A Preliminary Analysis of the Convergence of 5G Technology and Media: Postprint

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Abstract

In the contemporary context, 5G technology has achieved further development, creating numerous innovative opportunities for modern life and catalyzing media advancement. The convergence of 5G technology with media plays an effective practical role in our nation' s social development. From this perspective, this paper conducts a detailed analysis of the significant impacts generated by the development of 5G technology and presents a comprehensive exposition of new media integration approaches.

Full Text

An Analysis of the Convergence Development of 5G Technology and Media

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Abstract: Against the backdrop of our current era, 5G technology has achieved further development, providing numerous innovative opportunities for modern life and catalyzing media development. The convergence of 5G technology and media offers tangible benefits for China' s social development. From this perspective, this article provides a detailed analysis of the significant impacts generated by 5G technology development and offers a comprehensive exposition of new media convergence approaches.

Keywords: 5G technology; media development; Internet development; media convergence

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The effective convergence of 5G technology with media during its development manifests as comprehensive integration across multiple dimensions, including business models, platforms, and technologies. In its current evolution, media has

already exhibited characteristics of globalization, full-process coverage, and diversification, with its informatization features undergoing continuous optimization. The integration of 5G technology with media development represents a further application of Internet technology in the field of information dissemination, warranting attention from both technology R&D personnel and media industry professionals.

1. Analysis of 5G Technology and Media Development

5G technology refers to the fifth-generation mobile communication technology. The digital cellular network formed by 5G divides service areas across different geographic regions, presenting various digital analog signals on mobile terminals. When a mobile terminal moves from one region to another, the device automatically switches to the new network to transmit the most current information. As an emerging communication technology, 5G offers broader access and faster speeds in information processing and acquisition, along with greater storage capacity and lower development costs for new technologies. Due to its numerous advantages—including high transmission rates, low latency, low energy consumption, low costs, large system capacity, and excellent device compatibility—5G occupies a pivotal position in the new round of technological transformation.

Compared with previous 4G technology, 5G' s transmission rate is 100 times faster, and its response speed is 30-60 times quicker. If 4G solved the problem of connecting people to people, then 5G realizes communication between people and people, people and things, and things and things. Therefore, the future popularization of 5G will undoubtedly elevate the lives of the general public to a new level. The mature development of 5G technology forms the foundation for the Internet of Everything. Once IoT becomes widespread, people can use terminal devices to achieve remote control, making office work more intelligent. In 2020, 5G communication technology was officially commercialized. This new technology not only improves public communication methods but is also expected to achieve deep integration across multiple fields, including media, medical services, education, machine learning, and autonomous driving, fundamentally transforming modern lifestyles.

In terms of its conceptual definition, media refers to effective channels for disseminating information and represents the means through which humans transmit and acquire information during societal development. Media convergence involves the integrated unification of various media forms—including print, television, radio, and online media—within a networked and digital framework, as well as the integrated development of personnel allocation, media copyrights, and organizational structures. Therefore, media convergence is not merely the integration of information transmission methods but also encompasses the integration of media content and media operations. Through the development of new media terminals, the media industry will spawn various information industries, ultimately delivering this content to ordinary users across different publishing platforms.

Current 4G technology is already highly mature, and its role in driving tremendous changes in the media industry is evident to all. Although it has given rise to many excellent converged media industries, numerous thorny issues remain. The emergence of 5G technology provides possibilities and strong technical support for resolving these problems.[1] In the current context, some media outlets have already gained effective practical advantages by leveraging their media characteristics combined with 5G technology for dissemination. The advent of 5G technology has ushered the current mobile Internet into a period of efficient innovation. The convergence of 5G technology and media can effectively alter mobile user habits and further optimize the innovative characteristics of media transmission speeds and modes, enabling effective alignment with contemporary demands.[2]

2. Realistic Background of 5G Technology and Media Convergence Development

2.1 Era Demands for 5G Communication and Media Convergence Currently, commercial giants represented by Huawei have focused their attention on the technological R&D of 5G technology. Undoubtedly, 5G communication technology has become the technological focal point of 2020. The development of 5G technology enables people to enjoy faster experiences and more intelligent services in all aspects of daily life, from clothing and food to housing and transportation. The application of various terminal devices will provide the public with intelligent lifestyles, injecting fresh vitality into society.

The period from the early 1980s to the late 1990s witnessed 20 years of exponential growth in mobile communications. This generation represents the primary user group of mobile communication tools, accounting for 75% of the world' s total population. The generation born after 2000 has grown up alongside the Internet, demonstrating strong adaptability to Internet updates and iterations, with more personalized and distinctive cultural symbols. With rapid technological development, various high-end and intelligent products require such a group as their market, and this generation also craves the emergence of cutting-edge technologies.[3] Their consumption concepts and acceptance capabilities, different from those of the past, are also driving and contributing to Internet development. These groups have gradually become China's middle class, and their scale will profoundly influence the composition of the labor force and urbanization trends, consequently affecting media development and transformation.

2.2 Feasibility of 5G Communication and Media Convergence From the perspective of the audience, the world currently has a massive base of Internet users, particularly among the middle class with innovative consumption concepts. The middle class exhibits strong curiosity about new things and possesses high consumption capacity for quality information. By 2050, the escalating aging problem will create enormous development potential for the healthcare industry and intelligent information media industry. Urbanization has become

an unstoppable trend. In the all-media era, to provide higher-quality services for urban users, it is necessary to utilize 5G technology to achieve organic integration of traditional and new media, thereby enabling media to further enhance information service levels in cities.

