World Journal of Educational Research
ISSN 2375-9771 (Print) ISSN 2333-5998 (Online)
Vol. 13, No. 2, 2026
www.scholink.org/ojs/index.php/wjer

Original Paper

Research on the Path Innovation and Risk Prevention Mechanism of Artificial Intelligence Empowering University Scientific Research Management

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Received: January 29, 2026 Accepted: March 29, 2026 Online Published: April 17, 2026
doi:10.22158/wjer.v13n2p106 URL: http://dx.doi.org/10.22158/wjer.v13n2p106

Abstract

With the rapid iteration of AI technologies, their capabilities in natural language processing, knowledge discovery, data analysis, process optimization, and intelligent decision-making continue to strengthen, expanding from industrial scenarios to higher education governance. Existing research suggests that AI and big data are driving scientific research management from an experience-led model toward a data-driven, intelligently collaborative, and dynamically governed one, showing significant potential in project management, outcome evaluation, resource allocation, risk identification, and service platform construction. However, introducing AI into university research management also presents challenges such as data security, algorithmic bias, ethical concerns, inadequate organizational adaptation, and system integration difficulties. Accordingly, this paper follows the thread of "mechanism construction—path innovation—risk prevention". Based on a review of relevant literature, it analyzes the operational logic of AI-empowered research management across four dimensions: intelligent platform construction, research process optimization, outcome evaluation reconstruction, and behavioral supervision enhancement. It then proposes a tripartite risk prevention framework of "technological prevention—institutional guarantees—organizational synergy." The study argues that the key to AI empowerment lies not in partial tool substitution, but in the synergistic upgrading of governance concepts, institutional structures, and organizational capabilities. Effective implementation depends on the mutual support of mechanisms including data governance, algorithm review, ethical regulation, platform integration, and talent cultivation.

Keywords

Artificial Intelligence, University Research Management, Research Governance, Path Innovation, Risk

Prevention, Intelligent Platform

1. Introduction

Against the backdrop of a new wave of technological revolution and industrial transformation, artificial intelligence (AI) is increasingly becoming a significant force in reshaping organizational governance models. Relevant research indicates that the rapid development of new-generation information technologies, such as big data and AI, is driving the transition of science and technology management and research governance from traditional linear, decentralized, experience-based models towards a new stage characterized by data-driven approaches, platform support, and intelligent synergy (Zhao, 2024; Wang, J. Y., 2025; Lin, S. Y., & Zhou, H. T., 2023). This change is not only reflected in the automation upgrade at the tool level but also embodies systematic changes in management concepts, institutional structures, and process logic.

Universities are crucial components of a national innovation system, and university research management serves as a key hub connecting research projects, researchers, research outcomes, funding utilization, and disciplinary development. As research activities continue to expand in scale, research data becomes increasingly complex, and the demand for interdisciplinary collaboration intensifies, the limitations of traditional research management systems in terms of approval efficiency, information sharing, process tracking, outcome evaluation, and risk early warning have become increasingly apparent. Existing research generally agrees that traditional models struggle to meet the needs of modernizing research governance in universities, necessitating an urgent upgrade of the overall research management system with the help of data platforms, AI, and intelligent analysis technologies(Wang, Y., Zhou, X. J., Wei, X., et al., 2024; Wang, J. B., & Chen, B., 2024; Chen, Y., Meng, Q. Y., Hou, X. W., et al., 2024).

From a practical perspective, current university research management still commonly suffers from issues such as cumbersome processes, excessive manual intervention, prominent information silos, and rigid evaluation mechanisms. In key stages like project application, review, execution, conclusion, and outcome commercialization, management work remains heavily reliant on manual review and empirical judgment, leading to low efficiency, delayed decision-making, and imprecise resource allocation. Research has shown that leveraging big data, process mining, and AI analysis tools can, to a certain extent, improve data processing, process analysis, and resource scheduling capabilities in research management, thereby alleviating the inefficiency and fragmentation issues inherent in traditional models (Wang, Y., Zhou, X. J., Wei, X., et al., 2024; Li, Y., Zhao, J. Y., & Zuo, J. P., 2022; Liu, L. P., Xu, H., & Zhao, L. L., 2025).

