

Intelligent revolution and communication reconstruction: the impact of AI technology on the media production chain—a full-process analysis based on content production, distribution, and consumption

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Abstract. The rapid advancement of artificial intelligence (AI) technology is fundamentally reshaping the production chain of the media industry. This study focuses on the impact of generative AI (e.g., ChatGPT, DeepSeek, Doubao) on content production, employing content analysis to reveal core differences between AI-generated and human-authored content. By comparative analysis, this paper discussed the issue across three dimensions: text structure, information density, and perceived credibility. Key findings include: Regarding textual features, AI content averaged 29% fewer words than human content (856 words vs. 1,203 words), exhibited more fragmented paragraph structures (average paragraph length 98 words vs. 152 words), and cited data sources only 32% as often as human content. In quality assessment, while AI content readability scores approached those of human content, its perceived information credibility was significantly lower. Readers with social science backgrounds exhibited particularly strong distrust towards AI content (average rating 2.1/5). High-frequency word analysis further indicated AI content's tendency to use vague expressions like "possibly" and "data suggests," whereas human content more frequently cited specific sources.

Keywords: content generation, content distribution, content consumption, AI, media production chain

1. Introduction

In recent years, the Zhihu platform has seen a surge in answers explicitly labeled "Artificial Intelligence (AI) Creation." While superficially fluent, this content exhibits significant limitations. For instance, case repetition is common, and in professional discussions, vague phrases like "studies show" often replace specific sources, lacking rigorous citation standards. This phenomenon prompts critical questions: Why does AI-generated content, ostensibly efficient, still struggle to gain full user trust? Such concerns are equally critical in specialized fields. In 2023, a science writer faced widespread academic criticism after an AI-generated article on quantum computing erroneously conflated "quantum entanglement" with "wormhole theory." Such incidents demonstrate that while AI offers clear advantages in boosting content production efficiency, over-reliance significantly increases the risk of factual errors. As AI permeates information dissemination contexts like news and short videos, clearly defining the differences between human and machine-generated content is imperative. However, current research often prioritizes technical optimization over addressing core user concerns—namely, the credibility and applicability of AI-generated content. For the average reader, urgent questions include: Under what circumstances can AI-generated science content be trusted? In which scenarios is human intervention necessary to ensure accuracy and reliability? Answers require systematic empirical comparative studies.

This research conducts a comparative analysis from the perspectives of text structure, information density, and credibility. It explores how AI technology reshapes the entire process of media content production, distribution, and consumption, and its consequent impact on the overall structure and operational logic of the media production chain. The significance of this study lies in providing users with more targeted criteria for judgment through an in-depth dissection of the differences between AI-generated and human-authored content. Simultaneously, it offers theoretical support for the standardized development of AI content creation, contributing to a healthier, more trustworthy information ecosystem.

2. AI technology application in content production

2.1. Automated content generation

Artificial intelligence is progressively transforming content generation within the news industry. Driven by developments in generative pre-trained models (e.g., GPT, Claude, which utilize unsupervised learning to automatically extract general features and patterns from vast datasets like internet text and images), an increasing number of news organizations are integrating AI tools into their editorial workflows to enhance output efficiency. For example, Reuters employs AI for drafting initial versions of financial news flashes, with human editors primarily responsible for review and refinement [1]. The Italian newspaper *Il Foglio* experimented with an entire edition written by AI in 2024. Despite controversy, this underscores the practical potential of AI in content generation [2].

In sports and entertainment, International Business Machines Corporation (IBM) launched an AI content engine capable of automatically generating match recaps and fan-oriented content based on game data. During the 2023 US Open, this system served over 90 million global users, generating 800 million page views [3]. AI is also deeply applied in entertainment news: The Hollywood Reporter uses AI systems to automatically generate movie box office analyses and music chart interpretations; Disney developed an AI tool leveraging social media trends to generate real-time popularity reports for Star Wars characters based on fan discussions, boosting entertainment reporting efficiency by 300% [4]. AI is evolving from an auxiliary tool to a core participant in news production.

2.2. Personalized production

Beyond automation, AI technology is widely used for personalized content creation. By analyzing user browsing histories and interest tags, AI helps social media platforms "tailor" content for different audiences. For instance, Douyin's (TikTok) algorithm analyzes frequently watched tags to recommend similar videos, fostering user engagement [4]. Similarly, advertising giant WPP has embraced AI through its WPP Open platform, which integrates multiple large language models (LLMs) to generate personalized marketing assets such as videos, slogans, and campaign proposals. This not only boosts creative efficiency but also ensures that content aligns with the unique preferences of different client audiences [5].

