Journal of International Education and Development
2025, VOL. 9, NO. 12, 24-27
DOI: 10.47297/wspiedWSP2516-250005.20250912

From "Synthesis" to "Symbiosis": Paradigm Transformation and Professional Boundary Reconstruction in AI-Driven News Production

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ABSTRACT
With the in-depth penetration of AI technology into the news industry, China's implementation of the Measures for Labeling AI-Generated Content in 2025 has officially ushered in the era of "human-machine symbiosis" in journalism. This study explores the paradigm transformation of news production and the reconstruction of professional boundaries driven by AI, adopting a three-dimensional analytical framework of "institution-practice-cognition." The research finds that AI has evolved from an auxiliary tool to a core production subject, promoting the transformation of news production from a linear process to a networked structure and reshaping the power structure of editorial departments, professional identity of journalists, and industry ethical norms. Faced with challenges such as blurred professional boundaries, authenticity crises, and ethical controversies, the news industry should respond through institutional innovation, educational reform, and industry self-regulation, ultimately building a virtuous cycle of "technology empowering professionalism and professionalism constraining technology" to achieve responsible symbiosis between humans and AI.

KEYWORDS
AI-driven news production; Paradigm transformation; Professional boundaries; Human-machine symbiosis; Journalistic professionalism

1 Technological Revolution Reconstructs the Underlying Logic of News Production

On September 1, 2025, China officially implemented the Measures for Labeling AI-Generated Content, mandating the compulsory labeling of "AI-Generated" for all news manuscripts produced with AI assistance. This policy marks the formal entry of the news industry into the era of "human-machine symbiosis." This transformation is no accident but a result of the dual drivers of technological revolution and industry demand. Since Xinhua News Agency launched the world's first AI-synthesized female anchor to cover the Two Sessions in 2019, AI technology has permeated the entire news production chain: from intelligent public opinion monitoring in data collection, to multimodal generation in content creation, and personalized recommendation in dissemination and distribution. AI is reshaping the news industry as a "production subject" rather than an "auxiliary tool."

Taking the manufacturing transformation in the Guangdong-Hong Kong-Macao Greater Bay Area as a mirror, the reform of the news industry presents a similar logic. The establishment of the Guangdong Artificial Intelligence + Manufacturing Industry Alliance in 2025 reveals the leap from "single-point technological breakthrough" to "ecological collaboration." The same applies to the news field: People's Daily's "AIGC Editorial Department" has transformed news production from a linear process to a networked structure through functions such as "case-based video production" and "image-to-image generation"; the Converged Media Center of Futian District, Shenzhen, has used AI to reduce the hand-drawing time of images from 72 hours to 2 hours, improving efficiency by 97%. These cases indicate that AI is no longer limited to optimizing traditional production links, but is promoting a paradigm shift in news production from "human-led" to "human-machine collaboration" through process reengineering, subject expansion, and relationship reconstruction.

The in-depth involvement of AI has posed unprecedented challenges to the professional boundaries of journalism. In traditional news production, journalists' role as "information gatekeepers" has been partially deconstructed by technology: AI can independently complete data mining, first draft generation, public opinion analysis, and even achieve the extreme speed of "generating earthquake reports in 20 seconds" for breaking news. However, this technological empowerment is not a one-way replacement but has spawned a new division of labor. For example, in the coverage of the 2025 Two Sessions, People's Network's digital host was responsible for summarizing key points, while journalists focused on in-depth investigations and value judgments, forming a complementary relationship of "technological efficiency + human insight."

The reconstruction of professional boundaries is more reflected in the diversification of creative subjects. The judgment of the "Ultraman Case" by the Guangzhou Internet Court revealed disputes over the copyright ownership of AI-generated content: when AI becomes a co-creator, the traditional dual relationship of "author-work" is broken. Academic journals in Shenzhen have introduced an AIGC detection and traceability system, which attempts to reconstruct a responsibility tracing mechanism at the technical level by recording service providers, timestamps, and operator information through a metadata management database. This transformation has forced the news industry to redefine the

connotation of "professionalism," shifting from a single human skill standard to an ethical framework and competence system for human-machine collaboration.

Faced with the disruptive impact of AI, the core values of journalistic professionalism are facing dual tests. On the one hand, the tendency of "information cocoons" and "amusing ourselves to death" caused by algorithmic recommendations has impacted the ethical bottom line of "objectivity, impartiality, and serving the public." The controversy triggered by AI public welfare advertisements in Shenzhen Metro in 2025 exposed the erosion of public values by the abuse of technology. On the other hand, the authenticity crisis of AI-generated content, such as fake news created by Deepfake face-swapping technology, has forced the industry to re-examine the professional standards of "fact-checking."