Meanwhile, embedding AI into university research management is not a simple technological addition but a complex process involving platform construction, process reengineering, institutional adaptation, ethical regulation, and organizational restructuring. Existing research cautions that while AI enhances efficiency and optimizes management, it can also introduce risks such as algorithmic black boxes, data

bias, privacy breaches, unclear accountability, weakened researcher autonomy, and lagging organizational capabilities (Luo, J. H., 2024; Xu, H., Li, X., & Gao, Y., 2024). Particularly in sensitive areas like research evaluation, resource allocation, and behavioral supervision, if the technological logic lacks transparency and institutional constraints, AI may not only fail to improve governance quality but could instead trigger new forms of unfairness and uncertainty.

Based on this, this paper adopts the main thread of "mechanism construction—path innovation—risk prevention" to systematically explore the operational logic and institutional safeguard pathways for AI empowering university research management. Compared with existing research, this paper expands on the following aspects: First, it constructs a systematic analytical framework from four dimensions: platform construction, process optimization, evaluation reconstruction, and risk governance. Second, it proposes a tripartite risk prevention model of "technological prevention—institutional guarantees—organizational synergy." Third, it offers relatively actionable implementation suggestions focusing on platform integration, algorithm governance, organizational optimization, and policy support.

2. Literature Review and Theoretical Foundations

2.1 Overview of Research Status

In recent years, research on the application of AI, big data, and digital platform technologies in research management has been steadily increasing. Early studies primarily focused on research management platform construction, research data integration, and digital process transformation, emphasizing the enhancement of standardization, informatization, and collaboration in research management through database development, standardized data interfaces, platform integration, and service synergy. For instance, some studies proposed building comprehensive research big data service platforms by integrating resources such as scientific research projects, outcomes, personnel, and archives, further utilizing data analysis to support research decision-making and service innovation (Wang et al., 2024). Similar studies also pointed out that digital education research management service platforms can integrate functions like project management, outcome management, team collaboration, and resource sharing, providing support for the entire research management process (Chen et al., 2024).

As research deepens, academic focus has gradually shifted from "platform construction" to "management model innovation." Relevant studies indicate that AI is driving the transformation of research management from traditional transactional management towards intelligent, collaborative, and precise governance. Specifically, AI can be embedded in stages such as project planning, progress monitoring, risk assessment, resource allocation, and team collaboration, enhancing the efficiency of whole-process project management (Li, Zhao, & Zuo, 2022); process mining and machine learning technologies can promote the fine-grained reengineering of science and technology management processes by identifying process bottlenecks, analyzing resource utilization, and evaluating optimization effects (Liu, Xu, & Zhao, 2025).

In the university context, the impact of AI on research governance is increasingly understood not merely as auxiliary tool value but as a paradigm shift in management. Research suggests that digital intelligence technologies are driving the upgrade of university research management from information-based management to digital-intelligent management, characterized by dynamic management supported by data monitoring, scientific decision-making enabled by human-machine collaboration, and standardized academic governance facilitated by technological supervision (Wang, Y. et al., 2024). From the perspective of "new quality productive forces", some studies indicate that AI propels research management into a new stage centered on innovation, efficiency, and integration, with its essence lying in achieving high-quality development of research management through technological breakthroughs and data governance (Wang, 2025).

Regarding research evaluation and assessment systems, considerable attention has been paid to the role of AI in restructuring evaluation logic and tools. Relevant research suggests enhancing the efficiency, objectivity, and scientific rigor of research evaluation by building intelligent evaluation platforms, optimizing evaluation indicator systems, innovating evaluation methods, and strengthening the application of results (Wang & Chen, 2024); studies focusing on the upgrade of university research management systems advocate for establishing data-driven management systems based on research data collection, statistical analysis, and dynamic researcher profiling to support evaluation and management decisions (Wang et al., 2024).

Concurrently, researchers are increasingly emphasizing the institutional boundaries and governance risks associated with AI empowering research management. On one hand, existing research indicates that AI holds promise for optimizing management services, improving the management ecosystem, and enhancing personalized support in university teaching and research management. On the other hand, it also explicitly identifies risks such as digital ethics lapses, digital divides, disorder in individual rationality, alienation of human-machine relationships, algorithmic bias, and privacy security (Luo, 2024). In studies focusing on AI-based research management models, scholars generally stress the importance of policy system construction, talent cultivation, privacy security, and scientific and technological ethics (Xu, Li, & Gao, 2024).

