Research on the Application of AI Technology in Financial News Production (Postprint)

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

Abstract

【Objective】To investigate the primary pathways through which current financial media apply AI technology to news production, and to prospect future optimization and development directions for this model. 【Method】 The article proceeds from artificial intelligence technology empowering financial news production, and uses the application in the news production process of "National Business Daily" as an example to discuss the necessity of this model' s emergence and its practical application directions, while analyzing the value and significance of AI technology for news production and smart media transformation. 【Results】【Conclusion】 Financial media represented by "National Business Daily" have taken AI technology as a breakthrough point, comprehensively integrating artificial intelligence into various business scenarios of news production such as writing, reviewing, short video generation, and video livestreaming, achieving positive effects in improving production efficiency and communication impact, while also heralding the transformation toward smart media. With the continuous development and maturation of AI technology, it is expected that the application and value of AI technology in financial media will continue to develop in depth. However, this process is also accompanied by the emergence of some new issues, which need to be addressed through continuous upgrading of AI algorithms, normalized human-machine collaboration, and unification of data standards, in order to achieve the goal of managing technology well, using it well, and using it effectively, thereby empowering media transformation and development in the new era to a greater extent.

Full Text

Research on the Application of AI Technology in Financial News Production

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Abstract:
[**Purpose**] This study examines the primary pathways through which financial media currently apply AI technology to news production and explores future directions for optimizing and developing this model. [**Method**] Beginning with AI' s empowerment of financial news production and using its application at *National Business Daily* as a case study, this article discusses the necessity of this model and its practical applications while analyzing the value and significance of AI technology for news production and intelligent media transformation. [**Results**] [**Conclusion**] Financial media outlets, represented by *National Business Daily*, have leveraged AI technology as a breakthrough point, comprehensively integrating artificial intelligence into various news production scenarios including writing, auditing, short video generation, and video livestreaming. This has achieved positive results in improving production efficiency and communication effectiveness while launching the transformation toward intelligent media. As AI technology continues to mature, its application and value in financial media are expected to develop further in depth.

However, this process has also given rise to emerging challenges that must be addressed through continuous AI algorithm upgrades, normalized human-machine collaboration, and unified data standards to achieve the goal of managing technology effectively, utilizing it properly, and producing tangible results, thereby empowering media transformation and development in the new era to a greater extent.

Keywords: AI technology; financial news; intelligent media; artificial intelligence; applied research
Classification Code: G216
Document Code: A
Article ID: 1671-0134(2023)06-017-05
DOI: 10.19483/j.cnki.11-4653/n.2023.06.003
Citation Format: Zhang N, Zhou YX, Yang T. Research on the Application of AI Technology in Financial News Production [J]. China Media Technology, 2023(06): 17-21.

With the maturation of emerging technologies represented by AI and the expansion of their application scenarios, an increasing number of media organizations have introduced AI technology into news content production and dissemination in recent years, becoming an important pathway and lever for deepening media transformation. Depending on their nature and positioning, media outlets employ different specific methods of utilizing AI technology. Some focus on innovative applications at the distribution end, such as Xinhua News Agency and China Central Television, which pioneered the use of AI virtual anchors for frequent application on their new media platforms. In the financial media sector, financial news possesses inherent characteristics of being data-driven, visualizable, and standardizable, leading major media outlets to focus AI applications on content production. As media transformation deepens and AI technology

further matures, media utilization of AI technology will inevitably shift from isolated links in news production to full-process integrated applications. This article uses *National Business Daily* as a case study to analyze its development of a product matrix based on AI technology that covers multiple processes including content monitoring, production, and distribution, as well as multiple media formats including text, video, and television livestreaming, thereby investigating advantageous pathways for financial intelligent media transformation.

1.1 Timeliness Requirements for Financial News

Among all news production categories, financial news has the highest requirements for timeliness. This is because, on the one hand, the financial sector that financial news focuses on is closely linked to the market, where news directly impacts various domains of the financial market. On the other hand, due to the global nature and high interconnectivity of financial markets, the scope of financial news monitoring is not limited to domestic affairs but encompasses all global financial events, while market monitoring covers not just a specific area but all financial fields including stock markets, futures markets, and foreign exchange markets.

