Reconstruction and Innovation of News Communication Ecology under Media Convergence: Postprint

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Objective: To explore the transformation characteristics and innovation pathways of news communication ecology in the context of media convergence.

Method: Employing literature analysis and case study methods, this research systematically reviews media convergence development practices both domestically and internationally, and conducts analysis within the theoretical framework of communication studies.

Results: Media convergence has given rise to a new communication landscape, reconstructing news production processes, communication channels, and audience relationships. Technological innovation drives transformation in content production methods, and platform-based operation has become the mainstream trend.

Conclusion: In the context of media convergence, the news communication ecology exhibits characteristics of diversification, interactivity, and intelligence. It is recommended to promote the transformation and upgrading of traditional media through technology empowerment, content innovation, and mechanism reconstruction.

Full Text

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With the rapid development of emerging technologies such as 5G, artificial intelligence, and big data, media convergence has entered a new stage of deep development. The boundaries between traditional and new media are gradually blurring, and the news communication ecology is undergoing profound transformation. In this context, communication subjects are becoming diversified, communication channels increasingly varied, communication methods accelerating innovation, and user demands continuously upgrading. Exploring the reconstruction paths and innovative directions of news communication ecology under media convergence is of great significance for promoting the transformation and upgrading of traditional media and building a new communication system. This study deeply analyzes the transformative characteristics of news communication ecology and explores effective paths for reconstruction and innovation, aiming to provide theoretical reference and practical guidance for the healthy development of the news communication field.

Under media convergence, the role of traditional media is undergoing profound transformation. Driven by digital technology, traditional media such as newspapers, radio, and television have embarked on the process of all-media transformation, shifting from single media forms to multi-media platformization. Traditional media actively build a "central kitchen" style converged news production system to achieve "one-time collection, multiple generation, all-media dissemination." Taking *People's Daily* as an example, through the construction of an all-media editing platform that integrates multiple communication channels including newspapers, websites, clients, microblogs, and screens, a production and dissemination model of "central kitchen + converged media platform" has been formed [1]. In this transformation process, the core competitiveness of traditional media has shifted from communication channel advantages to content production capabilities, focusing on building professional content production teams and strengthening the supply of original and in-depth content. Meanwhile, the business model of traditional media has also transformed from single advertising revenue to diversified business models, expanding revenue sources through developing digital products, organizing offline activities, and providing information services. During the transformation, the organizational structure and operation mechanisms of traditional media have also been adjusted accordingly, establishing converged media centers, breaking departmental barriers, and promoting deep collaboration among editorial, technical, and operation departments.

1.1.2 Rise of New Communication Subjects

Media convergence has given rise to the emergence of diversified communication subjects, reshaping the landscape of news communication ecology. As shown in [Figure 1: see original paper], between 2020 and 2023, the market share of short video platforms grew rapidly from 15.8% to 36.2%, self-media platforms increased from 18.5% to 30.5%, while traditional news clients rose from 19% to 22% before declining to approximately 18% by 2023. This data clearly reflects the rapid rise of new communication subjects [2]. Various new media platforms have quickly grown into important forces in news communication by leveraging technological advantages and innovative models.

New media platforms represented by internet portals and news clients provide personalized news and information services for users by relying on algorithmic recommendation and big data analysis technologies. Social media such as self-media and short video platforms have built multi-level content production systems based on massive user groups, creating a situation where "everyone is a communicator." Internet technology companies participate in reconstructing the news production chain by launching intelligent writing, video editing, and other news production tools.

1.2.1 News Production Process Reengineering

Media convergence has driven fundamental changes in news production processes, transforming from traditional linear models to flat, networked struc-

tures. Convergence media news centers establish intelligent editing platforms to achieve unified collection and distribution of news materials. The interview process introduces mobile editing equipment that supports live broadcasting and instant publishing, significantly improving news production efficiency [3]. The editing process shifts from single-media editing to all-media editing, emphasizing one-time collection and multiple-generation output. The news planning stage focuses on all-media communication characteristics, developing differentiated content strategies according to audience features on different platforms.

Intelligent writing technology is applied in news writing, providing standardized reports such as data news and financial bulletins through natural language processing. The processing of multimedia materials such as images and videos introduces artificial intelligence technology, offering functions like intelligent editing and automatic dubbing.

