

# Postprint on the Application of Mobile Live Streaming Technology in the Construction of County-Level Converged Media Centers

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

## Abstract

Since the central government explicitly issued guiding opinions on the construction of county-level media convergence centers, the construction and development of such centers have entered a fast track, with various new media forms being continuously integrated into the construction system to meet the diversified information needs of different groups while continuously improving construction standards. Based on clarifying the drivers and models of county-level media convergence center construction, this paper elaborates on the background of live streaming system construction for county-level media convergence centers from two perspectives, conducts an in-depth analysis of the application functions and characteristics of mobile live streaming technology, and proposes its practical application forms, aiming to provide theoretical references for enhancing its application level and contribute to the advancement of county-level media convergence center construction.

## Full Text

### Preamble

**Title:** Application of Mobile Live Streaming Technology in County-Level Media Convergence Center Construction

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**Abstract:** Since the central government explicitly issued guidelines for county-level media convergence center construction, the development of these centers has accelerated rapidly, with various new media forms continuously integrated into the construction system to meet the diversified information needs of different groups while continuously improving construction standards. Based on clarifying the motivations and models for county-level media convergence center

construction, this paper elaborates on the background of county-level media live streaming system construction from two perspectives, deeply analyzes the application functions and characteristics of mobile live streaming technology, and proposes its practical application forms, aiming to provide theoretical references for improving application levels and contribute to promoting county-level media convergence center construction.

**Keywords:** county-level media convergence center; mobile live streaming technology; platform construction; production system; security protection

**CLC Number:** G210.7

**Document Code:** A

**Article ID:** 1671-0134(2021)05-061-03

**DOI:** 10.19483/j.cnki.11-4653/n.2021.05.018

**Citation Format:** Liang M. Application of mobile live streaming technology in county-level media convergence center construction [J]. China Media Technology, 2021(05): 61-63.

News live broadcasting constitutes a fundamental operational form in the media industry, encompassing both traditional television live streaming and network live streaming under the new media context. In county-level media convergence center construction, it is essential to organically integrate these two forms to build a more comprehensive mobile live streaming technology system and enhance application capabilities, thereby truly adapting to the public's diversified demands for news information and providing audiences with higher-quality news content.

## 1.1 Construction Background of County-Level Media Convergence Centers

The construction of county-level media convergence centers was proposed by the Party Central Committee as a new model to meet the needs of news and public opinion work in the new era. Based on existing county-level media publicity platforms, it integrates traditional and new media operations to create a novel media operation model that strengthens grassroots media construction. Before the rapid development of new media, county-level media underwent a complex reform process, with traditional print media largely eliminated from the industry, leaving most regions with broadcasting and television stations as the primary operational model. These county-level broadcasting and television stations played a crucial bridging role in grassroots public opinion work. However, against the backdrop of rapidly developing new media, various social media platforms have flourished, particularly short-video-based mobile media, which now dominate news dissemination channels. This situation has posed significant challenges to social opinion guidance, rendering traditional media operation models inadequate for current work requirements. Consequently, building media convergence centers encompassing various new media operation models based on broadcasting and television stations has become an inevitable requirement of the times.

## 1.2 Driving Factors for County-Level Media Convergence Center Construction

In the era of rapid new media development, county-level media convergence center construction is driven by multiple factors. First, from a policy perspective, following the 2018 National Conference on Propaganda and Ideological Work, county-level media convergence center construction has been elevated to a national strategic level, with continuous issuance of guidance policies and development standards that effectively promote their development. Second, from a technological standpoint, information network technology has reached advanced levels, with continuous improvements in digital media technology and 5G infrastructure, facilitating greater convergence of various media forms and particularly laying a solid foundation for video live streaming development. Third, for grassroots communities, the rapid development of social media necessitates establishing a highly credible news media platform capable of delivering accurate news information promptly to ensure normal social production and life. Based on these factors, county-level media convergence center construction has become an inevitable requirement of the times.

## 1.3 Basic Models for County-Level Media Convergence Center Construction

Due to variations in previous reform models of county-level broadcasting and television stations and different construction entities, different provinces, municipalities, autonomous regions, and directly-administered municipalities have explored diverse forms of county-level media convergence construction. The first is the platform-sharing model, which primarily relies on existing city- and county-level technical platforms to provide media resources, technical support, and hardware construction assistance for county-level media convergence centers, thereby achieving interconnectivity and information sharing. The second is the financial support model, which builds new media convergence sharing platforms based on central and local fiscal support, including command centers, content creation centers, studio systems, and media asset management systems to reconstruct news gathering and editing processes, integrate media resources, and build integrated media operation channels. The third is the enterprise operation model, which transforms traditional media operation modes by integrating existing information media departments into media groups, adopting enterprise-style operational processes for public institutions, and reconstructing news gathering and editing processes and human resource management systems to continuously improve media convergence center construction standards.

