Construction and Upgrade of Non-linear News Editing and Production Network Systems in the New Media Era: Postprint

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Date: 2025-07-09T15:34:20+00:00

Abstract

[Objective] To conduct an in-depth exploration of the construction and upgrading of news nonlinear editing and production network systems in the new media era. [Methods] Starting from the significance and upgrading necessity of constructing news nonlinear editing and production network systems in the new media era, this study analyzes their technology development direction in the new period and puts forward relevant suggestions regarding the construction and upgrading strategies for such systems. [Results] In the new media era, the limitations of traditional news editing models have prompted media organizations to shift towards nonlinear editing, enabling journalists and editors to flexibly select and arrange various media materials, thereby enhancing the interactivity and appeal of reports. Many news organizations are adopting cloud computing and big data analytics technologies to achieve real-time updates and efficient management, thereby improving editing efficiency and content precision; the introduction of intelligent tools has further promoted the optimization of editing workflows. Conclusion Media organizations need to emphasize technology research and development and talent cultivation to ensure that their nonlinear editing systems can keep pace with the trend of digital development and meet audience demands for diversified content.

Full Text

Preamble

Title: Construction and Upgrade of Non-linear Editing and Production Network Systems for News in the New Media Era
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Abstract:
[**Purpose**] This paper conducts an in-depth exploration of the construction and upgrade of non-linear editing and production network systems for news in the new media era. [**Method**] Starting from the significance of construction and necessity of upgrade, the paper analyzes the direction of technological development in the new period and proposes relevant recommendations for construction and upgrade strategies. [**Results**] In the new media era, the limitations of traditional news editing models have prompted media organizations to shift toward non-linear editing, allowing journalists and editors to flexibly select and arrange various media materials to enhance interactivity and appeal. Many news organizations are adopting cloud computing and big data analytics to achieve real-time updates and efficient management, thereby improving editing efficiency and content accuracy, while the introduction of intelligent tools further optimizes editing workflows. **Conclusion** Media organizations must prioritize technological research and talent cultivation to ensure their non-linear editing systems can adapt to digital development trends and meet audience demands for diversified content.

Keywords: new media era; news editing; non-linear editing and production network system for news; construction; upgrade
Classification Code: G201
Document Code: A
Article ID: 1671-0134(2025)05-73-05
DOI: 10.19483/j.cnki.11-4653/n.2025.05.015
Citation Format: Dong Hui-min. Construction and Upgrade of Non-linear Editing and Production Network Systems for News in the New Media Era [J]. China Media Technology, 2025, 32(5): 73-76, 81.

In the new media era, non-linear editing and production network systems for news are experiencing rapid development. By integrating advanced technologies such as cloud computing, big data analytics, and artificial intelligence, these systems endow news production with greater flexibility and interactivity. News editors can efficiently access and integrate multiple media formats, enabling real-time content updates and diversified presentation to meet audience demands for immediacy and variety. However, the development of these systems still faces challenges including technical maintenance costs, insufficient talent cultivation, and information security concerns. It can be said that non-linear editing and production network systems in the new media era are leading the digital transformation of the journalism industry, opening up new possibilities for future news dissemination methods.

1. The Significance of Building Non-linear Editing and Production Network Systems for News in the New Media Era

1.1 Improving Information Dissemination Efficiency and Flexibility

Traditional news editing models are typically linear, requiring editors to complete information collection, writing, editing, and publication through fixed, sequential processes. This model often struggles to respond swiftly to breaking events, diminishing the timeliness of information dissemination [1]. In contrast, non-linear editing systems break through these limitations. On one hand, they allow news editors to access and integrate various media materials—including text, images, video, and audio—on demand according to actual needs. This flexibility enables richer and more diverse information presentation, more effectively capturing audience attention. For instance, when covering a sporting event, editors can rapidly produce video news incorporating live footage, real-time data, and expert commentary, conveying the progress and highlights of the event in a more vivid format [2]. Particularly when facing breaking news events, editorial staff can quickly organize and process information, releasing multi-angle, multi-layered reports to satisfy the public's strong demand for immediate information, ensuring rapid content deployment and achieving the goal of "reporting as updating."

Furthermore, these systems help optimize news production workflows [3]. In a non-linear environment, news editors can process different tasks in parallel, improving team collaboration efficiency. Supported by cloud platforms, team members can share information and materials at any time, reducing delays and errors in information transmission, thereby enhancing overall work efficiency. This not only accelerates news production cycles but also strengthens collaboration across different roles, forming a more cohesive team.

