

Research on Application Scenarios of Intelligent Agents in Media Content Production (Postprint)

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Full Text

Research on Application Scenarios of AI Agents in Media Content Production

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Abstract

[Objective] With the breakthrough development of generative artificial intelligence technology, AI Agents are profoundly reconstructing the entire process paradigm of media content production, demonstrating revolutionary potential in reshaping content production logic and expanding creative boundaries. **[Method]** Based on the technological evolution of AI Agents and industry practices in media, this paper systematically explores their application scenarios and potential value in various stages of content production through typical case analysis and technical path deconstruction. **[Results]** The study reveals that AI Agents have evolved from rule-based systems (L1) to autonomous agents integrating large language models (L3-L5). Through four core capabilities—multimodal generation, intelligent auditing, dynamic distribution, and precise interaction—they are driving media production’s transformation from “human-led” to “human-machine collaboration.” In the wave of intelligent transformation in the media industry, AI Agents are reshaping the entire content production process from “topic planning—editing and auditing—distribution and interaction.” However, the application of AI Agent technology is accompanied by multiple challenges at ethical, technical, and ecological levels, including risks to content authenticity, pressures for talent transformation, and concerns over data monopolies. **[Conclusion]** In the future, mainstream media must strike a balance between technological application and value guidance to build a healthy and sustainable intelligent content ecosystem.

Keywords: AI Agent; Intelligent Media; Content Production; Multimodal Large Models; Generative Artificial Intelligence

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1. AI Agents and Their Value in Media Content Production

1.1 AI Agents and Their Development

The concept of an Agent originates from philosophy, describing an entity with desires, beliefs, intentions, and the capacity to take action. In the field of artificial intelligence, this term has acquired a new meaning: an intelligent “agent” (AI Agent) characterized by autonomy, reactivity, and interactivity. The emergence of Large Language Models (LLMs) has brought new hope for the further development of AI Agents. LLMs provide a breakthrough technical solution at

the foundational level: they introduce a new paradigm for deep learning, and their chain-of-thought capabilities and powerful natural language understanding promise to equip AI Agents with strong learning and transfer abilities, thereby making it possible to create widely applicable and practical agents [1]. Some research has classified the capabilities and effectiveness of AI Agents into the following levels [2]:

L0–No AI: Only tool functions with perception + action capabilities.

L1–Rule-based Symbolic Intelligence: Uses rule-based AI.

L2–Reasoning and Decision Intelligence: Replaces rule-based AI with Imitation Learning (IL)/Reinforcement Learning (RL) based AI, adding reasoning and decision-making functions.

L3–Memory and Reflection Intelligence: Replaces IL/RL-based AI with LLM-based AI, additionally incorporating memory and reflection.

L4–Autonomous Learning Intelligence: Builds upon L3 by adding autonomous learning and generalization.

L5–Individual and Group Intelligence: Builds upon L4 by adding personality (emotion + character) and collaborative behavior (multi-agent).

Currently, AI cores have evolved from no AI (L0) to rule-based AI (L1), IL/RL-based AI (L2), and LLM-based AI (L3-5). L5 AI Agents signify the emergence of superintelligence, possessing true digital personalities capable of performing tasks in human roles with superior performance exceeding 100% of adult human skills. From the most basic rule-driven systems (L1) to potential superintelligence (L5), each level's performance and functionality depends on different technical approaches, demonstrating AI's gradual evolution from simple task automation to complex, autonomous learning systems.

The emergence of LLMs has significantly enhanced AI Agents' comprehension and generalization abilities, enabling them to better handle multiple tasks and contextual information. This strengthens their natural language processing capabilities, thereby providing more personalized and coherent interactive experiences. However, constrained by current limitations in computing power, models, data, and other factors, some AI Agent products still lack “memory capacity,” “reflection capacity,” and “planning capacity,” with their effectiveness often relying on digitalization and previous automation methods.

