

Reflections on the Transformation and Development of News Media Under Artificial Intelligence: Postprint

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

Abstract

The traditional news industry maintains strict production workflows across its gathering-editing, production, and distribution stages, with dedicated personnel responsible for each phase, thereby forming a linear news production system oriented along a temporal axis. The introduction of artificial intelligence has impacted the entire production process of news media; AI can harness big data for information collection and organization, utilize precise algorithms to discern users' news requirements, and render news customization feasible under its support. Artificial intelligence exhibits extensive applications in news presentation, publishing platform reform, news fact verification, and other domains. As AI continues to penetrate more deeply across various sectors of society, it will inevitably exert more profound influences upon news media. News media must actively leverage AI's advantages to achieve transformational development and effectively respond to the new challenges and demands of social change.

Full Text

Preamble

Abstract

Traditional journalism has long operated through rigid production workflows in its collection, editing, production, and circulation stages, with specialized personnel overseeing each step to create a linear, timeline-based news production system. The introduction of artificial intelligence has profoundly impacted every aspect of news media production. AI leverages big data to gather and organize information while employing precise algorithms to discern users' news preferences, thereby enabling customized news delivery. AI finds extensive application in news presentation, platform reform, and fact verification. As AI permeates deeper into all spheres of society, its influence on news media will

undoubtedly intensify. News organizations must actively capitalize on AI's advantages to achieve transformative development and effectively address the emerging challenges and demands of social change.

Keywords: artificial intelligence; news media; transformation and development; reflections

Main Body

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Artificial intelligence is playing an increasingly important role in news media. It can automatically verify the authenticity of news and provide feedback. Through analysis, we find that AI has begun to comprehensively enter the news media industry, bringing all-around impacts to the field. The ecological environment of the journalism industry is significantly influenced by AI technology. Introducing AI into news collection, editing, and review processes can effectively enhance the work efficiency of news media and actively promote the transformation and upgrading of news information in the new social environment.

2. Analysis of AI's Impact on the Media Sector

AI's impact on the media industry is comprehensive. Technological innovations in narrative, presentation, and production have substantially enhanced the industry's production capacity. For instance, virtual reality technology can effectively support on-site news reporting, significantly improving the sense of presence and interactivity, and ensuring users have more intense and intuitive news viewing experiences.

2.1 AI Enhances Information Dissemination Speed in the Media Industry Machine computing and learning capabilities continue to improve in the current environment. Robot journalism has emerged as a novel approach to news production. AI can collect vast amounts of information and effectively integrate it within the shortest timeframes. Its powerful information analysis and integration capabilities have substantially accelerated news writing speed, ushering news production into a new stage. In 2018, at an AI media conference organized by Tencent, a robot editor integrated the speeches of conference hosts, and AI software converted spoken language into text form, releasing the news to the internet and other media outlets within the shortest possible time. The AI automatic editing system Dreamwriter can produce over 2,000 news pieces daily, covering various industries and fields. AI applications have largely broken through the limitations of news editing, greatly enhancing news editing and production efficiency, fundamentally transforming the production model of the media industry and vastly improving media productivity. Users can obtain the

news they need in less time, while media organizations can closely track current hot topics and utilize AI technology to complete news creation and writing.

2.2 AI Drives Innovation in Media Distribution Mechanisms In the internet era, artificial intelligence can effectively differentiate news content and distribute it more effectively based on user needs. Traditional news distribution lacked differentiation standards and targeted distribution mechanisms, resulting in users obtaining information that might not interest them. Users spent considerable time and effort filtering news information, making it difficult for some news media to align with user needs, particularly in niche news domains where sustainable development was unattainable. AI technology has brought a fundamental revolution to intelligent distribution and content recommendation technologies. A news distribution mechanism based on users' reading tendencies and news acquisition interests ensures that AI delivers news information to those who need it most, while enabling timely adjustments based on user feedback. This model is not only more user-friendly but also propels news media into a new development stage. For example, Toutiao's rapid growth is inseparable from its construction of an interest-based recommendation model, which comprehensively deconstructed and reconstructed information content and distribution mechanisms according to user behavior patterns and interest needs, making the matching between news information and users more efficient and accurate. In the foreseeable future, as AI technology continues to develop, the precision and personalization of news distribution will be further enhanced, better satisfying the needs of news development and user consumption.

