A Preliminary Exploration of Content Innovation Directions for Short Videos Under 5G Conditions (Postprint)

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Abstract

With the advancement of 5G technology research and development and its gradual commercialization, short videos are ushering in a period of technological dividends. Characterized by high speed, low latency, and ubiquitous connectivity, 5G technology will enable short videos to better leverage artificial intelligence, Internet of Things, virtual reality, augmented reality, and other technologies, thereby providing more extensive and compelling new application scenarios. Consequently, the focus of content innovation for short videos is concentrated on directions such as immersion, interactivity, refinement, and intelligent connectivity.

Full Text

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Abstract: With the advancement of 5G technology R&D and its gradual commercialization, short videos are ushering in a period of technological dividends. Characterized by high speed, low latency, and ubiquitous connectivity, 5G technology will enable short videos to better leverage artificial intelligence, Internet of Things, virtual reality, augmented reality, and other technologies, providing broader and more exciting new application scenarios. Consequently, content innovation for short videos is focusing primarily on directions such as immersion, interactivity, refinement, and intelligent connectivity.

Keywords: 5G; short videos; artificial intelligence; Internet of Things

Short videos, with their brief duration, concentrated content, and strong expressive power, rapidly penetrated mass culture during the 4G era to become a mainstream form of cultural consumption. In June this year, China officially

issued 5G commercial licenses, marking the beginning of the 5G commercial era in the country. The integration of 5G technology with 4K, 8K, and VR will open up endless possibilities for short video development. *The New York Times* has partnered with Verizon to launch a 5G News Lab, believing that 5G' s high-speed transmission may trigger a digital journalism revolution in two key areas of the media industry: newsgathering methods and news distribution approaches. In terms of content dissemination, the lab will focus on exploring how to deliver better VR content, enhanced AR experiences, and develop more 3D environmental applications. Indeed, Xinhua News Agency has already taken the lead in VR/AR/MR short video content production, not only operating dedicated VR/AR news channels but also launching holographic, rich-media short videos like *Holographic Interactive Report Viewing* using MR smart studios during the 2019 Two Sessions sessions. Such immersive short video content will have even broader space for technical application and creative upgrading under 5G conditions.

1. Immersive Content: Short Videos Utilizing VR/AR/MR Technologies

In the 4G era, VR/AR wearable devices frequently suffered from issues such as blurring and slow response times. However, with the upgrade to 5G technology —characterized by high speed, low latency, and ubiquitous connectivity—the immersive audio-visual experience of VR/AR/MR will be significantly enhanced, continuously optimizing user experience. According to the *2018 VR/AR White Paper* released by the China Academy of Information and Communications Technology, China's VR market size exceeded 60 billion yuan in 2018 and is projected to surpass 160 billion yuan by 2020, with 5G likely being the catalyst for VR' s explosive growth.

The innovation opportunities for short videos in the 5G era are naturally first embedded within VR/AR/MR technologies, as evidenced by the strategic positioning of major streaming platforms and news media. iQiyi released its Qiyu 2S VR all-in-one headset in 2019, while ByteDance acquired VR video live-streaming solution provider VSCENE in 2018. In early 2019, China Media Group partnered with mobile operators to establish a 5G New Media Laboratory. Aiming to build a world-class new mainstream media outlet, the laboratory has elevated short video development to a strategic priority, proposing to integrate 5G technology with 4K, 8K, and VR capabilities.

2. Interactive Content: User-Driven Narratives and Video-Based Interaction

Interactivity represents the most important characteristic of new media content. In the 5G era, enhancing short video interactivity naturally becomes a crucial direction for content innovation. This interactivity has two dimensions: one at the narrative level, where users determine content direction, and another at the

technical level, involving video-based feedback through intelligent technologies.

At the end of 2019, Netflix launched *Black Mirror: Bandersnatch*, an interactive video content that allows viewers to select protagonist actions during playback, thereby generating multiple branching storylines that influence the main narrative. Similar scenario and character interaction designs hold significant implications for short video content innovation. As 5G reduces transmission latency, the entire interaction chain— "receiving choice prompts—making selections—obtaining narrative feedback"—will become more efficient, substantially improving viewing experiences. The emergence of multiple choice points will better engage users with short video content, granting them greater viewing autonomy.

On the other hand, short video platforms including Douyin and Tencent Weishi have leveraged artificial intelligence to develop numerous novel video feedback interaction methods. In recent years, Douyin has successively launched features such as the 尬舞机 (Awkward Dance Machine), AR stickers, rain control, duets, and spotlight functions. The popular "rain control" feature, for instance, applies two AI technologies—gesture recognition and particle systems. Each time users open their hands, the underlying AI gesture algorithm begins high-speed computation to render raindrop particle effects. The "spotlight" function enables users to record small videos that interact with favored content and creators, transforming traditional comment-and-like interactions into video-based feedback. Tencent Weishi, in partnership with the variety show *Produce Camp 2019*, also introduced a series of interactive video features, allowing audiences to click on-screen to select little-known scenes from idol trainees' lives—such as eye exercises or cool dance moves—thereby enhancing users' sense of participation in idol "development."

