

SKI RESORT DIGITAL TWIN SCENE CONSTRUCTION LOGIC AND PROMOTION STRATEGY

Sutirtha Moody
Virginia Tech, Blacksburg, VA 24061, United States.

Abstract: Affected by the new coronavirus pneumonia epidemic, the realization of high-quality development of the sports industry has become an issue of the times. With new digital technologies With the application of technology, digital twins, as a new digital technology that promotes the development of digital economy, have gradually become an academic consensus. Use digital twin scenarios as a way for ski resorts to break through business bottlenecks, put forward the idea of constructing digital twin scenes of ski resorts. Based on digital twin technology foundation, Based on the inherent requirements of high-quality development of my country's sports industry and meeting personalized consumer needs, a digital twin scene is constructed as a ski venue The motivation is to achieve the goal of improving the service efficiency and intelligent construction of ski resorts, and to build ski clothing centered on improving consumer experience. business scenarios, ski resort operation and management scenarios based on simulation models, skiing decisions based on early warning linkage and intelligent decision-making systems Scenarios to promote ski resorts to improve service quality. Based on the above, suggestions are made: 1) Strengthen the top-level design of the digital construction of ski venues and give full play to the guiding role of China's relevant policies and industry standards; 2) Stimulate the market vitality of China's ice and snow sports industry, and ski venues should increase the use of digital twin technology development The strength of ski products and services; 3) Ski resorts should strengthen the construction of digital twin platforms and improve active services; 4) Strengthen the cultivation and training of practitioners in the ice and snow sports industry, and promote the improvement of professional service levels for ice and snow venue operators.

Keywords: Domestic digital twin ski venues; Smart venue operations and management; Sports industry; Ice and snow sports industry digitization

1 MULTIPLE LOGICS FOR BUILDING DIGITAL TWIN SCENARIOS OF SKI RESORTS

Ski resorts are venues where the public can participate in ice and snow sports. main place of payment. In recent years, most ski resorts have been undergoing renovation and upgrading efforts. While gradually realizing the importance of software infrastructure, effect. How to apply new digital technologies such as the Internet of Things, 5G, and AI to the design, operation, and management of ski resorts to build a system that is compliant with the digital economy. A new type of ski resort that follows the trend of economic development and has become a sports venue to improve quality and expand capacity. issues of the times. Digital twins are widely used in the field of intelligent manufacturing. Digital technology has seen success stories in many industries and has continued to Extending to areas such as smart city construction, with safety risk prediction, decision-making It has application value such as policy assistance and has been used in aerospace, smart logistics, etc. Become an important player in assisting digital transformation and promoting the development of the digital economy Section [1] also has certain practical significance for the intelligent construction of ski resorts. Meaning [2]. When the Beijing 2022 Winter Olympics and Paralympics are held, including More than 200 high-tech items including ice and snow venue digital twin simulation system Project [3-4] is helping the smart, visualized and low- carbon operation of sports venues It has played an active role in the construction of digital twin ski resorts. Oral period has been formed. According to relevant data, global digital twin technology technology had a market value of nearly \$4 billion in 2019, by 2025 It is expected to exceed US\$35 billion [5]. Digital twin scenarios will be a new form of smart stadium construction, with multiple data fusion, multiple digital Features include technology integration, ultimate visual experience, real-time scene interaction and collaboration, simulation based on sports venue operating data [6]. This study uses Literature research method and logical analysis method are used to explore the application of digital twin technology to build The feasibility of setting up smart ski resorts in Beijing, Heilongjiang Province, etc. The province (municipality directly under the Central Government) investigated the management and operation of multiple ski resorts. With reference to the existing smart construction models of sports venues, it is proposed to use digital twin technology to promote the transformation and improvement of ski resort operation and management models.

