

Research on Strategies for Digital Empowerment of the Ice and Snow Sports Tourism Industry

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Abstract: *The era of the data economy, driven by digital technologies such as big data, blockchain, and cloud computing, has arrived. It is essential to leverage the digital economy to promote the high-quality development of the ice and snow sports tourism industry. This paper employs methods such as literature review and inductive reasoning to argue that the digital economy enhances the high-quality development of the ice and snow sports tourism industry through three main aspects: improving supply efficiency, achieving industrial transformation, and promoting industry integration. However, China's ice and snow sports tourism industry faces several challenges, including inadequate institutional supply, a lack of high-quality talent, traditional operational models, and a singular investment body. To address these challenges, this paper proposes several strategies: strengthening government leadership to create a suitable policy environment; establishing a talent cultivation system to support the upgrading of the ice and snow sports tourism industry; empowering the industry through technology to promote integration; and fostering a collaborative approach among diverse stakeholders to innovate the industry's business models.*

Keywords: *Digital Economy, Ice and Snow Sports Tourism, Sports Industry*

1. Background

In 2017, the digital economy was first included in the "Government Work Report," officially becoming part of the national strategic plan. General Secretary Xi Jinping emphasized the comprehensive vision of building a "Digital China" in the report of the 19th National Congress of the Communist Party, highlighting the importance of vigorously developing the digital economy and promoting a deep integration of internet technology, big data, artificial intelligence, and the real economy. In recent years, emerging digital technologies, represented by key 5G communication technologies, cloud computing, and mobile internet, have rapidly developed, making the digital economy a crucial driving force for high-quality industrial development and ushering in a new wave of technological and industrial revolution in China. The Chinese economy is transitioning toward a high-quality development phase characterized by transformation and optimization of industrial structures. As an emerging industry within the tourism sector, the ice and snow sports tourism industry has exhibited strong growth, supported by the "Let 1.3 Billion People Enjoy Ice and Snow" strategy and the Beijing 2022 Winter Olympics. With the broader application of digital technology, China's ice and snow sports tourism market is poised to unveil immense potential for industrial upgrading and rapid development. Therefore, seizing this broad development prospect and promoting the high-quality development of the ice and snow sports tourism industry in the digital economy era has become a significant issue within China's cultural tourism and sports industries. This paper conducts field surveys and expert interviews to objectively analyze the challenges faced by the sports tourism industry, providing a scientific path for further promoting the development of China's ice and snow sports tourism industry.^[1]

2. Opportunities for Development of the Ice and Snow Sports Tourism Industry Empowered by the Digital Economy

Under the continuous influence of the digital economy, China's sports industry is aligning with the new development philosophy and leveraging national top-level design to empower industrial construction. It can be said that digital empowerment of regional ice and snow sports tourism has become an essential path to promote high-quality industry development.

2.1 Innovating the Supply Side to Enhance Market Supply Efficiency

With the changing social dynamics in China, there has been a corresponding shift in consumption structure. In the first half of 2021, the per capita consumption expenditure of residents reached 11,471 yuan, with service consumption accounting for about 50% of total expenditure. Moreover, driven by the Beijing Winter Olympics, the number of residents participating in ice and snow activities reached 346 million, fulfilling the vision of 300 million people enjoying ice and snow. By utilizing internet platforms and big data, companies can accurately understand user needs and meet consumers' personalized demands for ice and snow sports tourism, achieving precise and high-quality supply. Additionally, artificial intelligence on the service end can replace traditional labor, effectively enhancing enterprise work efficiency while reducing consumers' time costs, thus expanding the scale of supply and promoting the growth of the ice and snow tourism market. Furthermore, digital technology has led to a flatter organizational structure, enabling collaborative cooperation and efficient communication in the ice and snow sports tourism industry, which in turn enhances supply efficiency.

2.2 Promoting Industrial Transformation and Creating New Development Models

Since 2020, due to the pandemic, the number of participants in ice and snow tourism plummeted to 94 million. As we enter the post-pandemic era, the ice and snow tourism industry is in need of recovery. The digital economy provides an opportunity for the industry to shift from offline to online operational models. Technologies such as blockchain and cloud computing are facilitating innovative applications like the Internet of Things (IoT), big data, and virtual reality (VR) to promote the upgrading and transformation of the sports industry. For example, the "Internet Plus" marketing model enables the creation of online travel agencies, leveraging the vast reach of e-commerce to enhance brand effectiveness. The popularity of esports during the pandemic has made the monetization of digital sports services a reality, leading to the emergence of new business models in ice and snow tourism. The integration of ice and snow sports with esports through digital technology creates impactful online sports competitions, satisfying consumer sensory experiences while promoting consumption in the ice and snow tourism industry. Therefore, the digital economy provides a favorable opportunity for the transformation of the ice and snow tourism industry, aligning with the goals set during the 14th Five-Year Plan to develop new tourism models. The new business models that emerge will also serve as important engines to drive economic development and recovery after the pandemic.