Given these characteristics of financial news, the traditional manual monitoring model faces several insurmountable obstacles in achieving the ideal state of comprehensive, uninterrupted 24/7 monitoring and publishing of global financial news. First, the human resource costs are enormous. Full-volume, full-time, and high-efficiency monitoring requires far more editorial staff than other news production fields. Second, financial news production demands higher professional knowledge, with requirements for financial expertise among editorial staff even exceeding those for journalistic skills themselves. As AI technology gradually matures and becomes implemented, financial media' s utilization of AI technology to solve timeliness issues in news production has become an inevitable choice and development direction, precisely because "machines never sleep."

1.2 Quantity Requirements for Financial News Production

In addition to timeliness, financial news production also has extremely high quantity requirements, again related to the special objectives of financial news. Unlike non-financial news production, which lacks fixed and continuous objects or topics, financial news differs in that its objects, as mentioned above, primarily face global financial markets. This determines the vast number of subjects involved—there are nearly 5,000 listed companies in the mainland A-share market alone. Coupled with trends such as global economic integration, the linkage between major capital markets is strengthening, and investors' scope of information attention is no longer limited to local markets. Consequently, investors have placed higher demands on the coverage of financial media information. Using AI technology, financial media can achieve comprehensive, automated news monitoring and writing functions, meeting investors' increasingly broad needs while also freeing up editorial staff and alleviating production pressure. This

represents a feasible approach for current financial media to enhance content production capacity.

1.3 Data and Visualization Characteristics of Financial News

Beyond timeliness and full-volume characteristics, financial news has a significant feature that distinguishes it from non-financial news: its data-driven nature and data visualization characteristics. This is determined by the nature of the financial sector and markets. In the financial news production process, whether focusing on market fluctuations or company-specific reporting, data is indispensable. The direct manifestation of financial market fluctuations is data, and the direct manifestation of corporate performance is also data. In traditional financial news production, the process for editorial staff to monitor, search for, statistically process, and graph data is quite complex and cumbersome, consuming significant time and effort. Moreover, without appropriate data storage and organization mechanisms, this data analysis and statistical model is often "one-time" —a single data statistic is performed only for a specific article and lacks reusable value. By combining AI technology with big data and cloud computing, financial news production can achieve systematic innovation in data statistics models. Technological means can integrate the entire process of data involved in financial news production, from monitoring and extraction to usage, calculation, statistics, and analysis. Furthermore, massive amounts of historical data can be stored in the cloud via technological means for ready extraction and reuse, continuously preserving and leveraging data value. Additionally, AI technology can assist editorial staff in historical data comparison, analysis, and charting, enhancing data visualization in financial news production while greatly alleviating the data processing burden on editorial staff.

1.4 Standardization Characteristics of Financial News

As mentioned above, financial news is highly data-driven, meaning that data-based financial news production can be carried out through structured data processing using AI technology. In financial news production scenarios, since data-driven financial news writing features fixed data sources and unified, standardized writing formats, intelligent writing by AI technology can completely replace manual labor. AI can perform editorial work, forming a fully automated process integrating data monitoring, extraction, and model-based writing. Simultaneously, having AI operate this process can reduce production time to seconds, which in turn greatly promotes the timeliness of financial news.

2. Application Directions of AI Technology in Financial News Production

Currently, AI technology applications in financial media primarily cover several parts of the news production process, including content production and auditing, as well as enriching communication media and formats. The following analysis

uses *National Business Daily* (hereinafter referred to as "NBD") as an example to examine its main types of AI news products.