Although many capabilities of AI Agents remain to be improved, their application has facilitated a paradigm shift in work: migrating from “process-oriented architecture” to “goal-oriented architecture,” and from “human-centered, AI-assisted” to “AI-centered, human-assisted.” In this transformation, AI Agents demonstrate enormous application potential and industrial value across multiple directions, including media content creation methods, editing and auditing, distribution formats, and interactive interfaces.

1.2 The Value of AI Agents in Media Content Production

The application value of AI Agents in media content production can be systematically summarized across four core dimensions. First, **multimodal content generation capability**: By integrating generative AI and multimodal large model technologies, AI Agents can achieve automated content creation across text, images, audio, and video dimensions. In news production scenarios, they can automatically generate standardized news reports such as sports event coverage and financial bulletins based on structured data, and in film and television creation, they can realize script generation and intelligent video material editing. Second, **intelligent content governance mechanisms**: Based on deep learning-based multimodal semantic analysis technology, AI Agents can build end-to-end content auditing systems. Through the collaborative application of Natural Language Processing (NLP) and Computer Vision (CV), they can accurately identify non-compliant text, sensitive images, and inappropriate video content, while combining knowledge graph technology to achieve semantic-level compliance verification, significantly enhancing content safety governance effectiveness. Third, **dynamic dissemination network optimization**: Through real-time data analysis and algorithmic optimization, AI Agents dynamically adjust content distribution strategies. Their core functions include automatically adapting resolution and encoding formats for different terminals, optimizing dissemination paths based on user reach effectiveness, and coordinating cross-platform dissemination matrices to maximize communication effectiveness. Fourth, **precise user interaction models**: Relying on reinforcement learning and transfer learning algorithms, AI Agents can build personalized recommendation systems based on user profiles. These systems analyze user historical behavior data (including click heatmaps, dwell time, social interactions, etc.) to establish multi-dimensional feature vector spaces and dynamically generate tailored content push solutions for individual users.

AI Agents have reconstructed the underlying logic of traditional media production and dissemination, not only substantially improving content production efficiency but also expanding the boundaries of creative expression through human-machine collaboration mechanisms.

2. Applications of AI Agents in Media Content Production

In the wave of intelligent transformation in the media industry, AI Agents, with their autonomous perception, reasoning, and execution capabilities, are reshaping the entire content production process from “topic planning—editing and auditing—distribution and interaction.”

2.1 AI Agent Applications in Topic Planning

As the starting point of content production, the “topic planning” stage determines topic direction, audience positioning, and dissemination strategy, with its efficiency and accuracy directly impacting media competitiveness. AI Agents

have the following core application scenarios in the “topic planning” stage.

First, **data-driven topic planning**: AI Agents identify potential hot topics and user interest points by real-time crawling of multi-source data from social media, search engines, and public opinion platforms, combined with Natural Language Processing (NLP) technology. Compared with traditional manual screening, AI Agents can significantly improve topic discovery efficiency while covering long-tail demands. Second, **user profiling and deep demand mining**: Based on machine learning algorithms, AI Agents can construct dynamic user profiles, analyzing audience content consumption preferences, time-slot habits, and cross-platform behaviors. Third, **hotspot prediction and risk assessment**: Through time-series analysis and causal reasoning models, AI Agents predict the evolution trends of social hotspot events. Additionally, they can identify sensitive content and public opinion risks, providing compliance warnings for planning. Fourth, **cross-platform content integration planning**: Addressing the needs of media matrix operations, AI Agents can automatically analyze content styles and user differences across platforms (such as WeChat, Douyin, and Bilibili) to generate customized planning solutions.

Typical cases of domestic media using AI Agents in the “topic planning” stage include the following.

