Digitalization Logic and Application Technology Implementation for All-Media News Communication Operations: Post-Print

Authors: Pan Yongjie

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

Abstract

【目的】Promoting media convergence development is a strategic decision of the Party and the state; strengthening the construction of all-media communication systems and shaping a new pattern of mainstream public opinion are developmental issues currently facing mainstream media.

【方法】Adhering to problem-oriented and systematic thinking, comprehensively applying digital concepts, thinking, methods, and means, and following the technical framework of "Platform Brain + System Runway + Application Scenarios + Integrated Portal", we construct the "All-Media News Communication" application, promote "Three Convergences and Five Crosses" [1], and achieve the coupling of decision flow, business flow, and execution flow with data flow.

【结果】The application of digital technology helps alleviate bottlenecks, difficulties, and pain points in all-media news communication within the internet environment, enhancing the dissemination power, guidance power, influence, and credibility of news and public opinion.

【结论】The construction of this application can provide practical reference for new mainstream media to accelerate the reengineering of news communication processes, reconstruction of models, and reshaping of systems, thereby promoting the deep convergence and development of media.

Full Text

Abstract

[**Objective**] Promoting media convergence development is a strategic decision of the Party and the state. Strengthening the construction of all-media communication systems and shaping a new pattern of mainstream public opinion represents a critical development challenge facing mainstream media outlets today.

[**Method**] Adopting a problem-oriented and systematic-thinking approach, this study leverages digital concepts, mindsets, methods, and tools to construct an "All-Media News Communication" application following the technical framework of "Platform Brain + System Runway + Application Scenarios + Integrated Portal." This initiative advances "three integrations and five cross-overs" [1], achieving the coupling of data flows with decision-making, business, and execution flows. [**Result**] The application of digital technologies helps alleviate bottlenecks, difficulties, and pain points in all-media news communication within the internet environment, thereby enhancing the dissemination power, guidance, influence, and credibility of news and public opinion. [**Conclusion**] This application construction provides practical reference for new mainstream media to accelerate news communication process reengineering, model reconstruction, and institutional reshaping, thereby advancing in-depth media convergence development.

Keywords: media convergence; news communication; digitalization; application scenarios; China Blue Cloud
Classification Code: G2
Document Code: A
Article ID: 1671-0134(2023)05-143-05
DOI: 10.19483/j.cnki.11-4653/n.2023.05.033

1. Introduction

In August 2014, the "Guiding Opinions on Promoting the Integrated Development of Traditional and Emerging Media" was reviewed and approved, elevating media convergence development to a national strategy [2]. In 2020, the "Opinions on Accelerating the In-Depth Integrated Development of Media" was officially released, proposing an all-media communication system with content construction as the foundation, advanced technology as the support, and innovative management as the guarantee [3]. The Party' s 20th National Congress emphasized strengthening all-media communication system construction and shaping a new pattern of mainstream public opinion. Advancing in-depth media convergence development has become an essential requirement for consolidating and strengthening mainstream ideology and public opinion, occupying the commanding heights of public opinion guidance, thought leadership, cultural inheritance, and serving the people.

Currently, new-generation information technology is developing rapidly, with digitalization, networking, and intelligence evolving swiftly, playing important roles in promoting economic and social development, advancing national governance systems and capabilities, and meeting people' s growing needs for a better life [4]. As a leading force, digital technology is increasingly integrated into all fields and the entire process of economic and social development, profoundly transforming production methods, lifestyles, and social governance [5].

Zhejiang launched its digital reform process in February 2021 to advance the construction of "Digital Zhejiang" [6]. Guided by digital reform, the province has promoted the reconstruction of work systems, reengineering of business processes, and reshaping of institutional mechanisms in the publicity and cultural fields, empowering transformative changes in development quality, efficiency, and dynamics, and facilitating the modernization of provincial governance systems and capabilities.

Zhejiang's digital reform adopts a "1612" system framework, comprising: one integrated intelligent public data platform; six systems (Party building and holistic governance, digital government, digital economy, digital society, digital culture, and digital rule of law); one grassroots governance system; and two theoretical and institutional systems. The digital culture system, centered on human modernization and aimed at satisfying people's growing cultural needs, employs digital concepts, methods, and tools to create five runways: theoretical guidance, public opinion guidance, cultural benefits, culture-tourism integration, and civilization cultivation. It seeks to reshape cultural innovation and creativity from five aspects—theoretical armament, public opinion guidance, cultural supply, culture-tourism integration, and civilizational literacy—building a new-era cultural highland and modernizing cultural governance [7]. The "All-Media News Communication" application belongs to the "public opinion guidance" runway led by the Provincial Party Committee's Publicity Department.