However, challenges also contain opportunities. People's Daily's "National Party Media Information Public Platform" has realized the automated processing of massive content through the "Party Media Algorithm" by building a knowledge graph of mainstream values and an intelligent labeling system, adhering to value orientation while meeting personalized needs. This practice shows that journalistic professionalism is not opposed to technology, but can be upgraded through technological empowerment: AI can expand the cognitive boundaries of human journalists, but the ultimate responsibility for value judgment must be borne by humans. As shown in the AI participation standards formulated by the journal Sports World, clarifying the boundaries of technology use (such as prohibiting AI generation for core viewpoints) and the dominant position of humans is the evolutionary path of professionalism in the era of symbiosis.

2 Research on the Evolutionary Path of AI-Driven News Production

2.1 Theoretical Foundations

2.1.1 Technological Determinism and Social Constructivism

Technological determinism holds that technology is the core force driving social change, with an inherent and autonomous development trajectory. The impact of AI on news production follows this logic: from early natural language processing for news summaries, to deep learning-driven multimodal content creation, and finally to generative AI enabling "end-to-end" automated news production, technological iteration shows obvious linear evolutionary characteristics. For example, People's Daily's "AIGC Editorial Department" in 2025 demonstrates that AI has evolved from a single-link efficiency tool to a "production subject" covering the entire chain of "topic planning - content creation - dissemination and distribution."

In contrast, social constructivism argues that technology is not an objective entity independent of social contexts but gains meaning through human interaction, institutional norms, and cultural contexts. The evolution of AI-driven news production is deeply influenced by social factors: the implementation of China's Measures for Labeling AI-Generated Content reshapes public cognition of news authenticity through mandatory labeling; the AIGC detection and traceability system in Shenzhen's academic journals builds trust in the academic community via metadata management. These cases prove that AI news production is co-determined by technology, policies, culture, and ethics.

2.1.2 Core Theories in Journalism and Communication

Traditional journalistic professionalism is built on three pillars: "autonomy," "public service," and "professional ethics." Autonomy emphasizes the independence of news organizations from political and commercial interests; public service focuses on promoting citizen participation and supervising power through information dissemination; professional ethics restricts journalists' behavior to ensure news authenticity and impartiality.

Boundary work theory, proposed by sociologist Thomas Gieryn, explains how professional groups maintain authority by delineating knowledge, practice, and ethical boundaries. In journalism, this manifests as media distinguishing professionals from non-professionals through discourse, norms, and technical barriers—such as the Guangzhou Internet Court's "Ultraman Case" clarifying copyright ownership of AI-generated content to protect professional authority.

Actor-Network Theory (ANT), proposed by Latour, expands "actors" to include non-human entities (technology, institutions, etc.). In AI-driven news production, AI actively shapes production rules through interaction with humans and systems—for instance, People's Daily's AI redefines "news value" via algorithmic recommendations, reflecting the reconstructive role of non-human actors.

2.2 Evolution of Human-Machine Interaction in News Production

Human-machine interaction in news production has evolved through three stages:

(1) *Assistance Stage:* Early AI undertook repetitive tasks such as data crawling;

(2) *Collaboration Stage:* AI and journalists cooperate (e.g., AI for data mining, humans for value judgment in in-depth reports);

(3) *Symbiosis Stage:* A "partnership" where humans and AI achieve complementary capabilities and value co-creation through continuous interaction.

2.3 Research Framework

This study proposes a three-dimensional analytical framework of "institution-practice-cognition":

Institutional Dimension: Focuses on the regulatory role of policies, laws, and ethics, revealing external constraints on technological development;

Practical Dimension: Examines AI's application in the entire news production chain, analyzing how technology drives paradigm transformation;

Cognitive Dimension: Explores journalists' and audiences' perceptions of AI, uncovering the internal logic of boundary reconstruction.

3 Reconstruction of Institutional Boundaries: Changes in the Power Structure of Editorial Departments

3.1 Power Redistribution in Decision-Making

Traditional news editorial departments feature highly centralized decision-making, with human editors dominating topic planning, content review, and distribution. AI's involvement breaks this structure: algorithm engineers become key decision-makers by designing news value evaluation models and content generation rules. For example, a provincial media's "AI Converged Editorial Department" adopts a joint "editor-algorithm" decision-making mechanism—editors propose preliminary topics, and algorithms optimize topic weights using historical data, shifting decision logic from "experience-driven" to "data-experience dual-driven."

