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From assistance to symbiosis: a study on human-machine collaborative practices in mainstream media's news operations from the perspective of media convergence

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Abstract:
From the perspective of media convergence theory, this study examines human-machine collaboration practices in mainstream media news operations, the mechanisms of political influence, and the active paths through which journalists achieve balance and adaptation. Using content analysis and case study methods, the research conducts statistical analysis of human-machine collaborative reporting in mainstream media and investigates cases including Xinhua News Agency's "Editorial Assistant" and "CCTV's Large Model". The findings reveal that hard news is more constrained by political security factors than soft news, with significantly lower levels of AI application. Major thematic reports emphasize human-machine collaboration in the presentation stage; investigative and explanatory reports focus on the information collection stage; and routine reports concentrate on the content writing stage. Political security and guidance shape human-machine collaboration practices in mainstream media, and active journalists achieve adaptation through prioritization and balance in this process. In the context of deep media convergence, this adaptation provides insights for achieving the unity of orthodoxy and innovation in human-machine collaborative reporting.

Keywords:
human-machine collaboration, media convergence, mainstream media, news operations, AIGC

1 Introduction

In the current era, with the vigorous development of artificial intelligence technology, many AI tools have profoundly influenced human production and lifestyles, playing an important role in human activities. The relationship between AI and humans has grown increasingly close. As artificial intelligence continues to integrate with the journalism industry, various intelligent media technologies have emerged. Some mainstream media have deeply integrated intelligent media technologies into the entire process of news production, and human-machine collaboration has become an innovative working model in the contemporary media industry. Through continuous observation of the media industry, this study finds that efficient human-machine collaboration not only improves the production efficiency of mainstream media in scenarios such as investigative

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reporting and major thematic reporting, but also reflects news practitioners' active choices in applying intelligent media technologies and promotes their transformation and upgrading.These phenomena raise several questions: In which stages of news gathering and editing activities is artificial intelligence applied? How is artificial intelligence embedded into traditional news gathering and editing processes across different types of reporting? How do political factors influence the application of AI in specific news operations? What role does journalists' agency play in this process?

2. Literature Review

2.1 Media convergence theory research

The concept of media convergence was first proposed in 1983 by Professor Ithiel de Sola Pool from the Massachusetts Institute of Technology in his book Technologies of Freedom. In this book, Professor Pool introduced the concept of "convergence of modes", which refers to the integrative trend of various media forms moving toward integration. With the continuous development and advancement of media technologies, numerous scholars have conducted in-depth research and elaboration on the concept of media convergence from different perspectives. For instance, Andrew Nachison, Director of the Media Center at the American Press Institute, defined media convergence as "the strategic, operational, and cultural alliances between print, audio, video, and interactive digital media organizations." Subsequently, Professor Rich Gordon of Northwestern University further enriched the concept of media convergence, suggesting that it specifically includes ownership convergence, strategic convergence, structural convergence, news-gathering process convergence, and news presentation convergence.

The localized development of "media convergence" in China began in the 1990s. Cui Baoguo mentioned this concept in his article Technological Innovation and Media Reform, though most scholars consider 2005 as the true "year of introduction" for media convergence in China. In 2005, Professor Cai Wen drew attention to changes in American journalism and journalism education, thereby asserting that "media convergence is an inevitable trend" in China. It was from this point that systematic research on media convergence in China officially began.

Subsequently, Chinese scholars have conducted localized research on "media convergence" from various perspectives, with domestic studies showing an increasing trend year by year. This scholarly research has also guided diverse and innovative convergence practices in Chinese news media. For example, Yu Guoming argues that media convergence is an interdisciplinary pan-convergence process, based on the foundational logic of media connectivity, aiming to achieve "broad convergence" across different fields. Zhang Lei, approaching from the perspective of media's social functions, contends that the mission of media convergence is to help various media better serve as the "eyes, ears, and voice" of the Party and the people, thereby facilitating public opinion guidance and optimizing social governance.

In 2014, the Fourth Session of the Central Leading Group for Comprehensively Deepening Reforms reviewed and approved the "Guidelines on Promoting the Convergence Development of Traditional and Emerging Media", elevating "media convergence" to a national strategy. Driven by national policies, Chinese media convergence research has focused on the theoretical and practical guidance of media convergence for media

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practices, actively exploring pathways for the transformation and upgrading of traditional media in the new media era. Concurrently, some scholars have identified practical challenges in media convergence, such as the difficulties arising from indiscriminate convergence at the county-level media and the dilution of journalistic professionalism among practitioners due to media convergence.

