

Practical Application of 5G Technology in News Production: Postprint

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Date: 2023-10-08T00:00:00+00:00

Abstract

The development of 5G technology has brought about a transformation in journalism philosophy, shifting from the past “audience-centered” approach to a “user-centered” approach, moving from the concept of “segmented audiences” to personalized customization, and altering the connotation of news value. With the further advancement of 5G technology, major media organizations are actively constructing 5G converged media platforms, applying 5G+4K technology to video live streaming and 5G+VR and 5G+AR technologies to news production, thereby engendering tremendous transformation in the field of news production. While 5G technology facilitates transformation in news production, it also intensifies industry competition to a white-hot level, impacts the information dissemination environment, and renders network information security issues more severe. By analyzing the challenges that 5G technology presents to the field of news production and identifying its developmental direction within this domain, the objective is to promote its advancement in news production and drive the progress of journalism in China.

Full Text

Practical Application of 5G Technology in News Production

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Abstract

The development of 5G technology has brought about transformations in journalistic concepts, shifting from the traditional “audience-centered” approach to a “user-centered” paradigm, moving from the “segmented audience” concept toward personalized customization, and altering the connotation of news value. As 5G technology continues to advance, major media outlets have actively built

5G converged media platforms, applied 5G+4K technology in video livestreaming, and utilized 5G+VR and 5G+AR technologies in news production, ushering in tremendous changes in the field of news production. While 5G technology promotes transformation in news production, it also intensifies industry competition to a white-hot level, affects the information dissemination environment, and makes network information security issues more severe. By analyzing the challenges that 5G technology brings to news production, this paper identifies its development directions in the field, aiming to promote its advancement in news production and drive progress in China's journalism industry.

Keywords: 5G technology; news production; user-centered; video livestreaming; 4K; VR; AR; network security

CLC Number: G20

Document Code: A

Article ID: 1671-0134(2021)01-030-03

DOI: 10.19483/j.cnki.11-4653/n.2021.01.006

Citation Format: Chen Yuxiao. Practical Application of 5G Technology in News Production [J]. *China Media Technology*, 2021(01): 30-32.

1. Transformation of News Concepts Brought by 5G Technology

1.1 From “Audience-Centered” to “User-Centered” The so-called “audience-centered” approach refers to news organizations fully considering the real needs of their audience during news production, taking meeting audience demands as their mission, thereby forming their core audience group, expanding market space, and achieving profitability. However, with the further development of network technology, especially the arrival of the 5G era, the term “audience” can no longer fully capture the demand of online groups for massive amounts of information and personalized content; only “users” can adequately reflect the information needs of online communities in the 5G era [1]. The “user-centered” concept means that news media must fully consider the different needs of various groups when disseminating information online, thereby satisfying their personalized requirements. Simultaneously, the user-centered approach places greater emphasis on user participation and interactivity in news production.

Taking the Xinhua News Agency mobile client as an example, the manifestation of “user-centered” design is primarily evident in its provision of contextualized experiences for users, which enhances news authenticity while meeting users' visual demands. For instance, every spring, thousands of people visit Wuhan University to view the cherry blossoms, but the sudden outbreak of the pandemic prevented anyone from enjoying this beautiful scenery. During the cherry blossom season, Xinhua News Agency launched a “cloud livestream,” enabling people across the nation to appreciate the beauty of Wuhan University's cherry

blossoms through its client. This not only enriched people's daily lives but also elevated users' visual aesthetics.

1.2 From “Segmented Audience” to Personalized Customization The concept of “segmented audience” refers to the idea that audiences are not homogeneous, isolated collections of individuals but rather socially diverse populations. The emergence of the segmented audience perspective stems from the development of network technology, which has increased people's access to information channels and reduced their sole reliance on mass media. Audiences can now obtain needed information online, and to reshape media authority and grasp discourse power in the new era, news media have begun to respect audience members' personalized needs and satisfy the diverse requirements of different audience groups. However, in the 5G era, merely respecting audience personalization is far from sufficient; personalized customization is also required. Personalized customization means that news production should gradually orient toward individual users, striving to meet each user's personal information needs.

For example, the homepage of the Xinhua News Agency client is divided into multiple channel types, including Top News, Study, Politics, and International, allowing users to select different news channels for browsing based on their preferences. Moreover, the Xinhua client can infer users' preferences from their browsing history and promptly recommend corresponding news information to satisfy their information needs. Additionally, the Xinhua News Agency mobile client has added a “Follow” section where users can follow different subscription accounts to obtain information, thereby meeting their diverse information needs. Although personalized customization in China's news media remains in its initial stage, it will further develop with the support of 5G technology.