Overall, existing research provides a crucial foundation for AI empowering university research management, yet three shortcomings persist: First, many studies tend to describe technical application scenarios, with relatively insufficient systematic analysis of governance mechanisms and institutional evolution. Second, the synergistic relationships among platform construction, process innovation, evaluation reconstruction, and risk prevention are not discussed comprehensively enough. Third, while existing literature touches upon data security, algorithmic bias, and ethical governance, there remains a lack of systematic design for operable comprehensive prevention mechanisms within the university context. Based on this, this paper aims to build upon existing research to further construct an analytical framework that balances technological empowerment with institutional constraints.

2.2 Theoretical Foundations and Research Support

To enhance the systematic nature and explanatory power of this study, an analytical framework jointly supported by innovation management theory, big data analysis theory, and AI intelligent decision-making logic is constructed.

First, innovation management theory emphasizes that technological progress is a significant driver of organizational transformation and performance enhancement. In the context of university research management, AI is not merely a simple replacement of manual labor but an institutional innovation based on data, algorithms, and platforms, driving the shift in research management from experience-based decision-making to data-driven decision-making, from static control to dynamic response, and from result review to whole-process governance (Zhao, 2024; Wang, 2025).

Second, big data analysis theory emphasizes extracting valuable information from multi-source, complex, and dynamically changing data to support organizational decision-making. Existing research demonstrates that the construction of research management platforms, comprehensive research big data services, and the digital transformation of research governance fundamentally rely on the integrated analysis of data related to research projects, personnel, outcomes, funding, and collaboration networks (Lin & Zhou, 2023; Wang et al., 2024). To achieve precise allocation and intelligent governance, university research management must establish a whole-process data governance chain encompassing data collection, cleaning, modeling, analysis, and feedback.

Third, AI intelligent decision-making logic emphasizes leveraging methods such as natural language processing, machine learning, knowledge discovery, and pattern recognition to achieve auxiliary judgment and dynamic response to complex management issues. Research indicates that AI can provide intelligent support in areas like project application text analysis, expert-reviewer matching, researcher profiling, outcome impact assessment, anomaly behavior identification, and risk early warning (Wang, 2025; Li, Zhao, & Zuo, 2022). This “data—model—decision” chain provides the technical foundation for university research management to transition from “functional empowerment” to “systemic transformation.”

Based on the above theoretical support, this paper forms the analytical logic of “mechanism construction—path innovation—risk prevention”: first, explaining how AI is embedded in the entire process of university research management from the perspective of technology-management integration; second, conducting mechanism analysis from the four aspects of platform, process, evaluation, and supervision; and finally, constructing a corresponding risk prevention and institutional guarantee system.

3. Mechanism Construction of AI Empowering University Research Management

3.1 Constructing an Intelligent Research Management Platform

An intelligent research management platform serves as the foundational infrastructure for AI empowering university research governance. Existing research points out that the key to platform

construction lies in integrating multiple types of data resources, such as research project databases, outcome databases, personnel files, financial systems, and evaluation models, achieving resource sharing, business collaboration, and data linkage through unified data standards and integrated interfaces (Chen et al., 2024). Building on this foundation, the platform can further integrate functions like intelligent analysis, task scheduling, service recommendations, and process early warning, constructing a digital base for the entire research process.

From a technical mechanism perspective, leveraging methods like natural language processing, machine learning, and knowledge discovery, the platform can facilitate research text recognition, project classification assistance, expert matching recommendations, team collaboration analysis, and resource allocation support. For example, semantic analysis of project applications, final reports, and research outcome texts can enhance information extraction efficiency; data analysis of research teams, collaboration networks, and outcome associations can help identify potential synergies and disciplinary development trends (Lin & Zhou, 2023). Consequently, the research management platform evolves from being merely an information storage system into an intelligent decision support system.

From a governance effectiveness perspective, intelligent platforms can break down traditional "stovepipe" system structures to a certain extent, improve information silos and duplicate data entry, and enhance the visualization, collaboration, and refinement of research management. By aggregating research data in real-time, the platform can generate research operation trend maps, project execution status analyses, and resource allocation profiles, providing management departments with more timely and accurate decision-making bases (Wang et al., 2024).

