

Analysis the Structure and Business Model of E-sports

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Abstract: Due to the advancement and popularization of Internet technology, the gaming industry has become a global competitive activity that continues to grow consistently worldwide. As the industry continues to grow, the size of the market continues to expand, the number of competitors continues to increase, and related career development and employment opportunities continue to grow. After the leapfrog development in recent years, the eSports industry has formed a complete industrial chain. However, under the background of rapid development, there are some problems, including regulation, management, business model, talent cultivation and social recognition. This paper analyzes the e-sports industry by means of literature review and theoretical analysis, and based on its current situation, it proposes to combine ANN technology to solve the problems in the actual operation process, so as to improve the commercial value of the e-sports industry. ANN technology can optimize the cheating problems occurring in athletics, scientifically evaluate and analyze the performance of players, assist in the operation and management of the industry, and provide personalized training.

Keywords: E-sports, industry strategy, ANN, operation.

1. Introduction

The esports industry is growing rapidly and attracting global attention. The spread of the Internet and technological advances have made it a global competitive event. Investments and sponsorships continue to grow to support players and the industry. Related careers and employment opportunities are also increasing, providing more choices for young people. E-sports usually means using electronic equipment as a carrier to participate in games developed by various game developers, compete with each other, and achieve projects similar to traditional competitive competitions such as Go and badminton [1]. In this way, e-sports refers to the use of various electronic devices, such as mobile phones, iPads, PCs, etc., as sports equipment, to carry out mental, physical and other confrontation sports between players [2]. In this sport, if it is a team event, it can greatly cultivate team spirit, or if it is an individual event, it can continuously improve the athletes' various willpower and coordination and control capabilities [3]. In recent years, with the continuous development of the industry, the scale of the market is expanding, the number of players remain to increase, the championship competition attracts more and more attention globally. After growing by leaps and bounds in recent years, e-sports has formed a complex and diverse industrial chain. Based on the result, there is nearly 81% players prefer to watch the competition online. So it is significant to gather the stream data, summary it and adjust the way to improve spectator experiences. Therefore, this paper studies the

current eSports industry through theoretical analysis and data analysis, and applies ANN technology to improve the commercial value of the eSports industry. The analysis can provide new development and help for e-sports industry.

2. The market structure of E-sports industry

As an emerging industry, e-sports has been sought after by the majority of young people in metropolis due to its high participation and entertainment elements. In recent years, with the continuous expansion of e-sports industry scale, e-sports related brand and services have also shown explosive growth. According to the research by Gamma Data and Wanlian Securities Research Institute, the business model of e-sports consists of two parts, namely e-sport games broadcasting and e-sport industry content. Game event broadcasting means that game manufacturers or third-party sports organizations make match videos in a certain e-sports project and broadcast them to the audience through channels such as TV or the Internet [4]. At present, the income of China domestic e-sports events mainly comes from sponsors, which is generally composed of official platform (such as Tencent) and clubs (such as IG). The official platforms mainly obtain income through advertising revenue and live broadcast sharing, while the clubs mainly obtain income through ticket revenue and commercial sponsorship. In addition, driven by game publishers, third-party channels can also achieve revenue. As for the e-sports industry content which includes hardware devices, content services. The content in the e-sports industry plays a vital role in the organization of the event, which is the key to determine the quality of the whole event and the audience experience. At present, there are two main types in the industry: content producers (i.e. platforms) and event operators (i.e. clubs and league) Among them, the content producer, namely the platform, is mainly responsible for the production and communication of the event program, while the event operator is mainly responsible for the provision of the event related services, such as venue rental, transportation and so on [5].

3. The current situation of the e-sports industry

3.1. Revenue

From a revenue perspective, the esports industry is projected to generate 144.503 billion dollars in 2022, marking a year-on-year decline of 14.01% and the first decrease in five years (Figure 1).

