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The Application of Generative AI in Internal Auditing—A case study of DeepSeek

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Abstrat: *Under the strategic background of strengthening audit through technology and the construction of audit informatization, this article explores the application of generative artificial intelligence in internal audit. Taking the domestic model DeepSeek as an example, the study systematically analyzes the compatibility of its functional characteristics, such as multi-format document parsing, long text processing, and deep adaptation to Chinese scenarios, with the needs of internal audit work. The article focuses on three stages: pre-audit investigation, audit implementation, and report formation, specifically exploring the application scenarios and empowerment paths of DeepSeek in key areas such as legal system sorting, regulatory information analysis, preliminary evaluation of financial data, intelligent review of textual materials, auxiliary judgment of irregularities, and report generation and proofreading. The research shows that DeepSeek can effectively enhance the breadth, depth, and efficiency of audit work, promoting the transformation of audit mode towards intelligence. However, it is also necessary to pay attention to risks such as data security, model illusion, and over-reliance. Finally, the article proposes suggestions such as building a human-machine collaboration framework and strengthening the cultivation of composite talents, aiming to provide reference for promoting the safe, compliant, and efficient integration of generative artificial intelligence into internal audit practice.*

Keywords: *Artificial intelligence; DeepSeek; Internal audit*

1. Introduction

General Secretary Xi Jinping emphasized the need to strengthen auditing through technology and enhance the informatization of auditing. The "14th Five-Year Plan for National Audit Work Development" also points out the need to continuously promote innovation in audit techniques and methods and deepen the application of modern information technology in audit practices[1]. With the introduction of the "strengthening auditing through technology" strategy and the in-depth promotion of audit informatization, utilizing modern information technology to empower audit practices and enhance supervision efficiency has become an inevitable requirement for promoting high-quality development of audit work. This article focuses on exploring the application prospects, potential challenges, and corresponding coping strategies of generative artificial intelligence in internal auditing, with the aim of providing reference and inspiration for promoting the deep integration of artificial intelligence technology in the audit field.

2. Current application status of generative artificial intelligence

2.1. Emergence and development

The emergence and development of generative artificial intelligence (AI) represent a pivotal leap from "perception and understanding" to "creation and generation" in the field of AI. Its ideological origins can be traced back to statistical language models and early neural networks in the 20th century, but the real breakthrough occurred after the deep learning revolution in the 2010s. In 2014, the proposal of the generative adversarial network (GAN) enabled AI to generate realistic images; in 2017, the emergence of the Transformer architecture laid the foundation for large language models. Subsequently, models such as the GPT series and BERT demonstrated astonishing text generation capabilities through massive data pre-training. At the end of 2022, the release of ChatGPT became a technological tipping point. Its human-feedback-based reinforcement learning achieved a breakthrough in enabling smooth, multi-round conversations with humans, marking the entry of generative AI into a stage of widespread application.

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Since then, the technology has exhibited diversified development.

2.2. Research status of industry applications

Since the rise of generative artificial intelligence, domestic academia has extensively explored its cross-domain applications. Scholars have generally focused on the feasibility, application scenarios, practical effectiveness, and potential risks of this technology. They have not only recognized the transformative potential of generative artificial intelligence in workflows across multiple domains such as auditing, but also provided theoretical references for its risk prevention and control, as well as standardized application.

In terms of application exploration across diverse fields, research has demonstrated multidimensional expansion: Jiang Hua and Wang Chunxiu et al. pointed out that AI can empower student learning, assist teacher teaching, and optimize the educational environment in the field of education[2]; Cao Yiming et al. focused on mathematics education and explored specific paths for AI-assisted selection and matching of example exercises[3]. In the field of journalism, Chen Sha compared the application differences between domestic and foreign media[4], while Zhou Baohua et al. analyzed the practical innovation of AI in various aspects of news production through empirical data[5]. Ye Caixian et al. emphasized its creation of efficient, intelligent, and immersive user experiences in new media art[6]. Furthermore, Lin Daizhong confirmed its effectiveness in enhancing data processing and report generation in statistical work[7], while Cheng Yuanyuan explored its role in improving administrative efficiency and scientific decision-making in the construction of digital government[8].

Focusing on research in the field of auditing, scholars have primarily emphasized the path of technological integration and the enhancement of efficiency. Cao Zhiwei et al. emphasized the need to strengthen the cultivation of auditing talent and the construction of professional AI from a top-level design perspective[9]. Yao Meiqin et al., based on the resource-based theory, systematically explained the enhancement mechanism of AI on auditing strategy, management, implementation, and sustained efficiency[10]. Lv Junjie et al. and Cheng Ping et al. specifically analyzed the application potential of ChatGPT in auditing processes such as text processing, data analysis, risk identification, and report generation[11,12]. He Jian and Ma Fei verified its advantages in improving the efficiency of big data auditing and the accuracy of financial auditing through case studies[13,14].

