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Evolution of Knowledge Production and Reconstruction of Communicator Roles in the AIGC Era

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Abstract

The iterative development of AI-generated content (AIGC) technologies has given rise to a new paradigm of knowledge production and dissemination. Drawing on a systematic literature analysis, this study reviews the evolutionary trajectory of traditional knowledge production models. The study focuses on the transformative changes driven by the AIGC-powered "human–machine collaboration" paradigm—particularly in terms of dynamic mechanisms, organizational methods, quality control, and value orientation. On this basis, the paper examines the challenges faced by traditional communicators, including the erosion of authority and the weakening of gatekeeping functions. It argues that communicators need to transition into multiple new roles: strategist in human–machine collaboration, facilitators of higher-order thinking, critics of algorithmic ethics, and emotional liaison. Finally, a dialectical examination is conducted on potential issues arising from the new paradigm. The paper aims to provide a theoretical reference for building a sound knowledge ecosystem, where a dynamic network of actors, technologies, and institutions can work cohesively in the production, dissemination, and use of knowledge.

Keywords: AIGC; Knowledge Production Models; Roles of Communicators; Human–Machine Collaboration; Knowledge Ecosystem

1. Introduction

Under the tide of digitalization, AIGC is reshaping the landscape of knowledge production and dissemination at an unprecedented pace, driven by its ability to generate multimodal content and process data efficiently.The evolution of knowledge production models has always moved in step with technological development. The transition from Mode 1 to Mode 2 proposed by Michael Gibbons and his colleagues, together with the later addition of Mode 3 by Elias G. Carayannis and others, forms a classic analytical framework (Chen, 2023). However, AIGC is beginning to move beyond the logic of existing models by integrating data and algorithms in new ways, giving rise to a form of human–machine collaborative knowledge production: in which human judgment

and intention are combined with the generative and analytical capabilities of AI systems, enabling more efficient and scalable knowledge creation. At the same time, the knowledge dissemination environment has undergone dramatic changes. Under the impact of knowledge equalization and intelligent production brought by AIGC, traditional knowledge communicators, who once served as knowledge authorities and information gatekeepers, are now facing multiple challenges such as the erosion of their authority and the weakening of their functions. The reconstruction of their roles has become inevitable.This paper follows the main line of "evolution, transformation, and reflection." It analyzes the internal mechanisms behind the dissolution and reconstruction of the communicator's role, and offers a critical discussion of the new knowledge ecology shaped by AIGC. The goal is to provide academic support for the healthy development of knowledge production and dissemination in the AIGC era.

2. Research Methodology

The foundational data for this study was gathered through a systematic literature review. This involved:

(1) Source Selection: An extensive search of high-impact international databases (e.g., Web of Science, CNKI) was conducted using keywords such as "AIGC," "Knowledge Production Mode," "Communicator Role," and "Human–Machine Collaboration."

(2) Inclusion Criteria: Priority was given to peer-reviewed journals published between 2023 and 2026 to ensure the analysis reflects the most recent advancements in generative AI and communication theory.

This study adopts an evolution–transformation–reflection analytical framework, combining comparative paradigm analysis, role theory, and critical–normative evaluation. It first traces the historical evolution of knowledge production models, then analyzes the transformation of communicator roles under the AIGC paradigm, and finally provides a critical reflection on the emerging knowledge ecology.

3. Evolution and Breakthrough: The Paradigm Shift of Knowledge Production Models Driven by AIGC

3.1. The Basis of Evolution: A Review of Paradigms from Mode 1 to Mode 3

The way knowledge is produced has always evolved alongside broader technological and social change. The progression from Mode 1 to Mode 3 offers a useful starting point for understanding how knowledge systems have gradually expanded in terms of participants, organization, and purpose.

Mode 1 refers to a more traditional, discipline-based form of knowledge production. It is largely carried out by individual scholars working within academic institutions, with a primary focus on developing theoretical knowledge. In this model, knowledge production tends to remain relatively closed and confined within specific academic communities.

Mode 2 marks a shift toward more application-oriented and interdisciplinary forms of knowledge production. Here, research is increasingly shaped by practical needs and involves collaboration between universities, industries, and other institutions. As a result, knowledge is valued not only for its theoretical contribution but also for its usefulness in real-world contexts. Formal peer review also becomes more central in maintaining quality and credibility.

