

Development Opportunities of TikTok and Virtual characters Based on SWOT Analysis

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Abstract: With the innovation of 5G technology, the online social interaction platform, which is connected by short videos, is becoming more and more popular among Internet users. As a new carrier of visual information dissemination, TikTok provides a broad social interaction space for the original self-media operators and related users, significantly enhancing information sharing. The updated development driven by the modelling of Computer graphics and artificial intelligence makes the virtual digital human industry enter a period of rapid development, and its business model is becoming more and more diversified. In the mobile Internet economy era, TikTok utilizes the huge user group and apparent social gene to combine the virtual character with the traditional short video social form and expand the competitive advantage in the mass and homogeneous short video APP. This paper introduces the development status of the virtual digital human in the field of short video. Through SWOT analysis, analyze the internal advantages and disadvantages, as well as external opportunities and threats in the process of using virtual characters to gain competitive advantages, predict the development opportunities of virtual characters created by TikTok in the field of live e-commerce, and adapt to Byte Dance's entry into virtual digital people market.

1. Introduction

1.1 research background

TikTok, as a member product of the booming short video industry, faces the standard competitive pressure from both competitors and new entrants in the market development and marketing operations. The development of horizontal competitive enterprises often presents a situation of mutual constraints. The leading development of a business in the industry will bring pressure to other businesses and promote the competition of business strategies among enterprises. Statistics released by Professional Integrity Quality Service show that in 2020, TikTok and Kwai accounted for 70.9% and 52.3%, respectively. The user scale of these two platforms is significantly ahead of other short video platforms. "Matthew effect" is prominent, which indicates that the pattern of "two superpower and multi-great power" in the short video industry has been stable [10].

Under such circumstances, although TikTok has a particular advantage in the number of active users, it still lags behind Kwai in terms of market share [13]. To break this situation, TikTok needs to find new ways to attract more user groups, improve content quality and operation level, and further expand its competitive advantage in the Internet field from the "metaverse" field. Therefore, TikTok firmly launched the virtual character "Liu Yexi" and began to focus on building a new world view and IP universe with development potential for her. At the same time, due to the low threshold of the short video industry, a large number of emerging short video products have joined the competition in the short video industry, trying to take a share of the spoils.

In contrast to its leading position in the short video industry, TikTok is looking for a new direction as a new entrant in the new market of virtual characters. Based on its existing large user base and its unique position in the product matrix of ByteDance, TikTok is trying to open a new market for virtual digital humans.

1.2 research significance

The advantages of TikTok in video content diversification and advanced intelligence of algorithms can provide a broader development prospect for the combination of virtual digital human and short video forms. As the virtual characters have not been fully developed in the Chinese market, the trial-and-error cost of TikTok in the field of virtual characters is still at a low level. As a cross-border enterprise, Byte Dance can take advantage of the competition pattern already formed in virtual digital person and quickly seize the head market of the virtual digital industry, first-mover advantage and excellent voice in the virtual digital industry.

Moreover, the threat posed by homogenous, short video APPs depends on how well they replace the existing features and content of TikTok. Therefore, finding the differentiation between product content and function has become an important way for TikTok to gain a foothold. The combination of short video and virtual characters is to attract more diversified users, continuously expand the influence of the platform, and reverse the dependence of users on other platforms to increase escape costs of users, effectively improve the stickiness of users, and compress the living space of other alternative products [5]. From this point of view, it is necessary to try to merge TikTok with the virtual digital industry.

2. TikTok and the development of virtual characters

With the vigorous development of Internet technology in recent years, the development of the virtual digital human industry has obvious late development advantages. ‘Qubit virtual digital human white paper’ point out, China's virtual digital human market will proliferate to 270 billion by 2030 ^[11]. The outline of the 14th five-year plan also included "virtual reality and augmented reality" in the critical industries related to the digital economy [13]. Therefore, whether from the perspective of market scale or national policy, the combination of virtual digital characters and the short video will bring significant changes to the whole industry. The first step is to study the application of virtual characters in TikTok. On October 31, 2021, TikTok launched the virtual digital man Liu Yexi to open a new blue ocean in the virtual digital industry.