## 2.1 Development and Limitations of Traditional Live Streaming Technology

Traditional live streaming technology has a long history, enabling the public to enjoy various program content through television live broadcasts. Televi-

sion live streaming technology operates based on portable satellite transmission systems, which involve setting up cameras at the scene to transmit signals to on-site broadcasting vans or production centers. The processed signals are then transmitted via satellite systems and received in real-time by in-house satellite receivers before being delivered to audiences. Satellite live streaming models require high hardware investment and operational costs and are significantly affected by weather and geographical location. Particularly due to the fixed nature of television terminals, its application level is relatively low, with this live streaming model only used for large-scale events. Against this background, new mobile live streaming technology based on network technology has begun to see widespread application.

## 2.2 Application Advantages of Mobile Live Streaming Technology

Mobile live streaming technology based on network technology employs devices such as drones for on-site signal acquisition, freeing signal transmission from satellite channel limitations by utilizing 4G/5G networks, with mobile devices such as smartphones becoming the terminal platform. This gives it significant advantages over traditional live streaming technology. First, program transmission is more effective, with lower requirements for equipment and on-site personnel and reduced operational costs. Second, the technology threshold is lowered, allowing editorial staff to master basic live streaming skills after simple training and join the live streaming network anytime via platforms. Third, live streaming angle selection better meets audience needs, creating an immersive experience. Fourth, mobile live streaming offers greater flexibility, stronger audience participation, and richer content. These advantages make it essential for county-level media convergence centers to strengthen mobile live streaming platform construction, build comprehensive technology application systems, and improve overall operational levels while continuously enhancing mobile live streaming technology application standards.

## 3. Application Functions and Characteristics of Mobile Live Streaming Technology in County-Level Media Convergence

With continuous improvements in mobile live streaming technology software and hardware, platforms such as Douyin, Huoshan, and Baidu have developed rapidly. However, these platforms primarily target self-media users and have significant deficiencies in live broadcast functions for county-level media convergence centers. Therefore, in county-level media convergence center construction, it is necessary to build more functionally comprehensive mobile live streaming platforms based on actual conditions. This paper uses a “City Cloud Media Interactive Live Streaming System” as an example to illustrate the basic functional characteristics of mobile live streaming technology in county-level media conver-

gence center construction systems, providing references for related construction activities.

### 3.1 Mobile Live Streaming Platform Construction

Mobile live streaming platforms must include not only basic audio and video live broadcasting functions but also certain technical processing and interactive management capabilities. The basic business functions of the “City Cloud Media Interactive Live Streaming System” are shown in Table 1 .

**Table 1 Basic Business Functions of Mobile Live Streaming Platform**

Function Module	Specific Content	Management Requirements
Interactive Live Room Management	Live broadcast introduction, cover image, title, time, status	Add, modify, and sort basic information
Live Streaming Server Address Management	Access and exit of live sources from cameras, mobile phones, TVs	Selection of live streams and video-on-demand programs
Live Role Management	Live roles such as hosts, reporters, or guests	Add, modify, and delete role identity information
User Comment Management	Text, images, short videos, etc.	Secondary processing of graphic information using intelligent editing tools
User Message and Comment Content Review	Batch review using artificial intelligence or manual methods to improve interaction security	
Interactive Lottery Scene Management	Participation in lotteries through comments, voting, and lucky wheel	Improve lottery forms and user participation management
Live Delay Management	Backup source management and delay broadcast duration	
Live Assistant App	Live directing software for smart mobile devices	Management of live encoding streams, resolution, server addresses, etc.

Through the modular design of the “Mobile Live Streaming and Interactive Management Platform,” a more flexible service system can be provided. During

system operation, the platform's excellent integration and expansion capabilities can meet future business development needs. All module designs adopt visual management modes, providing editors with more convenient operating conditions and effectively improving work efficiency.

### 3.2 Mobile Live Streaming Production System

In traditional television live streaming technology, material transmission and production relied on satellite and microwave transmission modes, involving complex operation processes, high skill requirements for operators, and significant external factor influences. With network technology development, mobile live streaming production systems based on computer equipment have rapidly developed. Currently, numerous enterprises specialize in live streaming system construction, with varying technical levels and application advantages among different companies. This paper lists commonly used technology brands (see Table 2), allowing different regions' county-level media convergence centers to make selections based on actual conditions.

**Table 2 Comparison of Mobile Live Streaming Systems**

Live Streaming System Brand	Basic Service Content	Basic Hardware System
Xiangfei Live Backpack	Testing, encoding, program switching, etc.	4G transmission equipment, HEVC (4K-SDI), external 4G network modulation antenna, ultra-small video transmission unit
Gaojun 5G 4K Live Backpack	Ultra-high-definition video live streaming, multi-link bundled transmission	HEVC portable 4G/5G transmitter
TVU One 4K Live Backpack	12-channel data connection, integration with drone systems	Vehicle-mounted live streaming equipment, multi-network aggregation router, etc.

In actual operation, the basic functions of different mobile live streaming systems do not differ significantly, as all can perform IP video acquisition, program production, and distribution management. During specific construction processes, technical personnel can conduct thorough investigations to meet the current operational needs of media convergence centers, reasonably plan future operational objectives, and select the most optimized construction solution based on financial investment to effectively improve mobile live streaming technology application levels.