1.1 Theoretical Logic: Wide Application of Artificial Intelligence Technology

Digital twins were introduced by the National Development and Reform Commission and the Central Cyberspace Administration of China in 2020. "On Promoting the Action of "Moving to the Cloud and Empowering Intelligence with Data" released in 2019 to cultivate the new economy. It has been mentioned many times in the Development Implementation Plan. Digital twin is the digital classic New digital technologies emerging in the process of economic development are widely used in industry industry and intelligent manufacturing, it is currently becoming the focus of

digital transformation in many fields. new choice. The term "digital twin" first appeared in the United States in 2010. It is believed that digital twin is a vehicle or integrated multiphysics, multi-space simulation system The system can completely present mirrored space twin objects, and can update vehicle operation history information through models and sensor data [7-9]. Some researchers believe: Digital twin is an important technology that depicts the physical world, simulates the physical world, optimizes the physical world, and visualizes the physical world in the information world [10]. Some researchers believe that digital twins are driven by multi-dimensional heterogeneous data in a specific data management closed loop and form responsive scenarios by creating simulation digital models [11]. In short, digital twins use physical modeling and simulation technology and sensing technology to map the real physical world into virtual digital space. It has functions such as interaction and control between the physical world and digital space, and can realize the direction of real physical space. digital space transformation. The most typical feature of digital twins is that they can realize the interactive integration of information and physical systems. Based on the panoramic simulation of the physical space, they can accurately map and reproduce the specific monitoring scenes involved in the ski resort into the virtual space. They can be divided into levels, sub- dimensions, simulate the real scene of the physical space according to a certain proportion, and build it into a digital virtual scene. This mapping is not static, but real-time and dynamic. Virtual space and the real world are realized through intelligent sensing sensors and high-speed network connections. Accurate mapping of mapping objects and real-time updates of scenes. Application scenarios constructed by digital twin technology have the necessary characteristics of the physical world. For example: multiple dimensions can be constructed under GIS, BIM and other technical conditions, digital application scenarios that are perceptible and interactive; under technical conditions such as AI and ML, digital space can be used to adjust specific aspects of specific scenes in the physical world. all. This kind of interaction between virtual digital space and real scene is closer to what users want. real-world scenes, allowing people to have an understanding of the physical world and virtual space Create two-way perception and form an immersive experience. With the Internet of Things technology With widespread application, the Internet of Everything is becoming a reality. Using digital twins Technology constructs include the relationship between people and people, things and things, and people and things. Information sharing networks enable sensors, mobile communication devices, and machines to The ability to compute data and learn. By connecting to 5G and Wifi, the data The heart can carry out decision-making optimization on the entire computer application system and construct all kinds of A network scenario where everything is integrated. Risks existing in the physical world can be constructed through digital twin technology, which can be used in big data analysis and cloud Under the conditions of computing, artificial intelligence and other technologies, after data collection, analysis, simulation, prediction and other steps, can achieve real-world risks Simulate predictions to provide reasonable and feasible reference for scientific decision-making.

1.2 Goal Logic: Intrinsic Requirements for High-Quality Development of the Sports Industry

It has long been a consensus in the sports community that the sports industry has become a pillar industry of the national economy. The background of socialism with Chinese characteristics in the new era Under the current situation, the sports industry should further promote the development of the national economy and high-quality development Exhibition is the key. In the context of the increasingly intensified trend of economic globalization, it is necessary to Give full play to new digital technologies to help build China's domestic circulation-oriented and national The positive role of the new development pattern of domestic and international dual circulation has enabled it to promote the High-quality development of education industry. At present, competition in the international market is intensifying, and the global body There are bottlenecks in the development of the education industry [12]. Especially when affected by the new coronavirus pneumonia epidemic, the sports consumption market and sports consumption structure have changed. Profound changes have taken place, and high-quality development of the sports industry is imminent. at the same time, The "" The 14th Five-Year Plan for Sports Development has been It has been proposed: Create mass organizations, venue facilities, and events covering national fitness Digital national fitness with activities, fitness guidance, equipment and other content Service platform to innovate the national fitness public service model. speed stadium Digital transformation of ground facilities. Develop QR code system for public sports venues, Promote local digital upgrading and transformation by no less than 1,000 sports venues, build a number of smart sports venues, and build More than 10,000 smart fitness paths, smart fitness trails, smart sports parks, smart fitness centers, etc. Intelligent fitness venue facilities [13]. In addition, as our country's "Arctic extends from the south to the west, With the implementation of the strategy of "expanding eastwards", the number of people participating in skiing in my country has shown Increasing trend year by year. The actual demand of the broad masses for skiing It will promote the development of the ski resort service industry. At a limited number of ice and snow resorts On the basis of the resort, it has become a ski resort to meet the growing demand for skiing consumption. There are inherent requirements for improving the quality and capacity of the library. Developing digital economy and sports in our country Under the guidance of policies to strengthen scientific and technological innovation in the field, build smart ski resorts pavilion, transforming the ski sports scene and building an intelligent and interactive digital Ski resorts with twin scenes have become the main service effect of the sports industry market. An effective way to improve.

