Research on the Application of Artificial Intelligence Technology in Media Convergence (Postprint)

Authors: Liu Meng

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Abstract

With the continuous growth of the national economy and continuous innovation in science and technology, China' s artificial intelligence sector has achieved a qualitative leap in its development. The rational application of artificial intelligence technology constitutes a top priority in the process of modern media convergence and is an indispensable key element. It not only maximizes the dissemination function and societal impact of media, but also effectively endows media communication with diversified advantages, enables real-time interactive exchanges between media and market users, and comprehensively enhances the core competitiveness of mainstream media. This paper will further analyze and discuss the application of artificial intelligence technology in media convergence, aiming to provide scientific references for practitioners in the field.

Full Text

Preamble

Title: Research on the Application of Artificial Intelligence Technology in Media Convergence
Author: Liu Meng, School of Culture and Media, Huanghuai University, Zhumadian, Henan 463000, China

Abstract: With the continuous growth of the national economy and ongoing scientific and technological innovation, China' s artificial intelligence sector has achieved qualitative leaps in development. The rational application of AI technology is a critical priority in modern media convergence—an indispensable component that not only maximizes the dissemination function of media within society but also effectively endows media communication with diversified advantages. This enables real-time interactive communication between media

and market users, comprehensively enhancing the core competitiveness of mainstream media. This paper further analyzes and explores the application of AI technology in media convergence, aiming to provide scientific reference points for industry practitioners.

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Introduction

In this era of technological innovation, China' s media convergence development must advance with the times. Even influential cultural newspapers such as *People' s Daily* have begun collaborating with technology companies like Baidu to establish an "Artificial Intelligence Media Laboratory." This laboratory, built upon Baidu' s core capabilities, maximally satisfies the operational requirements of market media in daily work, focusing primarily on research and application of AI technologies including natural language processing and knowledge graphs to assist *People' s Daily* in autonomous news production, thereby comprehensively improving the quality and efficiency of news content editing.

The convergence of traditional news media with modern internet technology companies will become a new trend in the next round of media market integration. The development of multifunctional intelligent media under the AI technology backdrop can help traditional media platforms effectively alleviate the pressure of intelligent R&D while simultaneously improving their intelligent operational capabilities. However, it is noteworthy that during this convergence process, traditional media should not allow their intelligent transformation to be completely controlled by internet technology companies. Instead, they should focus on cultivating innovative technical talent teams that align with their own developmental characteristics, continuously enhancing their comprehensive capabilities in proprietary core technology R&D and application by appropriately increasing investment in intelligent media construction.

1. AI-Enabled Development of Multifunctional Intelligent Media

In the new era of social development, competition in the media industry is no longer solely about the quantity of content resources but rather about the ability

to optimize and integrate internal resources. To stand out in the competitive market, traditional media must enhance their market adaptability and capacity for transformative innovation. In recent years, AI technology has been widely applied across various media development domains including news dissemination, AI anchors, smart terminals, and automated media writing, significantly promoting the stable and rapid development of China' s media industry. Under this new media communication landscape driven by the dual engines of internal resources and AI technology, the convergence of traditional and emerging media extends beyond the mere integration of content, channels, and terminals across different media forms. It requires the deeper integration of AI-centered advanced technologies into the development of multifunctional intelligent media.

Following this approach, an increasing number of media platforms are choosing to collaborate with contemporary advanced internet technology companies to jointly create distinctive intelligent media products that help cultivate loyal user bases. For instance, in 2017, a news agency partnered with the renowned internet enterprise Alibaba through investment cooperation to innovate and develop a platform called "Media Brain"—China's first media artificial intelligence platform capable of providing diversified, high-quality communication services to meet the operational needs of various media institutions and different user requirements. Additionally, traditional ideological and cultural newspapers like *People' s Daily* have also begun cooperating with technology companies such as Baidu to build the "Artificial Intelligence Media Laboratory," which leverages Baidu' s core capabilities to maximally satisfy the diverse operational needs of market media in daily work.

2. AI Technology Integration in Media Development

In today' s society, people increasingly rely on mobile devices to access news and information. The practical application of AI technology in the media field ensures the provision of the highest quality and most comprehensive news services to market audiences, satisfying the operational requirements of different media production activities and the demands for rapid, large-scale dissemination of news content. The scientific and efficient application of AI technology in media integrated development enables more sophisticated approaches to media news and information dissemination while achieving optimal integration and utilization of text, image, and video information resources, thereby creating more development opportunities for modern media sector growth.