Case 1: Nanjing Media Group’s “Xiao Jinling” AI Agent for Two Sessions Coverage. “Xiao Jinling” is built on AI technology and the DeepSeek large language model, with deep analysis and precise matching as its core highlights. Relying on a massive database and authoritative information sources from the National Two Sessions, “Xiao Jinling” can not only provide the audience with the freshest and most concerned Two Sessions information daily but also conduct in-depth thinking and precise responses to various user questions such as “What new expectations do Nanjing residents have for the future?” and “What else do people want to say?” It can also integrate authoritative data and policy information from multiple fields including education, employment, and consumption, providing detailed data support for the audience while multi-dimensionally analyzing why these fields attract attention and their future development trends, enabling the public to have a more thorough and comprehensive understanding of livelihood issues involved in the Two Sessions, significantly enhancing the depth and professionalism of Two Sessions coverage [3].

Case 2: Chengdu Media Group’s “Yuyan Zhixuan” Platform. This platform integrates AI Agent technology to achieve full-chain automation of “data collection—hotspot prediction—solution generation.” Taking “Fenxiang Finance,” which focuses on Shaanxi urban content, as an example, it utilizes “Yuyan Zhixuan’s” short video rapid generation and one-click distribution capabilities to immediately cover breaking events and current political news. A 20-second video completes the condensation of core content, highlighting an “instant information” approach to capture first-hand platform traffic, with almost daily 爆款 works achieving 100,000+ views. Efficient video production capabilities have

made 80% of the public account's follower growth come from its video account, achieving the goal of shaping news influence through video [4].

Case 3: Dazhong Daily's "Dazhong" New Media Platform. In August 2024, the "Dazhong" new media platform launched a brand-new version 9.0 client, explicitly establishing "AI-powered platform" as one of its core strategic goals. Empowered by the Dazhong Party Media large model, the diversified functional advantages of AI Agents run through the entire content production chain, improving human-machine collaboration efficiency and injecting endless momentum into content innovation. The platform has created multiple AI news columns such as "Morning AI Dazhong" and "Evening AI Dazhong," achieving "news following hot topics." It explores an "AI+data journalism" model, allowing AI Agents to work continuously and automatically integrate and generate livelihood information such as stock market trends, oil price fluctuations, and weather forecasts, which appear on screens after human-machine collaborative review [5].

2.2 AI Agent Applications in Editing and Auditing

AI Agent applications in the editing and auditing stage have evolved from single-function tools to full-process intelligent assistants, with their value lying not only in efficiency improvement but also in building a "human-machine symbiosis" content production paradigm. AI Agents have the following core application scenarios in the "editing and auditing" stage.

First, **automated integration of multimodal information:** At the material acquisition stage, AI Agents enable intelligent processing of unstructured data. They can real-time crawl web-wide text, audio-video, and social media content, classify and store it after semantic understanding, providing a resource pool for secondary creation. Through real-time clipping and keyframe extraction, they condense hours of live video content into highlight clips, saving manual editing time, particularly suitable for time-sensitive breaking news coverage. Second, **from writing assistance to one-click generation:** AI Agents have evolved from simple text generation tools to multimodal content production engines. They can automatically organize interview recordings into structured notes or even directly generate first drafts. Their video modules can also match media library materials based on text to generate short videos with subtitles and background music with one click. Such applications significantly lower content creation thresholds, allowing editorial staff to focus on creativity and in-depth reporting. Third, **human-machine collaborative editing and auditing:** The "hallucination reduction" capability of AI Agents is particularly important in the editing stage. Through large model chain-of-thought reasoning and information source verification, they ensure content authenticity and logical coherence, automatically checking historical facts and data sources to reduce manual verification burdens. Such technology automates mechanical editing and auditing work, freeing human resources for value judgment and creative review.

Current typical cases of domestic media using AI Agents in the “editing and auditing” stage include the following.

Case 1: Xinhua Zhiyun’ s “Xiaomai” AI Agent for Full-Process Empowerment. As a vertical domain AI Agent specifically designed for media, “Xiaomai” deeply integrates editorial business logic. In the writing stage, it supports automatic transcription of interview recordings, automatic organization, and image search. In video production, it can complete live clipping, intelligent mixed editing, and text-to-video generation. Additionally, Xiaomai has strong adaptability, enabling seamless integration with various systems and software. It can also adopt a co-construction model with customers based on their existing business systems and operational processes to create customized AI Agents that meet business needs [6].