In conclusion, AI-powered personalized content production is transforming digital media by making it more relevant, engaging, and efficient. From social media platforms like TikTok to enterprise marketing tools like WPP Open, AI is enabling a new era of content creation that prioritizes individual user experience. As the technology evolves, balancing personalization with ethical considerations will be key to ensuring a diverse and trustworthy digital ecosystem [6].

3. AI technology application in content distribution

3.1. Intelligent recommendation systems

The primary application of AI in content distribution manifests in personalized recommendation systems. These systems analyze massive user data to accurately predict interests and preferences, enabling precise content delivery. Netflix is a prime example, where approximately 75% of plays originate from system recommendations rather than user searches [7]. Netflix's algorithm synthesizes factors like viewing history, rating behavior, and browsing time to create personalized watch lists for each user. This precision enhances user satisfaction while significantly increasing platform stickiness and content consumption [8].

AI recommendation systems demonstrate strong potential in other domains. For instance, BytePlus uses AI within live streaming platforms to adjust recommended content in real-time based on viewer interaction data. This dynamic adjustment mechanism effectively prolongs user dwell time and significantly boosts interaction rates. However, this customization also fosters "filter bubbles" or "information cocoons" [9]. Algorithms, favoring content aligning with existing user interests, progressively lock users into narrow information streams, limiting diversity. This can narrow perspectives and hinder exposure to diverse viewpoints.

3.2. Social media dissemination strategies

As crucial media outlets, social platforms heavily rely on AI to optimize dissemination strategies. AI analyzes user active hours and topics of interest to determine optimal posting times for reaching target audiences. Platforms like Facebook and Twitter utilize AI algorithms to analyze behavioral patterns, pinpointing the best times for maximizing exposure and interaction rates. YouTube employs AI to recognize emotional tones in titles and optimize thumbnail designs, improving video click-through rates [10].

However, according to an Enders Analysis report, the proliferation of AI summarization features and recommendation mechanisms is also diverting traffic from traditional news websites. Increasingly, Gen Z users prefer accessing news through platforms like TikTok and YouTube Shorts rather than clicking through to original news sources [11]. This trend threatens traditional media outlets while raising concerns about information quality and depth. Short video platforms enable rapid information spread but often lack the depth and contextual analysis characteristic of traditional journalism.

4. AI technology application in content consumption

4.1. User behavior analysis

In the content consumption phase, AI plays a critical role in understanding and predicting user behavior, enabling platforms to deliver more personalized and engaging experiences. E-commerce giants like JD.com (Jingdong) utilize AI algorithms to track and analyze user interactions within their mobile applications, such as click paths, browsing time, product views, and purchase history. By processing this data, AI systems can identify user preferences, forecast purchasing intent, and dynamically adjust content recommendations and promotional strategies. This level of personalization has led to measurable improvements in key performance indicators, including higher repurchase rates, increased daily active users, and enhanced customer satisfaction [12].

Similarly, short video platforms such as TikTok (Douyin) and Kuaishou rely heavily on AI-driven behavioral analysis to maintain user engagement. These platforms collect a wide range of user interaction data, including viewing duration, likes, shares, comments, and even pause or skip behavior. Natural language processing (NLP) techniques are employed to analyze comment sentiment and extract user opinions, while machine learning models cluster users into distinct behavioral segments. This granular understanding of user preferences allows the platforms to deliver highly tailored content recommendations, ensuring that users remain engaged for longer periods. Over time, these AI systems continuously learn and adapt, refining their recommendations to align with evolving user interests.

Moreover, AI-powered user behavior analysis has become a foundational infrastructure for content platforms. It not only supports recommendation engines but also informs content creation strategies, advertising placements, and platform interface design. By understanding what users want and how they interact with content, platforms can optimize every aspect of the user experience, ultimately driving user retention and platform growth.

4.2. Emerging consumption models

Beyond optimizing existing content consumption patterns, AI is also driving the emergence of entirely new models of content interaction and creation. One notable example is Fable Studio's "SHOW-1," an AI-driven platform that allows viewers to participate in the storytelling process. Users can input their preferences or make choices at key narrative points, and the AI system generates customized animated episodes in real-time. This interactive storytelling model represents a significant shift from passive content consumption to active participation, offering users a sense of agency and personalization that traditional media cannot provide.

AI-generated content is not limited to animation. In the gaming industry, procedural content generation powered by AI enables the creation of dynamic, ever-changing game environments tailored to individual player behavior. In the music industry, AI systems can compose personalized soundtracks based on a user's listening history and emotional state, detected through biometric data or interaction patterns. These innovations are redefining the boundaries of content creation and consumption, making entertainment more immersive and individualized.

