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Analysis of Development Trends in the Animated Film Industry in the 5G Era: Postprint

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Abstract

With the commercial deployment of 5G technology in China, it will achieve deep integration with an increasing number of industries and sectors, thereby inevitably exerting certain impacts on the development of traditional industries. This paper approaches from the perspective of animation film industry development, summarizes the characteristics of the 5G era, contemplates the development trends of the animation film industry against the backdrop of the 5G era, and proposes development strategies for the animation film industry on this basis.

Full Text

Analysis of Development Trends in the Animation Film Industry Under the 5G Era

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Abstract: As 5G technology enters commercial application in China, it will achieve deep integration with an increasing number of industries and sectors, inevitably impacting the development of traditional industries. This paper examines the animation film industry's development from the perspective of 5G era characteristics, analyzes development trends in the animation film industry under the 5G backdrop, and proposes corresponding development strategies.

Keywords: 5G era; animation film; film industry; communication technology; 5G technology

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Countries and regions worldwide currently treat 5G technology development as a strategic priority, actively implementing macro-level deployment to rapidly integrate 5G technology across all industries and maximize its effectiveness. The development of the animation film industry is built upon communication technology, meaning that the advancement of 5G technology will undoubtedly exert varying degrees of influence on this sector. At present, China's 5G industry has established preliminary competitive advantages, with the foundation for commercialization gradually taking shape. This necessitates continuous expansion of the 5G commercial landscape to connect with all aspects of public life and construct an ideal information ecosystem. In this process, it is essential to examine the logical relationship between technology and film industry development from a proper perspective [2].

2. Development Trends of the Animation Film Industry Under the 5G Era

On June 3, 2019, China's Ministry of Industry and Information Technology announced the issuance of 5G commercial licenses, marking the arrival of the 5G era. As an industry operating within this new communication age, animation film will inevitably enter a higher-quality development pattern driven by advances in mobile communication network technology. From this perspective, animation and film entertainment content will become major beneficiaries of 5G technology. As 5G technology sees broader application, it will interact with every link in the animation industry chain, enhancing the dissemination and contemporaneity of animation film entertainment content. Specifically, development trends in the animation film industry under the 5G era can be summarized as follows:

2.1 Mainstreaming of Online Ultra-High-Definition Animation Viewing

If the animation film industry can capitalize on the high-speed train of ultra-high-definition animation, transitioning from 8-second transmission to 1GB data transmission, the foundation for ultra-high-definition animation industry development will be substantially strengthened. As 5G technology continues to evolve, the animation industry will inevitably prioritize ultra-high-definition animation, leveraging 5G's advantages in flow velocity and traffic standards to meet audience demand for ultra-high-definition animation viewing. In the future 5G era, audiences will see more excellent high-definition animation works, and the increasing availability of such works will also set the tone for AI and VR animation industry development. During this process, audiences will enjoy not

only faster transmission speeds but also lower latency, elevating the animation viewing experience to higher quality levels. For instance, “Yu the Great,” China’s first three-dimensional 4K ultra-high-definition animated series produced by Zhejiang Radio and Television Group, can be smoothly viewed online in a 5G environment. Many audiences have reported that this viewing experience is unprecedented, demonstrating that 5G technology will play a fundamental role in the future development of the animation industry [3].

2.2 Refined Animation Production

As animation audiences’ demands for ultra-high-definition animation continue to rise, they naturally expect animation production companies to achieve high-quality design and production of animation content after obtaining good network experiences. Currently, due to suboptimal network conditions, animation resolution on online streaming platforms is generally not very high, mostly around 1080p, with some works still at 360p. Few platforms can guarantee animation resolution above 2K. As 5G technology penetrates the film industry, it is necessary to fully leverage its low-latency capabilities to transmit more information per unit time, eliminating 卡顿 (lag) and blurriness during animation viewing, thereby continuously improving picture quality and optimizing viewing experiences. However, achieving these goals also requires animation production companies to advance their production technologies, pursue high-quality visuals, invest more in visual technology, refine production details, ensure continuous improvement in the creative team’s innovative capabilities, and achieve specialized production development. Only then can they present more excellent animation works. Additionally, with the rapid development of live streaming, the high bandwidth and low latency characteristics of 5G networks will drive animation live streaming toward new directions, continuously upgrading both formats and technical standards. This will result in more delicate and expressive real-time transmission images, more stable and coherent frame rates, more authentic and accurate colors, and better control over detail loss rates in network transmission [4].

2.3 Immersive Animation Experiences

Against the backdrop of China’s continuously developing mobile communication networks, most mobile network users face insufficient data 流量 (traffic) issues. If this problem remains unresolved for an extended period, it may hinder the diversification of demands. As 5G technology integrates into animation, ultra-large data packages will emerge to meet users’ animation viewing needs, and related internet enterprises will continue to appear, bringing animation film distribution, promotion, and ticket marketing into a more ideal state. For major two-dimensional video websites, VIP paid services have become their core offering, through which users can obtain higher-quality visual experiences and are more willing to participate in such consumption. For gamers, the integration of 5G technology with AR and VR technologies can create more ideal perceptual en-

vironments. The addition of visual enhancement and virtual reality technologies makes game scenario setting more convenient. Taking currently popular games like PUBG and League of Legends as examples, smooth gameplay requires minimal network latency. Official statistics show that 5G network latency will not exceed 4ms, with a minimum of 1ms. This means that under 5G technology, data processing speed and quality between various terminals will continuously improve, and game 画面 (screen) display will be faster. In low-latency gaming environments, players can better immerse themselves in their roles and even achieve advertising interaction, making acquired information more experiential. As network transmission technology continues to develop, VR presence and immersive audiovisual experiences will enter a high-quality state, attracting more user participation. For animation film, this approach can also enable better interaction and create ideal game scenarios, ensuring entry into a more desirable animation situational experience pattern [6].