Case 2: Cover News’ s “Xiaofeng Zhizuo” Intelligent Production Chain. The “Xiaofeng Zhizuo” platform integrated in Cover News version 10.0 automatically generates news articles through algorithmic analysis of large amounts of data. Based on preset templates and rules, these articles can quickly cover various news events. For example, in sports event reporting, the system can automatically collect match data and player information, combine it with match backgrounds, and generate detailed competition reports. Meanwhile, Cover News also uses AI technology for content auditing. Through establishing deep learning models, the Cover Zhimei Auditing Cloud system can automatically identify and filter out sensitive, pornographic, violent, and vulgar content, greatly improving auditing efficiency, reducing labor costs, and ensuring platform content healthiness and compliance [7].

Case 3: Wenxin Yiyan and Cihai Jointly Launch “Ciwen” Intelligent Proofreading Agent with Precise Knowledge Traceability. “Ciwen” is based on Wenxin Yiyan’ s four capabilities of understanding, generation, logic, and memory, incorporating Agent RAG technology architecture to achieve precise knowledge traceability, powerful multi-round reasoning capabilities, dynamic knowledge updating mechanisms, and intelligent interactive proofreading processes. These four technical breakthroughs enable the knowledge in the “Great Cihai” to be learned and flexibly used. In practical applications, the proofreading efficiency has increased by 300% after adopting “Ciwen,” with error recognition accuracy reaching 80% [8].

2.3 AI Agent Applications in Distribution and Interaction

AI Agent applications in the distribution and interaction stage not only optimize the efficiency of traditional information distribution but also create immersive interactive experiences that combine virtual and real elements, pushing media interaction from “one-way communication” to “two-way co-creation.” AI Agents have the following core application scenarios in the “distribution and interaction” stage.

First, **personalized content recommendation:** By analyzing user behavior

data (such as browsing history, click preferences, and dwell time), AI Agents construct dynamic user profiles to achieve precise content matching. Personalized recommended content not only enhances user stickiness but also optimizes recommendation models through real-time feedback of interaction data, forming a “user behavior—algorithm iteration—content adaptation” closed loop. Second, **intelligent customer service and proactive service**: AI Agents have achieved a transformation from “passive response” to “proactive service” in media customer service scenarios. In breaking news reporting, AI Agents can automatically generate event timelines, FAQ databases, and rumor-refuting information, and push them to users in real-time through social media, significantly shortening response times. Additionally, multi-language-supported AI Agents facilitate cross-cultural interaction in international communication through automatic translation and localized expression. Third, **virtual anchors and immersive experiences**: Virtual digital humans, as the embodied carriers of AI Agents, are becoming new entry points for media interaction. Relying on real-time speech synthesis and expression-driven technology, they achieve human-like interaction. Through multimodal interaction (voice, gestures, expressions), they enhance immersion, shifting one-way communication to “participatory narrative.”

Typical cases of domestic media using AI Agents in the “distribution and interaction” stage include the following.

Case 1: CCTV.com Uses Multiple Interactive AI Agents to Play with “AI Grand Ceremony.” The comment section of the “2024 China · AI Grand Ceremony” live broadcast room specially launched an “AI Writing Assistant” to generate ceremony comments in different styles. For example, the “Panda Style” assistant would comment, “The atmosphere of the AI Grand Ceremony is so warm, as comfortable as a bamboo forest.” Additionally, there were various writing styles available such as “Su Shi Style,” “Zhen Huan Style,” and “Zhihu Style.” During the live broadcast, the CCTV host AI Agent “avatar” appeared in the CCTV.com APP live room, presenting an unprecedented novel experience through complete AI program announcements, thorough AI knowledge point explanations, and down-to-earth AI atmosphere comments [9].

