

Theoretical Logic and Strategy of Digital Economy Driving the High-quality Development of China's Regional E-sports Industry

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Abstract: As an emerging industry born in the era of digital economy, e-sports industry plays a crucial role in driving the development of urban digital economy in the new era and holds significant importance in promoting high-quality regional digital economic growth. The digital economy has a positive impact on enhancing production efficiency within the e-sports industry, optimizing its industrial structure, and fostering coordinated development at a regional level. This study aims to elucidate the characteristics of high-quality development within the e-sports industry, explicate its fundamental value and mechanism enabled by the digital economy, and propose strategies for achieving high-quality development from a perspective that addresses specific needs. These strategies are formulated through analyzing China's e-sports industry trends and challenges while considering key features of the digital economy era: reinforcing industrial support with e-competitions as core elements; integrating regional resources around competitive formats; enhancing talent training systems with focus on nurturing digital talents; and improving industrial supervision mechanisms utilizing digital surveillance technologies.

Keywords: E-sports Industry; E-sports; Digital Economy; High-quality Development; Digital Technology

1. Introduction

As an emerging industry in the era of digital economy, the e-sports industry represents a concentrated fusion of digital technology and sports culture. With China's e-sports industry experiencing rapid development, there has been gradual improvement in its industrial structure and constant increase in its industrial

value. However, China also faces several challenges such as an unbalanced development model [1], mismatched talent training [2], and imperfect system norms [3]. Additionally, issues related to mental addiction among youth caused by electronic games and the spread of vulgar culture have not been effectively addressed. Consequently, the development of the e-sports industry is confronted with significant challenges and threats. As a vital component of the digital industrial cluster, achieving high-quality development in the e-sports industry plays a crucial role in establishing a new pattern for digital economic growth and unleashing new momentum for the digital economy. Therefore, attaining high-quality development in the e-sports industry has become an inevitable consideration within this era of digital economy.

Since 2019 when esports was officially included in China's sports industry statistics by the National Bureau of Statistics, governments at all levels have introduced various policies from perspectives including digitization, culture, sports etc., affirming both the developmental potential of esports as well as its role in promoting regional economic growth. This further propels advancements within this sector. By 2022 alone, China's e-sports industry revenue had reached 144.503 billion yuan [4]. Currently, academic research interest regarding esports remains relatively low; primarily focused on overcoming practical obstacles faced during its development while providing decision-making references to promote high-quality growth within this field. Studies have demonstrated that the e-sports industry effectively facilitates the dissemination of urban culture, generates novel opportunities for economic, scientific, technological, and sports development, and serves as a crucial impetus for national scientific and technological innovation [5-6].

The aforementioned research provides

substantial theoretical support and practical guidance for this paper while also offering potential areas for further exploration. As a product of the digital economy era, the rapid advancement of the digital economy will undoubtedly exert a profound influence on the e-sports industry. However, limited studies have investigated the developmental status and promotion strategies of the e-sports industry from a digital economy perspective. In light of this gap in knowledge, this paper aims to comprehensively comprehend both the current state and future trends within China's domestic e-sports industry. It seeks to elucidate how digital economy empowers the e-sports sector by explaining its fundamental value proposition and enabling mechanisms. Furthermore, it endeavors to unveil both theoretical logic and promotional strategies conducive to achieving high-quality development within regional e-sports industries during this era of digital economy – thereby providing valuable theoretical references for coordinating such development efforts while simultaneously fostering a new pattern of digital economic growth.

2. Connotation Interpretation of High-Quality Development of E-Sports Industry

2.1 E-Sports Industry

There is no consensus in academia regarding the definition of the e-sports industry. Tokbaeva et al. (2022) consider it as a digital media business activity and aim to elucidate its operational model [7]. Yulia et al. (2019), on the other hand, perceive the e-sports industry as a novel category within the sports industry. From an industrial chain perspective, this sector offers diverse products and services through various entities such as video game publishers, infrastructure platform providers, teams and players, tournament organizers, advertisers, and sponsors [8]. It is important to acknowledge that the e-sports industry has emerged as a distinct field. Domestic scholars posit that it represents an amalgamation of science and technology industries, cultural industries, sports industries, and media industries; furthermore, its industrial chain and development mode have gradually improved over time [9]. The e-sports industry encompasses multiple domains including content authorization, event execution, content

production and dissemination, event participation, e-sports derivatives marketability aspects along with organizational structures and regulatory authorities [10]. Based on relevant research findings presented herein, this paper asserts that the e-sports industry constitutes a collection of economic activities centered around providing e-sporting experiences alongside related services while encompassing similar economic sectors [6,11].