1.3 Logic of the Times: Sports Consumers' Expectations for Personalized Services

With the improvement of my country's residents' consumption level, people's consumption of sports Expenditures are also increasing. In the context of consumption upgrading, China's residents People's consumption demand for diversified and high-quality ice and snow sports is bound to drive Ski resort changes original business model. At the same time, the basics of sports venues Functions gradually tend to be diversified, extended functions are further strengthened, and stadiums Museums and urban construction are becoming more and more closely related [14]. At present, ski resorts in my country are generally The ubiquitous problems of imperfect hardware facilities, incomplete software functions, and lack of diverse online services are still prominent [15]. Many large sports venues Reservation functions such as online online, WeChat public account push, and mobile applets It is common to book venues to increase venue utilization. To enrich ski sports Activating scenes and changing the ski resort business model, relying solely on investment funds to provide The hardware facilities of the ski resort are not enough. Changes in sports consumption structure From a cultural perspective, some consumers' ski consumption concepts have changed from traditional leisure Sightseeing consumption has shifted to experiential consumption, changing the business model of ski resorts. Help meet new consumer needs. According to relevant data, in 2020 — The number of people participating in skiing during the 2021 snow season fiscal year is 10 860 000 people, Although it is less than in 2019 17. 1%, but the proportion of ski enthusiasts is obvious There was a significant increase [16], and the number of skis per capita increased to approximately 2 times (compared to the previous year degree increased 18.8%). Hosting the 2022 Winter Olympics and Paralympic Winter Games in Beijing During the Olympic Games, ski resorts ushered in unprecedented development opportunities, but Due to the impact of the 2020 novel coronavirus pneumonia epidemic, new ski consumer demand has been greatly suppressed. At the same time, due to insufficient resource development, constraints due to factors such as, most ski resorts lack technological innovation capabilities, Consumers have a poor skiing experience. Digital twin is a comprehensive new Digital technology can accurately map the real scenes of ski resorts into virtual digital space through AI, GIS, BIM, AR, VR and other technologies, constructing A digital twin ski resort that combines virtuality and reality and interacts with reality. in big data Under the conditions of analysis, cloud computing and other technologies, ski consumers are using digital twins The ski resort will allow you to see the immersive skiing process and intelligent skiing. The panoramic experience scene of the ski resort will be presented to the venue managers. before. Venue managers can not only use digital twins of ski resorts The platform understands the operation status of ski resorts and can provide ski consumers with Provide personalized service.

