Exploration and Reflection on Media Convergence Driven by 5G Technology: Postprint

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Abstract

At the current stage, the development of 5G technology and the advancement of the 5G era have brought unprecedented development opportunities for media convergence. How to transform the developmental state of the 4G era and effectively lead industry development has become a critical issue that the current media industry must contemplate and address. Based on this, this paper investigates media convergence development in the 5G era, analyzing the application advantages of 5G technology in promoting media convergence, the development opportunities and directions of media convergence in the 5G environment, exploration pathways, and future trends, thereby providing references for promoting the in-depth development of China' s media industry.

Full Text

5G Technology Driving Media Convergence: Exploration and Reflection

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Abstract: The ongoing development of 5G technology and the advent of the 5G era have created unprecedented opportunities for media convergence. A critical challenge facing the media industry is how to transcend the limitations of the 4G era and effectively lead future development. This paper examines media convergence in the 5G era, analyzing the application advantages of 5G technology in driving media convergence, as well as the development opportunities, directions, exploratory pathways, and future trends for media convergence under 5G. The findings provide valuable insights for advancing the deep development of China' s media industry.

Keywords: 5G technology; media convergence; news production; development opportunities; media industry

1. Application Advantages of 5G Technology in Driving Media Convergence

As mobile communication technology continues to evolve, 5G technology has gradually demonstrated its distinctive advantages, primarily manifested in high transmission rates, reduced latency, and lower costs. Specifically, 5G achieves speeds up to 100 times faster than 4G technology, reaching 10 Gbit/s, which significantly enhances the smoothness of video streaming and gaming experiences. In terms of latency reduction, 5G can control delays to approximately 1 millisecond, demonstrating strong potential in transportation, healthcare, and other fields. Additionally, through ultra-large network capacity connections, 5G can further satisfy the operational demands of IoT communications. Overall, 5G technology not only improves transmission efficiency and optimizes user experience but also enhances the online connectivity capabilities of various systems, truly ushering in the era of the Internet of Everything.

Under such circumstances, the media industry has naturally been influenced by 5G technology, leveraging the relevant technological system to achieve innovative development and overall transformation and upgrading. The arrival of the 5G era has effectively broadened the communication pathways for the media industry, and its advantages in high transmission rates and low latency have enabled smoother connections between devices. Through the application of 5G technology, news collection models have shifted from traditional manual collection to sensor-based collection, greatly improving information gathering efficiency while significantly expanding collection scope. In the current media information environment, users increasingly emphasize personalization and independence when receiving information. Therefore, information dissemination should achieve precise personalized distribution based on user needs, while simplifying and popularizing complex data to accommodate users' reading habits. Consequently, in a media convergence environment, the constraints and deficiencies that information faced during previous circulation processes will be eliminated, and information content will be presented in the simplest, smoothest, and most convenient form, ensuring that users can complete information selection and reception more freely and diversely.

2. Development Opportunities for Media Convergence Under 5G

Examining current trends, the media industry has consistently been influenced by technological transformation, and has undertaken deep integration within the media sector supported by technology. Media convergence development has now entered the "deep water zone," and a key research focus is how to initiate profound changes in the media industry and news communication landscape in the 5G era. Therefore, in future development, we must firmly grasp development trends, maintain sensitivity to technology application and integration priorities,

and thereby achieve the goals of promoting deep media integration and building new mainstream media.

From the perspective of current development, China' s media convergence has demonstrated increasingly positive and rapid development momentum. However, media convergence is essentially a continuous and systematic process. After experiencing a period of rapid development, it has entered a critical phase requiring further optimization and upgrading across multiple dimensions including channels, platforms, and operations. In September 2020, the *Opinions on Accelerating the In-Depth Development of Media Integration* marked China' s entry into a new stage of media convergence development. Therefore, it is necessary to further strengthen the integration of science and technology on the existing foundation and promote the in-depth development of media convergence through technological revolution. In the 5G era, media information can effectively achieve the transformation of language, text, sound, and images during the communication process, promoting the organization and integration of content products and their production processes. Based on this, 5G technology has also launched a new round of revolution, effectively driving the transformation of digital information processing from data technology collection, storage, analysis, and application, thereby achieving data interoperability across various fields and laying a solid foundation for improving intelligent production levels, innovating business development, promoting social production, and enhancing economic levels.

Influenced by 5G technology, the media industry has begun to realize the transformation from "digitalization" to "datafication," while providing broader development space for data aggregation, connectivity, and analysis. Against the backdrop of the 5G era, 5G technology is bound to become a decisive inflection point for the development of the media industry, while also making possible the arrival of the all-media era.

