

---

AI translation · View original & related papers at  
[chinaxiv.org/items/chinaxiv-202310.01154](https://chinaxiv.org/items/chinaxiv-202310.01154)

---

## “Qilu Smart Media Cloud” Supporting Deep Media Convergence Development: Post-print

**Authors:** Tang Dailu

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

### Abstract

As a crucial component of the all-media communication project, the “Qilu Smart Media Cloud” has underpinned the construction of Dazhong Press Group’ s all-media communication landscape and system, propelling the in-depth convergence and development of media. This article delineates the exploratory process of how the “Qilu Smart Media Cloud” supports in-depth media convergence development from the perspectives of construction philosophy, construction content, service functions, innovation dimensions, and convergence exploration, and reflects on improvement measures.

### Full Text

## “Qilu Smart Media Cloud” Supporting the Deep Integration Development of Media

**Authors:** Dazhong Newspaper Group (Dazhong Daily) Media Convergence Center, Technology Committee, Jinan, Shandong 250014

**Abstract:** As a crucial component of the all-media communication project, the “Qilu Smart Media Cloud” has supported the construction of Dazhong Newspaper Group’ s all-media communication framework and system, advancing the deep integration and development of media. This paper presents the exploratory process of how the “Qilu Smart Media Cloud” supports deep media integration from the perspectives of construction philosophy, content, service functions, innovation dimensions, and integration exploration, while reflecting on measures for improvement.

**Keywords:** Qilu Smart Media Cloud; media convergence; all-media communication system; technical integration; autonomous control

**Classification Code:** G263.56

**Document Code:** A

**Citation Format:** Tang Dailu. “Qilu Smart Media Cloud” Supporting the Deep Integration Development of Media [J]. China Media Technology, 2021(03): 14-17, 39.

---

## 1. Construction Approach of Qilu Smart Media Cloud

Throughout its development, the Qilu Smart Media Cloud has continuously adapted and refined its approach, gradually establishing several effective construction strategies.

### 1.1 Open Technical Architecture System

The Qilu Smart Media Cloud employs an open hybrid cloud architecture. It builds its own IT infrastructure (IaaS, Infrastructure as a Service), independently configures common technology platforms (PaaS, Platform as a Service), and develops core application software (SaaS, Software as a Service), forming an autonomous and controllable private cloud. It also integrates public cloud services such as intelligent production, CDN network distribution, disaster recovery backup, live streaming, H5 production, and MG animation production. By designing standardized data interfaces, it enables data exchange and functional expansion between different business modules. This open technical architecture ensures the scalability of the Qilu Smart Media Cloud and supports flexible and diverse application models [2].

### 1.2 Collaborative Sharing Implementation Strategy

The Qilu Smart Media Cloud introduces artificial intelligence technologies including speech recognition, voice broadcasting, and facial recognition to build a shared common technology platform, transforming and upgrading traditional news production models and significantly improving production efficiency. By advancing technical integration and data connectivity across various media production platforms, it gradually achieves collaborative construction, sharing, and utilization, eliminating information silos and creating an integrated all-media communication platform. Through strengthened integrated security construction, the group’s major client publishing platforms have been migrated to the unified internet gateway of the “Central Kitchen,” sharing the group’s private cloud services, network resources, computing resources, storage resources, and security resources, as well as third-level information security protection services, thereby avoiding redundant construction.

### 1.3 Continuous Iteration Construction Method

[Figure 1: see original paper] shows General Secretary Xi Jinping’s important instructions on the 80th anniversary of Dazhong Daily. The Qilu Smart Media Cloud originated in 2017 as an iterative upgrade from the “Central Kitchen” [3].

In accordance with central and provincial requirements for autonomous, controllable, advanced, and practical media convergence key technology platforms, the group coordinated funds, personnel, projects, and platforms to conduct independent R&D and independent innovation in platform construction in April 2019. After continuous upgrades and transformations, the group independently developed and launched a new version of the “Central Kitchen” software system in May 2020, followed by the “End Media Unified Production Management Platform” software system in December 2020, while continuously building thematic database systems by aggregating big data resources. This has become the supporting platform for the group’s deep media integration development.

**Funding:** This paper is a phased achievement of the National Digital Composite Publishing System Engineering application demonstration project (Number: 1741STC41049/SF18), a major science and technology project of the Publicity Department of the CPC Central Committee.