2.3 Achieving Industry Integration and Building Collaborative Development of the Industry Chain

The digital economy creates a platform that connects various ice and snow tourism enterprises, allowing them to meet their needs and maximize their capabilities, thereby reducing marginal costs and enhancing industry efficiency. Digital technology applied at every stage of the supply chain improves resource utilization efficiency, accurately grasps market demand, expands online influence, and maximizes industry profits. At the same time, intelligent digital monitoring can eliminate internal competition within the supply chain, fostering a healthy industrial environment. In the future, the ice and snow tourism industry can radiate outward and collaborate closely with neighboring sectors such as dining, transportation, and healthcare through this intangible network of the digital economy, achieving industry integration and driving regional economic development.^[2]

3. Challenges in the Development of China's Ice and Snow Sports Tourism Industry

3.1 Lack of Institutional Support for Ice and Snow Sports Tourism

Most policies, such as the "14th Five-Year Plan for Digital Economy Development," remain at the macro level, resulting in weak policy support for the ice and snow sports tourism industry and lagging institutional frameworks. First, the relevant policies lack effective guidance. The existing policies regarding "digital + ice and snow sports tourism" are generally macro-level summaries focused on "digital + sports," leading to a lack of effective policy support for the digital empowerment of the ice and snow sports tourism industry. This creates a disconnect between digital technologies and the ice and snow sports tourism sector, causing it to develop in isolation. Second, the supporting regulatory framework is insufficient, making the digital transformation of the ice and snow sports tourism industry passive. There is also a lack of relevant assessment standards and systems to effectively evaluate the impact of digital empowerment, with most companies still relying on traditional assessment criteria. This oversight

diminishes the perceived value of digital transformation, reducing corporate enthusiasm.

3.2 Shortage of High-Quality Talent in the Ice and Snow Tourism Industry

Talent is the driving force behind the high-quality development of the sports industry. In China, there is a clear shortage of both composite and specialized talent in the sports sector. First, there is a lack of digital information talent. In the post-pandemic era, as the service industry urgently needs digital transformation, there is a severe shortage of information and communication technology (ICT) professionals. The "China Digital Industry Report 2020" indicates that ICT personnel account for only 1.0% to 1.5% of total employees in Chinese enterprises. Furthermore, many talents are constrained by traditional perceptions and are reluctant to engage in the sports sector, resulting in a significant deficit of digital talent in ice and snow sports tourism. Additionally, as an emerging industry, ice and snow tourism faces ongoing digital iterations. The supply of talent is lagging behind the innovative transformations of the emerging industry structure, leading to a shortage of digital professionals in the ice and snow tourism sector. Second, there is an insufficient number of specialized personnel. Due to the high-risk nature of extreme sports, specialized staffing is crucial to ensure visitor safety.

3.3 Traditional Operational Models in the Ice and Snow Sports Tourism Industry

China's ice and snow sports tourism industry still relies on traditional management practices in areas such as resource integration, project development, and offline operations, lacking a comprehensive strategic layout. The application of digital elements within ice and snow tourism enterprises is inadequate. First, most ice and snow tourism enterprises are small and medium-sized and operate conservatively. Although the digital economy is essential for high-quality industrial development, there remains ambiguity regarding the specific application of information technology in the industry, with companies primarily focusing on traditional resource management (human, financial, and material) and showing little enthusiasm for exploring the virtual economy. This lack of exploration prevents the digital economy from creating the necessary scale benefits for enterprises. Second, online operations are insufficient. Many enterprises have inadequate online presence and lack digital drivers, while information technology and digital infrastructure remain at a lower level within the industrial clusters. This results in a failure to establish stable technical support and foundational architecture, causing various ice and snow tourism projects and services to require in-person inquiries without online descriptions or booking options. The inefficiency in information transmission and acquisition leads to asymmetric information between supply and demand, hindering consumer participation.^[3]

3.4 Single Investment Entities in the Ice and Snow Sports Tourism Industry

Currently, the ice and snow sports tourism industry in China faces both a single investment entity and insufficient digital investment. First, the industry still relies primarily on government funding. Given the high costs, low short-term returns, and significant barriers to entry associated with the ice and snow tourism sector, attracting investments from various social entities is essential for its sustainable development. However, the majority of funding still comes from government allocations, with minimal social investment. Furthermore, the scientific layout of the ice and snow tourism industry remains within policy documents, with provinces and regions operating independently. The lack of unified standards has led to many small ice and snow enterprises disrupting the market, obstructing the healthy circulation of the ice and snow tourism industry chain. Second, the singularity of investment entities results in low economic efficiency conversion rates for the ice and snow tourism industry. The digital transformation of enterprises is a complex project requiring significant time and investment, leaving many ice and snow tourism businesses unable to invest in digital initiatives.