Mode 3 further expands this process by introducing a more open and networked approach. With the support of digital technologies, knowledge production becomes more distributed, involving not only institutions but also individuals and online communities. This makes the process more participatory and accessible. At the same time, quality control begins to rely not only on expert evaluation but also on forms of community feedback. However, despite these advances, knowledge production in Mode 3 is still largely driven by human actors and does not fully incorporate the capabilities of intelligent technologies.

Table 1. Comparison of Three Knowledge Production Modes

Dimension of Comparison	Mode 1	Mode 2	Mode 3
Core Agents	Individuals such as scientists and scholars	Organizations such as enterprises and research institutions	Institution + individual + community driven network
Driving Mechanism	Driving Mechanism	Social application needs	Curiosity + application needs + network connection
Value Orientation	Pursuit of truth	Pursuit of truth + social utility	Pursuit of truth + social utility + open sharing
Organizational Form	Disciplinary isolation	Interdisciplinary collaboration	Distributed collaboration
Quality Control	Limited peer review	Well established peer review system	Peer review + community feedback
Dissemination Characteristics	Traditional channels, limited reach	Parallel academic and applied dissemination	Internet driven, zero cost coverage

Table 1. shows a clear shift in knowledge production from closed, discipline-based systems to more open and networked forms. Across Modes 1 to 3, participation expands from individual scholars to institutions and eventually to distributed communities, while the focus moves from pure theory toward practical application and knowledge sharing. At the same time, organizational structures become more flexible, evolving from disciplinary boundaries to interdisciplinary and networked collaboration. However, despite these changes, Mode 3 remains largely human-driven and continues to face challenges in efficiency and consistent quality control at scale. In this sense, the AIGC paradigm represents a more fundamental shift rather than a simple extension, as it

introduces algorithmic systems as active participants in knowledge production, enabling faster, more scalable, and increasingly automated processes while also raising new concerns around reliability and accountability.

3.2. A New Paradigm of Knowledge Production Driven by AIGC

3.2.1. Shift in Driving Mechanism: From Human Curiosity and Application Needs to the Dual Drive of Data and Algorithms

The traditional driving forces of knowledge production mainly came from human curiosity about the world and the application needs of social development. With the emergence of AIGC technology, the driving mechanism of knowledge production has shifted. Massive amounts of data and algorithms now provide a new driving force for knowledge production. Through deep analysis and learning of data, AIGC can uncover potential patterns that are difficult for humans to detect, facilitating the generation of innovative knowledge outcomes. At the same time, the continuous improvement of algorithms can enhance the rigor and quality of AIGC-generated content. This process also helps overcome certain limitations of human cognition. As a result, knowledge production increasingly reflects an interaction between human intention and algorithmic exploration (Fu & Li, 2025).

3.2.2. Transformation in Organizational Form: From Institutionalized, Interdisciplinary, and Distributed Collaboration to Distributed, Agent Enhanced Real Time Production

Traditional knowledge production was mainly carried out by scholars and research institutions. With the development of AI technology, the mode of knowledge production has changed to agent enhanced real time distributed production. After the emergence and widespread use of AIGC, the barrier to knowledge production has been greatly lowered. Anyone can use AIGC to produce and disseminate knowledge, becoming a node in distributed production (Guo & Zhang, 2023). Take science popularization, which requires a high level of expertise, as an example. Creators can use AIGC to quickly access the latest professional research results from around the world, and then process them into easy to understand science content for dissemination. The whole process is simple and efficient, without relying on too much external support.

3.2.3. Reshaping of Quality Control: From Peer Review to Algorithmic Assessment and Human Machine Collaborative Verification

From Mode 1 to Mode 3, the quality control of knowledge production relied on peer review. In the AIGC era, the scale of knowledge production has expanded rapidly and the speed of dissemination has accelerated. The traditional peer review method can no longer meet current needs in terms of efficiency and coverage. Under these conditions, AIGC is reshaping quality control systems. Instead of relying solely on manual evaluation, these systems now combine algorithmic assessment with human–machine collaboration (Jiang et al., 2025). This transformation has already taken place in the publishing field, publishers like Elsevier is already using AI assisted screening tools to conduct completeness and plagiarism checks (Elsevier, 2025).