---

## 2. Construction Content of Qilu Smart Media Cloud

The Qilu Smart Media Cloud comprises integrated communication support platforms including the “Central Kitchen,” “5G Short Video Intelligent Production Platform,” “End Media Unified Production Management Platform,” “Big Data and Thematic Databases,” and “5G Media Convergence Laboratory.”

[Figure 2: see original paper] Qilu Smart Media Cloud

### 2.1 Central Kitchen Business Platform

The independently developed “Central Kitchen” breaks down barriers between platforms built in different periods and on different technical architectures within the group, forming an integrated business platform. Since 2019, it has achieved technical integration with national third-party platforms, further expanding the group’s new media communication channels. As of the end of February 2021, following the migration of the group’s various media outlets, the “Central Kitchen” had accumulated 22,000 new story topics and 229,000 articles.

### 2.2 5G Short Video Intelligent Production Platform

Against the backdrop of 5G commercialization, the platform adheres to the standards of mainstream values, positive energy, and premium content. Through AI technology, it automatically identifies pornographic, politically sensitive, violent, advertising, and prohibited content in text, images, video, and audio.

### 3. Service Functions

#### 3.3 Intelligent Dissemination Services

By introducing party media values into intelligent algorithms to form party media algorithms, the platform provides personalized intelligent recommendation services for content from various media outlets on the platform. Simultaneously, it achieves technical integration with various distribution channels, connecting with national news and information platforms such as People's Daily People's Content, Tencent Penguin Content, Baidu Baijia Content, Toutiao, NetEase News, and Huawei Browser, and is currently integrating with short video platforms including Douyin, Kuaishou, and Bilibili. It can provide technical integration with the aforementioned third-party platforms according to the needs of each media outlet, achieving on-demand dissemination services.

#### 3.4 Integrated Evaluation Services

By introducing big data monitoring and analysis services, the platform monitors content dissemination of media outlets on the Qilu Smart Media Cloud in real time, collecting quantitative dissemination data from perspectives such as media type, time node, and reprint frequency, and presenting dissemination paths visually. It reconstructs evaluation rules with an integrated approach, incorporating content from traditional and new media into a unified evaluation system, introducing quantitative dissemination data, and combining it with online quantitative evaluation by expert judges to achieve integrated quantitative assessment, guiding high-quality content to adapt to internet development requirements.

#### 3.5 Data Think Tank Services

Based on the Qilu Smart Media Cloud big database, the platform introduces data analysis and technology development to explore data think tank services. Through comprehensive network collection and intelligent analysis, combined with professional analysis teams, it forms think tank services to serve party committees and governments in achieving modern social governance and to serve enterprises and institutions in enhancing market competitiveness. Through big data services such as network hotspot monitoring and key provincial media coverage monitoring, it expands perspectives for story planning and enriches content creation methods, exploring new reporting models that integrate innovative technologies with content. By combining data analysis with major thematic reporting, it explores new news production models and designs interactive, visualized big data news products, exploring new models where programmers integrate into news production [4].

[Figure 4: see original paper] Big Data Media Convergence Product

### **3.6 Data Public Opinion Services**

The platform enhances data analysis capabilities to explore network public opinion services. Through the digitization, tagging, indexing, and visualization of information, it forms a closed loop of network public opinion services including monitoring, analysis, judgment, handling, and review, helping party committees and governments understand social conditions and public opinion and conduct effective guidance.

### **3.7 Smart Party Building Services**

The platform builds a “Smart Party Building Cloud,” launching party building big data products and applications to provide integrated solutions for party building information release, experience promotion, and party affairs management for party and government organs, enterprises, institutions, and universities, using advanced technology to assist grassroots party building work in leading grassroots business.

### **3.8 End Media Management Services**

The “End Media Unified Production Management Platform” integrates the production back ends of the group’ s various end media, achieving unified management of end media content and users, one-click distribution management across multiple platforms, major reporting instruction dispatch management, and comprehensive network dissemination monitoring.

### **3.9 Innovation Experimental Services**

The platform researches and applies 5G short messages, 5G+ video live streaming, 5G+ AR/VR live streaming, 5G+ online production, and 5G+ big data mining, providing innovative experimental services such as interactive live streaming, remote production, and data mining.

---

## **4. Innovation Dimensions of Qilu Smart Media Cloud**

In exploring deep media integration, the group has continued to innovate across technical, mechanism, content, and dissemination dimensions based on the Qilu Smart Media Cloud, forming application models that meet its actual needs.

