Research on the Collaborative Governance Model of AI Agents for University Network Public Opinion under the Concept of Management-Education Integration

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Abstract: *The governance of university network public opinion faces multiple challenges, including information fragmentation, carrier diversification, and inadequate collaboration. Traditional management models exhibit structural limitations in terms of monitoring coverage, depth of analysis, and response timeliness. Grounded in the concept of Management-Education Integration, this study explores the collaborative model of AI agents in the governance of university network public opinion, presenting a systematic analysis across four dimensions: theoretical perspective, structural design, mechanism construction, and operational model. The research reveals the inherent coupling between Management-Education Integration and technological empowerment, constructs a multi-stakeholder collaborative framework mediated by algorithms, proposes a four-in-one guarantee system encompassing departmental collaboration, research-practice collaboration, human-AI collaboration, and regulatory collaboration, and refines a three-in-one operational mechanism integrating digital-intelligent perception with educational recognition, collaborative regulation with flexible guidance, and efficacy evaluation with model iteration. The study indicates that AI agents can transform unstructured public opinion into structured educational topics, achieving the dual objectives of maintaining online order and promoting student development through human-machine collaboration.*

Keywords: *Management-Education Integration; AI Agents; University Network Public Opinion; Collaborative Governance; Operational Model*

Introduction

As a crucial space for students' ideological expression and emotional exchange, university cyberspace carries public opinion information that reflects students' genuine needs in academic development, interpersonal relationships, and value identification, thereby serving as a key window into the ideological dynamics of the student population. However, the diversification of platforms and the multimodality of expression render traditional manual monitoring methods incapable of penetrating the deep structure of online information. The lack of effective information sharing and action coordination mechanisms among multiple governance entities leads to delayed governance responses and missed educational opportunities. AI agents, with their technical capabilities in semantic understanding, sentiment analysis, and trend prediction, offer new possibilities for overcoming these challenges. Guided by the concept of Management-Education Integration, this study systematically explores the theoretical foundations and practical pathways for integrating AI agents into university network public opinion governance, aiming to construct a collaborative governance model that unifies technological embedding with educational orientation, thereby providing theoretical support for enhancing the effectiveness of university cyberspace governance.

1.The Connotative Evolution and Management Challenges of University Network Public Opinion

1.1 Definition of Core Concepts

The concept of Management-Education Integration, within the context of universities, refers to the

process of exerting systematic educational influence on student development through institutional design and organizational behavior. An agent, as an important concept in the field of artificial intelligence, refers to a computational entity capable of environmental perception, autonomous decision-making, and action execution. In the context of this study, it specifically denotes a software agent system serving university network public opinion management, which can automatically perform tasks such as multi-source information collection, sentiment tendency judgment, and evolutionary trend prediction through algorithmic models, while possessing the ability to collaborate with other intelligent systems or management personnel. Network public opinion is a collection of public emotions, attitudes, and opinions triggered by specific events and disseminated through cyberspace. Within the specific context of universities, its content primarily revolves around teaching management affairs, campus emergencies, the rights and interests of teachers and students, and the projection of social hot topics onto the campus community. Injecting the technical capabilities of agents into the management practice of network public opinion has its core value in achieving a transformation in management paradigm from passive response to active perception, and from experience-based judgment to data-driven approaches, thereby establishing a logical starting point for technology-enabled educational management[1].

1.2 Characteristics of University Network Public Opinion and Its Educational Relevance

University network public opinion exhibits distinctive characteristics that differentiate it from general social public opinion, and these characteristics constitute the intrinsic foundation for its deep connection with educational work. The carriers of public opinion present a diversified distribution, extending from traditional campus forums and discussion boards to social media platforms such as Weibo, WeChat, Xiaohongshu, and Douyin, thereby forming a cross-platform, multi-dimensional communication matrix. These platforms themselves serve as the primary arenas for students' daily ideological exchanges and emotional expressions. The dissemination of public opinion is characterized by its pervasiveness, as the high degree of interconnectedness among university faculty and students makes campus issues prone to attracting public attention. Once public opinion forms, it can generate a resonance effect both on and off campus within a short period, and its evolutionary process often reflects the collective emotional state and value orientation of the student body. The complexity of the impact of public opinion is manifested in its intertwining with deeper issues such as campus order, student development, and institutional reputation. What is embedded in the content of public opinion is not merely information itself, but also the genuine confusions and underlying needs of students regarding their academic development, interpersonal relationships, and value identification. This makes network public opinion a crucial window for gaining insight into students' ideological dynamics and developmental needs, thereby providing the possibility for its transformation into educational resources.