1.2.2 Channel Integration and Optimization

Under media convergence, communication channels exhibit diversified and three-dimensional characteristics, with various media platforms accelerating integration to build all-media communication matrices. Traditional media actively expand digital communication channels, creating integrated platform groups encompassing websites, clients, Weibo, and WeChat. In the mobile internet era, short video platforms and social media have become important communication channels, with media institutions opening official accounts to expand coverage [4].

During channel integration, media organizations emphasize collaborative linkage between channels, establishing unified content management platforms for multi-channel unified publishing. In channel operation, media institutions adopt differentiated communication strategies according to platform characteristics to enhance communication effects. Data analysis technology is widely applied in channel operation, optimizing content distribution strategies through user profiling and behavior analysis. In building channel matrices, media organizations focus on constructing user-centered communication systems, creating multi-level and three-dimensional communication networks.

1.3.1 User Role Transformation

Media convergence development has reshaped the traditional positioning of audiences in news communication. Users have transformed from passive information receivers to participants in content production and dissemination. The popularization of social media platforms gives users more discourse power and participation rights, allowing them to express views and attitudes through comments, forwarding, and likes. User-Generated Content (UGC) has become an important information source, with ordinary users participating in news agenda-setting through content creation and sharing on self-media platforms [5].

The application of big data technology enables media to accurately grasp user

needs, with data on browsing habits and interest preferences becoming important guidance for news production. In the innovation of media business models, user value is deeply explored, with user traffic and stickiness becoming core indicators for media development. Enhanced user participation drives transformation in media operation models, promoting the shift from one-way communication to user community operation. Media institutions strengthen user stickiness by establishing membership systems and building user communities. Users' dominant position in media convergence development is increasingly prominent, becoming an important force driving media innovation and development.

1.3.2 Interactive Model Innovation

Media convergence promotes innovation in interactive models in news communication, shifting from traditional one-way communication to multi-way interaction. The application of new media technologies provides diverse channels for user interaction, enriching interactive scenarios through live streaming, online Q&A, topic discussions, and other forms. Media institutions build multi-level user feedback systems by creating interactive platforms, responding to user needs in a timely manner [6].

Socialized communication characteristics promote closer connections between media and users, with user communities becoming important interactive carriers. Interactive data collection and analysis provide basis for media content optimization, with interactive effects becoming important indicators for measuring communication effectiveness. Media institutions develop innovative interactive products such as AR news and VR experiences to enhance user participation and immersion. In major news reporting, media institutions focus on building all-media interactive matrices to achieve multi-platform linkage. Innovation in interaction methods drives the upgrading of media service models, with user experience becoming an important direction for media innovation and development.

2. Key Issues in Reconstructing News Communication Ecology

2.1 Lagging Technical Support System Construction

Existing convergence media technology platforms exhibit uneven construction levels, with poor platform compatibility and obvious obstacles to data interoperability. Insufficient big data collection and analysis capabilities constrain the effectiveness of precision communication. The application of artificial intelligence technology in news production is still in its initial stage, with intelligence levels needing improvement [7]. The application of new technologies such as cloud computing and blockchain is not deep, with a gap between technological innovation capability and media transformation needs.

The shortage of technical talent is prominent, with insufficient professional tech-

nical teams affecting technology application effectiveness. Inadequate technology investment leads to slow system updates and upgrades, with technical architecture struggling to adapt to convergence development needs. Technical standard systems have not yet been established, with different media organizations having different technical specifications, restricting resource sharing and collaborative innovation. Lagging cybersecurity protection system construction increases data security risks. Insufficient technical support capabilities affect content production efficiency and constrain communication effectiveness improvement. Weak R&D capabilities in key technologies highlight the problem of core technologies being controlled by others. Technology application is disconnected from business needs, with system practicality needing improvement. Low specialization of technical maintenance teams affects stable system operation.

2.2 Insufficient Content Production Model Transformation

Under media convergence, content production model transformation faces problems such as insufficient transformation momentum and lack of innovation capability. Traditional editing concepts still dominate, with weak awareness of all-media content planning. Content production process transformation is incomplete, with mechanical application of traditional production models that cannot adapt to new media communication characteristics [8]. Content form innovation is insufficient, with single text-based reports lacking multimedia expression capability.