3. SWOT analysis of TikTok and virtual character development

Table 1. SWOT analysis of TikTok

Internal Factors	Strengths Simple and convenient operation Have community attributes Algorithmic advanced intelligence	Weaknesses The stickiness between bloggers and fans is not high High content homogeneity
External Factors	“SO”: Raise technical barriers and enhance research and development capabilities Fulfil social responsibilities and promote values	“WO”: Keep the content vertical Continuous and steady output
Threats App homogenization is profound Originality copyright consciousness needs to be strengthened Cross-platform sharing is imperfect	“ST”: Advocate original work presentation Improve the interaction between the platform and fans	“WT”: Improve video review requirements Optimize advertising quality

3.1 Internal advantage analysis

3.1.1 Simple and convenient operation, with community attributes

It is straightforward for users to publish or watch videos on TikTok. Mobile phone TikTok provides different types of music and background effects for video publishers. Users can only complete recording and publishing by shooting the phone. TikTok also has a "clip" APP video clip template to assist users in making short videos. For video viewers, TikTok interaction is a core point of user experience. Significantly simplified interaction is mainly reflected in click to pause; Slide right to switch the user's home page; Slide left back to the video; Slide up and down to switch video. It reduces the user's learning cost and increases the user's sense of dependence on the software.

Different from general short video software, TikTok has typical community attributes. It and its vast product matrix realize multi-platform interconnection, sharing and mutual drainage. Users can share videos through traditional social software such as QQ and WeChat and find their friends in real life through functions such as address book, location, and nearby people.

3.1.2 Algorithmic advanced intelligence

TikTok perfectly introduced and optimized the powerful algorithm function of today's headlines. The powerful algorithm function of shaking can identify and push users' interest more quickly and accurately than another short video. Moreover, cooperate with other social software to provide users with more choices in life and shopping. The algorithm of TikTok is advanced in two aspects. First, there is a double audit. TikTok uploads many new works every day, so it is easy to make mistakes in machine audit, and manual audit requires much workforce. Therefore, the combination of two ways is TikTok. A machine audit uses AI to identify the unlawful compliance of the screen and keywords and matches the weight of the existing homogeneity content in the extensive database. After the manual review is applied to the machine review, the illegal works screened by the machine review will be deleted and punished accordingly. Followed by cold start, the recommended algorithm for shaking is the funnel algorithm of information flow, which continues the core algorithm of today's TikTok. After the video is approved, the system will allocate the publisher's initial traffic pool, and about 200-300 online users will be exposed to further screen out high-quality content.

3.2 Internal Weakness Analysis

3.2.1 The difficulty of profit realization and high cost of operation and maintenance for virtual characters

The threshold for the creation and production of virtual people is high, and it takes a long time to realize profits. From the perspective of technical implementation, the limitations of CG special effects development are difficult to resist the aesthetic fatigue of the public. At present, 3D digital human modelling still requires a lot of manual production participation. It takes a long production cycle to achieve the effect of "simulating humans" [11], making it impossible for virtual characters to maintain fan stickiness effectively. A long video production cycle will continue to increase fans' expectations to a certain extent. Once there are mistakes in producing a video, it will cause a crisis of trust among fans. Therefore, Liu Yexi can choose to learn from the high-quality, long-cycle video output mode of "Li Ziqi" to develop further content creation, conducive to increasing popularity.

The high operating cost of virtual humans is also a key factor restricting the development of the industry. Liu Yexi's team once said that the R&D cost, personnel cost, and technology cost of launching Liu Yexi far exceeded one million. According to the research report of the Toubao Research Institute, there are currently tens of thousands of virtual idols in China, but less than 30% of them are profitable [15]. In the future, with the continuous development and maturity of technologies such as holographic projection, AR, and VR, the production and operation costs of virtual digital humans are expected to continue to decline.

3.2.2 The public acceptance of the national style culture conveyed by virtual characters still needs to be improved

From the perspective of cultural replacement, national style, a cultural symbol that has returned to the public's attention in recent years, has not yet become the mainstream cultural trend of thought. Under the double attack of Japan's two-dimensional pop culture and South Korea's Hallyu culture, the status of the Chinese style in the hearts of Internet users has been at stake in the past few decades. With the comeback of Guofeng in recent years, more and more users have begun to focus on the rise of Guofeng. Liu Yexi has well captured the fans' desire to revive the national style, combining virtual characters with Chinese style and unique mythological features in Chinese culture so that its image can quickly grab users' attention and attract much attention. However, as a cultural concept that has made a comeback, Guofeng cannot replace other cultural symbols and occupy a significant position in the hearts of Internet users in the short term. As shown in figure 1, even though the growth rate of the user scale of the two-dimensional culture in China is slowing down, the total amount is still expanding. The psychological appeal of the revival of Guofeng will indeed increase users' attention to Liu Yexi, but the core audience of his Guofeng is still limited.