At present, media convergence has entered a phase of in-depth development. During the 2023 "Two Sessions" (the National People's Congress and the Chinese People's Political Consultative Conference), the concept of "promoting deep media convergence" was included in the government work report for the first time, providing directional guidance for the theoretical and practical development of the media industry at the national strategic level. Consequently, numerous scholars have conducted research on the reforms and innovations of news media in areas such as institutional mechanisms, technology, channels, content, and discursive style, which has become a major focus in the current stage of deep media convergence research.

Examining issues related to Chinese media news practices from the perspective of media convergence has become a commonly adopted logical approach in contemporary academic circles. This approach not only possesses research validity but also responds to the national media development strategy. However, previous studies have not examined the human-machine collaboration practices in mainstream media news operations-the very focus of this study-from the perspective of media convergence theory.

2.2 Human-machine collaboration research

2.2.1 Overview of research on human-machine collaboration

The concept of human-machine collaboration refers to introducing human experience to assist machines in "learning" through reasonable and effective interaction mechanisms, and more importantly, enhancing the level of machine intelligence to more efficiently assist humans, ultimately achieving intelligent collaboration among multiple humans and multiple machines in complex environments. Human-machine intelligence integration can be regarded as an early stage of human-machine collaboration. In China, this concept was first proposed by Chen Xingyuan and Wang Kunjie, referring to the organic combination of human intelligence and computer intelligence, allowing each to leverage their strengths and compensate for each other's weaknesses. Subsequently, this concept has been further developed, extending to notions such as human-machine collaboration.

Regarding research on "human-machine collaboration," some journal articles have focused on the study of journalistic ethical risks. For instance, Li Kai, in his article Reflections on Journalistic Ethics Based on "Human-Machine Collaboration" in the Age of Intelligent Media, noted that with the in-depth application of new technologies such as artificial intelligence in media practices, the numerous challenges they bring have gradually emerged, particularly difficulties in protecting basic civil rights such as personal privacy and copyright. He argues that we need to increasingly adhere to the principles of value-oriented human leadership and human-machine division of labor and cooperation. Some other scholars contend that deficiencies in news review, the absence of manual verification, and inadequate rule systems are the causes of journalistic ethical anomie in the intelligent era.

Other studies on "human-machine collaboration" have focused on human-machine relationships. Peng Lan,

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in her article Human-Machine Relationships in Content Production under the Trend of Intelligent Media, noted that amid the wave of intelligent media, media content production is evolving into a new mechanism of human-machine cooperation, a mechanism that runs through various stages including information collection, verification, creation, and even content distribution. As machines gradually become integrated, humans must maintain their unique advantages in subjective observation, expression of personal viewpoints, construction of meaning, and judgment based on experience and intuition, while preserving internal drive and empathetic communication skills. Du Juan has also proposed an ideal model of human-machine collaboration: first, the design of news algorithms should embody and align with the values of journalistic professionalism. Second, journalists should engage in subjectively creative journalistic writing such as in-depth report analysis. Third, the "gatekeeper" role of news practitioners should become more prominent and strengthened, requiring news professionals to exercise professional judgment, selection, and editing, and to push content to audiences based on considerations of social public interest.

2.2.2 Overview of research on human-machine collaboration practices in media

In studies concerning "human-machine collaboration practices in media," most literature unfolds from the perspective of production processes such as content collection, writing, editing, and distribution in media. Among domestic studies, Zeng Xiangmin and colleagues, in their article Human-Machine Collaboration, Symbiosis of Reason and Emotion, Diversified Leveraging: A Study on Integrated Media Product Innovations in 2025 National Two Sessions Reporting, explored numerous practices of human-machine collaboration in Chinese mainstream media's news content production and presentation during the National Two Sessions reporting period. Sun Xinmin's "On the Symbiotic Relationship between News Writing Robots and Journalism Practitioners" examines the utilization of news writing robots in traditional mainstream media, thereby tracing the growth trajectory of writing robots and further discussing how they can more effectively complement journalists in terms of function and value to achieve innovation and development in the media industry. Yu Guoming and colleagues argue that in machine news writing, humans have always been the core element of news production, with machines merely serving as human auxiliaries. Journalists' gatekeeping occupies a crucial role in human-machine collaborative news production, particularly in reporting on significant and sensitive issues. Liu Yutao suggests that short video creation at the current stage is gradually presenting a new development trend combining "human consciousness" and "artificial intelligence," and that the synergistic development of both represents a new frontier in contemporary short video text creation.

