

Research on the sustainable development of trail running events empowered by new quality productivity

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Abstract: *With the rapid development of the global economy and the continuous progress of science and technology, the new quality productivity has become an important engine to promote social and economic development. As an emerging form of sports, trail running events have risen rapidly around the world in recent years. It not only provides a platform for participants to challenge themselves and enjoy nature, but also brings new development opportunities for the sports industry, and its sustainable development is of great practical significance for enhancing the overall competitiveness of the sports industry and promoting the high-quality development of the sports industry. The purpose of this study is to explore how the new quality productivity can empower the sustainable development of trail running events, and to analyze the connotation of new quality productivity and its application in trail running events, and propose corresponding optimization paths and strategies.*

Keywords: *new quality productivity; empowerment; trail running; sustainable development*

1. Introduction

High-quality development is the only way for the transformation of the sports industry, and with the surge in the number of participants, the special competition venues and the increase in the scale of large-scale sports events, the gradual internationalization, diversification and intelligence of the events will be promoted, and the efficient development of large-scale sports events will be ensured. Trail running is a kind of running in nature, the running path has moved from the track and field field to the natural environment, and the common paths are mountains, villages, deserts and Gobi and other paths, where people run in the terrain in the natural environment. At the same time, the paved road is almost less than 20% of the total distance during the run, and the uphill, downhill and some technical roads occupy the main part of each trail running route. Taking the Chongli 168 Supercross Race, Moganshan Mountain Running Race, Yunqiu Mountain Cross-Country Race, and Northeast 100 as examples, the bamboo forest, snow mountain, and Great Wall tracks have attracted many competitors to participate, and the in-depth organic integration of sports elements and tourism elements has promoted the rapid development of the sports industry [1].

In the wave of globalization and informatization, new quality productivity is gradually becoming the core force to promote the transformation and upgrading of all walks of life. As an important form of productivity in the new era, new quality productivity integrates high-tech, innovation-driven, green and sustainable, cross-border integration, and high intelligence, bringing new vitality and new impetus to the sustainable development of various fields [2]. Trail running is a new field in the sports industry, which not only carries the sportsmanship of challenging oneself and enjoying nature, but also plays a positive role in promoting local economic development, improving the image of the city and enhancing public health awareness. However, trail running events have also encountered many challenges in their rapid development, which have severely limited their sustainability. In this context, the introduction of new quality productivity provides a new solution for the sustainable development of trail running events, laying a solid foundation for the sustainable development of trail running events.

2. Concept of new qualitative productivity

As the cornerstone of human social progress and historical evolution, productivity comes from the transformation and influence of human beings on the natural world in order to adapt to social

development in long-term production. This kind of force is not only material, but also an inexhaustible driving force for the development of civilization. Compared with the traditional productive forces, the new quality productive forces represent a historical leap, and its core driving force is innovation, which is a comprehensive subversion of the original economic growth model and the development trajectory of the productive forces. The new quality productivity has the outstanding characteristics of high-tech content, high-efficiency operation and high-quality output, which is closely linked with the new development concept and forms an advanced form of contemporary productivity.

Breakthroughs in technological revolution, innovative allocation of production factors, and in-depth industrial transformation and upgrading have jointly formed the core driving force of new quality productivity. Its connotation is profoundly manifested in the optimal combination of the improvement of the quality of laborers, the renovation of labor materials, and the expansion of labor objects. The significant improvement of total factor productivity is regarded as a key indicator of new quality productivity. It takes innovation as the center, quality improvement as the core, and tirelessly pursues advanced productivity as the essence.

Specifically, the new quality productivity can be expressed as the product of the three main factors from the revolutionary progress of technology, the innovative allocation of production factors, to the deep transformation and upgrading of industries, and finally to the optimal combination of three factors: labor, labor tools, and labor objects [3]. The "new" here involves new technologies, new models, new industries, new fields and new kinetic energy; The definition of "quality" emphasizes the solidity of the material foundation, the excellent quality standards, the cutting-edge nature of the essential characteristics, and the continuous improvement of quality standards. With "new" as the distinctive feature and "quality" as the focus of development, the ultimate foothold is to promote the comprehensive upgrading and leap of productivity.

3. The importance of new quality productivity in trail running events

3.1 Expand the scope of event supervision and improve the event guarantee mechanism

In view of the particularity of the cross-country track, expanding the scope of supervision of competitors can reduce the probability of risk. The new quality productivity is used to significantly improve the competitive level of cross-country running events by means of science and technology. In the past, smart wearable devices can monitor important data such as athletes' heart rate, speed, and distance in real time, which helps athletes have a deeper grasp of their own sports status, while problems such as hypothermia, dehydration, and muscle spasms in outdoor events will seriously affect life safety.

