Impact of the 5G Era on News Communication and Reflections (Postprint)

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Abstract

Since the Ministry of Industry and Information Technology officially granted 5G commercial licenses to carriers including China Mobile, China Unicom, and China Telecom, it signifies the arrival of China's 5G era. At present, with science and technology serving as the core factor in productivity development, major technological innovations signify epochal transformations; naturally, the impact of 5G applications on the field of news communication is substantial. This paper expounds the fundamental concepts and connotations of 5G, analyzes its influence on the traditional news communication ecosystem, and proposes the application value of 5G in the domain of news communication.

Full Text

The Impact and Implications of the 5G Era on News Communication

Abstract

Since the Ministry of Industry and Information Technology officially issued 5G commercial licenses to operators such as China Mobile, China Unicom, and China Telecom, China has entered the 5G era. At a time when science and technology constitute the core factor of productivity development, major technological innovations inevitably herald epochal transformations, and the impact of 5G applications on the field of news communication is naturally profound. This paper expounds on the fundamental concepts and meanings of 5G, analyzes its influence on the traditional news communication ecosystem, and proposes the application value of 5G in the news communication domain.

Keywords: 5G era; news communication; impact

1. 5G Overview and Analysis of Its Impact on the News Communication Ecosystem

1.1 Basic Concepts and Meaning of 5G

The rapid development of 3G and 4G networks has transformed modern lifestyles, breaking away from the past model of single-mode audio calls and making remote human contact faster, more convenient, and visual, while simultaneously creating unprecedented development opportunities for multi-channel news communication. However, if the arrival of 3G and 4G networks changed existing lifestyles, the future popularization of 5G may well overturn our cognition of society and the world. 5G increases data transmission efficiency and hyper-connectivity by dozens or even hundreds of times, and against the backdrop of the "Intelligence Plus" era, it will accelerate the intelligent and smart development of various social fields and industries at an unprecedented pace. Naturally, the news media ecosystem will also usher in a new round of epoch-making transformation. The trial application of 4K+5G ultra-high-definition live broadcasting at the 2019 CCTV Spring Festival Gala fully demonstrated the broad practical prospects of 5G, revolutionizing television audiences' perception of traditional video transmission methods and delivering tremendous visual impact and enjoyment, thereby fully showcasing the promising commercial value of 5G.

5G communication technology (English: 5th generation mobile networks, 5th generation wireless systems, or 5th-Generation, abbreviated as 5G or 5G technology) represents the latest and fastest information transmission technology based on cellular networks. As a high-intensity version of 4G and 3G networks, 5G marks a historic breakthrough in mobile network technology. Built upon traditional cellular networks, 5G offers data transmission speeds up to 10GB per second—far exceeding conventional cellular networks—enabling perfect transmission of 4K and even 8K ultra-high-definition images while providing stable technical support for VR (Virtual Reality) and AR (Augmented Reality) live broadcasting. Moreover, 5G's advantages in broadband networks have triggered new development prospects for "cloud services" and "big data." 5G reduces 4G's already low latency even further, approaching zero delay, and enables unimaginably fast content display when clicking network links, fundamentally improving user experience. Additionally, 5G features an openness distinct from previous generations, essentially achieving open interconnection of IP (Internet Protocol) addresses and stable circuit interaction, enabling multi-channel connectivity among smart mobile terminals, smart TVs, and PCs, thus bringing endless possibilities for technological application scope and effectiveness.

1.2 Impact Analysis of 5G on the News Communication Ecosystem

Prior to 5G, mobile communication focused primarily on person-to-person interaction. With 5G's arrival, remote human communication has broken through the "human" barrier, gradually enabling information exchange between people

and objects, and between objects themselves. However, examining emerging science and technology through a dialectical lens reveals that any new technology or application is a double-edged sword with both advantages and disadvantages, and 5G is no exception. On one hand, 5G has transformed news resource production and dissemination methods, reshaping user behavior preferences; on the other hand, its rapid development has also brought more formidable challenges to the journalism industry. Issues such as increasing infotainment, frequent false information, unavoidable technical defects, and information cocoons have all constrained the optimization and upgrading of the media industry to varying degrees.