1.4 Practical Logic: A Breakthrough Choice for Sports Venues to Improve Service Levels

Due to the low willingness of some residents to consume sports and the ice and snow resource areas The impact of uneven distribution and the consumption potential of the majority of residents participating in skiing The force is not activated. As of the end of 2020, there were 715 slides operating normally In the snow field, Heilongjiang Province still ranks among the top ski resorts in the country with 94 ski resorts. Ranked first in terms of number of ski resorts, including ski resorts with level 4S or above The quantity accounts for 8.5% in Heilongjiang Province [16]. Judging from the operation situation of ski resorts, inefficiency in operation and management and long return on investment cycle are the problems that solve the problem. There has been. The reasons are: 1) The general residents' view of ski consumption There are differences in thoughts. Some researchers have suggested that recognition of ice and snow sports culture will Directly affects consumers' love and recognition of skiing degree [17]. 2) The scene and service of the ski resort are single. Diversity and individuality There are fewer specialized and customized ski sports scenes, which reduces consumer spending willingness to pay. Therefore, it is necessary to establish a modern ski industry system and improve The entire ice and snow industry chain promotes the integrated development of ski venues and related businesses exhibition. The existing ski resort services cannot satisfy the skiing needs of the majority of residents. When the demand is high, the intelligent service level of ski resorts can be improved to better meet the needs of the ski resorts. Solve the practical dilemma of insufficient manpower in ski resorts. From a fundamental analysis, It is necessary to promote the division of labor and cooperation among the key resources of sports venues management, Allocate advantageous operating resources to promote the development of the ice and snow sports industry. from international and Domestic cases of intelligent construction of sports venues can be seen, improving sports venues Intelligent service efficiency requires leveraging the advantages and grasp of new digital technologies Its characteristics apply new technologies to solve particularly difficult problems. For example: China The National Speed Skating Hall applied BIM technology to the entire construction process during the construction process. process simulation, Built around BIM spatial modeling and AI algorithms A digital twin platform was built, and indoor and outdoor integrated customization equipment was installed inside the venue. The digital navigation system and digital twin system make the entire venue a smart "big city". "Brain". A stadium in the United States also uses digital twin technology to develop a stadium existing resources, giving stadium operators unprecedented data analysis analysis ability [18].

2 THE CORE CONNOTATION OF DIGITAL TWIN SCENES OF SKI RESORTS

Building intelligent ski venues requires innovative ski venue operation models method, based on the actual ski resort itself to build a digital twin of the ski resort platform. Building a digital twin platform requires following certain technical standards. and industry standards, ski resorts have their own particularities, but they also have sports Common characteristics of venues. The main functions of the digital twin platform for ski resorts Can include ski scene

simulation, ski resort monitoring, ski sports damage Injury risk assessment, Ski travel risk prediction and ski resort management optimization, specific application scenarios include skiing risk virtual assessment, sliding Process route planning, ski resort safety risk and hidden danger investigation, skiing Behavior visualization, ski resort internal monitoring, ski resort equipment safety Monitoring, skier health assessment, sports injury behavior prediction, skiing There are about 30 venues equipment performance optimization and collaborative control [19]. not yet The coming ski resort will break through its single ski function and become a smart city important part of construction.

2.1 Service Scenarios Centered on Consumer Experience

User service system based on digital twins will break through ski resorts Scenario limitations, using new digital technologies such as big data, cloud computing, and artificial intelligence technical construction" Smartphone-Wearable Device-PC-Self-service terminals" etc. The user matrix associated with multiple terminals enables ski resort managers to manage Process ski consumption orders. Customized services throughout the entire skiing process can improve skiers' consumer experience and enhance the market competitiveness of ski resorts. As shown in the picture 1 institute According to the report, the ski resort digital twin platform has the following service functions: 1) Personalized service before skiing. First of all, this service function can provide skiers with Customize ski equipment, personalized hotel recommendations, and reservations before skiing Tickets, etc., and at the same time, after obtaining the skier's body shape parameters Provide skiers with personalized ski equipment customization through avatars Serve. Secondly, after applying the "smart city" system, suitable ski travel methods and sliding routes can be recommended for skiers, shortening the time skiers spend on the road. Finally, provide skiers with detachable consumption solutions, Matching ski equipment and ski instructors to skiers through facial recognition system wait. 2) Integrated services in skiing. Video cameras installed in the ski resort record skiers' sliding process, and carried out through AI technology Motion recognition, while analyzing and recording the skier's sliding distance and glide time, number of flights, number of turns and other data, and can be based on the skier's wear The smart ski equipment worn by the skier collects the skier's heart rate, blood pressure and other indicators to evaluate the skier's physical condition and prevent accidental injuries. Some researchers use wearable devices to integrate IMU sensors. According to the gyroscope The instrument data is used to calculate the skier's rotation angle during snowboarding, and And assist in judging the quality of snowboarding [20]. 3) Precise clothing for après skiing service. Captured through stereoaware IoT sensors installed at ski resorts Skiers' preparation activities before skiing and the movement track during sliding The computing center of the digital twin platform generates the skier's traces throughout the Virtual scene during taxiing. The scene mainly consists of skiers sliding Snow image data, skiing moments, sliding energy consumption, etc., and can Extending the skiing scene can realize the co-construction and sharing of skiing data.