In international research, empirical studies by Professor Nicholas Diakopoulos of Northwestern University reveal significant application boundaries for intelligent systems in current news production processes. According to quantitative analysis data released by his team in 2023, 15% of journalist tasks and 9% of editorial work in news gathering and editing can achieve process automation through existing AI technologies. In core competency dimensions of journalism such as interpersonal communication, critical thinking, contextual adaptability, and content innovation, human practitioners continue to maintain significant advantages. Research indicates that AI technology's auxiliary functions in structured data processing and repetitive labor substitution can effectively enhance news production efficiency, but cannot replace humans' core roles in value judgment, emotional resonance, and complex narrative. In February 2024, a Microsoft research team at Lehigh University published a paper titled Sora: A Review on Background, Technology, Limitations, and Op-

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portunities of Large Vision Models, in which the authors noted that Sora presents opportunities for journalists and news organizations: “Journalists and news organizations can leverage Sora to rapidly generate news reports or explanatory videos, making news content more vivid and engaging. This can substantially enhance the reach and audience engagement of news reporting.”

However, upon reviewing the research trajectories of previous scholars, while some scholars have conducted research from the perspective of human-machine collaboration, and while there is no shortage of literature respectively taking media convergence theory, mainstream media news operations, and human-machine collaboration practices as research objects, literature simultaneously incorporating all three as key research elements has not yet been identified.

2.3 Research questions

Therefore, this study starts from the perspective of media convergence theory and attempts to explore and answer the following questions: Which production links in news gathering and editing activities are empowered by artificial intelligence? What are the mechanisms of news gathering and editing processes involving artificial intelligence in different types of reporting? How do political forces influence journalists’ use of AI in the human-machine collaboration practices of mainstream media news operations? How do active journalists achieve a balance among these influencing factors?

3. Research Methods

This study adopts content analysis and case study methods in an attempt to answer the aforementioned questions.

3.1 Content analysis

Through hypothesis formulation, stratified sampling, sample coding, and other procedures, this study conducts an in-depth analysis of human-machine collaboration practices in mainstream media, investigates the focal points of such practices across different reporting types, and further examines the political influence mechanisms and journalists' active choices in mainstream media human-machine collaboration.

3.1.1 Hypothesis formulation

Based on the research questions above, the corresponding hypotheses are proposed as follows:

H1: Hard news is more likely than soft news to be influenced by political factors in mainstream media’s human-machine collaboration practices.

H2: Mainstream media are more likely to emphasize human-machine collaboration in broadcasting and presentation for major thematic publicity reporting.

H3: Mainstream media are more likely to emphasize human-machine collaboration in information collection for investigative and explanatory reporting.

H4: Mainstream media are more likely to emphasize human-machine collaboration in content writing for

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routine reporting.

To test these hypotheses, this study employs content analysis. Due to the relatively small sample size, a full-sample analysis is conducted.

3.1.2 Sampling method

The research object corresponding to these hypotheses is the human-machine collaboration practices of mainstream media.

First, representative sampling of mainstream media is conducted, selecting the human-machine collaboration reporting practices of CCTV News, People's Daily, and Xinhua News Agency as representatives. These media organizations, as central-level media, have extensive human-machine collaboration reporting practices and possess strong influence and representativeness.

Second, due to the relatively small sample size, a full-sample analysis of human-machine collaboration reporting works from these three media organizations is conducted. For Hypothesis 1, a total of 65 samples are collected by selecting human-machine collaboration reporting practices with AI usage identifiers from the official Douyin accounts of CCTV News, People's Daily, and Xinhua News Agency in 2025. These 65 samples are then comparatively classified, studied, and analyzed according to hard news and soft news reporting types. For Hypotheses 2, 3, and 4, by selecting human-machine collaboration practices with AI usage identifiers and those publicly reported in major thematic publicity reporting, investigative and explanatory reporting, and routine reporting from CCTV, People's Daily, and Xinhua News Agency in 2025, a total of 37 samples of human-machine collaboration practices in major thematic publicity reporting, 18 samples in investigative and explanatory reporting, and 63 samples in routine reporting are collected. These samples are then comparatively classified, studied, and analyzed according to the degree of emphasis on information collection, content writing, and broadcasting and presentation.