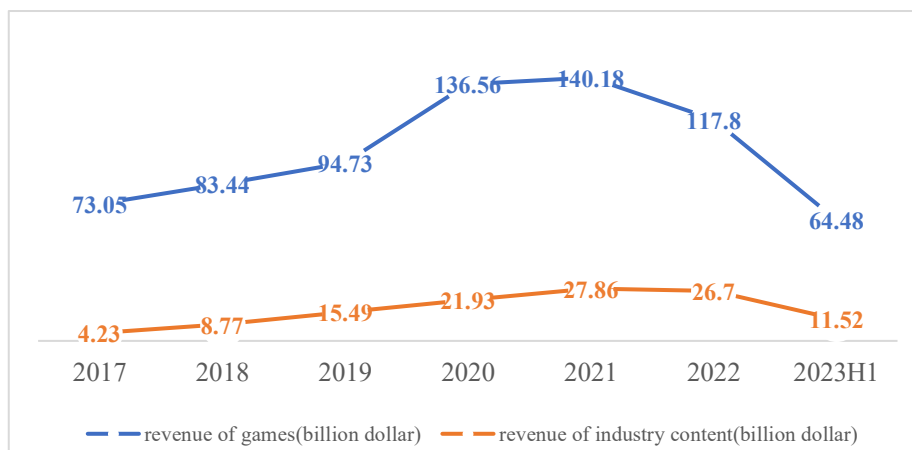


Figure 1: 2017-2023H1 E-sports market revenue scale

This can be attributed to two main factors. Firstly, the macroeconomic impact in 2022 has led to an overall downturn in the gaming market, resulting in reduced user willingness and ability to make payments for esports games and live broadcasting services. Secondly, limitations on offline travel

have resulted in conservative approaches towards esports events and related activities, leading to insufficient growth potential within the esports ecosystem. In the first half of 2023, the revenue of the esports industry reached 75.993 billion dollars, maintaining a similar level compared to last year with a significant quarter-on-quarter growth rate of 11.74%. This positive trend can be primarily attributed to steady increases in revenue from established and emerging esports games, driving overall revenue growth within this sector. As China social production and life gradually recover alongside accelerated consumption recovery, it is expected that with major events such as the Asian Games injecting further excitement into this field, business capacity will likely be unleashed during Q4 when core events and key activities are concentrated.

3.2. User base

From the perspective of user base, in recent years, the number of users has reached a stable level with consistent fluctuations. The e-sports industry is no longer solely reliant on macro factors for growth dividends. With the upcoming Asian Games, we anticipate an increase in the audience base, which will drive greater attention towards e-sports and result in certain growth in the scale of e-sports users [6].

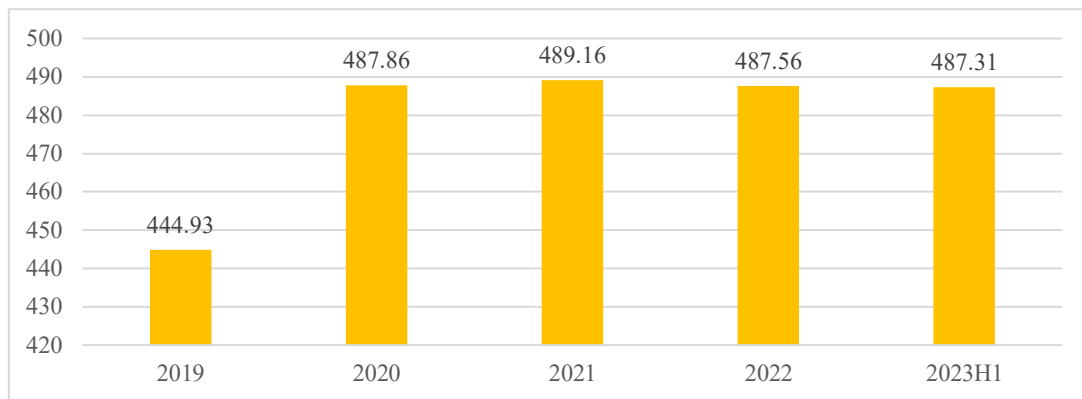


Figure 2: USER BASE(million)

3.3. Product classification

In terms of revenue composition and product classification, mobile esports games dominate the market. During the first half of 2023, Chinese esports industry witnessed a revenue distribution where esports games accounted for 84.84%, events and clubs accounted for 12.03%, while other sources contributed to 1.35%, 1.09% and 0.68% respectively.

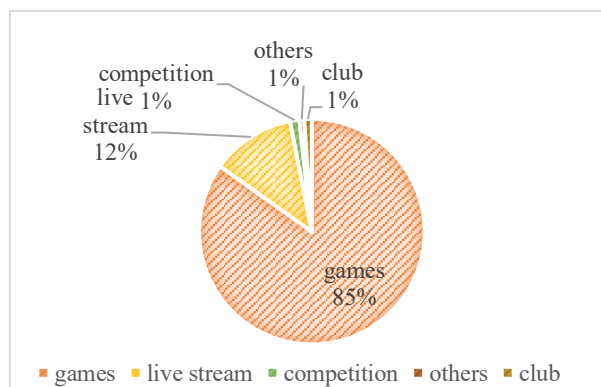


Figure 3: Revenue proportion

The decline in live content revenue is primarily attributed to electricity-related factors, which resulted in lower-than-expected revenues in the competitive industry sector. From a subdivision perspective, driven by China's rapid development in mobile internet technology, mobile esports games have consistently held a dominant position within the market over recent years. Furthermore, with the imminent commercialization of China's 5G network, these mobile esports games possess significant potential for further growth due to their inherent characteristics such as constant connectivity and ease of accessibility [7].