2.2 Ski Resort Operation and Management Scenarios Based on Simulation Models

The management scenario of the ski resort is mainly realized through two major functions: mapping update and simulation model optimization.. 1) Dynamics based on mapping updates The management system uses GIS and BIM technology to accurately map physical entities in the real world into virtual space, and implements virtual and real interconnection functions. The current digital virtual space and the real world information data are updated simultaneously. slip Ski resorts are the main places to participate in skiing, and skiers in them The quantity, usage of ski equipment, etc. are changing, which requires timely Skiers and ski equipment usage that will appear in the ski resort Objects in the objective world are mapped to the digital twin platform, making the digital twin The virtual objects in the scene are consistent with the objects in the real scene. This is An important basis for smart ski venues to predict data such as passenger flow and energy consumption of venue equipment. 2) Carry out real-life scenarios collected by the simulation system The virtual ski scene generated by surveying, mapping and modeling is rendered by a 3D model. The optimization of dyeing, AR, VR, MR, holographic projection and other technologies can maximize to ensure the fidelity of the simulation model. Simulating skiing through a computer program The real scene in the venue must ensure that the scene on the digital twin platform is consistent with the sliding The actual scene in the snow resort is the same. For example: the Xi'an Olympic Sports Center IOC platform is implemented by building a digital twin simulation model of the venue group. Multi-dimensional, high-precision, full-view reality based on time and space Field simulation scene [21]. To form a digital virtual mirror of the ski resort, it is necessary to Ski resorts need to be acquired through multi-modal sensing sensors and ski equipment information on the overall operating status of the museum. In the construction of smart ski resorts Process, A large amount of equipment needs to be set up for information acquisition and data transmission can be lost under the technical conditions of cloud computing centers and edge computing devices Construct a central computing system for ski resorts, and use this system to Control the energy consumption of power equipment and refrigeration equipment in the museum to achieve Maximize the operational efficiency and energy consumption of existing ski resorts, and maximize the Drastically reduce ski resort operating costs.

2.3 Ski Resort Management Decision-Making Scenarios Using Early Warning Monitoring

Decision-making scenarios mainly use safety early warning systems and ecological environment monitoring Measurement system construction. 1) The safety warning system is used for daily operations of ski resorts Important Guarantee. On the one hand, the conventional security early warning system can Real-time monitoring of the venue's camera equipment and intelligent face recognition system Scenarios of conventional security layout. Under the

conditions of massive data calculation, it is possible to identify Avoid dangerous actions by skiers during skiing (for example: falling, impacting etc.) to ensure the personal safety of skiers. In addition, real-time Monitor the equipment operation status of ski resorts. When equipment fails, you can Provide timely warning and automatically troubleshoot. On the other hand, early warning linkage Use intelligent decision-making system to monitor ski resorts due to force majeure equipment damage and personal injury caused by. For example: encounter a fire alarm police, public emergencies, etc., early warning linkage and smart decision-making systems will Initiate emergency plans in a timely manner and share accident-related information through the data sharing system The system is shared with traffic control departments, hospitals, etc. to facilitate vehicle coordination. Scheduling and medical resource allocation. 2) The ecological environment monitoring system is a ski resort An important "helper" for sustainable development. Green and low-carbon are the goals of ski resort operations and are also necessary steps to achieve the goal of "carbon neutrality" development. one In terms of performance, digital twin scenarios can be implemented based on the number of people entering the ski resort. Real-time energy consumption monitoring and analysis, temperature system, exhaust system, power control system Make effective adjustments to the system to avoid waste of resources. Indoor ski resort in operation During the operation, refrigeration equipment needs to be used to adjust the temperature in the venue. Snowmaking equipment is also required to make snow. Relevant surveys show that Beijing The annual electricity bill of a ski resort is about 6 000 000 yuan, while using new The construction technology, air film structure and intelligent power control system of the ice and snow venue can It saves about 5,000,000 yuan in electricity bills every year, but another ski resort passed Energy consumption monitoring equipment performs energy consumption analysis and early warning, and can be controlled remotely Energy consumption, so that the comprehensive energy consumption system of some energy consumption systems such as lighting facilities in the ski resort Combined energy consumption is reduced 1% [22]. On the other hand, through big data and the Internet of Things Intelligently configure the energy consumption supply of ski venues to effectively judge venue operations Peak energy consumption periods and idle times in the process, and a set of people can be constructed Attendant density reminder, ski venue indoor location precise navigation, venue owner A personalized smart venue management system that integrates the simulated layout of booths and booths.