3. Development Directions for Media Convergence Under 5G Technology

3.1 Gradual Blurring of Boundaries In reality, media convergence is not an entirely new approach or form. However, previous convergence models merely involved distinct interactions and collaborations among different types of media. Although various media forms underwent integration, clear boundaries remained evident. With the emergence and application of 5G technology, materials that previously required more than ten minutes to download can now be downloaded in just seconds under 5G networks, not only greatly improving transmission rates but also effectively reducing issues of lag and delay. Additionally, leveraging the high-speed transmission of 5G technology can effectively organize user interactions and discussions within small ranges, which will inevitably drive transformation and development in the news media industry. At this stage, users pay more attention to the content of news information, so media should focus their communication efforts on improving content quality to secure more

advantages for survival and development in fierce competition.

3.2 Deep Cooperation Between AI and Media Production With the deepening advancement of 5G technology, many internet companies have entered the media industry, and news media communication has begun to develop toward intelligence and diversification. Taking the application of intelligent robots as an example, Dreamwriter developed by Tencent can effectively participate in the creation and distribution of media content. Similarly, Xinhua News Agency' s "Kuai Bi Xiao Xin" and Nanfang Media Group' s "Xiao Nan" are also typical representatives. With the participation of intelligent robots, the efficiency of news draft creation and dissemination will be unprecedentedly improved, not only effectively reducing the workload of media industry personnel but also further achieving professionalization and intelligent development of news communication processes. Meanwhile, the participation of artificial intelligence technology can also provide users with more interaction opportunities. For instance, Baidu' s AI assistant "Xiao Du" can execute relevant services according to instructions after users converse with it and convey their needs, maximizing satisfaction of user demands in life services, audio-visual entertainment, and other aspects. In addition, Alibaba and Xiaomi have also successively launched their own intelligent voice speakers. When users employ these products, they also bring corporate concepts and services to their side, thereby better meeting various user needs in real life through 5G technology.

3.3 Application of AR/VR Technology Accompanying the transition from 4K, 8K, and 3D to IMAX, VR, and AR, users have also put forward higher requirements for audio-visual experiences. Compared with traditional media industries such as radio and newspapers, VR technology can help users achieve panoramic examination of news information, providing an immersive experience, while AR technology can further enhance the depth and breadth of news reporting. Affected by technical limitations, VR and AR technologies often face issues such as long delays, poor interactivity, and low resolution during use. However, with the adoption of 5G technology, these problems will be solved, thereby providing users with richer sensory experiences. Meanwhile, with the support of 5G technology, media businesses relying on VR and AR technologies will also present an explosive growth trend, and during this process, those who can accurately seize the application opportunities of 5G technology can gain advantages in the current media environment.

3.4 Enrichment and Development of Application Scenarios The arrival of the 5G era has made people pay more attention to the forms of information selection and reception, with simplification, speed, and convenience becoming users' primary pursuits. In this environment, smartphones, smartwatches, and other compact mobile terminals have begun to appear in people' s lives. With continuous technological upgrades, intelligent communication technology has entered family spaces, where refrigerators, televisions, kitchen appliances, and

other devices can all become carriers equipped with intelligent screens. Through effective connection via internet technology, people can watch live television even in the kitchen. In an environment of ubiquitous intelligent terminals, richer and more realistic application scenarios have become new development goals for the media industry, and in different scenarios, users will also propose different requirements for content reception. For example, in kitchen spaces, users often want to obtain information about diet and health, while on roads they want to obtain traffic information. Therefore, when distributing information, the media industry also needs to accurately understand users' special needs in different scenarios and provide personalized and targeted services.

4. Active Exploration of Media Convergence Under 5G Technology

Under the application background of 5G technology, the traditional media landscape will inevitably undergo development and innovation. In this process, we should strengthen the application of advanced technology while effectively ensuring information content, and introduce more innovative management models to achieve effective construction of an all-media communication system. Currently, China' s 5G technology research and development and construction have entered a new development period, and how to achieve further integration of the media industry through 5G networks has become a question that requires careful consideration.

4.1 Technology and Equipment Convergence With the arrival of the 5G era, communications and computing have gradually moved toward interoperability, thereby forming a broader technological ecosystem by leveraging their respective advantages. Introducing computing into communications can solve some of the problems within it while also endowing communications with more new functions. In this situation, users can directly control intelligent devices through mobile terminals. At the same time, the deep integration of communications and computing has also provided new development opportunities for the interoperability of the Internet of Things and the Internet, building a more intelligent network environment through big data, cloud computing, and the Internet of Things. Against the backdrop of technology and equipment convergence, the goal is not only to enhance the functionality of individual devices but also to achieve connection and interoperability between different devices, while effectively meeting the communication needs of millions of users through integration with 5G technology network capacity.