3.1.3 Coding tables

Based on the aforementioned classification of reporting types and the sample data obtained, this study has compiled Table 1 and Table 2 to compare the number of hard news and soft news reports, as well as the number of AI application types, in mainstream media's human-machine collaboration practice reporting, as shown below:

Table 1 Comparison of Hard News and Soft News Reporting Volumes in Mainstream Media Human-Machine Collaboration Practice Reporting

Types of reports on human-machine collaboration practices in mainstream media	Number of reports
Hard News	3
Soft News	62

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Table 2 Comparison of AI Application Types in Mainstream Media Human-Machine Collaboration Practice Reporting

Types of reports on human-machine collaboration practices in mainstream media		Number of reports focusing on AI-powered Information collection	Number of reports focusing on AI Content generation	Number of reports focusing on AI broadcasting and presentation
Major thematic reports	Reports on the Two Sessions	2	1	18
	Reports on the founding of the communist party of China	0	2	7
	Festival reports	1	2	4
Investigative and interpretative reports		11	3	4
Routine reports	Livelihood-related	1	13	1
	Popular science	0	21	2
	cultural	0	10	2
	sports	1	9	3

3.2 Case study method

Representative examples of human-machine collaboration reporting in mainstream media are selected for analysis. These include Xinhua News Agency's "Editorial Assistant" intelligent production engine, which integrates more than twenty functions ranging from intelligent search and topic planning to multimodal generation, empowering mainstream media news reporting; People's Daily's self- developed People's Intelligent Media large model, "WriteEasy" intelligent creation engine, and "Mainstream Values Corpus," which support human-machine collaboration reporting throughout the entire process of media content production and writing; and CCTV's CCTV Listening Large Model 2.0, which has created high-quality human-machine collaboration reporting practices such as the AI short video Nezha Discusses the Two Sessions and AI anchor Wang Guan. Through reviewing relevant video materials and literature, an in-depth analysis is conducted on the specific operations of mainstream media human-machine collaboration reporting across different production processes. Additionally, cases in which mainstream media have constructed proprietary large models and utilized proprietary AI platforms in human-machine collaboration reporting are examined in depth to study the underlying political security and political orientation influences.

4. Research Findings

4.1 Human-machine collaboration practices of mainstream media in the production process

4.1.1 Information feedforward and collection

With the application of generative artificial intelligence technology in the field of news production, mainstream media have achieved new upgrades in information feedforward and collection through the human-machine collaboration production model. In terms of information feedforward, mainstream media, by utilizing AIGC technology, collect and analyze data such as users' browsing history and search keywords, thereby

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achieving feedforward collection of users' interests and preferences, and ultimately providing journalists with intelligent topic recommendations. With the assistance of generative artificial intelligence technology, journalists have improved the precision and effectiveness of topic selection, and are also better able to exercise their gatekeeping role, creating high-quality news reports that uphold integrity and innovate based on mainstream values. For example, the Hotspot Discovery launched by CCTV's Artificial Intelligence Newsroom can monitor hot events in a targeted manner, issue real-time warnings for emergencies, analyze trend popularity, and organize related materials, providing technical support for news topic planning and online public opinion monitoring. During the 2021 Two Sessions, series reports such as AI Looks at the Two Sessions produced by CCTV.com precisely used "Hotspot Discovery" to filter topics and collect information, achieving collaborative creation between humans and intelligent media.

In terms of information collection, mainstream media empowered by AI can obtain rich and comprehensive news background materials and classic cases at extremely low costs in in-depth reporting such as investigative journalism, explanatory reporting, data journalism, and constructive journalism, effectively improving the speed, depth, and breadth of news information collection. Journalists leverage the power of intelligent media to excavate detailed information within report content, which further promotes their reflection on in-depth report content and lays a more solid foundation for subsequent in-depth report creation. Nowadays, with the continuous advancement of media convergence, major mainstream media rely on intelligent media technology for information collection in news reporting, promoting the deep integration of human value and intelligent media efficiency. For example, the "Editorial Assistant": intelligent production engine launched by Xinhua News Agency integrates more than twenty functions ranging from intelligent search and topic planning to multimodal generation. Based on the large model independently created by Xinhua News Agency, the "Editorial Assistant" not only assists journalists in collecting text-based information but also helps them gather diverse forms of news materials through image recognition and speech recognition capabilities, improving the validity and breadth of information collection. During the 2024 National Two Sessions reporting, Xinhua News Agency journalists achieved numerous human-machine collaboration reporting practices with the help of the "Editorial Assistant."