1.3 Transformation of News Value Connotation News value serves as a crucial criterion for evaluating whether a piece of information can become news. In traditional journalism, news value was primarily manifested in whether it possessed timeliness, importance, proximity, prominence, and interest. However, in the 5G era, the connotation of news value has changed, with the demand for news “timeliness” transforming into a demand for “immediacy.” Timeliness in news refers to recency in time, meaning that news should report recently occurred facts; any “stale news” fails to meet the timeliness requirement and consequently cannot be considered news. In the mass media era, due to technical limitations, the timeliness of news was reflected in reporting “yesterday's news.” In the 5G era, however, this timeliness requirement has transformed into “immediacy,” meaning that any news event must be disseminated at the fastest possible speed as soon as it occurs [2]. For example, after 137 new asymptomatic COVID-19 cases were identified in Shufu County, Kashgar Prefecture, Xinjiang, mainstream media responded swiftly, with “CCTV News” releasing relevant information at 22:47 to raise public awareness.

The ability to achieve immediacy in news reporting during the 5G era is largely attributable to the fact that news dissemination no longer relies solely on professional journalists; any witness to a news event can become an original disseminator of news.

2. Practical Application of 5G Technology in News Production

2.1 Construction of 5G Converged Media Platforms A converged media platform is a new type of dissemination platform that emerged against the backdrop of media convergence development. With the arrival of the 5G era, converged media platforms have gained new development directions and presented new characteristics. A converged media platform refers to the aggregation of various different media types through concentration or internal control to achieve “one-time collection, multiple generation, and diversified distribution.” Building such platforms can significantly enhance the influence of mainstream media and represents a crucial measure for mainstream media to meet the challenges of new media. The operation of converged media platforms demands high network speeds, as they need to generate and disseminate large amounts of information within short timeframes. Without excellent network speed support, it is difficult to effectively improve the efficiency of converged media platforms. 5G technology has substantially increased data rates, with download speeds reaching 1Gbps, far exceeding 4G networks’ 100Mbps. The advent of the 5G era has provided fundamental technical support for building converged media platforms, making the construction of 5G converged media platforms feasible. For example, the “central kitchen” model constructed by *People’s Daily* in the 5G era has significantly improved its operational efficiency as a traditional media outlet. Utilizing H5 pages and new media clients for information dissemination not only enhances dissemination efficiency but also satisfies users’ information needs.

2.2 Application of 5G+4K in Video Livestreaming 4K refers to high-definition video transmission. Utilizing 4K technology for video livestreaming can enhance users’ visual experience and thereby achieve better dissemination effects. However, high-definition video livestreaming requires extremely fast network transmission speeds; otherwise, it reduces picture quality or causes buffering, negatively impacting users’ viewing experience. Consequently, during the 4G era, news media rarely employed 4K technology for field livestreaming to ensure smooth broadcast processes. With the arrival of the 5G era, 5G technology has won the favor of news media through its stable transmission signals and fast transmission speeds. From its inception, it has been applied in news communication, bringing tremendous transformations to the field. During the 2019 National Day military parade, CCTV adopted the emerging 5G+4K technology to broadcast the parade live, significantly improving visual effects and providing online viewers with an excellent visual experience. This has greatly contributed to advancing the further development of news livestreaming in China. Since the 2019 National Day parade, the 5G+4K video livestreaming

model has been widely adopted by news media and has gained popularity among vast user groups. Currently, CCTV.com has developed a dedicated “4K Zone” to attract netizens’ attention, with programs such as *Fly to the Moon* and *Every Treasure Tells a Story* being recorded using 4K technology to enhance viewers’ experiences through the adoption of new technologies [3].

2.3 Application of 5G+VR in News Production VR technology, or virtual reality technology, can utilize technological means to create an entirely new world distinct from reality, enriching the manifestation of things. The arrival of the 5G era has created prerequisite conditions for the large-scale commercial application of VR technology. News media have intensified their use of VR technology in news production, thereby strengthening users’ understanding of news events. In the past, media typically relied on text, audio, or video formats to report news events. While these could help users understand the ins and outs of events to some extent and satisfy their information needs, text and audio could not create a sense of presence for users. Although video could somewhat enhance users’ sense of being at the scene, it failed to create a true “sense of being there.” The active adoption of VR technology in news reporting can accurately recreate the scene of news events. Users only need professional equipment to enter the “news scene” and interact with it, which helps create a “sense of being there,” reflects the internet-era user’ s consciousness of “I am the subject,” and simultaneously enhances the authenticity of news reporting. For example, during the 2019 Youth Day, a special “Time Machine” appeared at various universities, allowing students to have telephone conversations with historical figures such as Lu Xun. This “Time Machine” utilized VR technology to create a virtual world, thereby enabling communication between university students and famous personalities [4].