1.2 Enhancing User Interaction and Personalized Experience

By leveraging non-linear editing and production network systems for news, media organizations can more accurately capture and analyze audience interests and needs, thereby achieving personalized content recommendations and customized services. This user-centered design philosophy transforms news reporting from a one-way information transmission into an interactive platform that encourages audience participation [3]. Specifically, through data analysis tools, news organizations can gain deep insights into user browsing habits, click-through rates, and feedback, subsequently developing personalized content strategies that deliver information more aligned with individual interests and enhance user satisfaction. This enhanced interactivity is also reflected in social media integration, where audiences can comment on, share, and discuss news content on platforms. This not only facilitates communication among audiences but also provides valuable feedback for news organizations, enabling them to adjust content strategies promptly to meet evolving user demands [4]. For example, when a news story generates heated discussion, the editorial team can

respond quickly by adding follow-up reports or in-depth analysis, maintaining content freshness and attention.

Through such interactive and personalized experiences, non-linear editing and production network systems for news not only enhance content appeal but also increase user engagement and sense of belonging, encouraging them to actively share and disseminate information, thereby forming a virtuous dissemination ecosystem. This user-oriented transformation not only helps news organizations build stronger brand effects but also, in an era of information overload, improves audiences' ability to identify and appreciate high-quality content.

2. Technical Development Directions of Non-linear Editing and Production Network Systems for News in the New Media Era

In the new media era, the technical development directions of non-linear editing and production network systems for news are primarily manifested in three aspects: intelligence, real-time capability, and diversification. The development of intelligence, through the application of artificial intelligence and machine learning technologies, makes content creation and recommendation more accurate and personalized. Real-time technologies ensure that news can rapidly respond to current events, leveraging cloud computing and edge computing to achieve instant information transmission and processing, thereby enhancing the timeliness and interactivity of news reporting. The diversified development direction emphasizes integrating multiple media formats—including text, images, video, and audio—to enrich news content presentation through cross-platform publishing and dissemination [7].

2.1 Cloud Computing Technology Providing Flexible Storage and Processing Capabilities

Cloud computing technology has profoundly transformed traditional news production workflows. Based on cloud infrastructure, news editors can conveniently access, store, and process news materials from any location at any time. The core of this technology lies in its provision of elastic computing resources and dynamic storage management, enabling editors to acquire required computing power and storage space on demand. By employing distributed computing and virtualization technologies, cloud computing can pool physical server resources to enable multi-user sharing. This allows team members to share various media files—including text, audio, video, and images—in a real-time collaborative environment, enhancing material organization and retrieval efficiency through centralized management. In cloud environments, editors can typically utilize application programming interfaces to integrate with various software tools, achieving seamless data flow and thereby simplifying workflows [8].

Additionally, cloud computing technology supports the application of high-performance data analytics and machine learning models, elevating the

intelligence level of content creation. For example, cloud platforms can analyze audience data and feedback in real time, automatically generating content recommendations and planning strategies to help editors develop more targeted reporting approaches. Meanwhile, version control and backup mechanisms in cloud environments ensure the security and integrity of news materials, reducing data loss risks. In terms of information security protection, modern cloud service providers commonly employ advanced encryption technologies and multi-factor authentication measures to ensure user data privacy and security.

2.2 Artificial Intelligence and Machine Learning Technologies Providing Efficient Material Integration Capabilities

Artificial intelligence and machine learning technologies play a crucial role in non-linear editing and production network systems for news in the new media era, with their application scope continually expanding to encompass news content generation, classification, recommendation, and data analytics. In terms of news content generation, AI technology can leverage natural language generation algorithms to automatically write news summaries or short reports by analyzing structured data and factual information. This process can be implemented through deep learning neural networks, where models trained on vast amounts of textual data can understand context and generate highly readable news copy. For content classification and personalized recommendation, machine learning algorithms analyze user behavioral data—such as browsing history, click-through rates, bookmarks, and social sharing—to build user profiles and identify individual interest preferences. Based on this information, systems can recommend relevant news content in real time, achieving personalized customization.