2.4 Accessibility of the Two-Dimensional World

The emergence of 5G technology has brought animation production technology into a new round of revolution. Currently, animation works that meet audience needs may exhibit customized and interactive elements in the future. In other words, users can rely on devices to actively choose story directions, reshape character destinies, and even conduct on-site processing in auditory environments during animation viewing to ensure better human-computer interaction. In this process, VR and AR technologies can effectively enable the two-dimensional world to gradually interact with audiences, entering a state of joint adventure and play. From this perspective, animation production companies should also focus on auditory and visual interaction with audiences, collect more information, and implement technical adjustments to present more ideal images. The continuous application of computer technology in animation production can make animation characters more vivid and realistic [7].

3. Development Strategies for the Animation Film Industry Under the 5G Era

Based on the above trend analysis, 5G technology has constructed a new development environment for the animation film industry. It is now necessary to properly handle the relationship between technology and industry development, skillfully present the advantages of 5G technology, and guide the sustainable development of the animation film industry. Specifically, attention should be focused on the following aspects:

3.1 Emphasizing the Development of Internet Animation Companies and Platforms

For internet enterprises, the future use of big data technology will continuously enhance their core industrial advantages, thereby transforming the entire an-

imation film industry development environment [8]. Facts have proven that many outstanding high-quality animation works currently originate from internet animation companies and are broadcast and promoted on internet animation platforms. These enterprises often need to invest substantial capital in big data technology to understand animation users' preferences and interests, ensuring that animation content aligns with consumer psychology and satisfies their psychological demands, thereby entering a more ideal animation film development pattern. From this perspective, the development of the animation film industry in the 5G era must establish internet awareness, understand how to leverage the effectiveness of internet animation companies and platforms, and rely on these two elements to enter a more desirable industry development pattern [9].

3.2 Upholding Content-Centric Values in Animation Development

In the animation film industry, animation content serves as the benchmark, and the high quality of this benchmark is the prerequisite and foundation for sustainable industry development. In other words, it is essential to attach great importance to the sustainable development of the animation film industry and uphold content-centric development values. The main tasks in this process include: First, correctly understanding the new environment for animation creation under 5G technology, establishing innovative values for animation content, continuously integrating 5G technology advantages into daily animation production and design, and ensuring the construction of an ideal animation content production environment. Second, when designing or creating animation works, there is no need to consider screening carriers or work duration limitations. Instead, actively utilize big data technology to skillfully address these fundamental design issues, allowing more resources to be devoted to content production rather than subsequent promotion or application scenarios.

3.3 Building High-Quality Animation Production and Design Talent Teams

The integration of 5G technology with the animation film industry requires more high-quality animation talents who can understand the new demands that technological revolutions place on animation production and design capabilities, reflect on their own shortcomings, achieve professional development, and participate in animation creation practices in an ideal state. From this perspective, attention should be focused on: First, organizing expert teams to research the competency requirements for animation talents under the 5G era, establishing corresponding job competency models, and helping animation industries or enterprises select more high-quality talents who can correctly understand technological changes and examine issues from a developmental perspective, thereby becoming important actors in technology-animation integration. Second, encouraging higher education institutions to clarify the relationship between 5G technology and animation talent development when establishing animation majors, setting up specialized courses, optimizing educational content and formats,

and ensuring that more animation practitioners can correctly understand the relationship between 5G technology and animation work design. Third, as animation enterprises, they must also recognize the changing demands for animation production and design under new circumstances, establish comprehensive education and training programs for existing staff to achieve professional development and enter a more ideal animation production and design pattern. Fourth, as animation industry practitioners, they need to establish self-directed learning awareness, actively understand career prospects, identify deficiencies in their technical and conceptual competencies, and continuously improve themselves. Through autonomous learning, they can ensure continuous improvement in their professional qualities, maintaining a competitive advantage in future job markets and entering a more ideal development pattern. Through these measures, the talent pool in the animation film industry will develop toward higher quality, better contributing to industry development in the 5G era.

3.4 Creating a New Animation Development Environment Supported by Technology

It must be recognized that any industry's development and progress requires corresponding technological support. For the animation film industry, 5G technology should be regarded as an important opportunity for development and transformation. Seizing this opportunity requires correctly identifying shortcomings in existing technical support mechanisms, addressing gaps, and ensuring entry into a higher-quality industry development pattern driven by technology. Particularly as consumer demands for animation film continue to rise and user scale increases, it is even more necessary to use technology as support to build a new animation development environment. The main tasks in this process include: First, integrating new technologies such as 5G, AI, big data, AR, and VR to construct an ideal animation development platform that enables audience participation in film content production, generating corresponding pre-production, production, and post-production participation plans. This ensures good interaction between audiences and platforms, guiding animation film industry development into a more ideal state. Second, emphasizing the construction of communication technology standards and norms in animation development, summarizing relevant experiences and lessons, referencing international cases, and establishing national, industry, and enterprise standards to ensure that the integration of 5G technology and animation film progresses in a better direction, laying the foundation for subsequent sustainable industry development and creating an ideal technology-industry development pattern.

In summary, 5G technology represents a technological revolution. As its integration with the animation film industry deepens and broadens, the industry's survival patterns are changing. It is essential to correctly understand these transformation trends, rationally analyze development trends in the animation film industry under the 5G era, and formulate more comprehensive development plans guided by these trends. This ensures the sustainable development of the

animation film industry through continuous optimization of the technological environment, establishment of technical standards, cultivation of technical talents, and improvement of technical literacy.

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