2.2 High-Quality Development

High-quality development evolves from the paradigm of high-speed development, exhibiting the inherent traits of diversity and richness. From an economic standpoint, high-quality economic development entails the consistent enhancement of the quality of goods and services, the continual improvement of input-output efficiency and economic benefits, the emergence of innovation as the primary driver, the widespread adoption of green practices, the persistence in deepening reforms and enhancing openness, and the establishment of sharing as the fundamental objective [12]. Economic development serves as a crucial lens for examining high-quality development. The essence of high-quality development ought to be reflected in the comprehensive advancement of politics, economy, culture, society, and ecology [13]. In summary, high-quality development can be conceptualized as the efficient, equitable, green, and sustainable development of the economy, politics, culture, society, and ecological civilization, aimed at fulfilling people's ever-increasing aspirations for a better life [14].

2.3 Connotation of High-Quality Development of E-Sports Industry

2.3.1 The economic benefits are obvious, contributing to high-quality economic development

From an economic perspective, the high-quality development of e-sports industry is primarily manifest in the following two aspects: Firstly, the scale of the e-sports industry is gradually expanding, fostering the coordinated development of related industries. As the audience for e-sports continues to grow, the scale of e-sports industry expands, and its driving role in industries such as manufacturing, software and information technology, tourism, and other affiliated

sectors continues to strengthen. For instance, the surge in e-sports users leads to an increase in social demand for e-sports gaming chairs, thereby driving the economic output of the e-sports gaming chair industry. Secondly, the structure of the e-sports industry has been consistently optimized, contributing to the stable development of the overall economy. Specifically, the production structure of e-sports industry undergoes constant optimization and upgrading, and the industrial stability coefficient is continuously improved, propelling the industry towards a more rational and standardized direction of development, ultimately contributing to the high-quality development of the overall economy.

2.3.2 Outstanding social benefits, promote the harmonious development of society

The concept of high-quality development is not solely confined to the economic realm; it also encompasses the societal benefits achieved by the high-quality development of e-sports industry. Firstly, e-sports industry enriches the lives of residents and promotes social harmony. It offers society novel entertainment experiences, such as electronic games, game live streaming, and gaming events, which effectively alleviate the mental pressure stemming from rapid societal development. These experiences provide residents with a new outlet for emotional expression, thereby reducing the incidence of social conflicts. Secondly, e-sports industry disseminates refined culture and promotes civilization. The culture and spirit embedded in e-sports games are communicated to users through the medium of gaming. This reinforces content quality management and plays a pivotal role in propagating societal excellence and contributing to the construction of spiritual civilization.

2.3.3 Industrial coordination and orderly, maintain the vitality of scientific and technological innovation

For the e-sports industry to achieve high-quality development, its internal structure must first attain coordination, orderly institutional norms, and industrial innovation. With the consistent introduction of various favorable policies and management regulations for the e-sports industry by both national and local governments, the management mode of e-sports industry will gradually standardize. Moreover, e-sports enterprises are also

evolving towards specialization, division of labor, cooperation, and collaborative development. E-sports industry will jointly explore and share the latest technologies, develop products and services in alignment with scientific progress, consistently promote the advancement of related science and technology, and sustain the vitality of technological innovation within e-sports industry.

3. The Impact of Digital Economy on Regional E-Sports Industry

Since its inception, the connotation of the digital economy has undergone constant updates and changes, while the division of digital economy among countries remains non-uniform. In China, the digital economy is defined as a form of economic activity encompassing both digital industrialization and industrial digitalization. Digital industrialization refers to the traditional information industry, whereas industrial digitalization pertains to the integration of information industry and traditional industry resulting in digital economic activities [15-16]. The G20 Hangzhou Summit's Initiative on Digital Economy Development and Cooperation defines the concept as "a series of economic activities that utilize digital knowledge and information as key production factors, with modern information networks serving as important carriers, while effective utilization of information and communication technology acts as a driving force for enhancing efficiency improvement and optimizing economic structure" [16]. This definition has garnered widespread consensus within our country. Through an extensive literature review, this paper posits that the impact of the digital economy on regional e-sports industry can be primarily observed in three aspects: enhancing production efficiency within e-sports industry; optimizing production structures within e-sports industry; and fostering collaborative innovation across various facets of e-sports.