Furthermore, advances in speech recognition and natural language processing technologies provide powerful support for news editors. Speech recognition technology can efficiently convert spoken information into text, helping journalists quickly organize interview and meeting transcripts, while natural language processing enables computers to understand and process human language, providing a foundation for information extraction, sentiment analysis, and topic modeling [9]. For example, these technologies can analyze news comments and feedback on social media to mine public opinion and user sentiment, offering valuable insights for news organizations.

2.3 Virtual Reality and Augmented Reality Technologies Providing Immersive Experiential Effects

The application of virtual reality and augmented reality technologies in news dissemination is gradually emerging as an innovative narrative approach, providing users with unprecedented immersive experiences. Augmented reality technology enhances users' understanding of and engagement with news content by overlaying virtual information onto the real world. Through mobile devices or

smart glasses, users can see virtual elements integrated with real scenes, such as real-time data, charts, or expert interpretations. This information overlay not only enriches the amount of information but also enhances audiences' cognitive capacity for complex news events, enabling them to receive interactive-level feedback and understanding while consuming news. Additionally, the integration of both technologies supports multiple interaction forms, including gesture control, voice recognition, and haptic feedback, further deepening user engagement. Through these interaction methods, users become not merely information recipients but active participants. For example, with augmented reality technology, users can select different information layers through gestures or request more relevant data via voice commands. This high degree of interactivity breathes new life into news reporting, making information transmission more vivid and intuitive.

2.4 Social Media Integration Technology Providing Diversified Information Dissemination Channels

The application of social media integration technology enables non-linear editing and production network systems for news to efficiently combine social platform functionalities with news content publishing workflows, achieving instant information dissemination and user interaction. This technology deeply integrates with major social platforms (such as Twitter, Facebook, Instagram, etc.) through application programming interfaces, allowing news editors to directly share news drafts to multiple social media channels with a single click while writing and editing content. This integration not only accelerates information release but also significantly expands content reach, enabling rapid access to target audiences. By integrating social media functions, journalists can obtain real-time user interaction feedback, including comments, likes, and shares, providing intuitive basis for subsequent content adjustment and optimization [10]. Simultaneously, social media integration technology supports public opinion monitoring and analysis, utilizing natural language processing and sentiment analysis algorithms to conduct real-time monitoring of discussions about specific events or topics on social platforms, capturing public sentiment and focus points to enable timely responses from news organizations. Furthermore, integration technology allows news organizations to build user profiles, analyzing content preferences and behavioral patterns of different groups to achieve precision marketing and personalized recommendations. During content creation, editors can reference trending topics and patterns on social media, flexibly adjusting reporting content to ensure news aligns with audience interests, improving click-through rates and user engagement.

3. Construction and Upgrade Strategies for Non-linear Editing and Production Network Systems for News in the New Media Era

In the new media era, construction and upgrade strategies for non-linear editing and production network systems for news should focus on enhancing system flexibility, intelligence, and collaboration capabilities. By introducing advanced technologies such as cloud computing, artificial intelligence, and big data analytics, multi-platform integration and personalized content recommendation can be achieved. Additionally, strengthening the construction of team collaboration tools to promote real-time communication and cooperation among editors can improve work efficiency and content quality, adapting to rapidly changing media environments and user demands [11].

3.1 Promoting Cross-Platform Integration Technology

Cross-platform integration technology is particularly crucial in the new media era, providing news organizations with an efficient solution to meet multi-channel publishing demands [12]. Building a unified editing system capable of multi-platform content release means simultaneously supporting various channels including PCs, mobile devices, and social media, ensuring information can be disseminated quickly and widely. To achieve this objective, the system must possess robust adaptive functionality, requiring developers to consider different device resolutions, operating systems, and browser characteristics during design, enabling automatic content format optimization for various platforms. For example, an article may require larger fonts and simplified layout when displayed on mobile phones, while more complex layouts and detailed graphic-text combinations can be adopted on desktop devices. This intelligent adaptation not only improves user experience but also enhances content readability. Additionally, cross-platform integration technology can facilitate content reuse; with a unified editing system, news organizations can efficiently manage materials during content creation, transforming one-time productions into resources for multiple releases. Consequently, the same report can be conveyed to target audiences in different forms, such as video summaries, chart analyses, or social media posts, thereby achieving maximum dissemination effectiveness [13].