3.2.4. Expansion of Value Orientation: From the Pursuit of Truth and Social Utility to Inclusiveness and Creativity

Traditional knowledge production was driven by the human pursuit of truth and the needs of social development. In the AIGC era, knowledge production has become more accessible. The barrier to knowledge production has been greatly lowered, allowing ordinary people to participate in the creation and dissemination of knowledge. Duolingo for example, an application that is used to teach and help practice foreign languages, have incorporated AI into their application, allowing for lessons adapted real time based on learner's response (Duolingo, 2023). In addition, AIGC relies on large amounts of data to complete its creative work, which to some extent provides people with diverse intellectual inspiration and stimulates their innovative ideas.

4. Crisis and Transformation: Reconstructing the Role of Knowledge Communicators in the AIGC Era

While AIGC technology is driving changes in the way knowledge is produced, it is also having a disruptive impact on the stability of the traditional knowledge communicator role. The functions of traditional communicators as knowledge authorities, information gatekeepers, and providers of basic skills are gradually disappearing. They are beginning to shift toward new roles in human machine collaboration.

4.1. The Dissolution of Roles: Challenges Facing Traditional Communicators

4.1.1. The Erosion of Knowledge Authority

In the traditional knowledge production system, communicators relied on their professional expertise and information screening abilities to establish a certain level of authority within a given field. However, with the development of AIGC technology, knowledge production and dissemination are becoming increasingly democratized and accessible to the general public. Ordinary people can now use AIGC to create professional level content. Teachers are no longer the sole providers of knowledge in the classroom, and journalists are no longer the fastest information publishers for breaking news. The knowledge authority of traditional communicators has been undermined.

4.1.2. The Weakening of Gatekeeping Functions

Traditional communicators acted as information gatekeepers, that is, those who screen, filter, and process information before passing on quality knowledge to the audience. AIGC technology has brought information dissemination into an era of decentralization. A large amount of user generated content and AI generated content is flooding into communication channels, and the speed of information dissemination has become very fast (Li et al., 2025). Traditional communicators can no longer achieve comprehensive control and screening of information, and their gatekeeping function has been greatly weakened.

4.1.3. The Declining Value of Basic Skills

Traditional communicators needed to possess good basic skills in information collection, editing, and dissemination. However, AIGC technology can efficiently perform these tasks, delivering well written copy, reports, videos, and other content quickly and with good quality.Taking news as an example, AI can instantly produce structured news reports such as sports events and financial coverage, and can automatically proofread and format the content. The substitutability of traditional communicators' basic skills has increased, steadily weakening their core competitiveness and leaving them trapped in the dilemma of skill updating and role transformation.

4.2.Role Reconstruction: Moving Toward a New Paradigm of Human Machine Collaboration

4.2.1. Curator and Conductor in Human Machine Collaboration

In the AIGC era, knowledge content is growing exponentially, leaving audiences trapped in information overload. In this context, communicators should act as human machine collaborative knowledge curators, integrating, screening, and optimizing vast amounts of information to provide audiences with personalized and precise content services. In addition, they need to coordinate their working relationship with AI, much like a symphony conductor directing the work of various intelligent agents, ensuring that these agents cooperate and work together to jointly complete the production and dissemination of knowledge (Liu & Zhang, 2023). In the operation of science popularization accounts, for example, communicators can guide AI to produce first drafts of short science videos based on audience interests and preferences, and then adjust and improve based on audience feedback, thereby producing high quality science content (Liu et al., 2023).

4.2.2. Guide of Higher Order Thinking and Cognitive Coach

AIGC can generate a large amount of content, but it is not good at cultivating audience's innovative thinking and critical thinking. Communicators, on the other hand, can fully leverage their own strengths, transforming from traditional information disseminators into guides of higher order thinking and cognitive coaches. Take a hot topic as an example. In the process of information dissemination, communicators can build a discussion structure that contains multiple levels and multiple perspectives around the topic, allowing audiences to engage in discussions from different angles and sides, and prompting behaviors that demonstrate critical thinking and creative expression.

4.2.3. Critic of Algorithmic Ethics and Value Anchor

The development of AIGC cannot be separated from the support of algorithms, but algorithms themselves come with certain biases and value deviations. For example, algorithms can intensify information cocoons and may also contain false information, leading to ethical problems and misleading the audience's understanding (Wang, 2025). Communicators should possess a certain level of digital literacy and algorithmic awareness, view algorithms critically, and reveal to audiences the risks that exist in AIGC outputs.