2.1 Optimizing Media Information Allocation Through AI

The practical application of AI technology in modern media enables personalized development of media communication methods. On intelligent media platforms, AI operations assist staff in real-time understanding of diverse user needs and preferences, allowing for targeted recommendation of media products. This undoubtedly enhances service levels and attracts potential consumers to the platform. In traditional news content editing, innovative AI applications can

effectively overcome the limitations of conventional news interview methods, making artificial intelligence a core component of news workflows and significantly improving both the quality and efficiency of news gathering and editing.

Market media users can complete immersive sensory interactive experiences by utilizing AI and media development integration contexts based on real-world virtual technologies and other technical means. With AI technology support, the organic integration of traditional and emerging media enables intelligent aggregation of information sources across various media websites, helping media institutions comprehensively enhance their ability to gather the latest news clues and information. For example, Sina, as one of China' s four major web portals alongside Tencent, NetEase, and Sohu, has utilized Weibo data to model hotspot propagation algorithms, with over 90% of news reporting hotspots fermenting on the Weibo platform. Since 2018, Sina has successfully created a "knowledge graph" for hotspot clues, innovatively designing more granular hotspot data information analysis models.

2.2 Rapid Dissemination of Media Information Through AI

With AI assistance, media no longer relies on traditional manual information processing methods. AI can autonomously classify and process various information resources, helping media institutions significantly improve information processing efficiency and rapidly complete the design, processing, and production of media products. In traditional media operations, staff often consumed substantial time and energy optimizing and integrating information resources. AI technology applications can reduce human workload, greatly enhance the efficiency of news information resource optimization, and prevent errors caused by manual operations, thereby ensuring the accuracy of news content generation.

AI technology can also be applied to media content distribution. Before implementing AI, Phoenix News App' s daily content exposure was only about 5,000 items; after AI adoption, exposed content has exceeded 1.2 million items. Zhihu App's content distribution volume has increased by 200%, average user duration has risen by 45%, and click-through rates have improved significantly. AI technology not only allocates and utilizes media information but also enables rapid information dissemination. For modern media to achieve rapid development and meet diverse audience needs, comprehensive AI technology application is essential to realize the integration of information content, technology application, and production processes, thereby achieving in-depth media convergence development.

3. Practical Applications of AI Technology in Media Convergence

3.1 Enhancing Core Competitiveness in Media Convergence Through AI

3.1.1 Intelligent Information Collection Traditional media' s news information gathering process primarily involves assigning collection staff to offline locations to gather various latest news events and process them into complete news information products. Under AI technology, intelligent aggregation of information sources across various media websites can be achieved, helping media institutions comprehensively improve their ability to collect the latest news clues. For example, Xinhua Zhiyun Technology, jointly established by Xinhua News Agency and Alibaba Group, aims to empower the media content industry through AI technology, helping content producers gather and process news resources faster and better. Xinhua Zhiyun has innovatively developed China' s first media artificial intelligence platform and successfully launched eight advanced auxiliary news collection robots that effectively improve the intelligence level of news information collection in areas such as automatic text recognition, face tracking, and incident detection.

An increasing number of intelligent hardware devices are also being popularized in the media market, greatly facilitating news information collection. Hardware devices such as Sogou recording pens with recording and transcription functions, iFLYTEK' s "Xiaoyi Translator" with simultaneous translation capabilities, and aerial drones have all accelerated the speed of news information gathering.

3.1.2 AI Writing AI writing is widely applied in content creation for finance, sports, and natural disaster news. Staff only need to pre-set the format for specific news writing content, after which the AI machine searches for target writing content and formats to complete rapid and accurate matching, thereby achieving news information reporting through a "fill-in-the-blank"approach. For instance, during the 2016 Rio Olympics, China' s professional information platform Toutiao developed and launched the writing robot "xiaomingbot." This writing robot could implement real-time news drafting by connecting to the Olympic Committee' s data information, publishing news articles at almost the same speed as television live broadcasts. Within just six days, "xiaomingbot" produced over 200 news briefs and information pieces. This AI robot writing module, jointly developed by Toutiao and Peking University' s Institute of Computing Technology, represents China's first AI robot reporting on Olympic sports events, capable of generating news based on various grammatical compositions and sorting learning.

Similarly, in 2019, *China Science Daily* successfully developed and launched writing robots like "Xiao Ke," which can generate news texts from data tables, maximizing the speed of news information drafting for their media institutions while simultaneously increasing writing volume. Compared to domestic appli-

cations, foreign media' s AI writing shows certain differences. First, the news categories covered extend beyond sports and finance reporting with clear data sources to include social hotspot news and breaking events. Second, their data sources are more extensive, with foreign news media not only possessing full-text databases but also connecting to enterprise databases—for example, *The Washington Post* collaborates with sports database company Stats.com, and the Associated Press partners with MLBAM. Third, foreign media have moved beyond the primary stage in AI writing, beginning to explore ways to enhance the automation level of writing robots and how to use AI technology to equip them with writing capabilities that more closely approach those of human reporters.