### **4.1 Technical Innovation**

The Qilu Smart Media Cloud provides basic hardware support in networking, storage, computing, and security, as well as basic software support in operating systems, database management, stream computing, web services, and reverse proxy services, forming the foundational IaaS (Infrastructure as a Service) and

PaaS (Platform as a Service) layers of cloud computing. The platform comprehensively introduces artificial intelligence technologies such as speech recognition, speech synthesis, facial recognition, and computer animation, while utilizing new technologies including big data, blockchain, VR, AR, MR, and 5G to provide various media with collaborative reporting platforms, all-media processing platforms, news resource platforms, big data platforms, and public opinion service platforms, jointly promoting media convergence transformation across the province.

#### **4.2 Mechanism Innovation**

Fully leveraging the central role of the Qilu Smart Media Cloud and focusing on thematic planning, the group explores new editorial architectures adapted to the internet ecosystem through various forms such as “Editorial Department + Media Convergence Studio” and “Editorial Department + Research Group,” creating a “big chorus” across newspapers, websites, and clients, making integrated reporting routine and institutionalized. It builds a business framework and working mechanism centered on new media, achieving the organic combination of positive energy and high traffic, and making blockbuster products a daily occurrence.

#### **4.3 Content Innovation**

By leveraging the platform functions of the Qilu Smart Media Cloud, the group further enriches content sources for party media and explores new models of integrated media publicity cooperation with government departments. Through in-depth cooperation with the Shandong Learning Platform of “Study Strong Nation,” the group focuses on the central work of the provincial party committee and major themes, jointly planning and launching integrated media products that publicize Shandong’s achievements and showcase local characteristics. Under the guidance of the Shandong Provincial Government Information Office, the group has cooperated with some provincial departments to enrich and optimize the publicity and reporting model for provincial press conferences, transforming press conference content into integrated media products.

#### **4.4 Dissemination Innovation**

On the one hand, by integrating publishing resources within the group, it forms a “big chorus” across newspapers, websites, and clients. On the other hand, by strengthening cooperation with domestic mainstream new media platforms, it focuses on building a “1+3+3+N” all-media communication system. The “1” refers to the “Study Strong Nation” platform; the first “3” refers to the three central media outlets of People’s Daily, Xinhua News Agency, and CCTV; the second “3” refers to the group’s three major news clients of Dazhong Daily, Haibao News, and Qilu Yidian; and the “N” refers to national commercial platforms such as Toutiao, Baidu, Tencent News, NetEase News, Huawei Browser, Douyin, Kuaishou, and Bilibili. Through the construction and exploration of

this new communication system, it further expands the communication power and influence of integrated media reporting.

---

## 5. Deep Integration Exploration Supported by Qilu Smart Media Cloud

Supported by the Qilu Smart Media Cloud, Dazhong Newspaper Group continuously explores multi-dimensional integration methods across form, media, region, and industry, covering 278 million new media users. Through production process reengineering, content supply-side structural reform, and building an all-media communication framework, it supports deep media integration development.

### 5.1 Cross-Form Integration Exploration

In terms of all-media forms, the Qilu Smart Media Cloud integrates content production platforms and connects with third-party distribution platforms, supporting various media in gradually establishing an all-media communication framework covering newspapers, websites, clients, microblogs, and third-party accounts. Adhering to a “mobile-first” strategy, the group has gradually formed a mobile communication matrix including the Dazhong Daily client (positioned as a party client), Haibao News client (positioned as a national platform), Qilu Yidian client (positioned as an intelligent client), Shandong Mobile Newspaper (positioned for differentiated users), and nearly 300 third-party public accounts for segmented users.

### 5.2 Cross-Media Integration Exploration

Based on the multi-tenant model of the Qilu Smart Media Cloud, the group explores collaborative integration methods across media. During the coverage of the 2021 Shandong Two Sessions, 41 journalists and editors from six media outlets including Qilu Evening News, Rural Dazhong, Peninsula Metropolitan News, Shandong Legal Daily, Economic Herald, and Luzhong Morning News completed the submission of 117 articles for review through the “Central Kitchen” of the Qilu Smart Media Cloud. Group leaders and Dazhong Daily editors completed the review and approval of these articles. The “Central Kitchen” implements three types of three-level review models, supporting up to six levels of review within sub-media outlets, and completing multi-level review processes including second-level review by Dazhong Daily and third-level review by group leaders, thus establishing an effective method for cross-media collaborative integration in major reporting events.