3 PROMOTION STRATEGY FOR THE CONSTRUCTION OF DIGITAL TWIN SCENES OF SKI RESORTS

3.1 Strengthen the Top-Level Design of Digital Construction of Ski Resorts, Fully Developed Give Full Play to the Guiding Role of My Country's Relevant Policies and Industry Standards

Since 2020, Shanghai City, Zhejiang Province, Guangdong Province, etc. 16 provinces (autonomous regions and municipalities) have formulated relevant policies for the development of digital twin technology. relevant policies to encourage digital twin technology to empower smart city construction, and proposed It is necessary to build digital twin communities and construct urban governance and community grid collaboration. Same governance platform. Regarding the application of digital twin technology in ski resorts Therefore, the government and sports administrative departments must conduct in-depth research and evaluation of digital twin technology. The best combination of technology and smart ski resort construction, strengthen top-level design plan, refine support policies and standard evaluation indicators, and promote digital technology empowerment. It can improve the service quality and efficiency of ski resorts. One is to guide ski resorts The museum should strengthen in-depth cooperation with relevant technology companies, especially with local Cooperation between management information and surveying, BIM, and simulation modeling companies, through Special funds and related technology enterprises, scientific research institutes, and university researchers Jointly strengthen scientific and technological research on the application of digital twin technology in sports venues to enhance the technical applicability of digital twins in sports venue operations [18]; The second is to encourage the application of digital twin technology in other industries. experience, and establish a digital twin of ski resorts based on industry common experience. The basic framework of the platform, and the numbers are designed according to the particularity of ski resort operations. The specific functions of the twin platform, using the digital twin platform as a ski venue The role of high-quality development empowerment; the third is to improve the promotion of ski resort regulations industry standard for development. Zhejiang Provincial Market Supervision and Administration Bureau in 2021 The "Intelligent Construction and Management Standards for Large and Medium-sized Sports Venues" was released in 2018. In this way, we standardize the intelligent construction of large and medium-sized sports venues and provide solutions for skiing venues. Using digital twin technology to provide reference industry standards, local governments and sports administrative departments in China must further improve ski resort intelligence Industry standards for intelligent construction guide the construction of a number of applied digital technologies standardized ski resorts with technical management and operation to improve the intelligence of ski resorts The effectiveness of the in-depth integration and development of globalization construction and digital technology.

3.2 Stimulate the Market Vitality of My Country's Ice And Snow Sports Industry, Ski Resort it is Necessary to Apply Digital Technology to Independently Develop Ski Products

At present, there are still some problems in the practical application of digital technology. Data collection technology threshold is high, insufficient information infrastructure construction, data Zi Lisheng's platform model construction standards are not high and key stuck technologies are not mastered Problems such as grip. Therefore, lowering the application threshold of digital Lisheng technology is the key to skiing The key link in the application of this

technology in venues. With big data, cloud computing, AI, The integrated development of digital technologies such as 5G, The maturity of digital technology has made sliding The digital life scenes of the snow resort are more diverse and more comprehensive. National Speed Skating Hall and Alpine Ski Center Apply Digital Li The practical experience of biotechnology can serve as a basis for other ice and snow venues to apply this technology. Technical reference. Therefore, the integration of ski resorts and digital technology should be promoted develop and strengthen the role of new digital technologies in the intelligent construction of ski resorts application. First, it is necessary to stimulate the market vitality of the ice and snow sports industry and promote the Technological enterprises develop the ski resort market and serve the smart ski resorts Construction, promoting the overall digitalization level of the ice and snow sports industry Digital economic development. Second, ski resorts should apply digital technology to automatically Mainly develops ski products and applies digital technology to other industries The common experience is transformed into independently designed and developed ski resorts that meet the requirements of skiing. Ski supplies that snowboarders actually need, strengthen cooperation with university scientific research departments and departments Research institutes and relevant technology companies conduct joint scientific and technological research to cope with digital New challenges brought about by economic development.