4.1.2 Content writing and editing

While empowering the news information collection stage, generative artificial intelligence technology also plays an important role in the news content writing and editing stages of human-machine collaborative reporting. In news content writing and editing, the empowerment of AIGC has prompted mainstream media to improve efficiency in structural text creation and mechanized content production. Mainstream media can leverage generative artificial intelligence to enhance the efficiency of content writing in the production of structural texts such as data journalism, sports news, and financial news. For example, the intelligent writing assistant launched by Xinhua News Agency can quickly generate news content regarding match results and athlete performances in sports event reporting. It can accurately describe key moments of competitions, outstanding performances of athletes, and background information of events, greatly improving the timeliness and accuracy of news. Moreover, journalists can achieve multimodal news content writing through AIGC, facilitating the precise expression of news report content. For instance, mainstream media such as CCTV, People's Daily, and Xinhua News Agency extensively utilize AIGC in their daily news reporting to generate

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images, videos, audio, and other materials needed for news content writing. These multimodal contents are combined with the textual content written by journalists, achieving enhanced news expressiveness and providing users with interesting, precise, and easily understandable human-machine collaborative news reports.

Meanwhile, in terms of news content editing, AIGC can quickly complete mechanical and repetitive tasks such as word error proofreading, language standardization proofreading, intelligent typesetting, and format optimization according to journalists' instructions. For example, the AI-assisted proofreading system launched by Guangming Net "can conduct comprehensive reviews of various media types including audio, video, images, and text, and supports multi-source data access. The system supports convenient proofreading of WORD files, online documents, and WeChat public account articles through the WeChat client, greatly enhancing operational flexibility and efficiency. The Qingqiong content risk control intelligent platform independently developed by The Paper uses technologies such as natural language processing and knowledge graph embedding to accurately identify sensitive words and non-compliant content in multimodal content, reducing the proofreading pressure on journalists and editors. Therefore, the deep connection between intelligent media technology and mainstream media journalists and editors has, to a certain extent, liberated productivity and reduced labor costs, thereby promoting the transformation of news workers toward deeper-level creation and gatekeeping, achieving cost reduction and efficiency enhancement in news content writing and editing through efficient human-machine collaboration.

4.1.3 Content broadcasting and presentation

Mainstream media have also demonstrated numerous human-machine collaboration reporting practices in news broadcasting and presentation. As media convergence progresses toward depth, mainstream media have successively transformed traditional creative production logic and actively innovated content expression methods. By infusing intelligent media capabilities into news broadcasting and content presentation, they enhance the infectiousness of news report content and facilitate users' cognition, understanding, identification, and empathy with news report content. In terms of content broadcasting, mainstream media have created AI virtual anchors based on technologies such as large models and multimodal modeling. AI virtual anchors can automatically generate real-time synchronized audio and video broadcasts according to human logic of sentences, intonation, emotions, and movements, collaborating with human anchors in reporting. For example, during the 2025 National Two Sessions reporting, the series program Wang Guan Observes the Two Sessions launched by CCTV showcased the collaboration between human anchor Wang Guan and the AI virtual anchor Wang Guan. In the program, human anchor Wang Guan conducted interviews and exchanges with guests, while AI Wang Guan analyzed guests' speeches in real time, quickly generated summaries of interview content, and could even interact with real people in real time. Similarly, in international communication, the Shandong International Communication Center launched a Multilingual Digital Anchor Team, achieving dynamic Two Sessions broadcasts in multiple languages and jointly conveying China's voice and telling China's stories alongside human journalists.

In terms of content presentation, the past creative presentation model dominated by text with supplementary images has struggled to meet current user demands. Therefore, mainstream media now place greater emphasis on how to use diverse presentation forms to clearly and engagingly convey topic content to users. Against this backdrop, the collaborative efforts of mainstream media journalists and intelligent media technology have

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spawned numerous human-machine collaboration reports with innovative presentations. For example, the artistic blockbuster See You in Spring produced by Guangzhou Daily during the 2025 National Two Sessions reporting utilized AI technology to make ancient paintings "come alive" and "move," not only embodying profound cultural heritage but also presenting users with novel visual wonders. The AI Data Reads the Two Sessions series of short videos launched by CCTV News, through the visualization of Two Sessions-related data using the DeepSeek large model, provided users with clear and easily understandable Two Sessions content. The forms of news content and product samples have been enriched and innovated through human-machine collaboration, and mainstream media have continuously enhanced their communication effectiveness through this innovation.