4. Practical Strategies for the Development of China's Ice and Snow Sports Tourism Industry

4.1 Strengthen Government Leadership and Create a Suitable Policy Environment

Establishing and improving relevant policies for ice and snow sports tourism and reinforcing government leadership are foundational guarantees for the high-quality development of the industry. First, it is essential to refine specific policy documents. In recent years, China has introduced several policies aimed at developing ice sports and the ice and snow sports tourism industry, but many remain at the macro level and lack specific guidance, leading to discrepancies in implementation by various provincial

and municipal departments. Therefore, it is imperative to enhance existing policies and issue detailed action plans. In terms of fiscal policy, a multidimensional and multi-level special funding system for ice and snow sports tourism should be established, focusing on supporting small and medium-sized ice tourism enterprises, cultivating and attracting comprehensive ice sports talent, and purchasing and developing intelligent digital ice sports equipment to improve funding efficiency. Second, relevant policies for "sports + digital economy" should be established. As the digital economy becomes a development priority in the 14th Five-Year Plan, integrating sports with the digital economy is a key future trend. The government's foresight and leadership in this integration are essential. Proposing an overall concept of "sports + digital economy" and researching development priorities will strengthen financial support and encourage the digital transformation of the ice and snow sports tourism industry, significantly boosting its competitiveness in China's service-oriented economy, especially post-pandemic. Third, the government should innovate its regulatory system. Given China's vast territory and the numerous small and medium-sized enterprises, traditional regulatory methods face challenges. To address these, improving traditional oversight and creating a new regulatory framework using the digital economy's backdrop can establish a data platform for ice and snow tourism, utilizing smart devices for analysis to reduce time and spatial costs. The government could also involve third parties in monitoring policy execution and business operations, thereby increasing efficiency by alleviating its own workload.

4.2 Build a Talent Development System to Support Upgrading of the Ice and Snow Sports Tourism Industry

First, it is crucial to enhance the recognition of ice and snow sports talent, optimizing existing welfare provisions for composite sports professionals and specialized personnel in the ice and snow tourism industry through allowances and subsidies, and encouraging more individuals to join this sector. Second, in talent development, emphasis should be placed on cultivating composite talent in ice and snow sports. Higher education institutions should play a vital role by shifting from traditional single-discipline teaching models to promoting interdisciplinary integration, reforming course structures to incorporate computer science, artificial intelligence, and data management into sports tourism education, thereby creating composite talent suited to the digital economy. Additionally, enhancing academic exchanges and resource sharing among universities nationwide is essential. Given that European and American countries have conducted in-depth research on ice and snow tourism for some time, strengthening academic interaction with foreign institutions through exchange programs and online collaborations can create a dual-circulation talent cultivation model.^[4]

4.3 Empower Ice and Snow Sports Tourism through Technology and Promote Industry Integration

Comprehensively strengthening technological support and constructing a technology-driven smart ice and snow sports tourism industry chain is crucial for leveraging the market effects of industry clusters and promoting high-quality development. The digital economy fosters core concepts of sharing, and emerging technologies such as cloud computing, the Internet of Things, and blockchain provide opportunities for industry integration. First, digital construction in ice and snow sports tourism should be promoted. The industry must enhance its integration with information technology, fully integrating online resources and using big data to analyze consumer behavior, providing diverse and personalized ice and snow tourism services. Developing applications that integrate service reservations, smart detection devices, and digital management systems into a cohesive platform can create an interactive information platform that combines online selection, offline consumption, and intelligent monitoring, thus realizing smart marketing and services in ice and snow sports. Second, cross-regional collaboration should facilitate industry integration. The ice and snow sports tourism industry is primarily concentrated in the Beijing-Tianjin-Hebei region, Northeast, and parts of Northwest China. Influenced by the Winter Olympics, the industry in the Beijing-Tianjin-Hebei area has advanced technology and innovative operations. Improving product homogeneity in ice and snow tourism can enhance regional economic development.

4.4 Create a Multi-Entity Collaborative Supply Structure to Innovate the Ice and Snow Sports Tourism Industry

Establishing a collaborative supply structure with multiple entities in rural areas involves optimizing contributions from the government, enterprises, and social organizations to build a multi-faceted supply platform that fosters effective governance, market efficiency, and vibrant public sports services.

Conclusion

This study thoroughly explores the current challenges faced by China's ice and snow sports tourism industry, including the lack of institutional supply for ice and snow sports tourism, the shortage of high-quality talent in the ice tourism sector, traditional operational models, and the singular investment body in the industry. It is imperative to leverage the digital economy to promote high-quality development in ice and snow sports tourism. Practical solutions have been proposed to address these issues. It is hoped that technological empowerment will facilitate the integration and substantial development of the ice and snow sports tourism industry.

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