3.2 Optimizing the Research Project Management Process

Research project management is a core aspect of university research management and one of the most direct areas for AI empowerment. Existing research indicates that AI holds significant advantages in stages such as project planning, progress monitoring, risk assessment, and resource allocation, promoting the transformation of project management from traditional serial approval to automated, intelligent, and dynamic governance (Li, Zhao, & Zuo, 2022).

During the project application and review phase, AI can utilize text mining and semantic analysis to preliminarily assess the structural completeness, topic relevance, and basic standardization of application materials, thereby reducing the burden of manual initial screening. Simultaneously, by integrating data from historical projects, expert research areas, and review results, the system can provide expert matching and conflict-of-interest avoidance support for project reviews, enhancing review efficiency and fairness (Liu, Xu, & Zhao, 2025).

During the project execution phase, AI can continuously collect information on project progress, budget execution, phased outcomes, and research logs through data interfaces, enabling dynamic tracking of the entire project lifecycle. In cases of delays, budget anomalies, or deviations from expected outcomes, the system can issue timely alerts based on existing pattern recognition and anomaly detection logic, helping management departments shift from "post-event remediation" to

"in-process correction" (Liu, Xu, & Zhao, 2025).

During the project conclusion and knowledge accumulation phase, AI can assist in analyzing final reports, extracting outcome characteristics, and archiving project knowledge. By analyzing the text of project outcomes, citation trends, collaboration networks, and application contexts, the system can generate structured project profiles, providing support for subsequent project design, experience reuse, and the repurposing of research knowledge (Wang et al., 2024).

3.3 Innovating the Research Outcome Evaluation System

Research outcome evaluation is one of the most sensitive and directive areas in university research management. Existing research generally agrees that AI can facilitate the transition of research evaluation from a single quantity-oriented approach to a comprehensive evaluation system that considers quality, impact, efficiency, and collaboration through multi-source data integration, dynamic researcher profiling, and multi-dimensional indicator modeling (Wang & Chen, 2024; Wang, Y., et al., 2024).

Specifically, AI can integrate multi-dimensional information such as faculty basic information, research directions, project participation, paper outcomes, patent outcomes, collaboration networks, and research awards to generate relatively comprehensive researcher profiles. Such profiles not only help research management departments understand the development status of different faculty members, teams, and disciplines but also facilitate the construction of differentiated evaluation and stratified support mechanisms, thereby reducing the oversimplified tendency of applying a "one-size-fits-all" measure (Wang et al., 2024).

In terms of evaluation methods, existing research advocates for using intelligent evaluation platforms and multi-dimensional indicator systems to improve the objectivity and scientific rigor of evaluation. AI can construct a "quantity-quality-impact" comprehensive evaluation model based on historical data and dynamic monitoring results, incorporating indicators such as outcome quantity, outcome quality, disciplinary impact, output efficiency, collaboration degree, and social service contribution into a unified framework, thus helping to correct traditional evaluation biases favoring "solely papers," "solely titles," and "solely seniority" (Wang & Chen, 2024).

Simultaneously, with the help of visual dashboards and intelligent analysis tools, evaluation results can be presented in a more intuitive and dynamic manner. For instance, universities can monitor real-time data on disciplinary research activity, team collaboration intensity, the structural distribution of outcomes, and potential growth areas, providing a basis for resource allocation, disciplinary layout, and talent support (Lin & Zhou, 2023).

3.4 Strengthening Research Behavior Supervision and Risk Early Warning

As research activities become increasingly digitized, the importance of research integrity construction and risk prevention becomes more prominent. Existing research suggests that the application of AI in behavior recognition, anomaly detection, and risk early warning can effectively enhance the proactivity and refinement of research governance (Liu, Xu, & Zhao, 2025).

In terms of research behavior supervision, AI can utilize rule-based modeling and historical case learning to identify behaviors with high risks of research misconduct, such as duplicate outcome submissions, abnormal fund usage, frequent project interruptions, abnormal collaboration patterns, and academic dishonesty. Its advantage lies in its ability to process multi-variable, multi-stage, and often subtle data features, thereby improving the timeliness of risk detection (Liu, Xu, & Zhao, 2025).