Additionally, knowledge-based interactive short video apps like Guokr's "吱扭" (Zhi Niu) offer further innovative interaction methods. Whether through narrative path interaction or video-form feedback, the interactive possibilities for short videos in the 5G era remain to be vigorously explored.

3. Refined Content: The Trend Toward Premium, Longer-Form Short Videos

Information overload has surged user demand for quality content, and the short video sector is no exception. The *2019 China Online Audio-Visual Development Research Report* indicates that premium content will be the dominant factor driving short video development. Users expect to see better content during fragmented time slots, and short video consumption upgrading has already arrived. Research shows that users are growing tired of the short-term stimulation from 15-second videos and yearn for compelling storytelling within short video formats. This means short video content must be more substantial, with more complete narratives and extended duration, delivering more refined visual communication.

Following 5G's arrival, improved data plans and network environments will

boost the trend of short videos becoming "longer and more premium." In terms of duration, an increasing number of short video platforms and professional institutions are focusing on producing 3-15 minute video content. In June this year, Tencent Video announced a new short video category— "Hot Pot Dramas" —defined as micro-dramas or micro-variety shows with single-episode durations of 1-10 minutes, complete narratives, diverse themes, rich forms, and sophisticated cinematography. Represented by works like *Women 30+*, Hot Pot Dramas exhibit high diversity and inclusivity, encompassing narrative, variety, and documentary styles in both horizontal and vertical formats, granting creators tremendous creative freedom. Recently, Douyin has also been internally testing publishing permissions for 15-minute videos, hoping to move beyond the 15-second positioning by continuously "adding time."

Behind platforms' extension of short video duration lies a shift in content trends. Even in the era of fragmented communication, users still desire complete stories and full event pictures. During the 2019 Spring Festival, Xinhua News Agency released an 8-minute long video titled *Nian · Guan* (Year · Pass), which presented compact, well-orchestrated stories about border soldiers sacrificing family reunions for national duty, garnering over 2.2 million views on Xinhua' s client platform and thousands of comments and likes. In July this year, Kuaishou user "Zhao Xiaoming' s Rainbow Vending Machine" released a 3-minute short video *Kuaishou Group Portrait*, which used ONER' s *Existence is Perfection* as background music to seamlessly edit 160 Kuaishou clips, presenting a group portrait of ordinary Chinese people' s wonderful lives. The video quickly exceeded 100,000 reposts and nearly 300,000 likes on Weibo.

Currently, Douyin, Weibo, and other platforms are also expanding into vlog content lasting 5-15 minutes, allowing creators to compile life vignettes into premium video programs. Beyond life documentation, many vloggers are exploring skill demonstrations and knowledge explanations. Under 5G conditions, longer and more substantial short videos will bring further changes in content logic and operational strategies.

4. Intelligent Connectivity: The Potential of Machine-Generated Content (MGC)

A crucial 5G application scenario is massive-scale Internet of Things. When ubiquitous connectivity becomes reality, more devices will be online 24/7, generating video from multiple perspectives and lowering the barriers and costs of video production. This means short video production materials will be vastly enriched, content subjects will further expand, and beyond Professional Generated Content (PGC) and User Generated Content (UGC), Machine Generated Content (MGC) will emerge from all corners of the world, more meticulously documenting our lives. How to collect, store, edit, and produce MGC content becomes a comprehensive innovation challenge for short videos in the 5G era.

Enhanced IoT video capture capabilities must be matched by back-end AI and

big data technologies for video content selection, editing, and distribution. Xinhua News Agency' s "Media Brain" AI platform produced China' s first MGC video news on December 26, 2017—*Xinhua Releases China' s First MGC Video News, Media Brain Is Here!*—triggering widespread industry attention. Its production process involves first obtaining new video and data information through cameras, sensors, drones, and other means; then using image recognition and video identification technologies for machine-based content understanding and news value judgment. Relying on big data, "Media Brain" associates newly understood content with existing data, conducts semantic retrieval and reordering to intelligently produce news drafts. Simultaneously, AI generates rich-media news by editing video footage, synthesizing voice, and visualizing data based on the text drafts and collected multimedia materials.

Conclusion

Overall, as 5G technology advances toward commercialization, the short video industry is embracing a new period of technological dividends. From a content innovation perspective, we must not only boldly explore and experiment with new technologies but also avoid the pitfall of "form over content" and blind technical showmanship, striving to align content innovation with technological iteration to comprehensively enhance the communication value of short video content.

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