3.1 Enhancing Production Efficiency Within E-Sports Industry

The rapid development of digital economy means a series of subversive innovation of digital technology with information technology as the core. At this stage, the development of

any industry cannot be separated from the transformation of digital technology [16]. From the perspective of e-sports enterprises, the use of digital technology represents the investment of digital information and knowledge into enterprise production, improving the production efficiency of e-sports enterprises, reducing the production cost of enterprises, and releasing more productivity for enterprises. At the same time, digital technology provides a technical basis for e-sports enterprises to develop new businesses, provides a strong guarantee for the innovative development of enterprises, and gives birth to new formats and new business models of e-sports industry.

3.2 Optimizing Production Structures Within E-Sports Industry

The role of the prosperity of digital economy in the high-quality development of industry is first reflected in the structural level. The traditional e-sports industry structure is "content licensing - event execution - content production - content communication" [10], and digital technology can effectively optimize the e-sports industry structure. First of all, digital technology iteration drives the digital transformation of production mode of e-sports industry, resulting in the disconnect between traditional production technology and real demand, and the backward production technology is eliminated. For example, digital technology has greatly updated the game research and development technology at the content licensing level, leading to continuous innovation at the content licensing level and providing full power to the downstream industry. Secondly, digital platforms can break the traditional market supply and demand model, subvert the one-way supply relationship between e-sports enterprises and market consumers, and provide e-sports consumers with more say in the process of using e-sports products and services. In response to consumer demands, e-sports enterprises will strive to provide more reasonable and innovative products and services, so as to reshape the traditional industrial structure.

3.3 Fostering Collaborative Innovation across Various Facets of E-Sports

The industrial competition between regions is

the competition of the entire regional industrial ecology [16], and the impact of digital economy on regional e-sports industry is also reflected in the optimization of regional structure. The internal and external coordination of e-sports industry is an important prerequisite to achieve high-quality development of the industry. Internal coordination mainly includes effective dissemination of resources, continuous communication between subjects and division of labor. External synergy mainly refers to inter-industrial cooperation and resource complementarity. Under the digital production mode, the connection effect of digital technology can effectively promote the formation of an interconnected production pattern within the industry, and the timeliness of digital technology can break the information barrier between regions, increase the circulation of resources, and form a situation of complementary advantages and collaborative innovation. In addition, digital economy can also effectively realize the reorganization and agglomeration of production factors such as talents, capital, technology and information in the region, create the scale advantage of regional e-sports industry, and then promote the high-quality development of regional e-sports industry.

4. Development Trend and Dilemma of E-Sports Industry in China

4.1 Development Trend of E-Sports Industry in China

4.1.1 Market scale is growing steadily, industry content is gradually enriched

From the perspective of industrial scale, e-sports industry generally maintained a rapid growth trend before 2022, and then e-sports industry was affected by the external environment, and the industrial scale declined to some extent. Supported by the domestic economic recovery and the resumption of offline events, e-sports industry is expected to continue to grow [10]. At the content level, high-quality games continue to be delivered. Since 2020, a number of popular games have been launched, including Jelly Man: Ultimate Knockout, League of Heroes Mobile Game, Fearless Contract and Halo: Infinite, which has shown a high level of research and development in the game industry. E-sports

derivative content also emerges in an endless stream. E-sports IP has derived more high-quality products in the film and television industry, including e-sports TV series, e-sports music, e-sports novels, e-sports girl groups and other new cultural products.