Regarding dynamic early warning mechanisms, the system can establish a risk knowledge base based on historical violation cases and risk events, continuously train models using research project operation data, and provide graded warnings for issues such as abnormal project cycles, abnormal outcome commercialization, and abnormal budget execution. Compared with relying solely on human experience, such mechanisms are more conducive to achieving early identification, early intervention, and early resolution of risks (Lin & Zhou, 2023).

In summary, through the four pathways of platform construction, process optimization, evaluation reconstruction, and risk early warning, AI is reshaping the operational logic of university research management. Its essence is not to replace humans with machines but to enhance the perception, analysis, response, and governance capabilities of research management with the support of data and algorithms.

4. Risk and Challenge Analysis

4.1 Data Security and Privacy Protection Risks

University research management involves a large amount of sensitive data, including project plans, outcome content, budget details, personnel information, collaborative relationships, and academic resources. Existing research indicates that while digital platforms and intelligent systems increase the efficiency of data flow, they also elevate the risks of data leakage, unauthorized use, and external attacks (Luo, 2024). Without strict data classification management, access control, and security encryption mechanisms, research data is highly susceptible to security breaches during transmission, invocation, and storage.

Furthermore, AI systems themselves are vulnerable to threats like data poisoning, model inversion, or interface attacks. If information such as original research data, application materials, and yet-to-be-publicized project schemes is leaked, it not only harms the rights and interests of researchers but may also trigger intellectual property disputes and academic infringement issues. Therefore, data security should not be treated merely as a subsidiary technical issue but as a fundamental concern in the intelligent transformation of research management.

4.2 Algorithmic Bias and Discriminatory Decision-Making Issues

The judgment results of AI systems heavily depend on training samples, model settings, and historical data structures. Existing research points out that if the training data contains implicit biases related to gender, discipline, department, or seniority, the system may replicate or even amplify existing inequalities in evaluation, recommendation, and allocation processes (Xu, Li, & Gao, 2024). Especially

in scenarios such as research resource allocation, project funding recommendations, and outcome evaluation, algorithmic bias can create structural disadvantages for young faculty, emerging disciplines, or interdisciplinary research.

Moreover, complex models like deep learning possess significant "black box" characteristics. Managers often only receive scores, rankings, or recommendations from the system without being able to accurately trace the logic behind them, which undermines the transparency and accountability of management decisions. Furthermore, if universities over-rely on historical data-driven models for evaluation and recommendation, the system may solidify existing advantageous structures, stifling the development space for innovative, exploratory, and non-mainstream research directions.

4.3 Organizational Change and Management Capability Adaptation Risks

Empowering university research management with AI is not merely a technology deployment issue but also a matter of organizational structure adjustment and personnel capability redevelopment. Research generally indicates that if managers and faculty lack the necessary digital literacy, data understanding, and AI tool usage skills, even after system implementation, the platform may be built while operations remain unchanged (Wang & Chen, 2024; Xu, Li, & Gao, 2024).

Additionally, issues such as functional dispersion, unclear boundaries of authority and responsibility, and inconsistent data formats often exist among different departments within universities. AI systems typically require collaboration from multiple departments, including research, finance, information technology, libraries, and faculties. If organizational synergy mechanisms are inadequate, it can easily lead to difficulties in system integration, hindered process reengineering, and ambiguous accountability. In other words, the true implementation of AI requires simultaneous changes in both technological and organizational logic.

4.4 Ethical and Legal Challenges

As AI becomes more extensively involved in research management, ethical and legal issues concerning fairness, transparency, accountability, and researcher autonomy become more prominent. Existing research explicitly notes that excessive AI involvement in research evaluation, research direction recommendations, and resource allocation may weaken disciplinary differences and individual characteristics, thereby affecting the space for independent exploration in research (Xu, Li, & Gao, 2024). Simultaneously, when system decisions deviate from expected norms, accountability – whether it lies with the system developer, the platform manager, or the using department – is often unclear in practice.

Therefore, the role of AI in university research management should be that of an "auxiliary tool" rather than the "final arbiter." Without clear ethical guidelines, appeal mechanisms, and defined responsibility boundaries, AI might erode procedural justice and academic fairness under the guise of "improving efficiency."