1.3 The Failure of Traditional Management Models and the Inevitability of Agent Intervention

The aforementioned characteristics of university network public opinion directly lead to structural limitations in the response effectiveness of traditional management models. Traditional management approaches rely on manual monitoring and experience-based judgment, making it difficult to achieve comprehensive coverage of diverse platforms at the level of information collection, as a substantial amount of public opinion information scattered across various social media platforms and instant messaging groups remains outside the scope of monitoring. At the level of analysis and judgment, manual processing methods exhibit significant cognitive limitations when confronted with massive amounts of unstructured information, with analytical results often remaining at the level of superficial emotional description and failing to reach the deep structure and evolutionary logic of public opinion. At the level of emergency response, hierarchical decision-making processes and information transmission mechanisms struggle to match the instantaneous nature of public opinion evolution, often resulting in missed opportunities for optimal intervention. The root cause of these limitations lies in the inherent tension between traditional management models and the digital nature of network public opinion, and agent technology precisely possesses the technological potential to resolve this tension. Agents achieve comprehensive awareness of cyberspace through automated data collection and multimodal information processing capabilities, penetrate the concealment and diversity of online expression through sentiment analysis and semantic understanding, and realize the efficient transformation from information to decision-making through human-agent collaboration mechanisms with management personnel. Their intervention is not a patchwork improvement to traditional management but a systematic restructuring of the management paradigm, and this restructuring process

is intrinsically consistent with the realization of educational goals.

2. Agent-Empowered University Public Opinion Management: Objectives and Technical Support

2.1 The Four Major Objectives of Agent-Based Collaborative Governance

The embedding of agents into university network public opinion management points to a systematic upgrade of management objectives. Comprehensive monitoring, as a foundational objective, is manifested in the integration and enhancement of multi-source heterogeneous data sources, achieving round-the-clock, cross-platform continuous awareness of the campus cyberspace and bringing the various social scenarios where students are daily active within the scope of management. Agile emergency response focuses on establishing a human-agent collaborative response mechanism, wherein agents are responsible for real-time early warning and preliminary situation assessment, pushing structured information to management personnel terminals, thereby shortening the time cycle from public opinion detection to decision-making for intervention. Intelligent analysis and judgment aim to shift management approaches from being dominated by human experience to a combination of human expertise and technology. Agents provide in-depth analytical results that transcend the limitations of personal experience through technical means such as sentiment polarity analysis, opinion clustering identification, and communication path reconstruction, assisting educational administrators in grasping the ideological pulse of the student body. Strategic support extends the scope of management to the level of institutional development. Based on the accumulation of long-term data, agents offer data-driven decision-making recommendations for assessing student ideological dynamics, diagnosing the communication effectiveness of management policies, and monitoring institutional reputation, thereby enabling public opinion management to serve the holistic optimization of the university's educational system[2].

2.2 Core Technical Elements of Agents

The effective processing of public opinion information by agents relies on the refined deconstruction capability of multimodal information, with their technical core embodied in the organic integration of sentiment classification modeling and multi-level analytical tools. The sentiment classification model, as the core processing unit, requires the construction of a specialized sentiment lexicon and classification algorithm adapted to the university context to address the rich symbolic expressions of emotion prevalent in online communication. At the lexical level of analysis, the model identifies sentiment intensity information conveyed through topic indicators, mention symbols, emojis, and multiple punctuation marks. At the sentential level of analysis, the model determines the sentiment tendency and degree of subjectivity within a single statement, capturing the emotional coloring embedded in linguistic expression. At the document level of analysis, the model comprehensively evaluates the overall emotional tone and the density of opinion distribution within the text. At the image level of analysis, the model performs preliminary sentiment recognition on visual content such as memes, posters, and screenshots to address the communication ecology of image-based expression. Through a stepwise deconstruction process from the micro to the macro level and from text to image, agents achieve a deep understanding of the public opinion entity, thereby providing a clearly structured data foundation for subsequent analysis, judgment, and decision-making.

3. Constructing a Collaborative Public Opinion Management Mechanism

3.1 Enhancing Understanding and Mechanism Coordination: Breaking Down Departmental Barriers

The deep integration of agent technology into university network public opinion management imposes structural requirements on collaborative mechanisms at the organizational level. Enhancing understanding, as a prerequisite for mechanism construction, necessitates the establishment of a modern management concept of data-driven governance among university administrators, elevating network public opinion management from the purview of a single department to an important component of the university's overall educational system. The core of mechanism coordination lies in promoting the functional integration and data interconnection among multiple governance entities. The information dissemination functions of the publicity department, the ideological guidance functions of the student affairs department, the order maintenance functions of the security department, and the

technical support functions of the information technology department all require organic cohesion through a unified collaborative framework. The long-established operational boundaries and data barriers among departments need to be dismantled through the establishment of cross-departmental data-sharing standards and joint meeting mechanisms, enabling public opinion information and management resources originally scattered across different systems to be aggregated and deployed on a unified platform. This organizational-level collaborative restructuring provides the necessary institutional environment for the effective functioning of agent technology, allowing the technical system and the organizational system to form a mutually supportive, positive relationship through collaborative operation.