From the perspective of technical support for media convergence, the rise of 4G successfully integrated traditional media into new media. Leveraging its characteristic of interconnecting everything, 5G' s interconnection of various mobile terminals has built a new ecological environment for media convergence.[4] From the directional perspective of convergence, due to the vertical distribution of the media industry and the fragmented distribution of audience information, traditional and new media must undergo organic integration under market stimulation to further reduce information production costs and ensure maximum returns. Media convergence is a practical demand of the times. In the current development process, numerous technology companies have oriented their research toward 5G as a foundation for R&D. 5G can provide faster real-world experiences and superior service experiences, applicable to all aspects of life, transforming how people live, work, and travel in contemporary society while effectively highlighting intelligent experiences. In the context of new media, audience demand for media diversification and high-end content has further intensified, compelling the entire media market to possess innovative capabilities.

2.3 The Inevitable Demand of Global Development for Technology Convergence According to relevant projections, the world' s total population will exceed 2.5 billion by 2050, with China being one of the most populous countries globally. China is also among the countries with relatively rapid urbanization processes. According to statistics, China' s urban population will reach 70% of the total national population by 2050, indicating that China' s urbanization speed will further accelerate in the coming years. The construction of 5G and corresponding media convergence plays an extremely important role in promoting urbanization and provides development opportunities for the related media industry. According to statistics, by 2050, China' s total elderly population will exceed the total population of the United States.[5] From this perspective, 5G technology development can effectively boost the development of the aging market, and the elderly artificial intelligence industry will be effectively expanded within the development of 5G services. Various domains such as artificial intelligence and smart home services will create certain changes in the practical needs of cities as a whole. Effectively combining these demands with media will further highlight the intelligent characteristics inherent in 5G technology development.

3. Development Characteristics of 5G Technology and Media Convergence

3.1 Enhancing the Depth of 5G Technology and Media Convergence Traditional media in its development process has exhibited relatively singular

and fragmented characteristics. The convergence of the Internet with media has further optimized media, with VR and AR serving as representative applications throughout media convergence development. Compared with traditional media methods, VR technology can provide 360-degree coverage of news scenes, enhancing the authenticity and effectiveness of media reporting while further optimizing the depth and breadth of traditional media.

Although VR technology can also provide authentic experiences within the specific application of 4G technology, its low-resolution characteristics during application prevent effective enhancement of scene realism, and viewers easily experience visual fatigue after prolonged watching. 5G technology can effectively solve these problems in media development. Compared with 4G technology, 5G technology employs relatively higher throughput during its development—its throughput capacity is 10 times that of 4G, and its transmission volume can increase corresponding data by 100 times compared with 4G. This transmission capacity can fully meet the specific demands of VR and AR while effectively resolving issues such as insufficient data transmission volume and information delay. In practical applications, it can effectively promote various experiences including gaming and film viewing. The further development of intelligence has effectively increased the innovative characteristics of new media while further optimizing the depth and breadth of the entire journalism industry' s development.

3.2 Effectively Reconstructing the International Communication Landscape Mobile development has already assumed an irreversible development trajectory. 5G technology development can effectively solve the information application problems existing in 4G technology development, and 5G technology development can fully update technical standards worldwide. The effective development of 5G and media convergence in international markets can further dissolve existing boundaries, thereby enabling seamless global information communication. For China, effectively innovating corresponding technologies and content represents a practical characteristic of 5G technology development. Furthermore, the further development of 5G technology and its leading position have also broken the existing international pattern to a certain extent, enabling the country to occupy a relatively superior discourse power in global network development, thereby effectively enhancing national comprehensive strength and allowing the country to achieve further optimization in its Industry 4.0 development process.[6]

3.3 Fully Adapting to Media Industry Development Needs For the media industry, the convergence of 5G technology and media represents a once-in-a-decade opportunity. The media industry should seize this opportunity and vigorously promote deep media convergence to achieve leapfrog development. Media should facilitate integration in both technical and content aspects. Traditional media possesses mature development experience in content, with relatively stable publication quality and audience groups. However, compared with

new media, it remains at a disadvantage in terms of information transmission speed, timeliness and effectiveness of information, and information presentation methods.

As a new generation of media professionals seeking greater achievements, it is essential to use 5G as the development backdrop, accelerate the integrated development of physical publications and terminal devices, and simultaneously achieve deep, leapfrog development of media. Diversified, integrated, and popularized media is what the masses need, and media should develop in directions that meet public demand, thereby reversing the declining state of the traditional media industry in one fell swoop. The deep convergence of 5G technology and media is not merely a transformation of traditional media but also promotes the strengthening of national ideology and the modernization of national governance capabilities. Therefore, as media professionals in the new era, we should build professional teams, ride the wave of 5G technology development, continuously explore and practice under the deep integration of emerging technologies and media, create media that adapts to the times and possesses influential communication power, and further guide society toward better development.[7]

3.4 Development Trends and Obstacles of 5G Technology and Media Convergence The arrival of a new era will inevitably bring new development paths and new industry opportunities. First, in a network environment supported by 5G technology, the fermentation cycle of public opinion is compressed to an extremely short timeframe. New media after convergence can use advanced methods such as big data to promptly detect the latest trends in information flow, enhancing China' s social public opinion supervision capabilities and sentiment monitoring functions.

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