3.2 Organizational Structure Transformation

To adapt to AI-driven production, traditional media's organizational structure has shifted from a "vertical hierarchy" to a "flat network." Technical teams (algorithm engineers, data scientists) and news teams (journalists, editors) collaborate closely through cross-functional groups such as "AI Content Production Teams" and "Algorithmic Ethics Review Teams." A central media's "AI Editorial Department" exemplifies this: technical and news teams share office space, participate in joint meetings, and co-develop AI tools, shortening feedback cycles and promoting mutual understanding of technical and journalistic discourse.

4 Reconstruction of Cognitive Boundaries: Reshaping Professional Identity and Occupational Authority

4.1 Reconstruction of Production Processes

Traditional linear news production (topic planning - information collection - content creation - review and release - effect feedback) has been deconstructed into a networked structure by AI:

Topic Planning: Algorithms generate "potential hot topic lists" by analyzing user behavior data;

Information Collection: AI crawlers capture public data, supplemented by drones and sensors;

Content Creation: Generative AI produces first drafts, with human journalists providing in-depth supplements;

Review and Release: Algorithms conduct fact-checking and copyright detection, while human editors oversee value judgments;

Effect Feedback: User interaction data is real-time fed back to optimize subsequent production.

4.2 Emergence of New Key Links

AI-driven news production has spawned three critical new links:

(1) *Prompt Engineering and AI Training:* Practitioners design precise prompts to guide AI in generating objective, bias-free news content;

(2) *Human-Machine Collaborative Fact-Checking:* AI quickly compares public data, and human journalists verify ambiguous information;

(3) *Algorithmic Ethics Review:* Ethics teams assess algorithmic fairness and transparency before content release.

4.3 Transformation of Core Competencies and Supervision Models

Journalists' core skills have shifted from "writing, interviewing, and editing" to "human-computer interaction design, algorithm understanding, and data interpretation." To ensure content quality, media adopt a "human decision-making power" supervision model: AI completes first drafts, and human editors correct deviations through a "post-review" mechanism. For example, AI-generated content on a news client undergoes "three reviews and three revisions": AI self-checks grammar and format, algorithms conduct initial fact and copyright checks, and humans perform final value and

ethics reviews.

4.4 Boundary Conflicts and Response Strategies

AI has triggered three types of boundary conflicts:

(1) *AI Authorship Disputes:* Unlabeled AI-generated content by self-media has led to debates on AI's authorial rights;

(2) *Liability Attribution for Errors:* Data errors in AI-generated financial reports have caused investment losses, with media, AI developers, and data providers shifting responsibility;

(3) *Creative Ownership Controversies:* Journalists using AI for inspiration have been accused of "plagiarizing AI creativity, " challenging traditional definitions of "originality."

Media have adopted three boundary work strategies:

(1) *Expansionary Strategy:* Incorporate AI skills into professional standards (e.g., a news association includes "AI training ability" in journalist assessments);

(2) *Protective Strategy:* Emphasize humans' irreplaceable core values (e. g., media require "in-depth reporting capabilities" in recruitment to resist "pure AI operation" positions);

(3) *Obfuscation Strategy:* Build a "human-machine team" professional image (e.g., a journalism award adds "Best AI-Assisted Report" to weaken human-AI opposition).

5 Conclusion and Suggestions

5.1 Conclusion

As AI deeply penetrates news production, the industry is moving from "human-machine confrontation" anxiety to a new stage of "responsible symbiosis." This transformation is not only a passive response to technological impact but also an active evolution of journalistic professionalism in the digital age. AI has reconstructed news production processes, organizational structures, and professional boundaries, while journalistic professionalism maintains its core values by constraining technological abuse.

5.2 Suggestions

5.2.1 Organizational Structure Optimization

Construct adaptive hybrid organizational structures, break departmental barriers, and establish a "Human-Machine Collaboration Center" to coordinate AI tool development, process optimization, and ethics review. Design progressive training systems to help practitioners adapt to technological changes, and establish transparent AI usage guidelines and accountability mechanisms to clarify application boundaries and disclose technology use to users.

5.2.2 Journalism Education Reform

Reconstruct curriculum systems to balance technical literacy and humanistic spirit, add AI technology modules to traditional journalism courses, and strengthen ethics education to cultivate compound talents integrating technology and humanism.

5.2.3 Industry Norm Formulation

Develop industry standards and ethical guidelines for AI-driven news production, clarifying compliance requirements for content generation, fact-checking, and user interaction. Establish interdisciplinary ethics review committees (composed of journalists, technical experts, and legal scholars) to regularly evaluate AI tools' ethical impact and ensure technology serves public interests.

The future of responsible symbiosis is not a zero-sum game between humans and AI, but a virtuous cycle of "technology empowering professionalism and professionalism constraining technology." This requires practitioners to embrace technology with an open mind and examine it with critical thinking, ultimately achieving a dynamic balance between efficiency and value, innovation and ethics in the news industry.

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