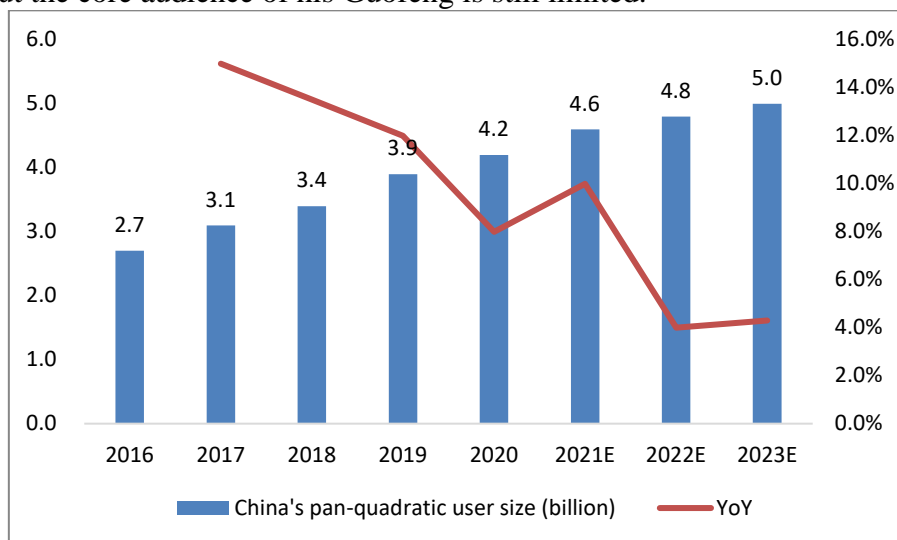


Figure 1. China's pan-quadratic user size (billion) and growth rate

3.3 Analysis of External Opportunities

3.3.1 Diversification of Communication Channels in the Internet Era

Since 2010, mobile intelligent terminal equipment development has been extremely rapid. The hardware improvement of these mobile smart devices has brought very favorable preconditions for the use of TikTok by all people, which has provided a very favorable opportunity for the subsequent development of TikTok functions [16]. Mainstream social media such as WeChat, Weibo, and QQ support TikTok for sharing and disseminating short videos. The diversification of channels brings more traffic and attention while also increasing the number of potential users. On the other hand, TikTok's more visual content output can effectively fill the marketing gap of traditional social media such as Weibo.

3.3.2 Live streaming of virtual characters

To create an avatar image suitable for short video dissemination, adapt it to the continuous update and development of digital technology and bring new ideas to many brands, TikTok should explore the long-term nature of the avatar's profit monetization model.

Live broadcasting occupies an important strategic position in Byte Dance's business strategy deployment [15]. Since 2017, ByteDance's revenue has been rising year by year. In 2020, its revenue will reach 240 billion yuan, of which e-commerce revenue will be 6 billion yuan, and live streaming will reach 45-50 billion yuan [6]. Judging from the current development trend of e-commerce and the

active live broadcast market environment, ByteDance's live broadcast delivery business still has considerable room for development. According to statistics, the daily activity of TikTok anchors exceeds 500,000, and the overall live broadcast is active daily. The number of users exceeded 200 million. In addition, ByteDance puts its core focus on creating a closed-loop model for live broadcast rooms, and it is expected that live broadcast e-commerce will generate 100-120 billion in scale revenue [16].

TikTok, as a pioneer of live streaming of virtual characters, needs to give full play to the advantages of TikTok's e-commerce platform and create a unique live streaming channel that belongs to TikTok. As a mainstream e-commerce platform for audiences, TikTok can help merchants conduct live broadcasts of virtual characters and create virtual idol IPs, reducing the cost of live broadcasts and assisting merchants in owning their virtual idol assets. According to Table 2, the virtual character live broadcast has apparent advantages and competitiveness compared with the traditional live anchor.