3.2 Emphasizing Intelligent Content Management and Recommendation Systems

Intelligent content management and recommendation systems are important tools for enhancing user experience and improving content dissemination efficiency in the new media era. By employing artificial intelligence and machine learning algorithms, news organizations can deeply analyze users' browsing history, reading preferences, and behavioral data to provide personalized news recommendations for each user. This efficient content recommendation mechanism not only increases user satisfaction but also effectively extends their dwell time

and engagement on the platform. For example, when a user frequently clicks on technology articles, the system will automatically push the latest reports, commentaries, and in-depth analyses in related fields, continuously capturing user attention. In this way, users' reading experiences become more fluid and enjoyable, as they find topics of interest constantly updated and pushed to them, increasing platform stickiness.

Moreover, intelligent content management and recommendation systems can assist news organizations in making data-driven decisions. By analyzing user feedback and interaction data, editorial teams can gain clearer understanding of audience needs, providing guidance for future content creation. Such feedback mechanisms help optimize content production, ensuring news organizations can adjust strategies promptly to adapt to rapidly changing market environments and user interests. Additionally, personalized recommendations are not limited to news but can be extended to video, images, or interactive content, forming diversified presentation formats.

3.3 Building Comprehensive Real-Time Data Analysis and Feedback Mechanisms

By constructing efficient real-time data analysis systems, news organizations can quickly obtain timely feedback on content popularity and market trends by monitoring user behavior, viewership data, and social media interactions [9]. These systems utilize advanced data collection technologies to track user interactions in real time, including click-through rates, reading duration, sharing frequency, and comments, while simultaneously analyzing forwarding, liking, and discussion heat on social media platforms to comprehensively assess user responses to specific content [14]. This data not only reflects the current popularity of news reports but also reveals potential market trends and user preferences, providing precise decision-making basis for editorial teams. Combined with big data analytics tools, news organizations can deeply mine the significance behind the data, identifying hot topics and content trends to assist in editorial strategy adjustments. For instance, when a news event rapidly captures user attention, the system can promptly alert the editorial team to conduct further reporting, create special features, or launch follow-up analyses to meet audience demands. This dynamic optimization capability not only improves reporting timeliness and accuracy but also ensures news organizations maintain close connections with their audiences.

Furthermore, real-time data analysis provides a feedback mechanism for content creation. By analyzing the performance of different content types, editorial teams can understand which reporting formats better attract audiences, thereby optimizing future content production and presentation methods [15]. This data-driven strategy helps continuously improve news products, enabling them to stand out in fierce market competition. Finally, establishing real-time data analysis and feedback mechanisms also provides data support for advertising and commercial partnerships. With precise user profiling and behavioral analysis,

news organizations can offer advertisers more targeted placement strategies, enhancing advertising effectiveness and achieving win-win outcomes [16].

3.4 Fully Utilizing Collaboration and Communication Tools

Collaboration and communication tools play a vital role in non-linear editing systems, particularly in fast-changing and high-demand news environments. On one hand, instant messaging tools enable team members to communicate quickly and in real time. Whether journalists at reporting sites or editors in the newsroom, all can rapidly share information and exchange opinions, ensuring everyone stays on the same page [17]. This instant feedback mechanism not only reduces information transmission delays but also encourages the free flow of creativity, facilitating rapid decision-making and response in emergency situations. Secondly, video conferencing functionality allows team members to conveniently discuss and coordinate regardless of location. This is especially important for editorial, reporting, and technical support teams distributed across different locations. Through face-to-face virtual exchanges, teams can discuss ideas more vividly and analyze complex topics, enhancing collaboration effectiveness. Additionally, video conferencing can be used for training and knowledge sharing, helping new members quickly integrate into the team [18].

Online document editing functionality further strengthens the depth of team collaboration. Teams can collaboratively edit documents in real time, with all members able to see modifications and comments, ensuring information accuracy and consistency. This approach not only improves work efficiency but also simplifies document version control, avoiding information confusion and duplicate work.

Conclusion

The construction and upgrade of non-linear editing and production network systems for news are gradually becoming a major trend in industry development. This paper begins with the significance and necessity of constructing and upgrading non-linear editing and production network systems for news in the new media era, exploring the technical development directions of these systems from several perspectives: cloud computing technology's provision of flexible storage and processing capabilities, AI and machine learning technologies' provision of efficient material integration capabilities, VR and AR technologies' provision of immersive experiential effects, and social media integration technology's provision of diversified information dissemination channels. The paper also offers corresponding recommendations for future construction and upgrade strategies for non-linear editing and production network systems for news in the new media era, aiming to provide relevant references for industry development.

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