3.2 Strengthening Technology and Research-Practice Collaboration: Adapting to Campus Scenarios

The transition of agent technology from the laboratory to campus management practice requires a process of deep adaptation to specific educational scenarios. The collaboration between technology research and development and educational application is manifested in the establishment of sustained cooperative research and development mechanisms between universities, technology enterprises, and research institutions, jointly developing agent tools and application platforms that are more suited to the university context. The specificity of campus scenarios lies in the uniqueness of their management subjects and the orientation of their educational goals. General public opinion monitoring technologies are difficult to directly transfer to the university setting, necessitating specialized local adjustments to sentiment lexicons, classification models, and analysis and judgment rules. Research-practice collaboration is reflected not only in the initial development phase of technology but also throughout the continuous optimization process of technological application, where feedback from frontline managers drives the iterative upgrading of algorithms, ensuring that technological capabilities remain synchronized with the evolving forms of campus public opinion. A normalized communication mechanism between technology providers and educational demand-side entities serves as the organizational guarantee for maintaining the contextual adaptability of agent tools, enabling technological development to genuinely serve the realization of educational goals rather than the self-referential operation of technological logic[3].

3.3 Enhancing Digital Literacy and Human-Agent Collaboration: Empowering Frontline Practitioners

The introduction of agent technology does not diminish the central role of educational administrators in public opinion governance; rather, it places new demands on their competency structure. Enhancing digital literacy targets the entire community of faculty and students, aiming to equip students with rational information discrimination abilities and a sense of responsible online expression through systematic media literacy education, thereby optimizing the ecosystem of expression within the campus cyberspace at its source. For frontline administrators such as academic advisors and student affairs cadres, cultivating the capacity for human-agent collaboration becomes a key aspect of technological empowerment. Administrators need to understand the technical principles and functional boundaries of agents, accurately interpret the analytical reports generated by intelligent systems, identify valid information and potential biases within them, and integrate the structured data provided by technology with their own in-depth understanding of the student body, thereby forming judgments supported by both data and humanistic insight. Administrators must also avoid two extreme tendencies: neither over-relying on agents to the point of abandoning their professional judgment and agency, nor completely rejecting the auxiliary value of intelligent systems due to a sense of technological unfamiliarity. The cultivation of this balancing capability needs to be ensured through systematic training mechanisms.

3.4 Coordinating Ethics, Privacy, and Regulation: Safeguarding Student Rights and Interests

In the process of collecting, storing, and analyzing students' online expression information, agent technology is consistently accompanied by core issues concerning privacy protection and ethical boundaries. The embedding of ethical principles needs to be implemented throughout the entire process of agent design and development, from clearly defining the scope boundaries and purposes of information collection at the source of data acquisition, ensuring that technological operations do not overstep the baseline of respect for students' personal privacy. For sensitive data involving students' identifying information, the system must employ technical measures such as desensitization processing and anonymization transformation to eliminate personally identifiable characteristics, enabling public

opinion analysis to be based on data at the group level rather than the tracking and surveillance of individual behaviors. Coordinating regulation refers to the pursuit of a dynamic balance between development and governance. Neither should technological innovation and management application be constrained by excessive emphasis on risk prevention, nor should the fundamental protection of student rights and interests be sacrificed in pursuit of technological efficiency. The operation of agent systems must adhere to the principle of minimal necessity in data collection and the principle of contextual limitation in information usage. The unification of technological logic and ethical logic is ultimately manifested in the organic integration of technological innovation and humanistic care under the objective of education[4].

4. Operational Model of AI Agent Collaborative Governance Embedded with Educational Orientation

4.1 Digital-Intelligent Perception and Educational Recognition Model

The operational model begins with comprehensive awareness of the campus cyberspace and the in-depth recognition of educational value. Relying on deep learning algorithms, agents conduct continuous scanning across diverse social media platforms, capturing initial signals of emotional fluctuations, topic concentrations, and opinion divergence from data streams such as forum posts, community dialogues, and comment interactions. The dimension of perception extends beyond the surface logic of keyword triggering, penetrating into the analysis of expression styles, emotional tones, and interaction structures. The collaborative processing of multimodal data enables the system to transcend the formal differences among text, images, audio, and video, establishing semantic associations across heterogeneous information and forming a holistic understanding of the context in which public opinion arises. On this basis, educational recognition becomes the core dimension of the model. The system matches raw information with educational objectives, filtering from massive data those types of issues that hold value for educational intervention, including ambiguous areas of value cognition, potential directions of collective emotion, dynamic tensions within group relationships, and the construction process of identity. Through comprehensive judgment across these dimensions, agents transform public opinion events into ideological maps interpretable by educational subjects, enabling technological perception to directly serve the precise formulation of educational decisions.