2.1 AI-Based Content Production: Automated AI Article Generation NBD's automated AI article generation system integrates data acquisition, data analysis, and model-based writing, achieving second-level production of financial data articles through a fully automated production process. This has greatly liberated and developed the productivity of traditional financial media data articles in terms of production speed, volume, and timeliness. For example, in the "NBD Beijing Stock Exchange Investment Express" project, AI writing technology was used to cover and automatically write about announcements from Beijing Stock Exchange companies, trading information, business registration data, judicial information, patents, and other content, significantly improving the granularity of investors' tracking of listed companies' fundamentals. The automated AI article generation system, relying on machines' capabilities for data storage and computation, can conduct comparative analysis of massive historical data and present it in text and chart formats, helping financial media break through previous bottlenecks where financial data analysis articles were "what people wanted to do but couldn't" or "what people could do but with great difficulty." In addition to producing text articles, the automated AI article generation system can simultaneously generate data charts corresponding to the text articles, achieving organic unity of text and charts to effectively enhance the visibility and readability of financial news articles. The system supports customized task settings and can perform specific requests and operations according to particular publishing requirements, enabling permanent fully automated article generation after a one-time setup.

2.2 AI-Based Content Auditing: AI Article Review To meet the auditing needs of AI-generated articles and improve internal review mechanisms, NBD has also developed an AI auditing workbench system that interfaces with the automated AI article generation system. This system categorizes and stores large volumes of machine-generated articles, enabling multiple editorial staff to conduct real-time verification against original texts, push articles, and classify publishing channels for batch machine-generated articles. The system groups multiple types of AI articles into three categories based on publishing priority, with different reminder mechanisms for each category according to priority level, facilitating editorial staff in publishing the most important information first. Additionally, all articles in the AI auditing workbench feature sensitive word query functions and, based on sensitive word categories, integrate a function for forwarding to leadership review through third parties. From an overall design framework perspective, the AI auditing workbench serves as a "public auditing platform," where all editorial staff using the workbench can observe the auditing progress of all articles on the platform in real time, facilitating real-time writing and aligning with the internal business processes and working mechanisms of media editorial staff.

2.3 AI-Based Content Format Innovation: AI Short Video Generation Beyond content production processes and in response to the current trend of diversified and short-video-oriented news content dissemination, NBD has also developed a short video generation tool platform based on AI technology. By integrating technologies such as web crawlers, natural language analysis, tagging, media asset libraries, intelligent text-to-speech (TTS), and material rendering, this platform successfully achieves fully automated completion of the entire short video process from topic selection, scripting, visuals, voice, and rendering by AI, providing a new solution for qualitatively improving short video production volume in the short video era. Currently, NBD has integrated this platform with the aforementioned automated AI article generation system and AI article auditing system, forming an automated workflow of machine writing—manual review—automatic video conversion—auditing and publishing, achieving synchronized production and distribution of both text and short video content formats. Additionally, the AI short video generation tool platform integrates crawler technology to obtain real-time internet news leads, monitor hot events across the entire network, and push them in real time, providing creators with topics and content materials. In the material acquisition phase, the system automatically extracts key points from news reports, eliminating the manual text extraction process, greatly shortening the video production cycle while following hot trends to improve short video content timeliness. In the video production phase, the platform uses natural language analysis technology to automatically perform sentence segmentation and word cutting on user-input text content to fit short video screen layout styles. Meanwhile, the embedded media asset library system automatically matches pictures or video materials in preset shots that correspond to the content, and finally synthesizes the video through real-time rendering technology. This breaks the difficult and labor-intensive 困境 of manual editing and matching visuals with text, further promoting the liberation of short video productivity. The AI short video generation platform also integrates intelligent voice functions, simplifying the cumbersome process of separately processing text, visuals, and sound in traditional short video production and creating a more efficient production model.

2.4 AI-Based Communication Media Innovation: AI Television Beyond short videos, NBD has also continuously conducted research and development on news video livestreaming products. In October 2021, NBD simultaneously launched "NBD AI Television" across the entire network—the world' s first 24/7 media video livestreaming product with a fully AI-driven workflow. NBD AI Television is supported by three systems: NBD AI Intelligent Writing, NBD AI Virtual Anchor, and NBD AI Broadcasting Control. It seamlessly integrates into the entire business chain of financial video content production and distribution as its underlying operational logic, achieving cost savings, improved production efficiency, reshaped content value, and precise content dissemination and efficient operation, providing platform empowerment for output across different financial content scenarios. At the technical level, NBD AI Tele-

vision comprehensively employs multiple AI technologies including AI virtual anchor generation and driving, AI text and video generation, and big data financial knowledge graphs, optimizing around the information categories users care about most. Video content covers 13 major categories and 222 subcategories including A-share announcements, institutional research, and brokerage research reports. NBD AI Television is the world' s first innovative product to complete the entire livestreaming chain from AI article writing to virtual anchor video generation, AI video generation, and video broadcast sequencing fully through AI. Except for auditing and broadcast monitoring, NBD AI Television' s 24/7 uninterrupted content broadcasting and transmission requires no additional manual operation. The achievements related to NBD AI Television have also been recognized as national innovation cases in China' s press industry deep integration and development for two consecutive years.