### 3.3 Online Live Streaming Vehicle Construction

Online live streaming vehicles can adapt to more live streaming scenarios, making appropriate vehicle selection essential. For areas with complex terrain, large off-road vehicles with four-wheel drive functions should be selected, while plain areas can choose light passenger or light truck vehicles that meet daily work needs and provide better working environments. Based on actual mobile live streaming technology applications, on-site operation system equipment typically includes cameras, hard disk video recorders, aerial drones, and smartphones. Audio processing systems include wired fiber optic transmission equipment, wireless microwave systems, editing all-in-one machines, high-definition switchers, central control hosts, and high-definition network encoders. During system installation, qualified professional enterprises should be selected for system construction to ensure stable on-site live signal acquisition and transmission, enabling live activities to proceed after timely editing.

### 3.4 Security Protection Technology Application

Mobile live streaming technology plays a crucial role in county-level media convergence center construction, providing grassroots communities with more direct news information content. However, its signal production and transmission rely entirely on network pathways. Therefore, system operation must emphasize security protection and comprehensively enhance security technologies. First, in computer software installation, antivirus software and hardware plugins should be combined to prevent network intrusion and signal loss. Second, in system operations, staff skills training must be strengthened, requiring technical personnel in all aspects to master basic operational skills to promptly identify and resolve simple operational issues, ensuring stable live streaming processes. Third, in the technical system, process monitoring should be enhanced and a comprehensive anti-theft chain system constructed through appropriate technical conditions to prevent live programs from being pirated.

## 4.1 Application in News Scene Live Broadcasting

Applying mobile live streaming technology to news scene broadcasting constitutes a basic function of county-level media convergence center construction. To ensure efficient application of live streaming technology, it is essential to establish comprehensive emergency plans and operational mechanisms in accordance with news event management standards. When major news events occur or breaking news information is obtained, teams must be able to reach the scene immediately and conduct mobile live streaming directly, presenting news content more directly to mobile clients. During live broadcasting, on-site editorial staff must not only transmit news content from multiple angles but also timely access relevant background materials, strengthen interaction with audiences, and promptly reply to and answer questions raised by viewers on the live streaming platform. Only in this way can news live programs become more

grounded and produce effects unattainable by traditional television programs, creating strong media communication influence.

## 4.2 Expanding Online Live Broadcasting Fields

Online live streaming has relatively low operational costs and no significant restrictions on program production fields, enabling good interaction with audiences in all aspects of social production and life. Therefore, county-level media convergence centers should strengthen construction in this area, summarize mobile live streaming technology application experience, and expand online live streaming to multiple fields including government affairs, culture, education, and sports. For example, some county-level media convergence centers have produced continuous live streaming programs about investment attraction projects and industrial project construction progress, allowing the public to better understand local socio-economic development conditions. In some rural cultural project operation systems, cultural programs are conducted simultaneously with online live streaming to more widely promote local characteristic culture. This integrates public opinion guidance work with cultural and tourism industry development, promoting better socio-economic development.

## 4.3 Conducting Diversified Theme Live Broadcasting

Against the backdrop of continuously improving mobile network technology, the rapid development of social media live streaming has posed significant challenges to grassroots public opinion guidance work. Therefore, in county-level media convergence center operation systems, it is necessary to penetrate social grassroots levels, conduct in-depth understanding of different public groups, reference live streaming platform backend operation data, and build more diversified theme live streaming systems based on grassroots communities' actual needs. By organically combining live streaming programs with traditional television program scheduling and constructing live streaming operation systems in a channel-based format, public groups' participation habits can be gradually cultivated, and audience stickiness and interaction levels can be enhanced using the interactive functions of live streaming platforms, thereby strengthening the public opinion guidance role of county-level media convergence centers.

## 4.4 Enhancing Credibility of Mobile Live Streaming

One advantage of mobile live streaming technology application in county-level media convergence operation systems is its ability to integrate organically with other media forms, enabling more diversified program creation. First, it can enhance in-depth cooperation in online live streaming business by connecting with national media platforms such as CCTV and Xinhua News Agency, providing audiences with richer program content. Second, it can utilize the operational advantages of media convergence centers to conduct in-depth mining of television programs through broadcasting and television stations, perform text editing of

live streaming programs via WeChat public accounts, and conduct retransmission through social self-media to strengthen public understanding of major news events and effectively enhance the guiding role of news publicity. Third, it can introduce expert interpretation during live streaming to provide deeper analysis of news scenes and improve audience understanding of news events. Fourth, it can rely on the comprehensive operational characteristics of media convergence centers to build more complete news information tracking systems for follow-up interpretation of news events. These approaches can better enhance the overall credibility of county-level media convergence and perform grassroots public opinion guidance work effectively.

In the context of new-era development, mobile live streaming has become an important form of media industry operation. Most county-level media convergence centers still lack experience in mobile live streaming. Relevant operational units must innovate work concepts, strengthen technical learning, accurately grasp grassroots communities' needs for live streaming information, effectively improve mobile live streaming program production quality, and make due contributions to grassroots public opinion guidance work.

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**(Responsible Editor: Yang Hu)**

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

*Source: ChinaXiv – Machine translation. Verify with original.*