Table 2. Comparison of live commerce of online influencers and live commerce of virtual characters

	Live commerce (online influencers)	Live commerce (virtual characters)
Costs	High	Low
Fluidity	High	Low
Image characteristics	Uncertainty	Fixed
Idol IP	The merchant has signed the contract	Merchants can adjust according to the needs of users

The cost of live streaming of virtual characters is relatively low. There is no upper limit on physical fitness and status to avoid the phenomenon of “rollover” in live streaming. Secondly, there is no anchor liquidity problem in the live broadcast of virtual characters. Virtual characters can be used as anchors for businesses and virtual assets to reduce disputes over copyright and other issues. In addition, virtual anchors have excellent image characteristics, carefully created by the AI anchor technical team behind the scenes. They can customize the image description according to the features of the goods, considering the brand and users' preference, and satisfy the merchants' brand promotion and the user's preference—the needs of the ideal anchor. Finally, virtual character anchors can help businesses build brand virtual idol IPs. The post-90s and post-00s have gradually become the primary consumers of today's society. As of November 2021, the post-90s group accounts for a significant proportion (Figure 2&3). Therefore, merchants can create exclusive avatars for different user groups, conducive to driving the live broadcast mode of avatars and goods, increasing virtual IP traffic, and enhancing users' stickiness to TikTok avatars to create the perfect brand image.

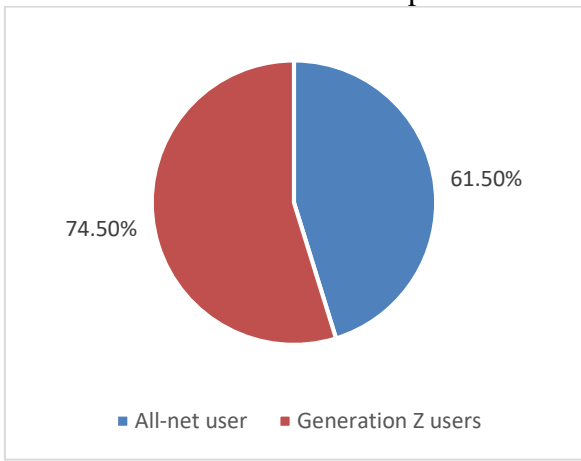


Figure 2. Proportion of people with online spending power in November 2020

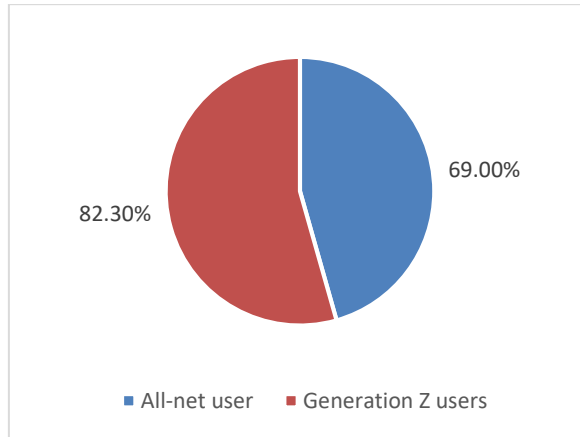


Figure 3. online willingness to spend as a percentage of the population in November 2020
 (Note: Generation Z refers to the post-95+ post-00 generation)
 (Source: Quest Mobile GROWTH User Portrait Tag Database November 2020 [11].)

3.3.3 ByteDance Enters the Virtual Character Market

As the core application scenario of the 5G market, VR is a vital terminal product after smartphones, and it also brings development opportunities to the virtual character market. According to Figure 4, the scale of China's VR market in 2020 will reach 41.4 billion yuan, a year-on-year increase of 46.2%, and it is expected to reach 54.5 billion yuan in 2021[15].