3.4. Industrial chain

From the upstream, midstream, and downstream of the industrial chain:

Upstream focuses on content authorization, encompassing game development and operation. This serves as the foundation for the survival of the entire industry. It mainly involves game manufacturers such as Tencent, NetEase, Electric Soul Network, Perfect World, etc., who develop and operate terminal games and mobile games to provide high-quality gaming experiences for the market. This helps establish a solid user base in order to facilitate subsequent industry operations. Midstream provides competitive content and events with an emphasis on team-oriented gameplay [8]. There is an increasing demand for major events like League of Heroes (corresponding to LPL), King of Glory (corresponding to KPL), Peace Elite (corresponding to PEL), etc. The international influence of e-sports competitions is also growing steadily; for instance, e-sports week was held during the Olympics in Singapore and e-sports will be included as a sport in Hangzhou Asian Games. E-sports event production and operation have become a core component within China's industrial chain. Leading e-sports operation companies such as VSPO and IMBA TV have emerged alongside this trend. Moreover, there has been significant growth in clubs involved in these events along with star players from renowned teams like EDG, IG, eStar.

Downstream focuses on content dissemination through live broadcasting platforms dedicated to e-sports as well as other derivative products related to media coverage. It plays a crucial role in promoting and operating e-sports by providing communication channels between content creators/competitions and users/consumers [9]. These channels bring substantial traffic sources and revenue streams into the industry. Prominent companies include the live stream platform like Huya, Douyu and TikTok.

4. Problem

However, there are still some significant problems that need to be solve in the e-sports industry.

(1)Lack of effective regulation and supervision: The e-sports industry is developing relatively fast, but it lacks a comprehensive set of regulations and supervision mechanism [10]. This has led to problems such as contract disputes and insufficient protection of plays' rights and interests. Establishing sound norms and regulatory systems is crucial for the sustainable development of the e-sports industry.

(2)Imperfect marketing and business model: Despite attracting large audience and sponsors, the e-sports industry still lacks a mature business model. Event organizers need to make better use of event resources and provide more business opportunities and ways to generate revenue.

(3)Talent cultivation and management: The e-sports industry needs a more professional and systematic talent cultivation and management system. This includes training and development of players, professional training of coaches and commentators, etc. the e-sports industry also need to better manage the physical and mental health of players.

(4)Uneven regional development: The e-sports industry is developing unevenly around the world, mainly concentrated in some developed countries and regions. The development of e-sports industry

in other regions is relatively lagging, lacking support in terms of capital, facilities and talents [11]. What's more, the different types of game e-sports have the different levels. For example, the competition of CSGO, which is a game type called "First-Person Shoot (FPS Games)", the European clubs have the fault-like levels of development, and as for the LOL belong to the game type called "Multiplayer Online Battle Arena Games (MOBA Games)", there is a huge gap development between the Asian clubs and other regions like America.

(5) Social recognition and cultural recognition: Although e-sports are very popular among young people, it still lacks widespread social recognition and cultural recognition in some regions where traditional ideas are more conservative. This may limit the development of the e-sports industry and affect its commercial value [12].

5. ANN technology application in E-sports

ANN is a computing model that mimics the structure and function of the neural network of the human brain. It consists of a hierarchy of multiple neurons (nodes), each of which processes the input data by learning and adjusting the weights and produces the corresponding output. ANN is widely used in various fields, such as image recognition, speech recognition, and natural language processing, etc. ANN technology can be applied in the e-sports industry to improve the existing problems.

5.1. Game improvement

First of all, since there are cheating behaviors such as plug-ins and auxiliary software in game competition, ANN technology can be used to build an intelligent game anti-cheating system. The system can detect and identify cheating behaviors by learning and analyzing players' behavioral patterns and game data, and take corresponding measures in time. In addition, ANN technology can be used to evaluate and analyze the player's performance, including game data, reaction speed, decision-making ability and other indicators, and the results can be used for personalized training and guidance before the game. In terms of match data analysis and prediction, since e-Sports competitions generate a large amount of data, such as match records, player behavior, etc., these data can be analyzed and mined through the use of ANN technology in order to extract valuable information and patterns. This information can be used to predict match results, optimize tactics and strategies, etc., thus improving the competitiveness of teams and players..