In light of this, news media practitioners must fully understand 5G, recognize its strengths and weaknesses, and master its application methods. Media organizations must also heighten their emphasis on 5G in platform construction, increase capital investment in relevant content platforms, strengthen the introduction and cultivation of talent, and comprehensively enhance news content innovation and public opinion guidance capabilities, thereby laying a solid foundation for the epochal transformation and upgrading of the news media field in the 5G era.

2. 5G Leads the News Communication Industry into a New Development Opportunity

The birth of 5G presents an excellent opportunity for deeper and higher-level integration between the news communication industry and the computer and internet sectors. In this new era, 5G, based on intelligence and informatization, will interact with emerging technologies such as AI, VR, and 4K ultra-high-definition, bringing unprecedented transformation and experience to news content collection, production, distribution, reception, and feedback.

2.1 5G + Micro-Video: Breaking Traditional News Communication Forms

As 5G has gradually become a social focus, mobile network intelligent terminal users have undergone deep expansion. By June 2019, the number of internet users in China reached approximately 854 million, with internet penetration exceeding 61%, among which mobile phone users accounted for 847 million, representing 99.1% of all internet users. This substantial growth in mobile users has further impacted traditional media audiences, continuously reducing their numbers and scale as they shift from newspapers, television, and radio to mobile media. Through this analysis, we can easily discern that internet users increasingly favor mobile terminals. 5G brings not only tremendous changes in information transmission and production methods but, more importantly, transforms traditional user behaviors and mindsets.

In the 5G context, information update and transmission speeds have increased dramatically, and new forms of communication such as ultra-high-definition,

AR, and VR have gradually become conventional in people' s lives. First, statistics show that Chinese mobile users already spend an average of over 3.12 hours daily on their devices, and 5G will break this "3.12-hour" barrier, making mobile usage time even longer. The emergence of new technologies gives rise to smoother and more enjoyable network services and experiences, closely linking human society with mobile intelligent terminals and enabling people to extensively experience the multi-faceted, multi-angle, and multi-level convenience services that 5G provides. Second, netizens have put forward new demands for fragmented, intuitive information browsing, no longer limited to pure text news. The proportion of picture and video news is gradually increasing, while lengthy text news is becoming marginalized. As news media widely adopt technologies such as VR panoramic shooting, naked-eye 3D, three-dimensional video, and all-media live broadcasting, mobile news reporting has gained universal recognition in both industry and academia, generating strong social response. Finally, media users' social pathways will be further expanded, with social attributes increasing substantially. As an important product of network and information technology, social functions serve as a crucial channel for enterprises to understand user information. Social media platforms can easily obtain various user data, thereby providing more personalized services that align with user characteristics and making news content push more targeted. The degree to which news media understands its audience determines the development direction of news content itself. The competition for traffic based on 5G communication networks will become more intense, further promoting the reshaping of media industry forms and systems in this fierce competition.

Currently, short video news accounts for a significant proportion in news communication apps such as Toutiao News, Oriental News, Tencent News, and Pear Video, with click-through rates ranging from hundreds of thousands to tens of millions, reflecting the enormous consumer market for short video news. Meanwhile, mainstream media have successively deployed short video news production and dissemination, with People' s Daily, CCTV News, and various provincial and municipal news media launching short video apps and establishing presence on multiple short video platforms including Kuaishou, Huoshan, Douyin, Pipixia, and Meipai, doing their utmost to develop short video news businesses.

2.2 5G + 4K Ultra-High-Definition: Bringing Ultimate Sensory Experience

Although 4K ultra-high-definition video technology has been available for many years, it has consistently struggled to break through data transmission bottlenecks until CCTV launched China' s first 4K ultra-high-definition television channel in January 2018, marking a breakthrough in this constraint. Now, the arrival of the 5G era has ushered 4K ultra-high-definition into a new development stage. In 2019, the CCTV Spring Festival Gala applied 5G network technology to conduct its first 5G network + 4K ultra-high-definition video

test. In mid-March 2019, the first 5G + 4K ultra-high-definition video news live broadcast was completed. In June 2019, the 22nd Shanghai International Film Festival' s news live broadcast achieved high-level integrated production of multiple signals, conducting full-course 4K ultra-high-definition live broadcasting of the opening ceremony and completing data transmission supported by 5G technology.