3. Feasibility of applying generative artificial intelligence to internal audit work

3.1. Characteristics of internal audit work

Internal audit is the cornerstone of organizational governance and a crucial mechanism for ensuring the stable operation and achieving strategic goals of an organization. Compared with other supervisory and evaluative activities, internal audit work possesses the following distinct characteristics. Firstly, the audit scope comprehensively covers organizational operations. The boundaries of internal audit align with those of the organization, encompassing all departments, business units, business processes, and key management activities. Secondly, the standards and normative systems followed are diverse. Internal audit work is conducted within a multi-tiered normative framework, with the core being the International Professional Practices Framework for Internal Auditing and relevant national guidelines. Thirdly, the business and management models faced are rapidly evolving. To adapt to market changes and technological advancements, the organization's business models, operational processes, and management tools are continuously innovating and changing. Fourthly, it is closely embedded in the digital environment of the organization. Modern organizational operations have become deeply reliant on information systems and data flows. The objects of internal audit—various business activities, management behaviors, and financial records—are generally generated, circulated, and stored in digital form within various information systems.

3.2. The integration of DeepSeek functions with internal audit work

As an advanced AI assistant, DeepSeek, with its powerful multimodal file parsing capabilities, long-context processing advantages, and deep optimization for Chinese scenarios, forms a high degree of fit with internal audit work, providing strong support for the intelligent transformation of audit processes. As an independent and objective confirmation and consultation activity within an organization, the core tasks of internal audit include assessing internal controls, identifying operational risks, ensuring

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compliant operations, and promoting governance improvement. Auditors need to handle massive institutional documents, financial data, process records, and contract texts, and make professional judgments based on constantly updated regulations and policies. The functional characteristics of DeepSeek can play a key role in this process.

For example, multi-format document parsing and information extraction. DeepSeek can extract key information from files and summarize content points. Internal auditors can use this function to quickly review long-form materials such as system compilations, contract archives, and meeting minutes, automatically generate summaries, identify similarities and differences in terms, locate potential risk points, and significantly improve the efficiency of initial data review. Secondly, it provides data correlation analysis and anomaly recognition assistance. By searching online for the latest regulatory developments and industry cases, and combining with uploaded internal datasets, DeepSeek can assist auditors in cross-document information correlation analysis, highlighting unusual transaction patterns, deviations in system implementation, or weak links in internal control, providing clues and references for risk screening.

Next is support for compliant text generation and report writing. Based on audit findings and working papers, DeepSeek can assist in writing audit descriptions, risk warning letters, preliminary audit reports, and other documents, ensuring rigorous expression and standardized format. At the same time, it can automatically generate advisory content such as audit procedure suggestions and internal control optimization plans according to the internal management requirements of the organization. Finally, it is code assistance and data analysis enhancement. For audit procedures involving a large amount of data verification, DeepSeek can provide code snippet generation and interpretation services in languages such as Python and SQL, helping auditors quickly build data analysis scripts, achieve automated verification and sampling, and improve the accuracy and breadth of audit evidence acquisition.

4. Exploration of DeepSeek's application in internal audit work

4.1. Pre-trial investigation stage

Pre-audit investigation is the cornerstone of internal audit work, with its core lying in efficiently and accurately identifying risk areas, providing direction for the formulation of subsequent audit procedures. DeepSeek, with its powerful information processing and analysis capabilities, can provide intelligent support to auditors during this stage, significantly enhancing the breadth, depth, and efficiency of the investigation.

On the one hand, internal audit needs to ensure that organizational operations comply with national laws and regulations, industry regulatory policies, and internal rules and regulations. Faced with a complex and constantly updated regulatory system, manual sorting is time-consuming, laborious, and prone to omissions. The empowerment path of DeepSeek is as follows: In terms of intelligent retrieval and systematic integration, auditors can issue instructions to DeepSeek such as "sort out the core regulatory requirements in the latest data security field of commercial banks" or "summarize the latest regulations on bidding and procurement of state-owned enterprises in a certain city". DeepSeek can quickly integrate information from authoritative sources such as the official website of regulatory authorities and legal databases through online search, generate a clear and structured list of regulatory summaries with clear points, and mark the effective date and scope of application of key provisions. In terms of compliance point comparison and difference analysis, auditors can upload the internal "Compliance Manual" or "Internal Control System" documents to DeepSeek and instruct it to "compare with the above national regulations to identify whether there are any missing, conflicting, or below-regulatory-requirement provisions in the system". DeepSeek can conduct cross-comparison and quickly output a difference analysis table, helping auditors locate weak links in system construction and providing direct basis for determining audit priorities.

On the other hand, analyzing information such as regulatory penalties, administrative sanctions, litigation, and arbitration that the audited entity or comparable companies in the same industry have faced in the past is an effective means of predicting high-risk areas and internal control deficiencies. The empowerment path of DeepSeek is as follows: In terms of automated collection and induction of historical punishment information, auditors can instruct DeepSeek to search for "penalty cases imposed by the Banking and Insurance Regulatory Commission/Securities Regulatory Commission/Market Supervision Bureau on a certain company or its industry in the past three years." DeepSeek can summarize relevant punishment decisions, regulatory letters, etc. from public channels and automatically

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extract key elements. In terms of risk pattern recognition and trend analysis, based on the aforementioned structured information, auditors can further request DeepSeek to "analyze which type of violations appears most frequently in these punishment cases."? ". ". DeepSeek can reveal the areas where risks are concentrated and their evolving trends through text analysis, enabling audit teams to "draw lessons from history" and precisely pinpoint the business modules and management processes that require special attention.