2. Digital Logic of All-Media News Communication Business

2.1 Needs Analysis

According to industry surveys, radio and television media are actively embracing the digital wave amid profound industry transformation and technological trends, aiming to accelerate media convergence and achieve overall transformation and upgrading [9]. In 2022, Zhejiang Radio and Television Group (ZMG) focused on the strategic goal of "integration, reshaping, innovation, and practical implementation, advancing high-quality development with communication power as the priority." The group strengthened its main responsibilities and business, highlighted cultural advantages, emphasized marketing transformation, promoted institutional reform, enhanced team building, revitalized the ZMG brand, and worked collectively to build major news communication platforms and cultural communication platforms. The group continuously deepened its "three-in-one" communication pattern of "channel terminals + group platform + external influencers," achieving strong comprehensive benefits and being selected as a "2022 National Radio and Television Media Convergence Pilot Unit."

Facing the "collapse" of traditional media influence due to channel shifts, platform displacement, and user loss, the pattern changes, discourse changes, and offensive-defensive changes brought by emerging media development, and ZMG'

s need to iterate and upgrade from radio and television to internet, all-media, and digitalization, consolidating and enhancing the communication power, guidance, influence, and credibility of news and public opinion has become imperative. Through analysis, the following key business needs have been identified:

In terms of strengthening mainstream public opinion, compared with the requirement of "the main force fully advancing into the main battlefield," there are insufficient synergies in key reporting planning, imprecise communication effect evaluation, ineffective closed-loop work processes, and relatively lagging command methods and approaches. The precision of all-media news communication and the timeliness and effectiveness of public opinion guidance need improvement.

In terms of orientation risk management and control, there is excessive emphasis on post-event supervision with insufficient pre-event perception, excessive qualitative assessment with insufficient quantitative analysis, and excessive reliance on experiential judgment with insufficient scientific methods. Orientation management and public opinion prediction and early warning capabilities are relatively inadequate, posing certain ideological risks.

In terms of resource integration and operation, the construction of vertically connected and horizontally united communication ecosystems is insufficient. Efficient linking and collaboration mechanisms and carriers for news media at all levels, party and government departments, and social forces such as influencers are lacking. The exploration of "news + government services and commerce" operation models urgently needs deepening.

In terms of news convergence communication, the depth of all-media news communication convergence development is insufficient, user reach rates are inadequate, and there remains a considerable distance from creating influential mobile news communication terminals.

2.2 Application Architecture

The "All-Media News Communication" application aims to promote the modernization of regional all-media news communication systems and capabilities. It achieves breakthroughs through efficient collaboration across levels, regions, systems, departments, and businesses, employs digital technologies such as big data, cloud computing, artificial intelligence, 5G, IoT, and blockchain as means, integrates and enhances decision-making, business, and execution flows through data flows, and actively promotes news communication work system reconstruction, business process reengineering, and institutional mechanism reshaping to accelerate in-depth media convergence development.

The application integration relies on the group's "China Blue Cloud" platform resources and adopts a "1+555+N" architecture: building one integrated, intelligent media data platform; forming five categories of shared components (databases, knowledge bases, rule bases, tool libraries, and algorithm libraries);

enhancing five communication capabilities (business collaboration linkage, content orientation control, resource convergence integration, editorial command scheduling, and communication assessment analysis); constructing five core application scenarios (converged editing, communication operation, assessment evaluation, publicity management, and public opinion joint control), which are progressively broken down into N sub-scenarios to promote systematic reshaping of the all-media news communication system and capabilities. Its architecture is shown in Figure 1 [Figure 1: see original paper].

2.3 System Composition

The integrated, intelligent media data platform is built on the "China Blue Cloud" PaaS layer services, constructing a full business process from topic planning to production editing, release, and data trace-back. Based on cloud storage and cloud media asset libraries of "China Blue Cloud" as foundational resources, the intelligent processing center provides relevant news business intelligence capabilities. The five categories of shared components originate from the group' s all-media production, office automation, third-party applications, public management systems, and province-wide unified general components, implementing "one-time creation, unified management, collaborative sharing." Through comprehensive integration of data, models, algorithms, tools, application modules, business ecosystems, and institutional policies, they form business production monitoring assessment, early warning prediction, and decision support functions.