4.2 Content Convergence The convergence of old and new media has already developed in the 4G era, mainly reflected in the transformation of diversified information dissemination modes such as pictures, text, and video, while also achieving reasonable compatibility between different media products. However, AR and VR technologies still face instability issues during application. With the emergence of 5G technology, not only has the stability of technology

application been greatly improved, but technical support for multiple application scenarios has also been achieved, maximizing users' sense of immersion and realism. From the perspective of content production and distribution, although 4G technology demonstrated certain advantages in the production and operation of all-media content, issues such as content homogenization were also quite prominent. Faced with such problems, 5G technology will effectively optimize the processes of information production, processing, service, and dissemination, forming a new media communication pattern of "one-time collection, multiple processing, and diversified distribution," thereby further achieving intelligent and innovative development of news production and dissemination.

4.3 Management and Operation Convergence In the 5G technology environment, convergence in management and operation is also an important development direction for accelerating media integration. First, transformation in business models can directly affect the operational efficiency of the media industry. In this process, emerging media and traditional media can maximize the advantages of 5G technology in large bandwidth and low latency to build a new media communication system, while intelligently completing content push according to the characteristics of each terminal and completing the development and application of different distribution channels. Second, compared with the 4G era, the profit model of media in the 5G era has also undergone certain changes. Considering users' significantly increased dependence on smart devices, the media industry can improve overall efficiency by establishing an "online marketing, offline delivery" operation system. Finally, in the 5G era, building its own brand image is key to success for the media industry, and in the process of brand building, it should always focus on high-quality content, advanced technology, and sound management to stand out in fierce market competition.

5. Future Trends of Media Convergence Under 5G Technology

In future development, 5G technology will further commit to building a new generation of media communication systems, using large-bandwidth access technology and slicing functions to complete the collection and dissemination of information content such as video, audio, and manuscripts, and ultimately complete information transmission in the optimal form to achieve multi-scenario, multi-terminal information presentation. Therefore, in the future development process, the media industry' s application of 5G technology will be further enhanced, committing to providing users with richer experiences and interactivity on the existing foundation. In previous information transmission processes, media often faced user loss due to channel interruption. However, in the application environment of 5G technology, the cost for media to acquire users will be greatly reduced, and they can attract more users by revitalizing "private domain traffic."

The application of 5G technology will bring broader development space to traditional media. To achieve sustainable and stable development, traditional media should mainly carry out innovation from the following aspects: First, further

improve the application level of VR and AR technologies to provide users with richer sense of presence and realism. Second, traditional media should further enhance their intelligence level by introducing AI anchors and other forms to optimize news collection, editing, and dissemination processes, greatly improving timeliness. Third, traditional media should further optimize visual experience as the development goal of media convergence in the 5G era. Taking CCTV Video as an example, by combining 5G technology, 8K technology, and AI technology to launch a new media flagship platform, it provides audiences with more shocking visual feasts. Therefore, in future development, traditional media should actively strengthen the application of 5G technology, 4K/8K technology, and AI technology to effectively improve video transmission efficiency and quality on the existing basis.

Moreover, with the continuous advancement of 5G technology, every smart device can achieve interconnection through internet technology, thereby accelerating the arrival of the "everything is media"era. It can be said that the application of 5G technology gives everyone the opportunity to connect with the internet and puts forward brand-new requirements for media communication in this process. Faced with such transformation, the media industry needs to continuously seize opportunities, meet challenges, firmly grasp the key points of 5G era development, and achieve in-depth development of media convergence by building new communication platforms. At the same time, mainstream media should keep pace with the times and give full play to their important roles in public opinion guidance, thought dissemination, and cultural inheritance, becoming leaders and main forces in era development.

In summary, in the context of the 5G era, the media industry must firmly grasp the corresponding technological advantages to effectively achieve optimization and innovation in various processes of news communication and substantially improve news production efficiency. In the development process of 5G technology, integration with communication technology can present a more precise content distribution trend, thereby further accelerating the pace of media convergence and transformation and upgrading. At the same time, the media industry should actively face the impact and challenges brought by 5G technology and further promote the all-round development of media convergence and the construction of a new communication pattern.

To further ensure that 5G technology can play its due role in the media industry, the media industry should further strengthen research on 5G technology and summarize practical experience, while achieving standardized and intelligent construction of network infrastructure to provide technical support for the digital transformation of the economy and society.

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Note: Figure translations are in progress. See original paper for figures.