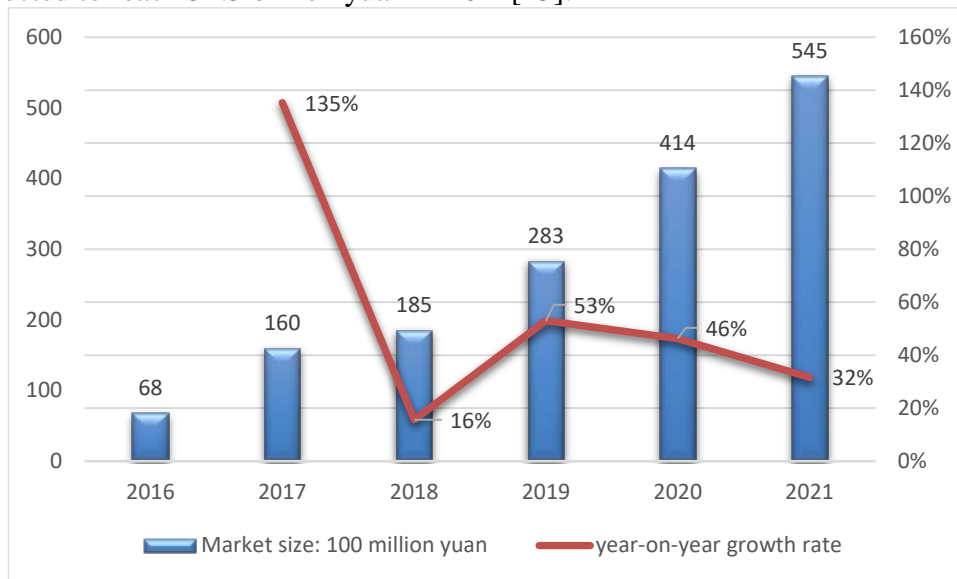


Figure 4. Statistics of China's VR market size from 2016 to 2021
 (Source: China Business Industry Research Institute)

After the acquisition of Pico, ByteDance will support its long-term investment in the VR field and use Pico's professional technology, software, and talent advantages to gradually deepen its long-term development in the virtual character industry and continue to upgrade the Internet giants. Seek advantage in competition. With the strong technical support of ByteDance, TikTok can rely on its group advantages to combine Pico with virtual character applications, follow the strong and strengthen among various business products within the enterprise, and centralize valuable resources from multiple The centralized traffic distribution mode from central distributed traffic to gradually one centre is conducive to strengthening the network increment and traffic for TikTok and creating opportunities for the development of TikTok virtual characters[10].

3.4 External Threat Analysis

3.4.1 App homogenization is serious

With the success of Tiktok's innovative model, many other short video software such as Xiaohongshu have begun to imitate and explore Tiktok's operating model, which has launched a homogeneous competition with Tiktok [16]. The increase of homogeneous products in the market can easily cause the audience's aesthetic fatigue, and it is difficult to find means to increase its core competitiveness. In addition, TikTok cannot achieve effective interaction between bloggers and users, making it impossible for users to have a close relationship with the software. It is challenging to convert seed users into loyal fans and bind them as core users.

The severe threat of homogenization is mainly reflected in two aspects: functional homogeneity and content homogeneity. In terms of functional homogeneity, many short video software has almost the same essential functions, which cannot meet the individual needs of users. For Tiktok, the duplication of standard procedures by industry alternatives has dramatically reduced its user stickiness, thus losing the advantage of its vast user base brought about by the complete product matrix. TikTok uses music clips to set topics and encourage users to publish related videos from content homogeneity. The content creation model is relatively simple, and the topic content is relatively limited to life, beauty, and funny entertainment, which is easy to cause users' Sensory visual fatigue.

3.4.2 Users' awareness of original copyright and government supervision are strengthened

In recent years, with the development of society and the improvement of the public's cultural level, the awareness of originality and copyright of the public has gradually awakened and strengthened. There are many plagiarisms, imitations, and idioms in Tiktok, which has also caused dissatisfaction among many users. At present, TikTok does not have a reasonable and effective solution, and such a long-term development will accumulate people's distrust and resistance to the software^[4]. Moreover, with the advent of the Internet era and big data, the state's supervision of new media has been continuously strengthened. The Cyberspace Administration of the People's Republic of China and several departments have centralized rectification of the online short video industry. The government's increased supervision has sounded the alarm on short video platforms with wrong values. If TikTok fails to rectify its corresponding deficiencies as soon as possible, it will be subject to compulsory rectification by relevant departments, which will be a blow.

4. Conclusion

4.1 Key findings

This article introduces TikTok's strengths and weaknesses and opportunities and challenges for future development by analyzing TikTok's SWOT. TikTok has many advantages such as simple, convenient operation and intelligent algorithm. In addition to the background of ByteDance's entry into the virtual character market, TikTok can seize the platform integration and interactivity to create a new Internet era. However, the challenges of making profits for virtual characters, high operating costs, and low acceptance of national culture require TikTok to leverage its powerful platform sharing and diversified information dissemination channels in the Internet age to enhance its competitiveness. In addition, in the face of commercial pressure from competitors, TikTok needs to expand its unique characteristics actively, make use of TikTok's live broadcast and the virtual character market field developed by ByteDance, and actively protect users' original copyright rights, become a giant leading the Internet era.