The five communication capabilities follow the concept of "dynamic + closed-loop + sharing," based on multi-cross collaboration between business units, to promote the full-process reshaping, full-period sharing, and full-chain evaluation of the group' s all-media news production. Among the five core application scenarios, the converged editing scenario breaks the situation where radio and television channels operate independently while resolving bottlenecks and pain points in external collaboration and coordination. The communication operation scenario real-time integrates data from central media submissions, international communication, and social media dissemination for comprehensive analysis of distribution themes, regions, and industries. The assessment evaluation scenario provides data references for publicity decisions and performance evaluation through relevant index evaluation profiling. The publicity management scenario couples the needs of publicity orientation management and command scheduling, featuring intelligent early warning of sensitive information, unified messaging management, and converged media reporting linkage functions. The public opinion joint control scenario comprises three sub-scenarios: public opinion perception, public opinion handling, and network construction, aiming to enhance network public opinion perception, response, and disposal capabilities. The N sub-scenarios are derived from the detailed breakdown of the five core application scenarios.

3. Technical Implementation of All-Media News Communication Application

3.1 Technical Framework and Process Design

The technical support platform for "All-Media News Communication"is designed based on a business closed-loop logic of "perception acquisition, memory storage, learning analysis, decision prediction, and disposal execution." The bottom layer relies on "China Blue Cloud" resources, connecting existing news sources such as public opinion analysis and cloud clues to the public data platform. After filtering and processing through the security service platform and data analysis platform, they form basic data support. The platform mainly includes topic planning, news production management, multimedia manuscripts, and all-media distribution systems. Its technical framework is shown in Figure 2 [Figure 2: see original paper], and the application process is shown in Figure 3 [Figure 3: see original paper].

3.2 Topic Planning System

The system provides functions for topic reporting, sharing synchronization, and material binding. Users can configure different operation permissions according to their job nature and position, such as topic editing, reporting, reviewing, and column viewing. When accessing topic planning through "China Blue Cloud" tenants, user information and functional permissions are automatically obtained, and topic reporting parameters can be flexibly configured according to user operation habits. Topics can be reported based on column categories, with material binding capabilities. Users with review permissions can approve or reject submitted topics.

The system features topic and attachment synchronization tracking capabilities, using automatic and manual synchronization modes. In automatic mode, reported and approved topics automatically synchronize to the shared topic library according to star-chain structure and isotope marking method rules. When synchronized topics undergo text content updates, they can be manually updated to the shared topic library. If a topic has synchronized attachments and the attachments are updated, the system can automatically trigger attachment updates to the shared topic library. If the topic has been selected by other tenants, users are prompted via message notification whether to update the attachments, allowing manual synchronization updates in the production management platform. The relevant working mechanism is shown in Figure 4 [Figure 4: see original paper].

3.3 News Production Management System

The system provides multi-tenant centralized resource management services for topic convergence and material binding interaction. Each tenant uses the shared topic pool as the center to exchange data on topics, materials, and finished

products through centralized resource management services, with corresponding data records collected into the news production management system. The system achieves closed-loop management of the entire news production process, featuring cross-tenant content sharing, task management, and process tracking functions. Simultaneously, a unified message management center is embedded into the news production management platform. When business operations, topic interactions, and material/finished product exchanges occur, the platform triggers user message notifications and passes processed process data to the news production management system. Its operation strategy is shown in Figure 5 [Figure 5: see original paper].

Specifically, when a channel tenant creates a new topic, it synchronizes to the shared topic pool. Channel tenants can also select topics shared by other tenants from the pool. Topics support the issuance of all-media production tasks, including traditional television programs and new media tasks. After editors and journalists receive tasks, they collect materials, which are then bound back to the topic and synchronized to the shared material pool. They can also select materials from the shared material pool to bind to topics for program editing. Approved finished products are bound back to the topic and synchronized to the shared finished product pool, or can be directly selected from the shared finished product pool to bind to topics. Finished products are then distributed through broadcast television channels or new media channels.

3.4 Multimedia Manuscript System

The system mainly provides services for task claiming, manuscript production and release, and multi-level manuscript review. The task claiming service achieves the purpose of task assignment through the all-media news production process and message interaction components to meet business production needs. The manuscript production and release service can produce various manuscript types—including graphic, social media, and video manuscripts—according to different distribution platform characteristics. If associated materials are carried in the claimed task, the editor automatically adds materials to the page when creating the manuscript. If no materials are carried, users can select public or personal materials already uploaded to the cloud through the material library plug-in page.