Original content supply capacity is insufficient, with homogenized content flooding and declining media core competitiveness. All-media talent cultivation lags, with insufficient all-media planning capabilities among editors and reporters. Content quality control mechanisms are imperfect, with inconsistent content review standards. Innovative content forms such as data news and visual news are insufficiently developed. User needs analysis is not deep enough, with low matching degree between content supply and user demand. Content resource integration is insufficient, with widespread redundant construction, lack of innovation in content product design, and user experience needing improvement. Content production efficiency is low, with insufficient rapid response capability and inadequate supply of in-depth and investigative reporting.

2.3 Imperfect Convergence Communication Mechanisms

In the process of media convergence development, communication mechanism construction has obvious shortcomings. Cross-departmental collaboration mechanisms are not sound, with departmental barriers restricting resource integration. Assessment and evaluation systems lag, making it difficult to effectively motivate convergence development. Resource allocation mechanisms are unreasonable, with imbalanced resource allocation between traditional and new media [9].

From the perspective of national media convergence development status, me-

dia organizations at different levels show obvious gradient differences in convergence maturity. As shown in [Figure 2: see original paper], central-level media convergence maturity reaches 85%, provincial-level media reaches 72%, while municipal and county-level media only reach 58% and 35% respectively, reflecting that grassroots media still have considerable room for improvement in building convergence communication mechanisms. Talent mobility mechanisms are rigid, with low talent utilization efficiency. Innovation incentive mechanisms are missing, resulting in insufficient innovation motivation.

3. Innovation Paths for News Communication Ecology

3.1.1 Constructing Convergence Media Technology Platforms

Convergence media technology platform construction should focus on building a unified, open, and intelligent technical architecture. Platform construction is based on cloud computing technology, building distributed computing frameworks to enhance system processing capabilities. Data middle platform construction becomes a focus, achieving data collection, storage, analysis, and application by establishing unified data standards [10].

Content Management System (CMS) upgrades and renovations support multimedia content production and management, providing convenient content editing tools. Platform interface standardized design supports docking with third-party systems to expand platform functions. Mobile development framework construction meets mobile office needs and enhances editing efficiency. Media resource management system development achieves unified management of graphic, audio, and video materials. User data analysis system construction supports precise profiling and personalized recommendation. Blockchain technology application exploration strengthens copyright protection and content traceability. Microservices architecture application enhances system flexibility and scalability. DevOps practice promotion improves technology operation and maintenance efficiency. Security protection system construction ensures stable platform operation.

3.1.2 Building Intelligent Production Systems

Intelligent production system construction focuses on the entire news production process, using artificial intelligence technology to improve production efficiency. Intelligent editing system development achieves functions such as automatic news clue collection, automatic text classification, and intelligent writing. Machine learning algorithm application enhances content analysis and processing capabilities. Natural language processing technology application supports multi-language content processing and translation. Computer vision technology application achieves automation in image recognition and video processing [11]. Voice recognition technology integration supports voice-to-text and automatic dubbing functions. Deep learning model training enhances intelligence levels. Data mining technology application discovers news value points. Intelligent re-

view system construction improves content gatekeeping efficiency. Personalized recommendation engine development optimizes content distribution. Knowledge graph construction supports intelligent retrieval and associated recommendations.

3.2.1 Innovating Content Production Models

Media convergence development requires reconstructing news content production models, establishing user demand-oriented content creation mechanisms. Data-driven topic planning models are promoted, discovering user interest points through big data analysis to determine reporting direction and depth. All-media collaborative editing and reporting models are gradually established, with editorial teams organized by reporting content rather than platform attributes to achieve resource integration and optimization. Mobile-first editing concepts are deeply practiced, with journalists equipped with mobile editing devices to support news collection and publishing anytime, anywhere [12]. Crowdsourcing models are applied in news production, attracting professionals to participate in content creation by building open platforms. Boutique content studio construction is promoted, forming professional teams to create original and thematic content. News product incubation mechanisms are established, cultivating innovative content products through project-based operations. Media laboratory construction is carried out to explore integration paths between new technologies and content production. User participation enhancement mechanisms are improved, enhancing user stickiness through interactive planning. Data news production process standardization establishes complete work chains from data collection to visualization. In-depth reporting topic databases are built to reserve key topic resources.