4.2 Mechanisms of political influence on human-machine collaboration practices in mainstream media

Mainstream media, with the assistance of intelligent media technology, have achieved human-machine collaborative news reporting, realizing cost reduction and efficiency enhancement throughout the entire process of news content production. However, in light of certain ethical issues currently present in artificial intelligence technology, mainstream media's application scenarios of AI technology are subject to the influence of political security factors. Additionally, political orientation factors also affect mainstream media's choices regarding the tools used in human-machine collaboration.

4.2.1 Selection of human-machine collaborative reporting types under political security considerations

In the era of intelligent media, human-machine collaborative news production has gradually become a mainstream trend in the journalism industry. However, some intelligent media technologies present ethical issues such as content value bias and the generation of false information. As the main front for disseminating national ideology, mainstream media consistently bear the mission of holding high the banner, gathering public support, cultivating new generations, promoting culture, and presenting a positive image. Simultaneously, as news communication entities with strong social credibility, mainstream media also shoulder the responsibility of delivering truthful and objective news content. Therefore, under considerations of political security, mainstream media exercise selectivity in the types of human-machine collaborative reporting. Through content analysis, this study investigates the volume of human-machine collaborative reporting in mainstream media from the dimensions of hard news and soft news. SPSS statistical analysis reveals a significant difference in AI utilization between hard news and soft news ($p < 0.001$).

Hard news, primarily comprising political reporting, is typically associated with topics such as political events, international relations, and emergencies. Consequently, hard news places greater emphasis on political correctness, values, seriousness, and truthfulness of news content. Given that AI training data may harbor value biases and false information, mainstream media must confront the algorithmic black box problem inherent in intelligent media technologies. When reporting hard news, mainstream media must consider political factors as crucial considerations, preventing value deviations that may arise from algorithmic black boxes embedded in some intelligent media technologies. They must also prevent factual errors and logical mistakes brought about by intelligent media technologies, avoiding inaccuracies in political content such as

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policy announcements and leader speeches. In contrast, when reporting soft news primarily focused on cultural and lifestyle content, mainstream media often employ relaxed and lively expressions, creating numerous truthful, positive, and engaging innovative news products through human-machine collaborative review and production. Examples include cultural animation series such as "Ode to the Millennium," the full AI-process micro-drama Chinese Mythology, and AI Reading Ancient Texts produced by CCTV based on AI technology.

Therefore, in hard news with stronger political factors, mainstream media engage less frequently in news reporting through human-machine collaboration. Conversely, in soft news with relatively weaker political factors, mainstream media more readily leverage intelligent media technology to achieve diverse human-machine collaborative reporting practices. Under considerations of political security, mainstream media exercise differentiated selection of reporting types for human-machine collaboration practices, achieving the goal of upholding integrity while innovating on the basis of maintaining political correctness and consolidating national ideology.

4.2.2 Selection of human-machine collaboration tools under the influence of political orientation

Against the political orientation of advancing systemic media transformation, and coupled with the algorithmic black-box issues inherent in commercial intelligent media technologies, political forces also exert an influence on mainstream media's selection of intelligent media tools for human-machine collaborative reporting. General Secretary Xi Jinping pointed out: "Globally, media intelligence has entered a stage of rapid development. We must enhance our sense of urgency and mission, strive for continuous breakthroughs in the independent innovation of key core technologies, explore the application of artificial intelligence in news gathering, production, distribution, reception, and feedback, steer 'algorithms' with mainstream value orientation, and comprehensively improve the ability to guide public opinion." With the continuous evolution of media convergence, the simple integration of mainstream media and intelligent technologies can no longer meet the needs of the current media environment and national development. Advancing systemic media transformation, building self-developed intelligent media platforms rooted in mainstream values, and unifying the underlying technical infrastructure have become urgent media layouts for mainstream media to implement.

