



Research on the Applicability of Digital Technology in the Development Process of Ice and Snow Sports Tourism Industry in the Perspective of Empowerment Theory

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Abstract. Against the backdrop of the surging wave of global technological revolution and industrial change, cutting-edge digital technologies such as big data, blockchain, cloud computing and artificial intelligence are unleashing unprecedented power in the process of empowering industrial development. How to grasp the opportunity of digitalization and promote the ice and snow sports tourism industry to achieve industrial upgrading is the key to realizing the high-quality development of the ice and snow sports tourism market. Resource empowerment, organizational empowerment and psychological empowerment, as the three major theoretical categories of empowerment theory, provide a comprehensive and systematic theoretical foundation for the high-quality development of ice and snow sports tourism. Based on the logical framework of the empowerment theory, this study reveals the internal mechanism of digital technology to promote the development of the industry, and accordingly proposes practical paths to promote the efficient empowerment of digital technology to realize the high-quality development of ice and snow sports tourism industry: digital resource empowerment aims to analyze the market demand of China's ice and snow sports tourism market in depth through the use of digital technology, and innovate the integration of the supply resources and methods accordingly to improve the supply quality and capacity, in order to realize the market demand and supply. Digital organization empowerment focuses on the use of digital technology to build a bridge of interest between the various parties involved in the ice and snow sports tourism industry chain, with the aim of promoting the fair distribution of resources and the common enjoyment of benefits, thus enhancing the efficiency and effectiveness of collaborative development of the industry: digital psychology empowerment focuses on the use of digital technology to accurately capture and respond to the psychological characteristics and needs of tourists in ice and snow sports tourism, so as to stimulate the psychological characteristics and needs of tourists in ice and snow sports tourism. Digital Psychological Empowerment focuses on the use of digital technology to accurately capture and respond to the psychological characteristics and needs of tourists in ice and snow sports tourism, so as to stimulate the consumption potential and promote consumption upgrade.

Keywords: Digital Technology; Ice and Snow Sports Tourism; Empowerment Theory

1 Introduction

It is widely accepted that Thorstein Veblen, regarded as the originator of institutional economics, and Lewis Mumford, a distinguished sociologist and philosopher of technology, subscribe to the notion that the advancement of science and technology will propel social development and socio-cultural transformation. They contend that technology can serve a dual function, contributing to material production while concurrently exerting a significant influence on the configuration of the social structure^[1]. With the strategy of “300 million people participate in ice and snow sports” and the help of the Beijing Winter Olympics, China's ice and snow sports and tourism industry is rapidly emerging. However, in the actual development process, the application of digital technology in the field of ice and snow sports tourism is still shallow, and it is difficult to meet the actual needs of market development. The high-quality development of ice and snow sports tourism driven by digital technology is a huge and complex system engineering, focusing on the synergistic evolution of multi-dimensional elements and continuous iterative innovation. It is necessary to play the role of digital technology empowerment to realize the high-quality development of ice and snow sports tourism by improving the market resource supply system, constructing the market benefit distribution mechanism, and promoting the upgrading of market tourists' consumption and other measures. Thus, this paper follows the three dimensions of the empowerment theory, analyzes the driving mechanism of digital resource empowerment, digital organizational empowerment and digital psychological empowerment on the high-quality development of ice and snow sports tourism, and clarifies the generative logic of digital technology empowering the high-quality development of ice and snow sports tourism industry (see Figure 1).

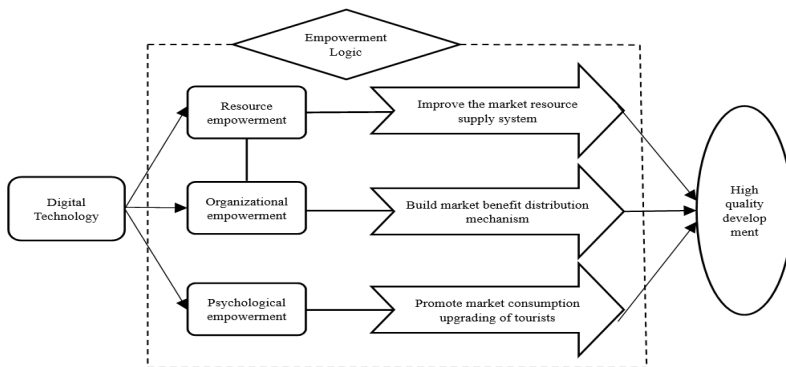


Fig. 1. Logical path of digital technology empowering the high-quality development of ice and snow sports tourism industry