3.5 All-Media Distribution System

The system is responsible for unified management of all-media distribution tasks, enabling viewing, editing, and submission of all-media manuscripts for review, as well as task auditing and channel pushing. The system supports account authorization management for various mainstream new media release channels. The backend user role management module can refine account permissions to roles and users, while the backend permission configuration module can set detailed permissions for editing, reviewing, and pushing for each authorized channel. The system also supports all-media manuscript viewing and assigned task querying,

allowing users to edit claimed tasks or create new all-media manuscripts under authorized channels. It supports manuscript editing and layout using third-party application editors such as 135 and Xiumi, calling "China Blue Cloud" content library materials and referencing video, audio, image, and manuscript materials to all-media manuscripts. It also supports submission and review of all-media manuscripts according to user permissions and release channels.

4. Key Technologies of All-Media News Communication Application

The "All-Media News Communication" application construction focuses on news business production needs, targeting multi-cross collaboration, efficient production, and precise communication. It comprehensively employs digital concepts, methods, and means to promote technology convergence, business convergence, and data convergence in the all-media news communication field. The application aims to improve cross-level, cross-regional, cross-system, cross-department, and cross-business collaborative management and service levels. It strengthens sharing, production tracking, and quality control of all-media news topics, materials, and finished products, enhances data analysis of communication power for new media and radio and television programs, and forms a closed loop of all-domain, full-cycle, all-media news production and broadcast communication management. By coupling data flows with decision-making, business, and execution flows, it promotes all-media news communication process reengineering, model reconstruction, and institutional reshaping, continuously improving mainstream news and public opinion communication power, guidance, influence, and credibility. This provides practical reference for further iterative upgrades of new mainstream media communication quality, efficiency, and dynamics, accelerating in-depth media convergence development.

The topic planning service for "All-Media News Communication" utilizes star-chain data structure and isotope marking method to aggregate topics reported by different tenants and columns into a shared topic library and achieve data link tracking. It employs micro-service interaction gateway technology to automatically trigger cross-tenant and cross-level topic/manuscript content and associated material data flow and synchronization when data changes occur, providing user interaction services and data support for all-media news communication.

An XXL-JOB distributed task dynamic scheduling platform is constructed, driven by topic services to converge cross-tenant topics into a shared resource pool. Asynchronous scheduling synchronizes topic attachments to the shared resource pool for user selection. Selected attachments are virtually duplicated using file hard link technology for material sharing. Through topic task assignment and unified message management driving, full-process tracking and data empowerment of all-media news from topic selection, production, release, capture, and feedback are achieved.

Based on iPaaS, a data connector service is constructed, utilizing the existing dynamic scaling, container, resource management, and self-service capabilities of the "China Blue Cloud" platform. It connects different systems or businesses within and outside the platform to unified application services through no-code and low-code methods. The service establishes mainstream communication protocol connectors (such as FTP, HTTP, AMQP, and Applicability Statement AS1/2/3/4) for message interaction with other business systems, providing data format conversion functions. It arranges and transforms input data according to target system data formats and structural requirements.

A unified message management center based on RocketMQ+Kafka technology supports message notification to users and passes process records to business monitoring services. Through relevant operations in the business production process, it triggers the unified message management center to send messages to the news production management platform, enabling more efficient all-media news production operation.

Since its launch in October 2021, the "All-Media News Communication" application has increased the group' s news clue sources to six with one-click intelligent delivery to the backend, improving production efficiency by more than threefold. It has connected the group' s radio and television channels, integrated the province' s "Blue Media Alliance" county-level converged media centers, and linked over 1,000 "Beautiful Zhejiang" ecosystem members, achieving co-construction and sharing of news materials and improving public sentiment reach channels. The system has established 12 sensitive feature libraries for text, faces, scenes, and objects, collecting over 100,000 samples, and employs NLP, OCR, visual AI, speech recognition, and other technologies to enhance intelligent early warning capabilities and better ensure content security. It has boosted large-scale converged media news campaigns such as "Common Prosperity in Zhejiang" with over 300 million clicks across the network. Zhejiang Satellite TV has gathered over 180 million fans across the network, ranking first among provincial satellite TV official accounts on Douyin and Kuaishou platforms. "Beautiful Zhejiang" ranks first among local government release accounts on the Douyin platform, and "News Sister" has become the top national radio and television news personal IP on Douyin [10]. The related project has been selected as a recommended case of technology empowering "news +" by the China News Technology Workers Association, enabling practical and effective results in the group' s all-media communication.

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