4.1.2 Industrial chain is gradually complete, business model continues to expand

Owing to the advancements in high-tech, capital influx, and the enhancement of residents' consumption levels, China's e-sports industry has established a relatively comprehensive coordinated development mechanism within its internal industry chain. Moreover, the level of professional operation across all tiers of the industry chain has witnessed significant improvement. Concurrently, the commercialization process of e-sports industry continues to accelerate, and the collaboration mechanisms and business models of e-sports enterprises are continuously expanding. At the content licensing level, game developers have integrated e-sports peripheral product sales links into the gaming platform to augment the revenue generated by e-sports cultural products. Game operators and brands constitute the primary force in cross-border marketing, making the e-sports circuit a pivotal channel for brand marketing. At the event execution level, brand owners have sponsored esports to achieve integrated marketing and conduct brand promotion leveraging the traffic generated by esports. Additionally, at the level of competition participation, advertising endorsements by e-sports clubs and professional e-sports players have emerged as a novel marketing avenue for brand owners, prompting numerous renowned brands to establish endorsement partnerships with e-sports clubs and professional players.

4.1.3 Esports are professional, mass competitions are diversified

As the premier esports professional leagues in China, the League of Legends Pro League (LPL) and the King Pro League (KPL), among others, have achieved professional operations. Both the LPL and KPL have formulated standardized league regulations to guarantee the fairness of the professional leagues and safeguard the interests of clubs, players, and league managers. Tencent Interactive Entertainment and Riot Games jointly established Tengjing Sports, which is responsible for managing and operating the

LPL, the core event league for "League of Legends." The emergence and entry of professional esports operating companies have significantly enhanced the specialization of esports. With the gradual popularization of esports games, the public's participation in esports industry continues to increase. Esports competitions are no longer confined to professional leagues, and mass esports competitions are gradually becoming more diverse. Major mainstream games have launched a series of mass esports events in various cities and universities, transforming esports users from mere spectators to active participants, competing for positions in these events, and experiencing the joy of national esports.

4.2 Development Dilemma of E-Sports Industry in China

4.2.1 The monopoly phenomenon of e-sports game industry is serious

Electronic games are the necessary conditions for the emergence of e-sports, the domestic game market is growing year by year, the game crowd is expanding, and the oligopoly phenomenon is becoming more and more obvious. In 2021, the revenue of the domestic game industry was 296.513 billion yuan, an increase of 6.8% [17], and the industry revenue maintained stable growth. This paper selects the formula of mainstream market concentration to measure the market concentration of the domestic game industry.

$$CRn = \frac{\sum (xi)^n}{\sum (xi)^N} (N > n) \quad (1)$$

Where xi is the game business revenue of the game company, n is several large game companies, and N is the total number of game companies in the industry. Through calculation, $CR4=79.6\%$, according to Bain's standard of market structure, $75 \leq CR4 \leq 85$ belongs to oligopoly II, the game industry oligopoly phenomenon is serious. Oligopoly will form economies of scale, improve product research and development capabilities of the game industry, and hinder free market competition, resulting in unequal income distribution within the industry, which is not conducive to free competition in the game industry. It is necessary to correctly play the leading role of leading enterprises in the game industry and improve the level of innovation and entrepreneurship in the game industry.

4.2.2 The development of urban e-sports industry is unbalanced

The domestic e-sports industry is developing rapidly, and the problem of uncoordinated regional development is becoming increasingly serious. Among the top 10 cities in the national e-sports Development Index, there are 7 in the eastern region and only 3 in the western region [18], and the gap between the east and the west is very obvious. 65.7% of e-sports companies are from first-tier cities such as Beijing, Shanghai, Guangzhou and Shenzhen. Among the TOP50 esports club value list, 44% are from Shanghai, and Shanghai's esports competition revenue accounts for 50.7% of the national esports competition revenue [19]. According to the above data, China's e-sports industry is more concentrated in developed cities along the eastern coast of China, and the backward development of the inland e-sports industry is very serious.

4.2.3 E-sports management norms are not sound

The development speed of the e-sports industry is very rapid, although the national ministries and local governments have promulgated some management norms and standards, but they have not implemented the management body, and the management force is scattered. As a sports event, e-sports has not yet formed a single management association in China to formulate unified rules and standards for single e-sports competitions. There are also many omissions in the e-sports industry management measures. For example, the approval of international e-sports events is vague in the Measures for the Management of Sports Events (2020) and the Interim Regulations on the Management of E-Sports Events (2015), which need to be further improved and refined.