5.2. Optimizing the content service

ANN have many potential commercial values in the content service. Here are some possible application scenarios:

(1) Game live streaming and entertainment: The live streaming and entertainment of e-sports matches is a huge market. By using ANN technology, better live experience and entertainment content can be provided. For example, image recognition and analysis technology can be used to track the progress of the game in real time, analyze the performance of contestants, and provide real-time commentary and narration. This can attract a larger audience and provide richer entertainment content.

(2) E-sports training and education: E-sports training and education is a rapidly growing field. By using ANN technology, personalized training and education programs can be provided. For example, data analysis and evaluation techniques can be used to assess the strength and potential of contestants and provide training and guidance accordingly. This can help contestants improve their skill level and enhance their competitiveness.

(3) E-sports management and operation: The management and operation of e-sports is a complex task. By using ANN technology, the event management process can be simplified and optimized. For example, data analysis and prediction techniques can be used to optimize the schedule, assess the

strength of competitors, develop reward mechanisms, etc. This can improve the efficiency and fairness of the event and attract more participants and sponsors.

(4) E-sports product development and marketing: The development and marketing of e-sports products is a promising market. By using ANN technology, better product experience and marketing strategies can be provided. For example, image processing and enhancement techniques can be used to improve the quality of game graphics and attract more players. At the same time, data analysis and forecasting technologies can be used to understand the needs and preferences of players and provide personalized products and services.

6. Conclusion

As a newly developed sport, e-sports integrates culture, technology, intelligence, and sports. Healthy e-sports is fundamentally different from online games. In essence, it regards electronic equipment and electronic technology as sports equipment to compete against each other in the specified time according to the unified competition standard in the virtual information technology environment it has set up. Moreover, e-sports is not only an intellectual exercise, but also a form of exercise that integrates the mind and body. It can not only promote the improvement of participants' responsiveness, thinking ability, teamwork, and stress resistance, but also better realize the ideals and values of participants.

References

- [1] J. Hwang, "Cheating in E-sports: a proposal to regulate the growing problem of E-doping," *Northwestern University Law Review*, vol. 166, no. 5, pp. 1283-1318, 2022.
- [2] A. Ersin, H. Tezeren, N. Ozunlu Pekiavas et al., "The relationship between reaction time and gaming time in e-sports players," *Kinesiology*, vol. 54 no. 1, pp. 36-42, 2022.
- [3] J. Hou, X. Yang, and E. Panek, "How about playing games as a career?" *The evolution of E-sports in the eyes of mainstream media and public relations*, *International Journal of Sport Communication*, vol. 13, no. 1, pp. 1-21, 2020.
- [4] P. E. Malik, "sports: a competitive electronic sports," *Int J Yogic, Hum Mov Sport Sci*, vol. 4, no. 1, pp. 87-90, 2019.
- [5] I. Rokosny, "HOW brands use potential in e-sports as a marketing tool," *Marketing Identity*, vol. 7, no. 1, pp. 954-973, 2019.
- [6] Wanlan Securities, *Media industry in-depth report: "e-sports industry in the explosive period, the Asian Games is expected to help capacity release*.
- [7] Shanghai Securities, *Internet Media Industry Weekly Data*.
- [8] B. Heere, "Embracing the sportification of society: defining e-sports through a polymorphic view on sport," *Sport Management Review*, vol. 21, no. 1, pp. 21-24, 2018.
- [9] Al Mashalah, H., Hassini, E., Gunasekaran, A., Bhatt, D., 2022. *The impact of digital transformation on supply chains through e-commerce: Literature review and a conceptual framework*. *Transp. Res. E* 165, 102837.
- [10] Cheng, X., Gou, Q., Yue, J., Zhang, Y., 2019. *Equilibrium decisions for an innovation crowdsourcing platform*. *Transp. Res. E* 125, 241-260.
- [11] Chikish, Y., Carreras, M., Garcia, J., 2019. *Esports: A new era for the sports industry and a new impulse for the research in sports (and) economics*. In: *Sports. (and) Economics*. Spanish Savings Banks Foundation, pp. 477-508.
- [12] B. Ivanytska, "Problems and prospects for the development of e-sports journalism in the modern media space," *State and Regions. Series: Social Communications*, vol. 2, no. 46, pp. 50-56, 2021.