3. Reflections on AI Technology Application in Financial News Production

3.1 Problems in AI Technology Application in Financial News Production

3.1.1 Conflict Between Mechanized News Production and "Content is King" Values In the practical application of AI technology-based news products to financial news production, some universal problems have emerged. For journalism, "content is king" is a widely recognized and practiced value in the news industry. The cornerstone of "content is king" lies in editorial staff' s subjective judgment of news topics, content, communication methods, and other elements. This process includes not only judgment of news value itself but also functions such as public opinion guidance and value transmission, ultimately involving journalistic ethics. Fundamentally, the subject performing this series of processes is human. In a fully algorithm-controlled AI news production process, the situation may arise where traditional media' s social control capabilities are greatly weakened, and its agenda-setting function—that is, selecting, editing, strengthening, or downplaying news according to media will and values—will gradually be manipulated and implemented by algorithms, leading to the displacement and delegation of traditional gatekeeping power. Furthermore, from a technical perspective, the relationship between technology and ethics is inseparable. Technology must advance following ethical trends, and ethics provides guidance, framework, and bottom lines for technological evolution. Technological progress cannot develop in uncontrollable directions detached from ethical regulation. Therefore, fully automated AI news production clearly cannot and should not completely replace editorial staff, and humans as technology guides still need to fully intervene and play their value in this process.

Specifically in financial news production, "content is king" is mainly manifested in two aspects. In addition to the aforementioned functions of news in guiding and transmitting values, how to differentiate the importance of news is also

an urgent problem to be solved in AI-based news production. As previously mentioned, financial news has the characteristic of full coverage. Although AI technology intervention has solved the "quantity" problem in financial news generation, this process is completely homogeneous. Relying on machines' linear production logic makes it impossible to distinguish and classify the importance of content itself. Thus, applying AI technology to financial news production as an important productive force is only the first step. How to equip AI with further thinking logic and judgment capabilities similar to humans is the key to achieving more intelligent artificial intelligence.

3.1.2 Human Resource Consumption in Data Processing and Structuring AI-based financial news production still involves manual consumption. On the one hand, although the entire news production process is automated after introducing AI technology, this automation premise requires humans to "teach" machines the logic and methods of news production—that is, algorithmic models. In establishing algorithmic models, large amounts of scattered, heterogeneous data need to be manually organized, analyzed, and deconstructed to transform raw, non-standard data prototypes into structured formats. This process requires participation from numerous journalists, editors, and other editorial staff while also requiring technical personnel involvement for code conversion. On the other hand, data processing, annotation, and production model establishment related to financial content is highly specialized work, placing higher demands on financial media practitioners' knowledge reserves and professional literacy. Additionally, after AI news products actually participate in news production processes, practical requirements may change with objective circumstances, leading to continuous updates in data deconstruction and modeling, which objectively increases human resource costs for product and technical personnel.

3.1.3 Data Procurement Costs as Production Materials With the widespread application of new technologies such as AI, data cost issues also need to be considered. Following the continuous development of information technology, data has become a production factor alongside land, labor, capital, and technology. The enormous value and potential of data as a production factor can be divided into three levels: first, data is a "new resource" ; second, data is a "new asset" ; third, data is a "new capital." Each level manifests in two dimensions—in both physical space and digital space. The three levels of "new resource," "new asset," and "new capital" can function independently or synergistically for greater effect. Thus, data in the present era is not only a resource but also an important asset. When media introduce AI technology into news production, data support is inevitably required, which is especially true for financial news production characterized by data and visualization. While enjoying the dividends brought by intelligent news production, media must also pay costs for data collection and usage, which are often substantial and continuous. This creates a situation where although technology reduces labor costs, data resource procurement costs have risen significantly. How to

make data, as a "new asset," more cost-effective is increasingly becoming an issue that media must consider and address.