4.2.4 Digital e-sports personnel training is insufficient

From the current situation of domestic e-sports related majors, mainly e-sports and management majors. In 2023, a total of 99 higher vocational colleges nationwide will enroll students in this major, including more than 10 undergraduate colleges such as Communication University of China, Shandong Sports University and Qilu University, which have provided a group of professional operation and management talents for the development of China's e-sports

industry. However, the application degree of digital technology is not high, and the training of high-level professional talents in e-sports industry is insufficient, which can not meet the needs of digital talents in e-sports industry. In particular, game development, live broadcast platform operation, animation design and other directions need a large number of professionals. At present, the talent training of e-sports industry is only paid attention to by some sports and media colleges, and the talent training is far from enough.

5. Digital Economy Drives the High-Quality Development Strategy of Regional Esports Industry

5.1 Increase Industrial Support to the Electronic Competition as the Core

At present, e-sports industry has been greatly developed in major regions of the country, and the role played by e-sports is indispensable. Esports have huge economic value, in addition to direct economic benefits such as tickets, event broadcast, advertising, but also to improve the visibility of the venue, cultivate the local esports atmosphere and drive the growth of related industries and other potential benefits. Local governments should actively host domestic and foreign brand events to build an internationally renowned esports event city. At the same time, we should cultivate local international brand events, strengthen the planning and selection of esports events, support brand events with development potential, simplify the approval process of local brand events, and increase the publicity of local brand events. Shanghai has hosted the 9th DOTA2 International Invitational Tournament (DOAT2 Ti9) and the 2020 League of Legends Finals and other top global esports competitions, and the esports industry has developed rapidly.

5.2 Integrate Relevant Regional Resources with Advantageous Business Formats as the Center

The integration of various resources in the region is a prerequisite for building regional industrial advantages. The government should give priority to the development of advantageous forms of business, and then take them as the center to develop and integrate various resources in the region, give play to the

driving role of advantageous forms of business, and lead the coordinated development of other forms of business in the industry. E-sports industry should strive to break the information barriers of various systems within the industrial ecosystem, open up information communication channels between systems, establish a close cooperation mechanism, establish an e-sports ecosystem of internal coordination and resource sharing, and improve the ecological competitiveness of the e-sports industry.

5.3 Improving the Talent Training System with the Goal of Digital Talents

The rapid development of e-sports industry has produced a large number of digital talents, and high-quality digital talents will be more conducive to the growth of the e-sports industry. Local governments should take the lead in setting up digital talent training centers, encourage colleges and universities in the region with computer technology, digital technology, animation design and sports related majors and high-tech enterprises, e-sports enterprises and e-sports industrial parks to join the training centers, encourage enterprises to provide employment and internship platforms for colleges and universities, and carry out oriented training models. Colleges and universities can try to establish research centers with enterprises to jointly explore technological innovation in the e-sports industry, and form a pattern of close cooperation between schools and enterprises to jointly promote industrial development. Then rely on the supply of high-quality talents and the business environment of the digital talent training center to attract the head enterprises of the e-sports industry to settle down, and solve the employment problem of college graduates, and form a perfect talent training system in the region, so as to promote the innovation and development of the e-sports industry.

5.4 Improving the Industrial Supervision System by Means of Digital Supervision Technology

The market environment of e-sports industry is the necessary basis for the healthy development of the e-sports industry, and is a key indicator to measure the development degree of the regional e-sports industry. Further improving e-sports market supervision

system, establishing a fair competition, harmonious and orderly market environment, and optimizing the business environment of e-sports market are conducive to enhancing the competitiveness of the regional e-sports industry. The regulatory authorities should cooperate with e-sports enterprises to jointly develop digital regulatory technology, increase the management of e-sports games, and use face recognition, voice recognition and other technologies to effectively curb youth addiction and excessive consumption. Establish a complaint platform and a big data supervision platform, increase the investigation of inferior games, and create a good atmosphere for online games.

6. Conclusions

In the era of digital economy, although the e-sports industry has the potential to drive economic and social development, it also faces evident developmental challenges. To mitigate these drawbacks, it is crucial to leverage advanced technologies in the e-sports industry and transform it into a high-quality sector with innovative vitality and significant societal value.

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