coach on the screen to do the same movements, whether the hands are flat lift up or not, the distance of the feet is long enough or not, and the knees are bend enough or not are all will be included in the statistics. Kick Boxing requires the player to hit the square with the opposite hand and foot, that is, the right square should use the left fist and the left square to use the right punch. This requirement forces the player to turn the body to achieve the effect of the movement; Besides, the strength and speed of the

player's shot will also be included in the calculation of the calorie consumption value. If the player just taps the brick, the score may be high, but the game will think that your movement is not correct and the calories consumed are insufficient [10]. In addition, there are a number of fighting games developed by Nintendo, such as boxing, fencing, etc., and many people use it.

Somatosensory games are not only suitable for families, but also for schools use in cold, windy, rainy weather, or in other bad weather. At present, some scholars have carried out research on the feasibility of applying somatosensory games in school physical education, the development of somatosensory game projects suitable for school physical education, and the fitness effects of somatosensory games. Wang Fei pointed out in the article "Study on the role of somatosensory games in assisting school martial arts teaching" that martial arts teaching is an important part of martial arts communication and spread and lead somatosensory games into martial art teaching has important practical significance [11]. Somatosensory games can make martial arts teaching content and methods more diverse, causing students' desire to explore, can activate the classroom atmosphere, stimulate students' enthusiasm for learning, and deepen students' understanding of martial arts culture. The interactive and entertaining characteristics of somatosensory games will also bring new vitality to martial arts teaching and make up for some shortcomings and have certain theoretical and practical significance for improving martial arts teaching.

### ***3.2. The Establishment of Smart Sports Classrooms Promote Chinese Martial Arts Teaching Reform***

Smart classrooms are a form of digital classrooms and future classrooms. In June 2017, the country's first "Smart Education Future Classroom" was completed in Hefei 7th Middle School [12]. The project was jointly built by Hefei 7th Middle School and Xunfei University of Science and Technology. She combines the world's leading artificial intelligence, big data, cloud computing, Internet of Things and other new generation information technology to create a real-time interactive, real-time future education space. This is also the country's first "Smart education future classroom", in addition to allowing teachers and students to deeply experience the changes in teaching and learning brought about by personalized teaching, and to experience the combination of cutting-edge technology and subject teaching such as virtual augmented reality technology. The ability to innovate and improve the overall quality. The construction of smart sports classrooms is also underway. Hefei Normal University affiliated elementary school invested to establish the Internet of Things smart sports classroom - student physical monitoring room, relying on the youth physical health service system, a collection of sports experts motion decomposition video library, high-quality courseware resource library, etc., through multi-dimensional data analysis, can give the school and family an automatic analysis report on the health of adolescents' physical fitness, and give a personalized physical exercise prescription that suits the child's own characteristics.

Parents can instantly see the data and reports of students' indoor testing through concern about the public number and school APP, then they can understand the physical condition of their children and watch the live video of the indoor physical education class. They can urge the children to complete the sports homework and form good home-school interaction [12]. Internet + physical education, which will achieve intelligent home school communication, is the inevitable trend of future physical education.

In 2017, Chinese National Martial Art Management Center will take school martial arts education as one of the key points of martial arts management. It is proposed to conscientiously implement "Opinions on Strengthening School Physical Education to Promote the Development of Students' Physical and Mental Health", through promote martial arts education in schools, expand the popularization of martial arts Dan system in primary and secondary schools, and steadily promote the inclusion of martial arts in various school curriculums. Further standardize the martial arts teaching materials and curriculum and broaden Chinese martial arts education channels for youth [13]. With the continuous advancement of hardware construction in smart campuses, it is necessary to grasp the development trend of deep integration of science and technology and teaching, and rapidly promote the reform of campus martial arts teaching. We should constantly standardize school martial arts courses construction, optimize the teaching content of martial arts courses, promote new ideas, focus on stimulating students' interest in learning martial arts, create new martial arts activities, learn novel martial arts teaching design and teaching methods, develop new martial arts teaching equipment, and make more scientific and reasonable training plan, then we will continuously improve the quality and effectiveness of the martial arts curriculum to achieve the goal of "lifelong physical education" and the goal of school physical education curriculum reform.

## **4. Smart Sports Information Service and Platform Promotes Martial Arts Competition Management**

The smart sports information application platform covers a wide range. The We Buzz Smart Sports Cloud Platform, which was developed by Tsinghua University team of Shenzhen Weiwang Technology Co., Ltd, is for all primary and secondary schools and colleges. It uses leading sports intelligence equipment and big data analysis technology to completely solve problems such as "difficult to quantify, difficult to record, difficult to supervise, difficult to analyze". The teaching platform covers sports teaching aids, classroom records, student files, data reports, sports supervision and other functions, helping school teachers to supervise physical exercise, improve classroom quality, and help students enjoy science and technology benefits, help parents understand children's sports. It is a perfect combination of Technology + Sports + Education.

In October 2014, Jilin Province introduced the “National Campus Wushu Dan System Information Service Platform” into the teaching management of the campus martial arts class. The student scans the QR code through mobile phone and enters the whole platform to obtain learning information and training videos such as manuals, promotional materials, schedules, training courses, etc. [14]. The trainees can continue to use the platform for learning, teaching results display. The use of this kind of platform will play a powerful role in promoting the popularization of martial arts in campus. So far to 2019, more than 600 schools in 7 provinces including Jilin, Hunan and Henan have applied the platform to show the basic situation of physical education classes, the current status of martial arts classes and activities in campus, teaching needs, and feedback information of martial arts teaching [14]. This not only build a foundation for the long-term effective martial arts education in school, but also provides a basis for the future development of standardized martial arts textbooks and martial arts Dan system.

The management and service of Chinese martial arts competition requires the construction of more intelligent sports information platforms. Such as martial arts athlete training management system, registration system, interpretation system, athlete's student registration information management system, coach management system, referee registration and management system, martial arts school and town management system and martial arts competition command system, games results information release system, martial arts venue map navigation, reservations, fitness equipment scan code repair.

## 5. Summary

All in all, the impact of smart sports on the future development of Chinese martial arts is profound, long-term and all-round. In the field of national fitness, smart sports can provide technical support for meeting the diverse needs of national fitness for Chinese martial arts and use virtual simulation technology to meet people's needs for high-quality martial arts fitness guidance. It can innovate and build shared wisdom martial arts fitness terminal equipment and make practice Chinese martial arts more convenience; In the field of school physical education, the application of intelligent sports teaching facilities has a positive impact on the popularization and promotion of Chinese martial arts teach and learn, and further promotes the reform of martial arts teaching. Moreover, the construction of intelligent sports information service and application platform further benefit the school martial arts education and martial arts Dan system and competitions management. The protection and development of traditional Chinese martial arts is also inseparable from the help of smart sports. The international and domestic communication of martial arts culture is quickly spread by means of smart sports. At the same time, Smart Sports contributes to the standardization and innovation of Chinese martial arts apparel and equipment and integrates the ultimate comfortable clothing wear experience with biotechnology and artificial

intelligence. Following the pace of development of smart sports, Chinese martial arts will develop faster and more suitable for people's upcoming smart life. It is suggested to study the theory and application of smart sports in depth, explore new ways, new methods and new measures for the development of Chinese martial arts under the guidance of smart sports, so as to fully play the role of martial arts in implementing the national strategy of national fitness and promote the construction of Healthy China. And provides a certain reference to promote the comprehensive, coordinated and sustainable development of Chinese martial arts.

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