2 Resource Empowerment to Improve the Market Resource Supply System

Resource empowerment achieves the goal of improving the ability of target audiences to access and manage resources^[2]. Digital resource empowerment, that is, relying on digital technology to deeply excavate and analyze the data on the demand side of China's ice and snow sports tourism market, as a guide to promote China's ice and snow sports tourism market to achieve innovative integration and upgrading of the supply resources and supply mode, with the aim of improving the quality and effectiveness of market supply and ensuring the balance between supply and demand in the ice and snow sports tourism market. The 2024 China Ice and Snow Tourism Development Report released by the China Tourism Research Institute shows that China's ice and snow tourism has entered a new stage of quality and innovation-driven development. In the ice and snow season from 2022 to 2023, the number of people received by China's ice and snow leisure tourism reached 312 million, while the related tourism revenue was as high as 349 billion yuan, maintaining a huge market scale of more than 300 million people for two consecutive ice and snow seasons. However, the supply side of the ice and snow sports tourism industry is characterized by "low-end locking", and the product supply can not keep pace with consumer demand, resulting in a structural imbalance on the supply side, which hinders the generation of new demand and its effective matching with the existing demand. How to innovate and integrate the supply resources and methods of the ice and snow sports tourism market, and how to meet diversified individual needs while guaranteeing basic supply, is the key challenge and important task for the ice and snow sports tourism market to realize high-quality development.

On the one hand, digital technology is used to optimize product content and promote diversified supply. Through big data analysis of consumer behavior, preferences and expectations in ice and snow sports tourism, analysis of tourists in the skiing process, such as speed, difficulty selection, stay time and other data, tourists based on their own preferences and time arrangements to customize ice and snow sports tourism packages, including the choice of ice and snow sports projects, accommodation types, catering services and so on, to meet the personalized needs of different consumers; to improve the level of quality of service and optimize the Resource allocation. Through the development of intelligent guide, intelligent customer service and other service systems to provide tourists with real-time scenic area navigation, project queuing information, the surrounding facilities query and other services, rapid response to the consultation and complaints of tourists, to provide 24-hour uninterrupted service.

On the other hand, the use of digital technology to optimize resource allocation and promote synergy. Use digital technology to optimize resource allocation. Integrate the supply chain of ice and snow sports tourism through the Internet of Things, big data and other technologies. For example, the use of Internet of Things technology for snow-making equipment, ski lifts and other facilities for real-time monitoring and remote operation and maintenance, to ensure the normal operation of the facilities; through the big data analysis of the accommodation, catering and other resources for

rational allocation, improve the efficiency of resource utilization; through the construction of an online platform to promote synergistic cooperation. The online supply chain collaboration platform connects suppliers, operators, service providers and other parties in the ice and snow sports tourism industry chain, and all parties can realize the collaborative development of the supply chain, reduce costs and improve the overall efficiency of the supply system through platform information sharing, collaborative procurement and joint promotion.

3 Organizational Empowerment to Build Market Benefit Distribution Mechanism

Organizational empowerment creates effective linkages between target audiences to enhance overall capacity^[3]. Digital organization empowerment, the core of which lies in the use of digital technology for the ice and snow sports tourism industry chain of the main body to build a benefit-sharing bridge, the industry chain of the main body can achieve fair and reasonable distribution of resources and the exchange of benefits, which in turn promotes the industry between the main body of the close cooperation and high efficiency synergies, and jointly promote the whole industry chain to a higher level, more efficient development. The establishment of a scientific and reasonable benefit distribution mechanism can ensure the fair distribution of various achievements in the process of ice and snow sports tourism industry development among different subjects such as enterprises and residents^[4]. Under the market economic system, the first distribution, centered on market and efficiency, constitutes the basic framework of social wealth distribution, and is also the starting point and source of subsequent distribution links. The second distribution, focusing on government and equity, plays the central role of regulating income distribution and curbing the widening gap between the rich and the poor. The third distribution, on the other hand, is dominated by civil power and social responsibility, and is a useful complement and balance to the first two distributions^[3]. The construction of a comprehensive distribution mechanism and system integrating the market efficiency as the core of the initial distribution, the second distribution led by government regulation and the third distribution focused on civil participation is undoubtedly a crucial path choice for promoting the ice and snow sports and tourism industry to the stage of high-quality development.

First of all, the basic and decisive role of the market distribution mechanism should be played. On the one hand, by using big data technology to collect and analyze relevant data from online tourism platforms and social media, tourism enterprises can more accurately design products and services and reasonably price them. When revenue is distributed, the market determines the initial distribution share of enterprises, employees and other stakeholders according to the contribution of each production factor (labor, capital, technology, etc.). On the other hand, a transparent supply chain system is constructed with the help of blockchain technology to record the contributions of each participant, such as the quality and price of products from raw material suppliers and the efficiency of logistics and transportation, from the manufacturing of

ice and snow equipment, venue construction and maintenance to the provision of tourism services. Based on these records, it is ensured that participants in each link receive a reasonable initial distribution of income based on inputs.