3. Challenges 5G Technology Brings to News Production

3.1 White-Hot Industry Competition Trend News media face a severe survival crisis in the 5G era, particularly as the emergence of self-media has significantly encroached upon the living space of traditional media, forcing traditional outlets to undergo transformation and convergence development. Traditional mainstream media cannot rely solely on their media status to possess discourse power in the internet era; they must adapt to the development of network society based on familiarity with the online environment and netizen group characteristics to reshape media authority. Fierce competition exists among traditional media during this transformation and development process, which has become an undeniable reality. A typical characteristic of the internet era is the presence of massive amounts of information. In this environment, where people have increased access to information channels, users with limited attention can only select the information they need. Consequently, how to form their own core audience group, compete for users’ attention, and thereby expand market space has become an issue that media must confront during transformation and development. The development of 5G technology has blurred the boundaries be-

tween mainstream media, self-media, and commercial media. To obtain profits and achieve profitability, all media must continuously adjust their operational strategies to compete for users' attention, causing competition in the media industry to present a white-hot trend [5].

3.2 Impact on Information Dissemination Environment The 5G era is a “user-centered” era in which users no longer rely on mass media to obtain information or passively receive information in a one-way manner. Instead, they can search for needed information anytime and anywhere on the internet, interact with media through comments and other forms on online platforms, and even become disseminators of news information through self-media and short-video livestreaming platforms. Network technology is a double-edged sword: while it elevates the status of user groups, it also brings a series of problems that affect the information dissemination environment. Timeliness is the lifeblood of news. In the internet era, fierce competition among various media for timeliness has led to the emergence of large amounts of fake news and reversed news. Fake news refers to news reports containing numerous details that do not correspond to actual circumstances. With the improvement of journalists' professional quality, intentional fabrication is relatively rare; in most cases, it results from one-sided pursuit of timeliness while neglecting information verification. Reversed news refers to situations where, at the beginning of a news event, journalists report without thoroughly investigating the truth, driven by timeliness and economic value considerations, thereby attracting widespread societal attention. However, as time passes and the truth gradually emerges, subsequent news reports present completely opposite coverage to the initial reports [6]. Both fake news and reversed news have caused a decline in media credibility, which is detrimental to creating a healthy information dissemination environment across society and cyberspace.

4. Development Directions of 5G Technology in News Production

4.1 Scientific Layout of Industry Development To address the problem of white-hot industry competition, the media sector should scientifically plan its industry development. First, traditional media should accelerate the pace of convergence development to achieve economies of scale. Media convergence includes aggregation-type and internal control-type models, but regardless of the form, both can achieve the important functions of integrating communication resources and improving dissemination efficiency. Therefore, traditional media should accelerate convergence by forming news groups or building converged media platforms, thereby enhancing the influence and credibility of traditional media and securing a stable market share in fierce competition. Second, both traditional and self-media should establish their own core audience groups to achieve economic objectives. A core audience group refers to people who consistently maintain interest in a particular medium. While establishing a core audience group may appear to narrow market space, in reality, only a minority of people view any comprehensive news product, whereas specialized news prod-

ucts often gain popularity among groups in certain fields, thereby generating better economic results. Moreover, the internet era is an era of niche markets, and mass communication methods are unsuitable for network society development. Consequently, news media should establish their core audience groups by formulating operational strategies [7]. Finally, news media should actively utilize emerging technologies to enhance their influence. Actively employing emerging technologies in news reporting can not only improve news production efficiency but also attract users' attention. Therefore, news media should strengthen the use of 5G+4K in news livestreaming, enhance the application of VR and AR in news reporting, and simultaneously build converged media platforms supported by 5G technology.

4.2 Maintenance of Information Dissemination Environment In the 5G era, maintaining the information dissemination environment is necessary to safeguard user groups' right to know about news information. First, journalists should return to pursuing the truth of events themselves. The emergence of large amounts of fake news and reversed news in the new media era is largely due to journalists' failure to emphasize fact-checking under fierce timeliness competition, instead writing news reports based solely on superficial phenomena or hearsay information, thereby causing news distortion. "What is closest to us is reality; what is farthest from us is truth." News reality means that every detail in a news report must withstand factual verification, but partial reality does not represent overall reality. Even when journalists achieve detail-level reality in their reporting, they can still produce overall distorted results. Pursuing the truth behind news events and excavating the reasons behind them constitutes an important pathway to satisfying users' right to know about news events. Therefore, in fierce market competition, news media workers should also return to pursuing event truth itself, using authentic news reporting to enhance media credibility and thereby win the favor of user groups [8].

Second, journalists should improve their professional quality. Possessing high professional quality is crucial for journalists to maintain news authenticity. Without professional quality, it becomes difficult to persist in pursuing news truth amid various external temptations. The rapid development of 5G technology enables everyone to search for needed information online in shorter time, and vast numbers of journalists also use this convenience to discover news clues on the internet. However, news clues are merely the embryonic form of news events; journalists need to conduct follow-up investigations to obtain a comprehensive understanding of news events. Many journalists do not entirely forego investigation after obtaining clues but merely "catch wind and shadow" of various online information to write news reports, thereby causing news distortion. Therefore, under the pressures of timeliness requirements and economic interests, journalists who wish to improve their professional quality need to clarify their professional goals and return to journalism itself in a materialistic world.

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(Editor: Zhang Xiaojing)

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

Source: ChinaXiv – Machine translation. Verify with original.