4.5 System Integration and General Applicability Challenges

Information systems for university research management have long suffered from "stovepipe"

construction issues, with significant differences in interface standards, data formats, and business processes across different systems. Existing research indicates that inconsistent system interfaces, redundant platform construction, and difficulties in data sharing are significant barriers to the intelligent upgrade of research management (Wang et al., 2024). If AI systems cannot achieve compatibility with existing research, finance, human resources, and asset management systems, it will result in high redevelopment costs, long implementation cycles, and difficulties in widespread adoption.

This implies that AI empowerment in university research management cannot be pursued in isolation from the foundational conditions of informatization. Only under the premise of establishing unified standards, integrating interfaces, and building a digital base can AI modules achieve lightweight integration and widespread application.

5. Comprehensive Construction of Risk Prevention Mechanisms

5.1 Multi-dimensional Risk Identification and Dynamic Early Warning System

To promote the healthy, sustainable, and controllable application of AI in university research management, priority should be given to constructing a multi-source heterogeneous data integration platform. This platform should connect data chains across research project management systems, financial systems, human resources systems, and research evaluation systems, forming a traceable data flow throughout the research process (Lin & Zhou, 2023). Based on this, combined with historical violation cases, research failure scenarios, and abnormal behavior patterns, a risk profile library should be established. Machine learning methods should be used to build risk identification models for predicting and identifying duplicate submissions, budget anomalies, outcome anomalies, and behavioral anomalies.

Furthermore, universities should develop a hierarchical, visualized dynamic early warning mechanism. Through visual dashboards, risk heat maps, and intelligent alert functions, managers can monitor the distribution of project anomalies, funding anomalies, and outcome anomalies in real-time and implement tiered interventions based on risk levels. This mechanism helps improve the timeliness and precision of risk response, shifting research governance from "dealing with problems after they occur" to “intervening when problems are nascent.”

5.2 Research Ethics Governance and Algorithm Review Mechanisms

At the institutional guarantee level, universities should establish dedicated AI ethics review and algorithm review mechanisms. Drawing on existing research discussions on digital ethics, algorithmic bias, and privacy security, universities can set up an AI Governance Committee composed of research management personnel, algorithm experts, legal affairs staff, and faculty representatives. This committee should be responsible for auditing models used for research evaluation, resource allocation, and behavioral supervision, focusing on their data sources, indicator structures, explainability, fairness, and error margins (Luo, 2024).

Simultaneously, an algorithm registration and traceability system should be established to manage records of model versions, data structures, parameter changes, and invocation logs. Any intelligent decision involving major research evaluations or resource allocations should retain channels for manual review and appeals, ensuring researchers have the rights to information, appeal, and correction. Only by placing AI under ethical regulations and procedural constraints can its governance capabilities achieve credibility and legitimacy.

5.3 Institutionalized Management Guarantees and Organizational Synergy Mechanisms

The effectiveness of AI implementation depends not only on system performance but also on institutional rules and organizational synergy. Universities should formulate specific application norms for AI in research management, clearly defining system authority scope, usage boundaries, responsible entities, and supervision procedures. Concurrently, the research management department should take the lead, collaborating with the information office, finance department, library, and faculties to establish a cross-departmental data governance committee responsible for coordinating data standards, interface specifications, resource sharing, and platform upgrades (Wang & Chen, 2024).

In terms of personnel and organization, universities should strengthen AI literacy training, incorporating data governance, algorithm understanding, and platform usage capabilities into the development systems for research management teams and faculty. New roles, such as Research Data Steward and Research Intelligence Analyst, should be established as needed to drive simultaneous upgrades in organizational capacity and technological systems. Existing research shows that without talent development and organizational adaptation, AI can easily remain at a superficial display level without penetrating core business processes (Wang & Chen, 2024).

5.4 Construction of an Intelligent Governance Platform for Research Management

Beyond institutional and organizational mechanisms, risk prevention should be embedded digitally through platform-based governance. Based on existing research on research management platforms and big data governance, this paper argues that universities should build a comprehensive intelligent governance platform that integrates functions such as risk identification, algorithm review, data security, decision explanation, and appeal correction (Lin & Zhou, 2023; Wang et al., 2024). The platform should include at least five core modules: first, a risk identification engine for graded early warning of abnormal behaviors; second, an algorithm review center for recording and managing the full lifecycle of models; third, a data security module for desensitizing, auditing, and encrypting sensitive information; fourth, a decision explanation module for visually displaying the rationale behind system recommendations and evaluations; and fifth, a complaint and correction channel to support appeals and manual reviews.