Secondly, the government's corrective and redistributive role in the process of benefit distribution should be utilized. On the one hand, tax supervision is strengthened through digital technology to ensure that ice and snow sports tourism enterprises pay taxes in accordance with the law. The tax department uses big data to analyze the financial data and transaction records of enterprises to prevent tax loss. For the ice and snow sports tourism industry, the government can support the construction of ice and snow tourism infrastructure in impoverished areas through financial transfer payments and subsidies according to the tax situation, or use it for public service inputs to balance the regional development gap. On the other hand, social security funds are efficiently managed and distributed through digital government platforms. For example, part of the tax revenue from the ice and snow sports and tourism industry should be used to improve the social security treatment of employees, including unemployment insurance and work injury insurance, etc., to ensure the welfare of employees and indirectly influence the pattern of benefit distribution.

Finally, the third distribution mechanism centered on social morality should be actively explored. On the one hand, it can encourage donations from ice and snow sports tourism enterprises and high-income people by building a digital public welfare platform. For example, through blockchain technology to record donation information, including the source, destination and use of donations, to ensure the transparency of the donation process and the rational distribution of charitable resources. On the other hand, digital technology is utilized to assess the effect of social impact investment in the ice and snow sports and tourism industry. By establishing a digitized evaluation index system to measure the social benefit portion of the investment return, it guides the flow of resources towards allocations with higher social value.

4 Psychological Empowerment to Promote Market Consumption Upgrading of Tourists

Psychological empowerment focuses on the positive transformation of an individual's internal psychological state, such as enhancing self-confidence, self-awareness and determination, so that the individual feels the power and autonomy to control his or her own destiny, thus stimulating his or her potential and vitality^[5]. Digital psychological empowerment refers to the use of digital technology to deeply explore and fit the psychological characteristics and needs of tourists in the context of ice and snow sports tourism, and then effectively promote the practice of tourists' consumption upgrading. Consumption upgrading is an all-round and multi-dimensional concept, which not only covers the growth of consumption and the optimization of consumption structure, but also involves the iteration and innovation of various aspects such as consumption concepts, consumption behaviors, consumption modes, consumption scenarios and consumption tools. Under the traditional consumption model, consumers are often restricted to limited channels and platforms, and it is difficult to fully

express their personalized needs, which leads to the supply side adjusting products and services based on the overall market macro-trends, and it is difficult to accurately capture and satisfy the growing personalized and differentiated needs of consumers^[4]. However, the rise of digital technology has provided consumers with a variety of media and channels, such as online shopping platforms, social media, short video sharing, etc., enabling them to express their personalized needs through multiple channels, greatly enhancing their initiative and promoting the growth of consumption and diversification of consumption structure. At the same time, the variety of products and services on the supply side has become richer and more diversified, the number of products and services has increased significantly, and the application scenarios have continued to expand^[6]. Consumers' consumption choices have gradually shifted from traditional physical goods to both physical and virtual services, which has not only significantly increased the total amount of consumption, but also brought unprecedented innovation and upgrading in consumption programs and experience.

In Harbin, Heilongjiang, for example, the local authorities have built an industrial information platform through the Internet and big data technology, integrating various types of information on the ice and snow sports tourism industry, including scenic area information, events, tourism routes, accommodation and catering, transportation and travel, etc., so that supply and demand sides of various factors of production can quickly and accurately access the information, thus promoting the reasonable flow and efficient allocation of human, material and financial factors. Configuration. At the same time, with the help of big data analysis of tourists' past travel preferences, consumption habits and other information, for tourists who often participate in ice and snow sports and have high requirements for difficulty, through SMS, scenic spots APP push, etc., accurately recommending professional ice sports training courses, difficult ice and snow slide and other experiential projects, to meet the needs of tourists' personality. The core power of consumption upgrade in the ice and snow sports tourism market originates from the psychological empowerment of digital technology, which not only leads the comprehensive transformation of the industry from the macro level, but also stimulates unlimited potential at the micro subject level. Reforms and innovations in consumption scenarios, consumption modes, sales channels, marketing strategies and payment methods have broken the barriers to the flow of factors of production, reshaped the pattern of resource concentration and spatial layout, and optimized the quality of supply to promote the upgrading of consumption levels, bringing unprecedented development opportunities and vitality to the ice and snow sports tourism market.

5 Conclusion

Deepening the application of digital technology in the field of ice, snow and sports tourism will break the boundaries of the traditional ice, snow and sports tourism industry, realize the in-depth fusion of digital technology and the real industry, and promote the synergistic development of industrial digitization and digital industrialization, so as to breed a new type of industry form that is more efficient and more

valuable. The high-quality development of ice and snow sports tourism driven by digital technology is a huge and complex system engineering, focusing on the synergistic evolution of multi-dimensional elements and continuous iterative innovation. It is necessary to improve the market resource supply system through resource empowerment, organizational empowerment to build the market benefit distribution mechanism and psychological empowerment to promote the consumption upgrade of market tourists and other measures, to give play to the role of digital technology empowerment, to achieve the high-quality development of ice and snow sports tourism.

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