3.2 Optimize event management and optimize public satisfaction

The planning of the cross-country event organizers at all stages is crucial to the satisfaction of the competitors, tourists or local residents. The pre-competition heat promotion activities, in-game supplies, and photography services can not only exchange for the satisfaction of the players, but also produce a certain lag effect, driving a virtuous circle for the development of the subsequent competition. Grasping the development trend of new quality productivity, the digital and intelligent event management system can track the registration, sign-in, and score statistics of participants in real time, greatly improving the efficiency and accuracy of event management [4]. At the same time, with the help of Internet of Things technology, the event organizers can monitor important information such as the status of equipment and the flow of personnel at the competition site in real time, ensuring the smooth development of the competition. The application of these new technologies is to reduce the workload of event organizers and capture the inner needs of participants, which is deeply in line with the atmosphere of off-road events in the new era.

3.3 Technological R&D and innovation to enhance the event experience

The new quality productivity also provides more experience for trail running events with innovative technological means. For example, through the application of virtual reality (VR) and augmented reality (AR) technologies, participants can experience and simulate the track before the race, addressing the doubts of the participants, thereby increasing the immersion and interactivity of the race. In addition, with the help of social media platforms, participants can also share their experience and

feelings about the competition in real time, and interact with the audience, so as to further improve the sense of participation and influence of the competition, which is conducive to the creation of the event IP and brings sustainable development momentum for subsequent events and local economic development.

3.4 Promote the green and sustainable development of the event

Green development drives the transformation of the sports event industry, and the support of environmental protection concepts can improve the event system and promote the green and sustainable development of trail running events. By using eco-friendly materials, not providing disposable items, and incorporating simple cups into mandatory equipment, event organizers can reduce the environmental impact of the event. At the same time, through the track organization, the event organizer can more accurately grasp the consumption of event resources, so as to formulate a more reasonable resource utilization plan and reduce the operating costs of the event. The implementation of these measures not only helps to protect the ecological environment, but also improves the sustainability and social impact of the event.

4. The core driving force of new quality productivity in cross-country running events

4.1 The integration and application of digital and intelligent technologies

The combination of digital and intelligent technology is the first driving force to become a new quality of productivity to participate in cross-country running competitions. After the introduction of the advanced digital management system, the event organizer can realize the intelligent management of the whole process of event registration, sign-in, timing, and score statistics, so as to improve the efficiency and accuracy of the event organization. At the same time, smart wearable devices and big data analysis can also bring more accurate and personalized service experience to participants, such as real-time monitoring of exercise status and training suggestions. The application of these technologies not only improves the intelligence level of the competition, but also improves the participation and satisfaction of participants.

4.2 The practice of the concept of environmental protection and sustainable development

The concept of environmental protection and sustainable development plays a crucial role in the new quality of productivity, and is an indispensable core driving force for trail running events [5]. The organizers of the event have reduced the loss of disposable items by enforcing equipment restrictions, and have joined forces with outdoor brands to promote the green development of cross-country running events through the concepts of recyclable equipment manufacturing and traceless mountains and forests. Strengthen tips from the links that may cause environmental pollution, such as the participants' own supply, event provision and post-competition services, and work together to create a green and low-carbon event atmosphere. The practice of this environmental protection and sustainable development concept is not only conducive to the improvement of the social image of the event, but also conforms to the global environmental protection trend and public expectations.

4.3 Improvement of professional and refined operations

Organizers of large-scale events generally have a team with professional knowledge and skills that are responsible for all aspects of the planning, organization, execution and evaluation of the event. Through the introduction of international advanced event management concepts and experience, the professional level of the event will be improved. At the same time, the refined operation of attention to details and services is also the key to improving the quality of the event. For example, providing participants with personalized training plans, nutrition guidance and other services before the race, such as pre-race training camps and cross-country related knowledge sharing sessions organized by Kaile Stone Outdoor Company, as well as setting up medical assistance stations, providing emergency rescue services and other measures and relaxing physiotherapy areas after the competition, are the concrete embodiment of professional and refined operations.

4.4 Promotion of innovation and cross-border cooperation

Event organizers need to constantly explore new event formats, new technology applications, and new business models to attract more participants and spectators. This kind of innovation and cross-border cooperation not only helps to expand the development space of trail running events, but also injects new vitality into the development of the events.