Therefore, under the political orientation of "steering algorithms with mainstream values," some mainstream media have vigorously developed large-scale intelligent models, built underlying technical infrastructures, and created self-controlled intelligent media platforms with mainstream values to safeguard national ideological security. In the practice of human-machine collaborative reporting, they have achieved a tool shift from commercial intelligent media technologies to self-owned intelligent media technologies guided by mainstream values. For example, China Media Group (CMG), in collaboration with Shanghai AI Laboratory, launched the first AI large model dedicated to audiovisual media content production with mainstream values—the CCTV Ting Media Large Model. Human-machine collaborative reports such as the AI short video Ne Zha Talks about the Two Sessions and the AI anchor program Wang Guan Observes the Two Sessions were all produced based on this model. In addition, there are the People's Intelligent Media large model independently developed by People's Daily, the self-controlled intelligent flagship client DuTe and the AI technology platform Shenzhen Intelligent Media Cloud built by Shenzhen Press Group, and the Lingzhi mainstream media algorithm released by Cover Media, which is rooted in mainstream values.

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4.3 Path selection for journalists to achieve human-machine collaboration by balancing political influence

Journalists in mainstream media, by balancing political factors and production efficiency, adopt differentiated emphases and adjustments in human-machine collaborative reporting. Through content analysis and SPSS statistical analysis of 118 mainstream media report samples, this study reveals that the chi-square test results show a highly significant association between reporting categories (major thematic reporting, investigative and explanatory reporting, and routine reporting) and AI application stages (information collection, content writing, and broadcasting and presentation) ($\chi^2 = 80.336$, $df = 4$, $p < 0.001$), with Cramer's $V = 0.629$, indicating a strong association. The row percentage distributions for each subcategory—such as 78.4% of major thematic reporting emphasizing broadcasting and presentation, 61.1% of investigative reporting emphasizing information collection, and 84.1% of routine reporting emphasizing content writing-all align with the hypothesized directions. Under the influence of political factors, journalists in mainstream media exercise their subjective initiative, achieving in human-machine collaboration practices that major thematic publicity reporting emphasizes broadcasting and presentation, investigative and explanatory reporting emphasizes information collection, and routine reporting emphasizes content writing.

4.3.1 Emphasis on broadcasting and presentation in major thematic publicity reporting

In major thematic publicity reporting, mainstream media tend to place greater emphasis on human-machine collaboration in broadcasting and presentation. Such reporting often includes political content, as seen in coverage of the National Two Sessions, Party building anniversaries, and the 80th anniversary of the victory in the War of Resistance Against Japan. Major thematic publicity reporting typically carries important functions of elucidating national policies, consolidating social consensus, and promoting core values, with its communication effectiveness directly relating to ideological security and the construction of social cohesion. In human-machine collaborative reporting, mainstream media place greater emphasis on ensuring the truthfulness and accuracy of serious political content in information collection and writing, thereby disseminating national development policies and conveying positive mainstream values through accurate and truthful content. Consequently, in human-machine collaboration practices for major thematic reporting, mainstream media prioritize the broadcasting and presentation stage over information collection and content writing. Research data also indicate that 78.4% of major thematic reporting emphasizes broadcasting and presentation. Mainstream media tend to focus on actively integrating intelligent media technologies in the broadcasting and presentation stage to create engaging human-machine collaborative reports. For example, during the 2025 National Two Sessions, CCTV launched the AI short video Nezha Discusses the Two Sessions, which used AI technology to create a new image of Nezha to explain livelihood data from the government work report to users. The short video gained widespread attention due to its interesting and innovative presentation format. Guizhou Radio and Television produced the AI short video Great National Moments Hidden in Daily Life, which used AIGC technology to generate animations depicting ordinary experiences such as shopping, commuting, and dining during the protagonist's journey home, connecting these with "Beidou Satellite Navigation," "China's WTO Accession," and "Hybrid Rice" to reflect broader epochal themes. During the coverage of the 15th National Games, China Media Group employed AI technology in badminton events to instantly generate three-dimensional tactical animations of athletes' exciting movements during competitions, using innovative

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presentation to enhance audience understanding and immersion in the events.