2.3 AI Brings New Reading Experiences to the Media Industry Artificial intelligence technology has enhanced interactivity between users and media. Users can engage in effective dialogues with AI, which has largely replaced manual services. It can provide users with diverse services anytime and anywhere, meeting different user needs. This not only delivers a better user experience but also substantially improves communication and interaction efficiency. For example, Apple has launched the Siri chatbot, Microsoft has introduced Xiaoice, and Baidu has rolled out Xiaodu. Meanwhile, the rapid development of VR, AR, and 3D technologies helps users achieve increasingly immersive effects, making them feel as if they are in real news scenarios. This has also transformed the way users passively obtain news, providing them with more intuitive news experiences.

3.1 Democratization of News Editing

News media editors can present news content through text, images, and video formats. Based on news requirements, they can utilize AI to collect effective information from massive data sets, precisely target user groups, and implement personalized customization. The application of speech recognition and text conversion technologies further enhances news editing efficiency. Moreover, every user can use smartphones and apps to complete news editing and upload content

to the internet, becoming both editors and disseminators of news. This further strengthens users' recognition of the platform. On social media, users' time is extremely valuable; uninteresting news information only causes user aversion. Intelligent algorithms can ensure that users' personalized needs are met. AI makes news production more efficient, information selection and writing faster, saving editing time while effectively improving the alignment between journalists' values and audience preferences.

3.2 Convenience of Editing Software

In the internet era, users can also become news publishers. Many users attempt to publish news on platforms such as Weibo, WeChat, and Toutiao. AI can help users better complete news editing, advancing crude production methods toward professional standards. AI also provides users with space for free expression and interactive communication, allowing them to participate in news construction in their preferred ways and become active participants in news formation. Users' autonomous content construction influences the system's judgment of their interests, forming individual big data based on daily browsing patterns to provide targeted push services. Simultaneously, users can timely feedback their ideas to the platform, providing effective support for content construction and more accurately reflecting user needs and feelings. AI is a highly knowledge-intensive industry, and the emergence of editing software further narrows the distance between users and news media, contributing to the sustainable development of news media.

3.3 Opening New Innovation Chains for News Media

In the internet era, competition among news media has become increasingly fierce. Different media platforms are attempting to adopt more proactive and effective methods to attract and retain users, with online news media in particular investing substantial human and material resources in technology research and market development. AI technology can help news media leverage their unique advantages to open up new avenues for innovation in the news industry chain, providing news data and related consulting services. For example, Guangming Daily has utilized its resources to collaborate with various universities, providing online and offline college application information for high school students, which has garnered widespread attention and a strong reputation in society. AI helps news media collect vast amounts of data while using this information to establish systematic resource databases, generating better revenue by leveraging media user resources. Many modern platforms have established Q&A platforms where user questions are answered by domain experts. This not only provides users with opportunities for exchange and learning but also further enhances users' dependence on news media platforms, while simultaneously enabling platforms to obtain more effective data.

4.1 AI Leads Technological Innovation in News Media

The development of the news media industry is closely related to technological advancement. From the traditional pen-and-paper era to the photoelectric era and then to the information age, technological innovation has both propelled the development of news media and intensified competition within the industry. AI provides both users and media with more choices. Intelligent filtering and automated processes can effectively organize complex information, enabling users to quickly access information through software, thereby providing technical guarantees. AI algorithms can establish user profiles and accurately analyze individual user situations, providing effective assurance for user information analysis. Currently, Xinhua News Agency has begun comprehensively applying AI technology, with tools such as Heima proofreading, simplified-traditional Chinese conversion, and semantic analysis effectively driving media technology innovation and better meeting user needs. AI technology has begun to permeate all aspects of news media. Technology is the fundamental guarantee for news media development and an effective means to satisfy diverse user needs, effectively improving the alignment between journalists' values and audience preferences.