4.2.4. Connector of Emotional Value and Community Builder

The content generated by AIGC is a recombination of large amounts of existing information. It lacks real feelings and life experiences, and therefore has limited human warmth and emotional connection. Communicators can make full use of their own strengths by transforming themselves into connectors of emotional value and builders of communities. On the one hand, they can incorporate human care into the process of knowledge production and dissemination, making the content more engaging and story like (Xiao, 2024). On the other hand, they can create online communities and organize interactive activities around relevant topics, forming knowledge dissemination circles with a sense of belonging and cohesion.

5. Challenges and Reflections: A Dialectical View of the AIGC Knowledge Ecology

While the reconstruction of communicator roles reflects an adaptive response to the AIGC-driven environment, these changes also introduce new uncertainties and structural risks. The same conditions that enable human–machine collaboration and decentralized knowledge production—such as algorithmic mediation and large-scale content generation—can give rise to challenges related to inequality, ethical accountability, and the stability of knowledge systems. In this sense, role transformation and emerging risks are closely intertwined. This section therefore examines the key tensions within the evolving AIGC-driven knowledge ecosystem.

5.1. The Paradox of Knowledge Equalization and the Digital Divide

AIGC technology allows more and more people to participate in knowledge production and dissemination, which to some extent promotes the development of knowledge equalization. However, it may also widen the digital divide. Differences in digital access and digital skills exist across regions and between different groups of people. Some individuals cannot fully take advantage of the convenience brought by AIGC technology, which may worsen inequality in knowledge acquisition. For example, remote areas often have weak network infrastructure, making it impossible for some people to access the internet. In addition, elderly people may lack basic digital skills and therefore cannot use AIGC technology effectively.

5.2. Concerns over Content Homogenization and the Dilemma of Innovation

The content generated by AIGC is essentially a reorganization and imitation of existing information, lacking true innovation. The stories, articles, and other materials it produces often share similar plots and expressions, making them largely indistinguishable and highly homogenized. When a large amount of AIGC generated content floods communication channels, it can on the one hand reduce the audience's reading experience, and on the other hand dampen human motivation for innovation. In the long run, this is not conducive to the innovation and development of knowledge.

5.3. The Ambiguity of Responsibility Attribution and Ethical Misconduct

The application of AIGC technology has blurred the boundaries of knowledge production. When AIGC-generated content involves false information or infringements (Zhang & Yang,

2025), responsibility becomes difficult to assign. This includes ambiguity among technology developers, users, and content communicators. Moreover, due to the low transparency of algorithmic processes, biases and ethical misconduct are more likely to occur (Zhang et al., 2025). With regard to issues such as portrait rights and intellectual property rights, legal protection is difficult to obtain, and there is a lack of unified standards for determining originality and attributing copyright. This ambiguity can lead to legal disputes and hinder the healthy and orderly development of knowledge production.

5.4. The Long Term Risk of the Erosion of Human Subjectivity

The development of AIGC has given rise to a human machine collaborative model of knowledge production. However, excessive reliance on AIGC technology by humans may lead to the erosion of human subjectivity (Zhu et al., 2025), and with it, the decline of human capacity for independent thinking. Furthermore, AIGC relies on algorithmic technology. While algorithms bring convenience to information dissemination, they also deepen the filter bubble effect, narrowing people's cognitive horizons to a certain extent. The ability of humans to think independently and make judgments is also at risk of being weakened. All of these factors mean that as humans enjoy the convenience brought by AIGC, they may lose their own subjectivity and their leading role in innovation.

6. Conclusion and Outlook

The advancement of AIGC technologies is reshaping the landscape of knowledge production, driving a paradigm shift toward human machine collaboration and data driven processes. Within this evolving context, knowledge communicators are confronting emerging challenges and progressively transitioning toward a human machine collaborative model. Meanwhile, the AIGC mediated knowledge ecology faces persistent issues including the digital divide, content homogenization, ambiguous attribution of responsibility, and the erosion of human subjectivity. Addressing these challenges requires coordinated efforts from technology developers, educators, policymakers, and society at large, with the goal of achieving complementary human machine strengths and fostering a more inclusive, innovative, and healthy knowledge ecosystem.

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