The significance of platform-based governance lies in embedding dispersed risk prevention requirements into daily management processes, creating a closed loop for risk identification, review, feedback, and correction, thereby truly enhancing the transparency, traceability, and correctability of university research management.

5.5 Comprehensive Evaluation and Policy Support Recommendations

From a broader perspective, the sustainable advancement of AI empowering university research management requires coordinated efforts from the state, universities, and the industry. At the national level, AI governance guidelines for university research, research data open standards, and intelligent platform certification rules should be further refined. At the university level, the effectiveness of AI applications should be incorporated into the performance assessment of research management, encouraging faculties to conduct localized innovations within compliance frameworks. At the industry level, the establishment of university research data sharing alliances and collaborative risk prevention mechanisms should be promoted to facilitate shared standards, experience exchange, and governance synergy (Wang, 2025; Wang, Y., et al., 2024).

6. Conclusion and Future Prospects

Focusing on the theme of AI empowering university research management, this paper systematically analyzes its functional mechanisms in areas such as platform construction, project process optimization, research outcome evaluation reconstruction, and behavioral supervision enhancement. Based on this analysis, it proposes a tripartite risk prevention framework of "technological prevention—institutional guarantees—organizational synergy." Synthesizing existing research, it is evident that AI is driving the transformation of university research management from experience-based governance to data-driven governance, from static management to dynamic governance, and from single administrative control to intelligently synergistic governance (Wang et al., 2024).

Firstly, AI is reshaping the fundamental logic of university research management. It is no longer merely an auxiliary office tool but is progressively becoming a critical infrastructure for integrating data resources, optimizing business processes, enhancing evaluation quality, and strengthening risk governance capabilities. Intelligent research management platforms, data-driven project management, multi-dimensional research evaluation, and real-time risk early warning constitute the main pathways for embedding AI into university research governance (Li, Zhao, & Zuo, 2022).

Secondly, the core value of AI empowerment lies in enhancing the holistic nature, precision, and sustainability of research management. Through cross-system data integration, whole-process business analysis, and intelligent decision support, university research management can potentially break free from long-standing issues like information silos, repetitive tasks, one-dimensional evaluation, and lagging responses, thereby serving research innovation activities more effectively (Chen et al., 2024).

Thirdly, the deep application of AI also brings non-negligible risks and boundary issues. Issues such as data security, algorithmic bias, ethical legitimacy, organizational adaptation, and system integration indicate that AI empowerment is by no means a linear, frictionless process. Rather, it is a complex governance process requiring the synergistic advancement of technological upgrades, institutional construction, and organizational reengineering. Therefore, universities must balance "efficiency improvement" with "risk governance," bedding risk prevention mechanisms throughout the system

design, operation, and supervision processes (Luo, 2024).

Looking ahead, there remains vast potential for AI empowering university research management. First, further efforts should be made to promote the intelligent integration of research, teaching, finance, evaluation, and resource management systems to build an intelligent ecosystem oriented towards holistic university governance. Second, deeper integration of AI with educational evaluation theory, research governance theory, and science and technology ethics research should be pursued to construct a more diverse, flexible, and explainable research evaluation framework. Third, the development of inter-university research data sharing, model collaboration, and joint risk prevention mechanisms should be accelerated to enhance collaborative governance capabilities at regional and sectoral levels. Fourth, the ethical and institutional norms for AI in university research should be refined as soon as possible, clarifying the boundaries of technological application, responsible entities, and review procedures, thereby ensuring the legitimacy, fairness, and controllability of AI-enabled research management (Lin & Zhou, 2023).

In conclusion, the key to AI empowering university research management lies not in "whether to use technology" but in "how to use technology in an institutionalized, platform-based, and human-centered manner." Only by respecting the inherent laws of research, ensuring academic fairness, strengthening data governance, and enhancing organizational capacity can AI truly become a significant force in advancing the modernization of university research governance.

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