4.2 Future studies

In the commercialization of virtual character realization mode, its advantages of uninterrupted live broadcasting, personalized service and a rich material library make it have more significant advantages than natural anchors in live-streaming e-commerce. Under the disadvantage that it is

difficult for natural anchors to carry out one-to-many delivery services, and it is almost impossible to remember the shopping preferences of consumers, virtual anchors can develop personalized delivery scripts with the help of AI support to meet the specific needs of consumers and recommend related products according to their preferences. However, virtual characters still face many problems to realize profits through live-streaming e-commerce. First, the audience of virtual anchors is not as broad as that of natural anchors, so the user base is unreliable. Secondly, it is challenging for the virtual anchor to sample food, colour and try on for the audience. Real people need to appear on the camera for a long time and cooperate with the virtual anchor to show goods. In this regard, the technical threshold cannot be broken. Thirdly, the demand of most people for virtual characters is companionship. Once virtual characters start to sell something, it is bound to break the sense of companionship that fans expect them to give. It will also cause many problems, such as unclear positioning of virtual characters and a narrow development path.

Even if there are difficulties, TikTok can still use the commercial value of virtual characters to develop in multiple fields. The use of virtual character live-streaming e-commerce to expand the platform's profits provides a strong impetus for the development of TikTok in the virtual character field. It lays a solid foundation for ByteDance to enter the virtual digital market. Even now, the public perception of virtual characters just stays based on the real world. However, with technological innovation and public acceptance, the combination of virtual characters and the short video will bring short video social networking platforms such as TikTok a more significant competitive advantage. It will also have far-reaching implications for the virtual digital industry in the world.

References

- [1] Artificial Intelligence Industry Alliance, Zhongguan Science Shuzhi Artificial Intelligence Industry Alliance. White Paper 2020: Development of Virtual Digital Human [R]. Beijing: Artificial Intelligence Industry Alliance, Zhongguan Science Shuzhi Artificial Intelligence Industry Alliance, 2020.
- [2] ByteDance Research Report: the new giants of the Internet driven by smart algorithms [R]. Guangzhou: iiMedia Research, 2019.
- [3] Cheng Mengzhu. Metaverse Topic Depth - The Future of the Future [R]. Guohai Securities Research Institute, 2021.
- [4] Gu Jia, Xie Xiaoyan, Yu Shiliang. With his back on Facebook, the two wings fly together, the Metaverse leads the new journey of Blue Label [DB/OL]. http://stock.finance.sina.com.cn/stock/go.php/vReport_Show/kind/search/rptid/69A5120338313/index.phtml.
- [5] Huang Hongzhen. Market competition strategy of mobile short video from the perspective of Porter's "Five Forces Model" [J]. New media research, 2019, (21): 48 - 50.
- [6] Internet Society of China. China Internet Development Report (2021) [R]. Beijing: Internet Society of China, 2021.
- [7] Liang Qiulan. Z Generation Series Report (3): With the advent of the Metaverse, can virtual idols seize the opportunity? [DB/OL]. https://www.djyanbao.com/report/detail?id=2525846&from=search_list. December 25, 2021.
- [8] Liu Mengyuan. Deep Industry Report on Virtual Digital Human [R]. Beijing: QbitAI, 2021.
- [9] Maria Lewczyk. The limitless Potential of Virtual Influencers on TikTok [DB/OL]. <https://www.virtualhumans.org/article/the-limitless-potential-of-virtual-influencers-on-tiktok.%202022> - 1 - 27.

- [10] Professional Integrity Quality Service. Report of Prospects and Investment Strategy Planning Analysis on China Short Video Industry (2021-2026) [R].Shenzhen: Professional Integrity Quality Service, 2020.
- [11] Quest Mobile. Mobile Internet Industry: QuestMobile 2020 Gen Z Insights Report [R]. Beijing: Quest Mobile Research Institute, 2021.
- [12] Su Qi. Metaverse hyped up a short video: Do you really understand Liu Yexi? [DB/OL]. https://www.thepaper.cn/newsDetail_forward_15247292. December 25, 2021.
- [13] Wang Jingfang. A Metaverse Comeback? The virtual reality portfolio has risen strongly or will start a new round of rebalancing plans [DB/OL]. <http://tech.hexun.com/2021-11-25/204813512.html>. December 25, 2021.
- [14] Yang Zan. What is the "metaverse" that detonated the technology circle? [DB/OL]. <https://m.gmw.cn/baijia/2021-09/10/35155556.html>. December 25, 2021.
- [15] Zhang Yi. "Kick off" Taobao's Douyin, can it be e-commerce smoothly? [DB/OL]. <https://www.ebrun.com/20201015/405906.shtml>. December 25, 2021.
- [16] Zhe Xuerui. Cultural Media Industry Douyin Special Report: Building a New Ecological Closed Loop for Live E-commerce Report [R]. Zheshang Securities, 2016.