4.2 Coordinated Regulation and Flexible Guidance Linkage Model

In response to the complex forms of expression in network public opinion, the operational model establishes a dynamic linkage mechanism between regulatory and guiding functions. After identifying a specific public opinion issue, agents conduct a multidimensional assessment based on emotional intensity, dissemination speed, value orientation, and group involvement, automatically triggering differentiated response levels. For expressions that may disrupt network order, the system initiates regulatory collaborative procedures, employing technical means such as content distribution and heat regulation to appropriately control the scope of information diffusion. The threshold for initiating regulatory measures and the intensity of intervention are adjusted in real time according to the evolving state of the issue. Operating in parallel with the regulatory function is the deep involvement of the flexible guidance mechanism. For public opinion issues reflecting students' ideological confusions, emotional appeals, or identity anxieties, agents classify them as priority targets for educational intervention, pushing to educational subjects a panoramic profile that includes the issue's background, emotional characteristics, and evolutionary trends. Based on this intelligent support, educational subjects employ guidance methods such as dialogic inspiration and issue reframing to transform the evolution of public opinion into educational opportunities for value clarification. Regulation and guidance form an interlocking linkage structure under the real-time adjustment of the intelligent system, dynamically adjusting the proportion and combination of the two functions according to the state of public opinion[5].

4.3 Educational Effectiveness Evaluation and Model Iteration Mechanism

The continuous optimization of the operational model depends on the systematic evaluation of educational outcomes and the incorporation of feedback. After the implementation of guiding actions, agents continuously track subsequent reactions within the cyberspace, conducting temporal analysis and group comparisons regarding the evolutionary trajectory of emotions, the distribution pattern of

opinions, and the cognitive changes among participating subjects concerning the issue. By comparing data characteristics before and after the intervention, the system generates multi-dimensional effectiveness indicators, including the degree of reduction in issue prominence, the extent of constructive shift in discussion direction, the level of improvement in students' rational expression, and the trend toward clarity in value cognition. These quantitative results are transformed into feedback information on the effectiveness of governance actions. The evaluation process simultaneously monitors potential secondary reactions triggered by guiding behaviors, forming a comprehensive understanding of the entirety of governance actions. Model iteration based on evaluation results constitutes the driving mechanism for the evolution of governance capabilities. The intelligent system incorporates the complete data from the governance process into machine learning datasets, optimizing subsequent algorithmic models through pattern recognition and enhancing the accuracy of identifying similar issues and the adaptability of responses. Based on the cognitive support provided by intelligent evaluation, educational subjects reflect on the appropriateness of guiding strategies and the timeliness of interventions, feeding their experiential judgments back into the system's rule base updates, thereby forming a positive relationship in which the technical system and educational subjects mutually shape each other through co-evolution[6].

Conclusion

This study systematically explores the collaborative governance model of AI agents for university network public opinion under the concept of Management-Education Integration from four dimensions: theoretical perspective, structural design, mechanism construction, and operational model. At the theoretical level, this study reveals the digital extension pathway of the Management-Education Integration concept, elucidates the technological empowerment logic through which agents transform management objectives into guiding cues, and demonstrates the value basis for converting public opinion into educational resources. At the structural level, this study designs a multi-stakeholder collaborative framework mediated by algorithms, reshapes the mode of stakeholders' digital presence, and constructs a cross-stakeholder collaboration mechanism for data sharing and task scheduling. At the mechanism level, this study proposes a four-in-one guarantee system encompassing understanding and mechanism coordination, technology and research-practice collaboration, digital literacy and human-agent collaboration, and ethics, privacy, and regulatory coordination. At the operational level, this study refines a three-in-one operational mechanism integrating digital-intelligent perception with educational recognition, coordinated regulation with flexible guidance, and efficacy evaluation with model iteration, thereby achieving the organic integration of governance processes with educational objectives. Future research needs to enhance the precision of algorithms in identifying implicit value appeals, explore the adaptive application of the model across different types of universities, address the new challenges brought by the proliferation of generative artificial intelligence, and continue to deepen the educational orientation through dynamic adjustment.

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