Furthermore, AI technologies are expanding the accessibility and reach of content across diverse audiences. Automatic caption generation, powered by speech recognition and natural language processing, makes content more accessible to hearing-impaired users and non-native speakers. Voice interaction technologies, such as smart speakers and voice assistants, enable hands-free content access, particularly beneficial for elderly users or those with visual impairments. Intelligent translation systems break down language barriers, allowing users worldwide to access and enjoy foreign-language content seamlessly. This not only enhances the user experience but also broadens the global reach of content platforms, creating new opportunities for content creators and distributors.

5. Challenges

Despite the transformative potential of artificial intelligence in the media industry, its rapid development also introduces a range of significant challenges that must be addressed to ensure responsible and sustainable implementation.

5.1. Content authenticity and misinformation

One of the most pressing concerns is the issue of content authenticity. While AI-generated content can closely mimic human-created material in terms of style and structure, it often lacks the critical fact-checking mechanisms that ensure accuracy and reliability. For example, AI-generated news articles may unintentionally misquote statistics, misrepresent events, or even fabricate entirely fictional scenarios. These inaccuracies, once disseminated, can mislead the public, erode trust in media institutions, and, in extreme cases, incite social unrest or panic. The challenge is further compounded by the speed and scale at which AI-generated content can be distributed across digital platforms, making it difficult to contain the spread of false information once it begins.

To mitigate these risks, there is a growing need for robust AI content verification systems and fact-checking protocols. Media organizations must invest in tools that can detect and flag potentially misleading or false content before publication. Additionally, collaboration between AI developers, journalists, and fact-checkers is essential to establish standards and best practices for responsible AI-generated content.

5.2. Privacy, data security, and ethical concerns

Another major challenge lies in the privacy and data security implications of AI systems. AI-driven content platforms rely heavily on the collection and analysis of vast amounts of user data, including browsing history, location information, and behavioral patterns. While this data is crucial for personalizing content and improving user experience, it also raises significant ethical and legal questions.

For instance, transparency in data usage remains a critical issue. Users are often unaware of how their data is collected, stored, and utilized by AI systems. There is also the question of user consent and control—do users have the right to access, modify, or delete their data at any time? These concerns are particularly relevant in light of stringent data protection regulations such as the European Union's General Data Protection Regulation (GDPR) and China's Personal Information Protection Law (PIPL).

To address these challenges, media organizations must adopt clear data governance policies, ensure informed consent, and implement strong data protection measures. Ethical AI frameworks should be established to guide the responsible use of user data, balancing innovation with individual rights.

5.3. Employment displacement and workforce adaptation

The integration of AI into media workflows also has significant implications for the employment structure of the industry. As AI systems become capable of performing tasks traditionally carried out by humans—such as writing, editing, and content curation—there is a growing concern about job displacement. Editorial roles, copywriting positions, and even some aspects of journalism may be automated, leading to workforce reductions or shifts in job responsibilities.

However, this transition also presents opportunities for workforce reskilling and upskilling. Rather than replacing human creativity and judgment entirely, AI can be viewed as a tool that augments human capabilities. Media professionals can focus on higher-level tasks such as strategic planning, creative direction, and ethical oversight. Educational institutions and industry organizations must collaborate to provide training programs that equip workers with the skills needed to thrive in an AI-integrated media environment.

6. Conclusion

This study investigated the application of artificial intelligence technology within the media production chain, focusing on AI's roles and impacts across content production, distribution, and consumption. Through literature review and analysis of representative cases, the research found that AI has deeply integrated into various media processes. From automated content generation and personalized creation to intelligent recommendation systems and user behavior analysis, AI has not only significantly improved media efficiency but also driven the transformation of communication models. This technological progress offers new pathways for digital media development and unprecedented innovation opportunities for creators and platform operators.

While this study attempts a comprehensive presentation of AI's current applications in media, limitations exist. Primarily, constrained by length and methodology, the research relies mainly on literature review, lacking empirical data support such as industry surveys, user interviews, or platform operational data. This limits the representativeness and depth of the conclusions. Secondly, the broad geographical and platform scope precludes in-depth analysis of specific countries or media platforms. Future research could incorporate quantitative surveys or case studies to conduct more profound and targeted analyses of AI's impact within specific contexts.

Looking forward, artificial intelligence will continue to play a pivotal role in the media domain. Advances in generative AI, multimodal interaction, and other frontier technologies will make content creation increasingly intelligent and personalized. Simultaneously, AI will assume greater responsibility in areas like content moderation, copyright protection, and information ethics. Media institutions must leverage AI for efficiency gains while diligently addressing ethical considerations, privacy protection, and algorithmic biases to ensure the sustainable development of the industry within an intelligent context. Ultimately, the deep integration of AI and media represents not only a technological revolution but also a new paradigm for communication principles and social responsibility.

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