3.3 Ski Resorts Can Improve Skiing by Building Digital Platforms Consumers' Consumption Behavior Experience and Improve Proactive Service Capabilities

Through research, it was found that the hardware facilities of ski resorts in China are The gap abroad is gradually narrowing, but the proactive service awareness is relatively lacking. lack. At present, many ski resorts in China can already communicate with each other. Online booking, but you still need to get a physical ski pass before skiing. The ski pass is required for the ski resort access control system and for picking up or returning ski equipment.. At the same time, ski instructors and other ski resort staff Difficulty understanding skiers' consumer needs, lack of accurate personalized services service. This can lead to a poor skiing experience for skiers. Therefore, through Improving the consumer experience of skiers through the construction of digital platforms for ski resorts can be an important measure to improve the active service capabilities of ski resorts. Give. The first is to break down barriers to data sharing. To connect ski resorts with other Barriers to data sharing in related industries, realize real-time data sharing, Enable the digital platform of ski resorts to independently obtain public transportation status conditions, hospitals, weather and other public information functions; the second is to explore ski resorts The potential value of the operational data generated by the museum and the analysis of the data collected by the sensors Ski resort operation data and public information sharing data to find skiers potential consumer demand, and proactively develop personalized ski supplies; thirdly, Pay attention to the comprehensive application of digital technology, That is, the comprehensive application of 5G, AI, large Data, Internet of Things and other technologies build a digital platform for ski resorts to provide High service quality at ski resorts.

3.4 Strengthen the Cultivation and Training Of Practitioners in the Ice AND Snow Sports Industry, Promote Ice and Snow Venue Operators Improve Professional Service Levels

May 2020 1st to April 2021 On the 30th, the number of skiers in 36 ski resorts in China reached 3,210,000 [16]. However, ski resorts in China have a long way to go from early construction planning to late operation. Operation management, there is a large gap in relevant professional talents. Thus, cultivating and satisfying skiing The comprehensive quality talents needed for the sustainable development of venues have become ice and snow. key to industrial development. First, improve the training of professional talents in ice and snow sports Policies to support relevant universities in adjusting majors according to the development needs of the ice and snow industry set up, accelerate the construction of ice and snow sports professional teaching team and curriculum system The second is to strengthen the construction of interdisciplinary disciplines such as sports, engineering, and computers, Cultivate a group of new sports talents with computer professional background; the third is to increase Strengthen international exchanges and cooperation in ski resort operations and learn from other countries Advanced experience in operating ski resorts, inviting overseas ski resort operators Talents return to China to hold training courses, quickly diversifying domestic ski resort operators The fourth is to increase training funds for ice and snow venue operation personnel Strengthen guarantees and increase investment in training for operators of ice and snow manufacturing equipment Intensify efforts to promote ice and snow venue operators to improve professional service levels.

4 CONCLUSION

Establishing a smart ski resort based on digital twin technology can be described as It's a long way to go. At present, the construction of smart ski resorts in China has The design has just started and is still facing many challenges such as digital technology and construction ideas. Bottleneck: How to better apply key digital twin technologies to "activate" skiing scene, promoting the development of my country's ice and snow industry is an important topic. but Yes, with the joint efforts of all parties, smart ski resorts in China The museum's digital technology application practice will definitely be fruitful.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