4.2 The Increasingly Prominent Value of AI Algorithms

Artificial intelligence is built upon big data and algorithms. Through the integration and organization of large volumes of key information, it can form different categories and aggregated content. In the internet era, news information has exploded in volume, generating massive amounts of information daily with enormous variations. How to filter and organize this content is an impossible task for humans. AI algorithms can quickly perform filtering, solving this highly complex process as long as classification standards and partitioning conditions are established. The intelligent filtering and clustering functions of AI algorithms can effectively enhance news production efficiency, but they can also easily lead to repetitive and homogeneous content presentation, which is a key concern that news media should address. For example, while publishing news, Toutiao uses intelligent clustering algorithms to distribute missing person notices with precise positioning, greatly improving location efficiency and platform influence. In news verification, AI also possesses advantages in both efficiency and accuracy, and is widely applied in news auditing.

4.3 Rapid Market Expansion and Development of AI

The development of artificial intelligence benefits not only from scientific and technological progress but also from national policy support and changes in the social environment. China has identified AI as an important component of future strategic development, issuing a series of policies and regulations to seize the high ground in AI development through multiple initiatives. Development standards formulated for AI have pointed the way forward, effectively covering related industries and providing guarantees for AI's effective application. In

2017, Xinhua News Agency launched its first media AI platform in Chengdu, primarily for news production based on AI fundamentals. Media outlets such as Southern Metropolis Daily, West China Metropolis Daily, and Toutiao have all established dedicated writing robots, providing strong support for the transformation of news media.

5.1 Using Real-Time Robots for Interviews

During the 2017 Two Sessions, People' s Daily employed both physical and virtual robots to jointly complete interviews and interactive work. Xinhua News Agency also used robots for interviews and broadcast content online. Robots from Guangming Daily, Guangzhou Daily, and Henan Radio and Television also appeared on the Two Sessions interview stage. AI robots effectively integrate technologies such as speech recognition, natural language processing, speech synthesis, and machine translation. Robots can not only complete basic interview and publishing tasks but also monitor the news they release, adjusting and modifying content based on monitoring results to better meet audience needs. Real-time robots will play an increasingly important role in the field of news interviews, particularly in special environments where robots can better accomplish tasks.

5.2 Intelligent Writing of Customized News

In early 2018, Xinhua News Agency released China' s first media AI platform, which produced a two-minute video news piece in just ten seconds. The intelligent platform obtains video and image information through cameras and sensors, then processes and evaluates this information. Using big data and algorithms, it analyzes and integrates this content, forming final intelligent news through information retrieval and reordering. Intelligent news features more precise information collection and editing. Intelligent production and distribution provide effective guarantees for news generation. Intelligent systems can formulate customized news based on user profiles, meeting diverse needs through personalized information recommendations. Intelligent news is user-centered, utilizing AI to perceive environments and collect information for maximum open-ended creation. This also provides more information feedback channels for journalists and editors, fundamentally transforming the news editing models of media organizations.

5.3 Distributed News Driving Resource Aggregation

Distributed news production is based on distributed computing engines and distributed systems. The distributed computing engine and operating platform provide a favorable runtime environment for upper-layer applications. By processing and analyzing data, distributed computing engines can provide multi-dimensional understanding of data, mining the information and value contained within data to provide support for decision-makers. Distributed storage technology does not store data on one or several specific nodes but instead utilizes

the disk space on every machine in an enterprise network, combining these dispersed storage resources into a virtual storage device to achieve effective aggregation of news resources. The integration of AI has fundamentally changed the traditionally uniform pattern of news reporting and dissemination, with user participation and cross-platform linkage becoming new characteristics. Future media organizations will be both human and machine. This shift toward machine-augmented human intelligence is crucial for the future of the media industry. To maintain their integrity and trustworthiness, media organizations themselves need to be able to determine how their AI solutions are built and used. The only way to achieve this is for media institutions to continuously construct their own AI solutions. Only in this way can we foster the emergence of numerous new industries, new business forms, and new models, bringing disruptive changes to global development and human production and life.

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

Source: ChinaXiv—Machine translation. Verify with original.