3.2 Countermeasures and Optimization Measures

3.2.1 Continuous Algorithmic Technology Iteration and Upgrading Addressing the problems in AI technology application in financial news production, the most immediate task remains continuously iterating and upgrading the algorithmic models involved in AI technology. Currently, applying AI technology to news production mostly remains at the first stage of "how to make news production work through technology." The more important second stage of "how to make news production quality and efficiency more human-like" concerns the future of AI-based news production models. It must be noted that AI technology, as an extension of human wisdom and thinking, has no upper limit in its learning process. As the core of AI technology application in news production, algorithms can only make AI thinking and logic infinitely approach human thinking through continuous training and learning, with algorithm models constantly updated through human operation to keep pace with media news production' s new demands and tasks. Based on this, as AI technology further matures, current problems such as the absence of "content is king" in AI news production will gradually be optimized and resolved.

3.2.2 Normalized Human-Machine Collaboration Model: Everyone is a Product Manager Beyond continuous algorithmic model iteration and optimization, AI news products also require constant adjustment and innovation. Although various AI news products can achieve full automation in content production and distribution, this does not mean the entire news production process is in an "out-of-control state" completely independent of humans. Besides manual auditing operations to ensure information security as a bottom line, the entire machine production process and final content products are carriers presenting media style and value judgment. Therefore, machines do not exist independently separated from humans. Applying AI technology to news production is actually a process of organic integration and mutual cooperation between humans and machines. This part cannot be achieved solely by product and technical personnel; it requires all editorial staff to propose requirements based on business realities and participate in the processes of research, testing, updating, and iteration. Only then can various AI news products become "down-to-earth" in terms of user experience and output effects, truly integrating into media production as an important component.

3.2.3 Deepening Government and Enterprise Digitalization Can Solve Data Standardization Issues Algorithm model and product updates will solve the quality and presentation issues in AI news production, while solving data standardization issues is an important lever for improving algorithm update efficiency and reducing algorithm model establishment difficulty. Data

concerns the development of AI technology, and data quality determines AI development levels. In financial news production, besides market data, large amounts of data and information publicly released by governments and enterprises serve as sources and foundations for news content. As mentioned above, establishing algorithmic models still involves substantial human consumption, primarily requiring manual organization, analysis, and deconstruction of large amounts of scattered, heterogeneous data to form standardized structures. The main reason for this phenomenon is that Digital China construction is still in its foundational promotion stage, where digital transformation standards and implementation progress are not unified across governments, enterprises, and other entities. With the widespread application of various new technologies based on data, promoting the unification and standardization of data formats and structures may become a major issue that the industry urgently needs to address next.

Financial media outlets, represented by *National Business Daily*, have used AI technology as a breakthrough to launch the transformation toward intelligent media. Applying AI technology to financial news production is only the first step. As AI technology application scenarios further expand, the scope of AI technology application in financial media will continue to broaden and deepen. For example, *National Business Daily* has proposed the organic integration of various AI media products, launching a strategy for all-media and all-format matrix coverage of financial content, and exploring the construction of a "financial content metaverse" to achieve the fusion and interpretation of rigorous financial news production with vivid "financial stories," providing audiences with personalized, immersive content services that are vivid and tailored to individual preferences.

The rise and development of AI technology have provided opportunities and means for integrated and technological development as traditional media transformation enters deep waters. From the current perspective, initial results have been achieved in improving media production efficiency and communication effectiveness. However, automation and intelligence do not equate to unmanned or laissez-faire operations. As media introduce new technologies to empower production innovation, how to adhere to and implement the principle that "positive energy is the overarching requirement, manageability is the hard principle, and effective use is the real skill," and how to manage technology well, use it properly, and produce tangible results to provide greater assistance for media transformation and development in the new era, are issues that require continuous exploration and reflection from top to bottom across media organizations.

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(Editor in Charge: Li Jing)

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