### 5.3 Cross-Regional Integration Exploration

In terms of geographical coverage, based on the hybrid cloud architecture of the Qilu Smart Media Cloud, the group has gradually established a communication framework covering province, city, county, town, and community levels, based in Shandong, facing the nation, and radiating overseas. Dazhong Daily actively promotes the creation of local editions and opens local channels on its client, achieving full coverage of Shandong's 16 cities in May 2020, which represents a major strategic measure to accelerate integration development and create a new highland for media development [5]. In 2019, it implemented a grassroots contact point system of "Going to the Grassroots, Strengthening the Four Forces," establishing over 100 grassroots contact points in rural communities and factories across the province. In 2020, it established the first batch of 23 public security contact points across the provincial public security system, covering grassroots police stations and teams for criminal investigation, traffic police, economic investigation, food and drug environmental investigation, and immigration [6]. The group has also created overseas editions including North American Edition (1998), South American Edition (2005), Japanese Edition (2017), and Australian Edition (2019) to publicize Shandong overseas. Since 2019, Haibao News has successively established news centers in Beijing, Shanghai, Western China (Xinjiang), and Guangzhou, launching its nationwide layout. Qilu Evening News and Qilu Yidian have achieved full coverage of cities across the province through newspaper local editions and client channels.

### 5.4 Cross-Industry Integration Exploration

Through the Qilu Smart Media Cloud, the group continuously explores cross-industry integration strategies for industry applications, actively expanding cross-industry integration models such as government services, convenience services, and online commerce. It actively promotes the construction of industry media convergence centers, having built media convergence centers for units including the Shandong Provincial Federation of Trade Unions, Shandong Provincial Women's Federation, Shandong Branch of China Construction Bank, and Liaocheng Public Security Bureau. It has jointly built a party building cloud platform with the Shandong Provincial Party School and 16 university Marxism schools across Shandong, and cooperated with the Shandong Provincial Government General Office, Shandong Provincial Market Supervision Bureau, Shandong Provincial People's Procuratorate, and other units to promote the application of smart party building cloud services. The network public opinion service supported by the Qilu Smart Media Cloud big data platform has covered major provincial departments in Shandong. By the end of 2020, a cumulative total of 5,700 institutions had established cooperative relationships with the group's various media outlets through joining the Qilu Smart Media Cloud.

## 6. Improvement Measures for Qilu Smart Media Cloud

The Qilu Smart Media Cloud' s support for deep media integration remains under continuous exploration. Through application, it has been found that further expansion and improvement are needed in technological innovation, key projects, and external cooperation.

### 6.1 Strengthening Technology to Enhance Innovation Capacity

By leveraging the R&D capabilities of high-level scientific research institutions, the platform will deeply utilize artificial intelligence, cloud computing, big data, 5G, VR, AR, H5, MG, and other technologies to continuously enhance the intelligent production capacity of the Qilu Smart Media Cloud, strongly supporting deep integration development. It will continue to promote the expansion of functional applications of the Qilu Smart Media Cloud, achieving technical integration and connectivity with county-level media convergence centers, introducing media convergence centers at all levels, and attracting party committees, governments, universities, hospitals, enterprises, institutions, and online self-media to join. By cooperating with authoritative data management departments, it will deeply explore big data applications and form a digital emerging industry. It will deeply participate in the development and construction of new media platforms such as government websites and clients at all levels within the province, as well as information platforms for smart government and smart cities. It will maintain sensitivity to new technologies, coordinate group resources in technology, funding, and policy, seize the technological high ground in the all-media era, and enhance innovation capacity driven by technology.

### 6.2 Strengthening the Leading Role of Key Projects

The focus will be on improving the “5G Short Video Intelligent Production Platform” by introducing more intelligent special effects production functions for short videos. The “End Media Unified Production Management Platform” will be enhanced with expanded intelligent local proofreading functions for new media. The “5G Media Convergence Laboratory” will combine 5G new applications with news practice, aggregating various application scenarios required by media and providing interactive and experiential services. It will actively explore the application of blockchain in content copyright confirmation, traceability, rights protection, and integrated assessment, and promote the construction of a media blockchain alliance.

### 6.3 Strengthening External Cooperation with Commercial Platforms

The platform will strengthen cooperation with commercial platforms such as Toutiao, Baidu, Tencent, and Huawei, promoting mutual embedding of application technologies. It will leverage the technological advantages of commercial platforms in artificial intelligence and big data processing to further enhance news creation efficiency and news product production capacity. By utilizing the

leading R&D capabilities and AI technologies of commercial platforms, it will jointly promote new media construction. By connecting with the dissemination advantages of commercial platforms, it will ensure the party' s voice reaches ordinary households.

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

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