4.3.2 Emphasis on information collection in investigative and explanatory reporting

In investigative and explanatory reporting, mainstream media place greater emphasis on human-machine collaboration in the information collection stage. Compared with major thematic reporting, investigative and explanatory reporting are less influenced by political security concerns. They pursue in-depth content exploration and precise interpretation, which typically prioritize the acquisition of relevant in-depth information, background, and details over automated content writing and diverse presentation formats. Conversely, journalists often rely on human deep thinking, multifaceted insights, and emotional resonance to independently write report content in investigative and explanatory reporting. Research data indicate that 61.1% of investigative and explanatory reporting emphasizes information collection. Therefore, in human-machine collaboration practices for investigative and explanatory reporting, mainstream media prioritize the information collection stage over content writing and broadcasting and presentation. With the development of technologies such as big data, natural language processing, and semantic analysis, intelligent media technologies have become more efficient in multimodal information gathering, retrieval, and data integration. The division of labor and collaboration between human journalists and intelligent media technologies endows news reporting with both depth and warmth. For example, The Paper launched its fact-checking brand The Paper Mingcha, which utilizes AI technology in some investigative reports to collect data, identify false information, and conduct fact-checking of news content, ensuring the truthfulness and accuracy of news reporting. Guangming Net employs an AI data intelligence analysis system to automatically collect and organize industry-related data and market dynamics analysis in industrial news reporting, helping enhance journalists' professionalism in investigative and explanatory reporting.

4.3.3 Emphasis on content writing in routine reporting

In human-machine collaborative routine reporting, mainstream media tend to place greater emphasis on the content writing stage. Routine reporting primarily covers topics such as culture, science and technology, sports, livelihood, and industry. Compared with major thematic publicity reporting, which focuses on political content, routine reporting has lower political relevance and is consequently less influenced by political security factors. Additionally, compared with investigative and explanatory reporting, routine reporting does not require extensive in-depth information and details for support, primarily serving users' needs for daily information. Routine reporting, such as sports events and announcements, possesses certain structural characteristics in news writing. Consequently, in human-machine collaboration practices for routine reporting, mainstream media prioritize the content writing stage over information collection and broadcasting and presentation. Research data indicate that 84.1% of routine reporting emphasizes content writing. Therefore, mainstream media often leverage artificial intelligence technology to accomplish content writing for such reporting. Moreover, under deep media convergence, mainstream media actively empower daily reporting through AIGC technology, achieving multimodal writing of news content and creating numerous integrated news reports through human-machine collaboration. In the content writing of human-machine collaborative routine reporting by mainstream media, intelligent media technologies assume the role of production and writing. For instance, the Zhejiang Daily Press Group's Communication Large Model possesses functions including news writing and AI poster and video generation. The Cover News platform Xiaofeng Intelligent Creation can automati-

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cally generate news drafts, efficiently assisting in news content creation for coverage such as sports events. Journalists, meanwhile, assume functions of providing idea guidance and content gatekeeping. Through this collaborative resonance, routine news reporting achieves enhanced quality and efficiency.

5. Conclusion and Reflection

Through content analysis and case study methods, this research conducts a sociological study of news production on human-machine collaboration practices in mainstream media news operations, attempting to answer questions regarding human-machine collaboration practices across different production processes, how political factors influence human-machine collaboration practices in mainstream media, and journalists' agentive emphases in balancing political influences. The findings reveal that hard news is more likely than soft news to be influenced by political factors in mainstream media's human-machine collaboration practices; mainstream media are more likely to emphasize human-machine collaboration in broadcasting and presentation for major thematic publicity reporting; they are more likely to emphasize human-machine collaboration in information collection for investigative and explanatory reporting; and they are more likely to emphasize human-machine collaboration in content writing for routine reporting.

This study proposes pathways for mainstream media's news operation practices and balanced adaptation under human-machine collaboration, reflecting the intelligent and efficient agentive development of mainstream media news production in the era of media convergence. Simultaneously, it provides practical reference and theoretical support for mainstream media news operations to uphold integrity while innovating and achieve high-quality development against the backdrop of Chinese-style modernization and deep media convergence.

Throughout this research process, this study also finds that mainstream media's human-machine collaborative reporting, influenced by political forces, experiences limitations on media innovation in terms of production efficiency. Additionally, some mainstream media, due to over-reliance on AI for content collection and writing, neglect the enhancement of journalists' "brainpower, insight, writing skill, and footwork"-a trend worthy of vigilance and reflection.

However, constrained by resource limitations, this study possesses shortcomings including a singular research context, insufficient research practice data, and a lack of in-depth interviews. Future research in the fields of media convergence and intelligent communication requires greater attention to the differentiated practice phenomena of human-machine collaboration across different regions and types of mainstream media, incorporating methods such as in-depth fieldwork to supplement research and practice.

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