REFERENCES

- [1] Fan Xiaohui, Wang Di, Sun Lin, et al. White paper on digital twin technology application. (2021-12-02)[2022-10-20]. <https://www.cdlf.org.cn/h-nd-1133.html>.
- [2] Chen Gen. Digital twin. Beijing: Electronic Industry Press, 2020: 19.
- [3] Shen Cong. Digital twins empower the Beijing Winter Olympics. China Electronics News, 2022-02-25(7).
- [4] Technology Winter Olympics" heading towards the future together— How technological innovation makes the Winter Olympics Even Refined Cai. (2022-02-21) [2022-11-16]. <http://www.news.cn/2022-02/21/c1128403737.htm>.
- [5] 500M florida sports district to use digital twin modeling.(2020-09-30)[2022-10-20]. <https://www.constructiondive.com/news/500m-florida-sports-district-to-use-digital-twin-modeling/585555/>.
- [6] Wang Hui. The construction of smart sports venues presses the " Accelerator key". China Sports News, 2021-03-31(1).
- [7] Liu Zhen. Seize the development opportunities of digital twin technology. (2020-12-04) [2022-10-20]. <http://news.sciencenet.cn/htmlnews/2020/12/450188.shtm>.
- [8] SHAFTO M, CONROY M, DOYLE R, et al. Modeling, simulation, information technology and processing roadmap, 2010.
- [9] Zhang Lin, Lu Han. Looking at digital twins from modeling and simulation. (2021-04-02) [2021-04-30]. <http://kns-cnki-net.vpn.chd.edu.cn:8080/kcms/detail/11.3092.v.20210402.0924.002.html>.
- [10] Tao Fei, Ma Xin, Hu Tianliang, et al. Digital twin standard system. Computer Collection Manufacturing Systems, 2019, 25(10): 2405-2418.
- [11] Chu Leyang, Chen Weidong, Tan Yue, et al. Symbiosis of virtuality and reality: digital twin (DT) technology and its educational application prospects — also on the reconstruction of ubiquitous smart learning space. Journal of Distance Education, 2019, 37(5): 3-12.
- [12] Qian Junwei, Li Rongri. Theory of development momentum of sports industry under new development pattern logic, Realistic review and model construction. Journal of Xi'an Institute of Physical Education, 2022, 39(1): 54-63.
- [13] The sports industry in the construction of China's sports power in the new era Development Logic. Journal of Beijing Sport University, 2018, 41(3): 8-13.
- [14] Chen Yuanxin, Chen Lei, Liu Heng, et al. Theoretical logic and practical dilemma of functional transformation of public sports venues -- Taking Hongshan Sports Center as an example. Shanghai Sports Science Journal of Chinese Academy of Sciences, 2020, 44(5): 37-46.
- [15] He Xiaoya, Liang Jinhui. Research on resource characteristics, problems and countermeasures of ski resorts in China Research. Journal of Hebei Institute of Physical Education, 2020, 34(6): 29-35.
- [16] Wu Bin. 2020 China Ski Industry White Paper (and 2020-2021 Snow Season Financial Report) Annual Report). (2021-07-03) [2022-10-20]. <https://www.vanat.ch/2020%20China%20Ski%20Industry%20White%20Book-Chinese.pdf>.
- [17] Bai Yunchao, Lin Xianpeng. my country's public ski consumption behavior intentions under the background of Winter Olympics Research--Taking Chongli area as an example. Journal of Shenyang Institute of Physical Education, 2021, 40 (2): 77-85.
- [18] New sofi stadium and hollywood park to sport digital tw in technology.(2020-10-27)[2022-10-20]. <https://sportsvenuebusiness.com/2020/10/27/new-sofi-stadium-and-hollywood-park-to-sport-digital-twin-technology/#>.
- [19] Tao Fei, Zhang He, Qi Qinglin, et al. Ten questions about digital twins: analysis and thinking. Computer Integrated Manufacturing Systems, 2020, 26(1): 1-17.
- [20] ALLEN T, SHEPHERD J, WOOD J, et al. Chapter 16-wearablesfor disabled and extreme sports//GODFREY A, STUARTS. Digital health: Academic Press, 2021: 253-273.
- [21] Ren Haoyan. China Electronics Technology: Empowering the 14th National Games with smart technology.(2021-09-18)[2022-10-20]. <http://www.potevio.com/s/1274-4627-18537.html>.
- [22] Why say cloud The top ski resort is A smart energy saving of Ski resort. (2021-12-05)[2022-10-20]. <https://hebei.hebnews.cn/2021-12/05/content8682339.htm>.