3.2.2 Optimizing Content Expression Forms

Under media convergence, content expression form innovation has become a focus, meeting users' diversified content consumption needs. Short video content production standards are established to adapt to mobile communication characteristics and enhance communication effects. Data visualization technology application is promoted, intuitively presenting complex information through charts, animations, and other forms. Immersive news reporting is explored, using VR, AR and other technologies to enhance user experience [13]. Interactive news product development enhances user participation through gamification design. Scenario-based news narrative methods are innovated, customizing content forms according to different scenarios. Innovative application of audio-visual language enhances content expression and appeal. H5 and other lightweight applications are developed to provide convenient mobile reading experiences. Graphic news standardized production simplifies the expression of complex issues. Short video serialized creation builds content IPs. Information graphic design standards are formulated to enhance visual communication effects. Audio product form innovation develops new auditory products such as podcasts.

Live streaming technology is innovatively applied to enrich on-site reporting forms. Visual creative tool development lowers production barriers.

3.3.1 Reconstructing Organizational Structure

Media convergence development requires comprehensive reconstruction of traditional organizational structures, establishing flat, matrix management models. Convergence media center construction becomes a focus, breaking barriers between collection, editing, and distribution to achieve optimal resource allocation. Content production centers are reorganized by content attributes, breaking original departmental boundaries to form specialized editorial teams. The status of technology innovation departments is elevated, responsible for technology platform construction and innovative application R&D. Data center construction is promoted, integrating user data, operational data, and other resources to support decision analysis [14]. Product R&D centers are established to coordinate various new media product development and operation. Brand operation centers are set up to handle media brand building and market expansion. Talent training centers are formed to promote all-media talent cultivation. Project-based management models are promoted to enhance organizational operation efficiency. Assessment and evaluation systems are reformed to establish scientific performance evaluation mechanisms. Salary distribution systems are innovated to motivate editorial staff. Talent introduction mechanisms are improved to attract outstanding technical talents. Cross-departmental collaboration mechanisms are established to enhance team collaboration efficiency. Content quality supervision mechanisms are improved to strengthen quality management. Decision-making consultation institutions are established to enhance decision-making scientificity. Innovation incubation mechanisms are established to promote business innovation.

3.3.2 Innovating Operation Models

Under media convergence, operation model innovation has become key to development, building diversified profit models. User operation models are transformed, enhancing user value through membership operation. Data operation system construction achieves precise and personalized services. IP operation strategies are implemented, creating high-quality content brands to expand influence [15]. Community operation mechanisms are established, cultivating user communities to enhance stickiness. Content payment models are explored, developing high-quality paid products. Advertising operation models are innovated, providing precise marketing solutions. Value-added services are developed to expand revenue sources. Cross-border cooperation mechanisms are improved to carry out multi-domain business collaboration. Regional operation center layout expands market coverage. Event planning capabilities are enhanced to create online and offline interactive platforms. Industry chain extension is explored to develop derivative products and services. Technology service output provides convergence media solutions. Business models continue to innovate to achieve

sustainable development. Brand value realization mechanisms are established to enhance operational benefits. Market response mechanisms are improved to increase market adaptability.

Conclusion

Under media convergence, the reconstruction and innovation of news communication ecology represents the general trend. New characteristics are emerging in diversified communication subject development, communication chain reshaping, and audience relationship reconstruction. Facing challenges such as lagging technical support system construction, insufficient content production model transformation, and imperfect convergence communication mechanisms, media institutions should focus on promoting technological innovation, content innovation, and mechanism innovation. Through paths such as building convergence media technology platforms, creating intelligent production systems, innovating content production models, optimizing content expression forms, reconstructing organizational structures, and innovating operation models, media convergence can be promoted to develop in depth. In the context of a new round of technological revolution and industrial transformation, actively exploring the innovative development path of news communication ecology and building a new all-media communication pattern is of great significance for promoting the high-quality development of news communication.

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