3.1.3 AI Auditing In traditional media news content auditing, media institutions typically employ manual auditing methods that require significant human and time resources. Under the influence of modern AI technology, image recognition processing technology and natural language processing technology can be leveraged to autonomously complete rapid and accurate identification of keywords and keyframes in news information resources. Through database comparison, screening and elimination of various types of undesirable news can be accomplished, thereby maximizing the quality and efficiency of news content auditing while helping media institutions save substantial costs. Major Chinese internet technology companies such as Baidu and Huawei have developed their own content auditing services to assist staff in completing AI-powered news information auditing.

As a provider of intelligent video production technology in China, Moviebook Technology combines AI recognition systems with knowledge graph systems to effectively provide media institutions with frame-accurate automated video structuring services, successfully applying recognition content to the auditing and management of various image and video content. However, since current AI-powered auditing methods cannot scientifically control content from the dimension of human values, media institution platforms still need to comprehensively adopt combined manual and intelligent auditing methods for news content management to prevent various negative and undesirable information from entering the market and influencing the formation of erroneous public perceptions.

3.2 Improving Production Processes in Media Convergence Through AI

In the modern intelligent media convergence field, big data technology is widely applied in news information retrieval and news authenticity verification. The research and application of various advanced technologies have promoted the effective integration of AI technology with media in China, while also establishing AI technology as a core development trend in contemporary media. Meanwhile, innovative AI applications can bring more diversified news production and distribution processes to the media convergence field. For traditional media industries to achieve scientific and effective integration with AI technology,

they must build their own core R&D talent teams or enhance their AI technology research and application capabilities through strengthened cooperation and exchange with excellent technology enterprises in the market.

In traditional news information presentation modes, users could only obtain needed information through simple text, images, and videos. Under the backdrop of AI technology application development, media institutions can effectively expand space through the rational introduction and application of AR technology. As a technology that cleverly integrates virtual information with the real world, AR technology applied in media news dissemination can maximize news communication capabilities, enabling media market audience users to personally experience news scene information and providing them with a sensory feast. Under AR technology assistance, media information readers can perceive a rich and colorful media world—something that traditional media forms of text and image information dissemination cannot achieve.

3.3 Strengthening User Insight Capabilities in Media Convergence Through AI

The fundamental purpose of media convergence is to better shape the communication competitiveness of mainstream media in the market, help national governments disseminate positive public opinion news information, and build connections between mainstream media and market audience users. To effectively enhance market user insight and analysis capabilities, AI technology must be leveraged to improve media platform services, real-time understanding of user dynamic behavioral characteristics, and targeted recommendation of information service products to help eliminate barriers between users and social culture.

AI technology-enabled composite intelligent media platforms can real-time record and obtain relevant data information, relying on graphic recognition, facial recognition, and other technologies to strengthen interaction with platform users, ultimately forming the foundational data for individual user profiles. Intelligent media platforms automatically analyze data in their databases to comprehensively and accurately grasp the information demand preferences of different users, thereby providing effective and complete foundations for subsequent news information product processing, production, and distribution. For example, *People' s Daily* has effectively built a comprehensive smart content aggregation and distribution platform by leveraging AI technology. This platform collects high-quality information content resources from the vast majority of mainstream media in the market and completes in-depth processing and analysis of massive news information content under AI technology application to form standardized and complete data. The platform also pushes corresponding media product content to users based on their daily login behavior and consumption capabilities through its user profiling system, thereby improving the operational efficiency of the entire media content industry chain from creative source to consumption scenarios.

Similarly, in May 2020, Microsoft released the latest news application NewsPro 2.0 with a newly added "News Robot" feature. This function specializes in news recommendation, delivering three relevant news items daily according to user instructions. When users simply input "Give me news," NewsPro 2.0 pushes personalized news to them. The construction of intelligent media convergence platforms can also extend service functions. Media enterprises can leverage big data, blockchain, and AI technologies to real-time collect and organize large amounts of valuable data information, using this data to connect national governments, enterprises, and individual market users, providing them with needed social resources.

Conclusion

In summary, for modern media industries to ensure their own stable and sustainable development while comprehensively enhancing the core competitiveness and influence of media platforms, they must strengthen innovative research and application of AI technology. During the practical development of media convergence, media institutions and organizations need to establish their own core technical talent teams and strengthen cooperation with excellent technology enterprises in the market. By doing so, they can continuously improve their research and application levels of AI technology, ultimately achieving the strategic goal of deep media convergence and sustainable development.

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