Case 2: Wenxin Yiyao Jointly Launches “Yanbao” Hotspot Sports AI Agent with Sports Vertical Platform “Live Bar.” During the Paris Olympics, Baidu Wenxin Yiyao leveraged Live Bar’s deep accumulation in sports content, enabling “Yanbao” to understand sports and the Olympics better, allowing users to chat freely about Olympic gossip and stories, make event predictions, and explain Olympic trivia. This is not only an innovation in traditional sports information dissemination methods but also an active exploration of AI technology in the sports field. Through “Yanbao,” users can more conveniently obtain needed sports information and enjoy a more personalized Olympic viewing experience [10].

Case 3: China Broadcasting Network Builds AI Agent Matrix to Optimize Customer Service and Content Recommendation Experience.

China Broadcasting Mobile's customer service AI Agent, trained on over 5,000 knowledge points from the Broadcasting 5G network's proprietary operational service data, can output answers at a rate of 50 Token/s and has launched experience services for Broadcasting 5G users. Jiangsu Cable uses large models to optimize content recommendations, fully leveraging "AI+converged media" production quality and efficiency to expand content service boundaries, creating more high-quality content with Jiangsu characteristics, style, and spirit, and promoting deep integration of audio-visual content and cultural IP. Guangdong Broadcasting Network has upgraded its interactive AI digital human to achieve natural interaction for film and television recommendations and business processing. Fujian Broadcasting Network has integrated voice remote controls and digital human "Fu Jingjing" with DeepSeek to optimize services such as AI TV watching and intelligent guidance, enhancing user interaction experience [11].

3. Risks and Challenges of AI Agents in Media Content Production

Currently, AI Agents continue to expand their multi-dimensional application scenarios in media content production fields such as topic planning, editing and auditing, and distribution and interaction, with their application potential being continuously explored. AI Agents demonstrate significant advantages in improving content production efficiency, optimizing dissemination paths, and enhancing user interaction experiences, not only reconstructing traditional media production paradigms but also providing solid support for the intelligent transformation of the media industry. However, as application depth increases, related risks and challenges are becoming increasingly apparent.

First, **issues of content authenticity and ethical risks**. The inherent "black box" and "hallucination" problems of AI large language models still exist, potentially causing harmful biases during the process of achieving specific goals and increasing the frequency of operational anomalies. The hallucination defects of large models inevitably extend directly into AI Agents, causing agent hallucinations. Without strict auditing and verification, false information may be released, further disrupting the public opinion field.

Second, **technical dependence and talent transformation pressure**. Excessive media dependence on AI may lead to the degradation of traditional editing and reporting capabilities, while journalism practitioners need to transform from "content creators" to "prompt engineers," mastering skills for collaborating with AI. This transformation places higher demands on practitioners' technical literacy, such as understanding AI Agent working principles and mastering prompt engineering techniques, and some organizations may face talent gap risks.

Third, **data security and monopoly concerns**. AI Agents rely on massive data for training, and media institutions face challenges in user privacy protection and data security. Additionally, the monopoly of technology giants over the

AI ecosystem may squeeze the development space of small and medium-sized media, exacerbating industry resource imbalances.

Fourth, **mainstream media needs to accelerate role transformation**. In the tide of intelligence, facing AI Agents' challenge to content dominance, mainstream media is transforming from traditional content producers to "intelligent content ecosystem governors." Mainstream media needs to strengthen its ability to guide AI values to establish a trustworthy content order, thereby enhancing public opinion guidance capabilities and consolidating the main position of public opinion [12].

In conclusion, AI Agents have brought productivity innovation and communication paradigm upgrades to the media industry, constructing new momentum, models, and ecosystems for media industry development, but they also accompany multiple challenges at ethical, technical, and ecological levels. In the future, mainstream media must balance technological application and value guidance, continuously optimize collaboration mechanisms, strengthen governance capabilities, and build a healthy and sustainable intelligent content ecosystem through policy regulation, industry collaboration, and talent cultivation.

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