Evidently, 5G development provides solid guarantees for the application of 4K imaging technology in the news media industry. First, based on the principle of news authenticity, the high-fidelity, high-simulation ultra-high-definition images displayed by 4K ultra-high-definition video imaging technology can enable audiences to have more direct and authentic visual experiences, allowing users to feel the true face of news as if they were physically present. Second, 5G enables 4K imaging technology to break through data transmission bottlenecks, substantially reducing information delay effects and enhancing the timeliness of news communication content.

2.3 5G + VR Virtual Reality Technology: Optimizing News Presence Experience

VR technology, or virtual reality technology, refers to the use of computers and other equipment to realistically simulate and restore 3D spatial environments, providing users with multi-dimensional sensory experiences including hearing, vision, and even touch. Under 4G network technology, VR virtual reality technology has undergone multiple practical attempts in the news media industry. However, due to constraints in data transmission, production, and practical application, as well as limitations in internet speed and data computing scale, these attempts have remained superficial without achieving substantial progress, and users' visual experience effects have been less than ideal. With the arrival of 5G, however, issues related to VR virtual reality information transmission, computing, and networking have been effectively resolved. The practical application and popularization of VR news are gradually increasing and will become a conventional news reception channel for the general public in the near future.

The development of VR virtual reality technology in the information age brings users to more authentic and objective news scenes, enabling 360-degree immersive, ultra-realistic experiences that allow people to feel news events from multiple angles and dimensions. This represents the core and key of VR technology and constitutes the ideal goal that modern news communication fields continuously explore, pursue, and aspire to achieve. Against the backdrop of the 5G era, VR virtual reality technology brings immersive news experiences to users, substantially enhancing audiences' objective understanding and cognition of various news information. In the near future, as 5G further matures, VR news is highly likely to become one of the mainstream channels for news communication.

2.4 5G + AI Artificial Intelligence Technology: Improving News Communication Efficiency

AI artificial intelligence technology refers to a newly emerging computer science technology in recent years. Applying AI artificial intelligence technology to the news industry is not a novel concept. In terms of data collection, the birth of intelligent unmanned aerial vehicle shooting equipment in 2014 enabled journalists to complete disaster scene tracking shots and actual battlefield tracking shots that were impossible under traditional interview modes, opening up a new pathway for news resource collection. The automated news input and writing equipment developed by Shenzhen Tencent Technology Co., Ltd. in 2016 substantially reduced the workload of journalists, accelerated the compilation speed of news materials, and deeply extended news content and perspectives. In news dissemination, AI artificial intelligence technology significantly improves data information transmission speed, making targeted and personalized news push a reality and comprehensively enhancing users' interest in news content and their enthusiasm for news reading.

With the continuous development of 5G modern network communication technology, the scientific application of AI artificial intelligence technology in the news media industry will achieve essential breakthroughs on the 4G foundation, substantially improving the quality and efficiency of AI news input and editing equipment and enabling more AI scenarios to be realized. Additionally, the high-level combination of 5G and AI artificial intelligence technology will comprehensively complete tracking and recording of user information, making news push and dissemination more precise.

Conclusion

In summary, against the backdrop of 5G, information update and transmission speeds have increased dramatically, and new forms of communication such as ultra-high-definition, AR, and VR have gradually become conventional in people' s lives. In the 5G era, news media workers will face more opportunities and challenges. We must continuously cultivate high-quality, high-level 5G talent, conduct in-depth analysis of the advantages and disadvantages of 5G applications, and overcome technical difficulties one by one. We must further improve the quality of news product production and service levels to avoid weakening news value, and construct and optimize network public spaces to break the constraints and limitations of information cocoons. Simultaneously, relevant administrative management departments should increase supervision, management, and support for the news media industry to safeguard the application of 5G in the news communication field. In practice, based on existing mainstream media institutions and fully utilizing their core production capabilities, social credibility, and other advantages, we should promote their upgrading and iteration toward "new mainstream media."

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