5. The path of new quality productivity to empower the sustainable development of trail running events

5.1 Blessing of scientific and technological innovation

The sustainable development of trail running events is inseparable from the important force of scientific and technological innovation. Through the introduction of advanced technology, trail running events can achieve more accurate and effective event management and services [6]. With the help of IoT technology, event organizers can monitor important information such as equipment status and personnel flow at the event site in real time, so as to find problems and deal with them in time. At the same time, through big data analysis, event organizers can conduct in-depth mining of participants' sports data, give participants more reference standards, and make reasonable plans according to their own level before the competition. In addition, the use of advanced technologies such as virtual reality (VR) and augmented reality (AR) can bring an immersive track experience to participants before the race, thus further enhancing the attractiveness and impact of the event. Smart wearable devices have been able to meet the real-time monitoring of participants' heart rate, cadence and calorie consumption, and link satellites to view contour maps, and in the future, adding body temperature, hydration status and muscle elasticity to the supervision can greatly reduce the risk of sports injuries, real-time monitoring of physical conditions to ensure the safety of the event, not only improve the completion rate, but also the cross-country event can be benign and scientific development.

5.2 Optimize event management

Driven by new quality productivity, the management of trail running events has been optimized and updated. Through digital and intelligent means, event organizers can manage event registration, check-in, and results statistics more effectively. Through the chip number step and each CP point sensor sign-in system, the event organizer can know the location of the participants on the long-distance track in real time and whether they are present, so as to avoid disputes about the players' results and inadequate personnel supervision. In addition, the introduction of data analysis technology can also enable event organizers to dig deep and analyze event data, understand and use the physical allocation of the stage, and plan the allocation in advance, so as to provide strong support for their decision-making and optimization.

5.3 Improve service quality

The quality of service is one of the most important criteria for measuring the success of trail running events. By introducing intelligent service means, event organizers can provide more convenient and considerate services for participants. For example, with smart wearable devices, participants can monitor their sports status and data in real time, so as to better adjust their sports strategies and improve their performance. The online photo gallery and the race number and facial recognition search system allow players to quickly search for photos of the competition after the competition and share them on social media platforms as soon as possible, expanding the influence and publicity of the event. The event organizers can also interact and communicate with the participants in real time through live broadcast and other means, answer the questions and doubts of the participants in a timely manner, and improve the participants' sense of participation and satisfaction. Therefore, improving service quality through digital intelligence not only achieves a good reputation for the organizers, but also doubles the effect of commercial promotion.

5.4 Promote green development

Green development is the only way for trail running events, and the long-term development of large-scale cross-country races also benefits from the concept of green mountains and forests. Driven

by the new quality of productivity, the green development of trail running events is also constantly advancing. By using eco-friendly materials and mandatory equipment methods, event organizers are able to reduce the environmental impact of the event. For example, when choosing event supplies, priority is given to materials that can be degraded or can be reused; Use personal lighting equipment such as headlamps during night races. In addition, event organizers can enhance the environmental awareness of participants and audiences by carrying out publicity and education activities, and work together to promote the green development of trail running events and achieve a green circular supply chain for large-scale trail races [7].

5.5 Cultivating professional talents

In the context of new quality productivity, the demand for professional talents in trail running events is also constantly updated. In order to meet the needs of the development of the event, the event organizer needs to actively cultivate and introduce talents with professional quality and innovation ability. Through cooperation with universities and scientific research institutions, we introduce talents with rich experience and professional skills in different directions; Through the establishment of business school groups, team challenges and other competition systems, more people are encouraged to participate in trail running events. In addition, event organizers can also retain and attract more talents to contribute to the development of trail running events by establishing a talent points-system incentive mechanism and career development channels.

5.6 Inherit the culture of the event

The culture of the event is the soul of the sustainable development of the trail running event, and the cultural creation of the IP trail running event needs to grasp the characteristics of the local cultural environment and natural environment, so that the runners can be attracted by it. By excavating and inheriting the historical and cultural connotations of the event, the event organizer can create an event brand with unique charm and influence. Through the holding of the event, you can learn about the local history and culture, so that the participants and spectators can have a deeper understanding of the history and development of the event; Through the design of event logos, medals and other souvenirs with local characteristics, the sense of identity and belonging of participants and spectators to the event is enhanced; By inviting well-known athletes and cultural celebrities to participate in the event, the popularity and influence of the event will be enhanced. In addition, event organizers can continue to inject new vitality and elements into the event culture by innovating the format and content of the event.

6. Summary

With the in-depth advancement of a new round of scientific and technological revolution and industrial transformation, new quality productivity has become an internal requirement and an important focus for the high-quality development of various industries, and plays an important role in the high-quality development of China's competitive sports in the new era. In the future, with the continuous progress of science and technology and the continuous development of new quality productivity, cross-country running events will usher in broader development prospects. At the same time, we should also be soberly aware that the sustainable development of trail running events still faces many challenges and problems, and the government, enterprises and all sectors of society need to work together to promote the high-quality development of trail running events.

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