4.2. Audit implementation stage

The audit implementation stage is the core of internal audit work. Auditors need to verify the accuracy of the preliminary risk assessment through detailed testing procedures, evidence collection, and analysis, and form specific audit findings. This stage involves a large workload, dense documentation, and high requirements for professional judgment. DeepSeek can provide strong support in the following two aspects to help auditors improve work quality and efficiency.

On the one hand, when implementing control tests and substantive procedures, auditors need to review a vast amount of unstructured text materials, such as economic contracts, approval process records, internal management systems, meeting minutes, correspondence confirmations, system operation logs, etc. Traditional manual review is time-consuming and difficult to ensure comprehensiveness, with key information easily being omitted. The empowerment path of DeepSeek is as follows: When automating the summarization and key information extraction of batch documents, auditors can upload dozens of PDF files such as purchase contracts and service agreements in batch and issue an instruction to DeepSeek: "Please summarize the clauses regarding 'payment terms', 'liability for breach of contract', and 'dispute resolution methods' in all contracts, and present them in a tabular comparison." DeepSeek can quickly read all documents, extract specified information, and form a structured comparison view, enabling auditors to quickly identify inconsistencies between contract terms and company policies or potential risky clauses.

On the other hand, identifying and determining whether there are violations of laws, regulations, internal policies, or professional ethics in business activities or financial processing is the key to audit implementation. This often requires precise comparison between specific facts and complex rule systems. The empowerment path of DeepSeek is as follows: During the automated preliminary comparison of rules and facts, auditors can submit the company's "Travel Expense Reimbursement Management Measures" and a batch of suspected abnormal reimbursement documents, which can be organized into structured data tables or text containing key information, to DeepSeek with the instruction: "Please check these reimbursement records one by one for application approval, invoice compliance, standard compliance, such as accommodation and transportation standards, based on the institutional clauses, to see if there are any suspicious points." DeepSeek can perform rule matching and quickly screen out suspected violation records such as excessive reimbursements, invoice non-compliance, incomplete approval processes, etc., providing auditors with a detailed list of suspicious points.

4.3. Report formation stage

The report formation stage is the culmination of internal audit work, where the core lies in systematically, normatively, and accurately presenting audit findings as persuasive professional texts. This stage demands extreme rigor in wording, tight logic, and standardized formatting. DeepSeek, with its excellent natural language generation and processing capabilities, can play a crucial role as an "intelligent collaborator" in this stage, enhancing the professional quality and preparation efficiency of the report.

On the one hand, audit working papers and preliminary reports are usually written by multiple auditors with different styles, which may have issues such as colloquial expressions, logical leaps, unclear focus, or improper use of professional terminology, requiring consolidation and refinement. The empowerment path of DeepSeek is as follows: In terms of professionalization and standardization of language, auditors can input the initial draft paragraphs into DeepSeek and issue the command: "Please modify the following audit findings description into a formal, objective, and rigorous expression that conforms to the style of internal audit professional reports." DeepSeek can optimize sentence structure, transform vague "seems to have problems" into precise "there is a deviation in control execution," convert subjective evaluations into objective statements based on facts, and accurately use professional terminology such as "internal control deficiencies," "significant risks," and "materiality level." In terms of logical structure and coherence optimization, for discussions with loose structure and unclear causal

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chains, the command can be issued: "Please organize the following paragraphs according to the logical sequence of 'problem phenomenon - specific facts/evidence index - violated regulations/standards - potential impact/risk,' to make the argument more coherent and persuasive." DeepSeek can help reorganize information, construct a clear "fact-rule-impact" logical chain, and enhance the rigor of the report.

On the other hand, based on detailed audit working papers, drafting the standard components of a report is a structured and highly repetitive task. The empowerment path of DeepSeek is as follows: For the rapid generation and filling of structured content, auditors can organize core audit findings, such as problem titles, specific facts, involved amounts, and relevant institutional bases, into structured bullet points and submit them to DeepSeek, with the instruction: "Based on the following bullet points, write a complete 'Audit Findings' paragraph, including problem characterization, specific manifestations, quantitative data, violated regulations, and risk analysis." DeepSeek can quickly convert these bullet points into fluent and professional paragraph texts. For assisting in the conception and writing of audit suggestions, for identified problems, the instruction can be: "For the aforementioned issue of 'missing procurement approval process', conceive three specific, operable, and management-level audit suggestions from the four dimensions of 'improving the system, clarifying responsibilities, strengthening review, and system solidification'." DeepSeek can combine general management principles and best practices to provide multi-angle and constructive suggestion drafts, stimulate auditors' thinking, and improve rectification plans.

5. Conclusion

The application of DeepSeek in audit work has significantly enhanced audit efficiency and quality. By automating the processing of vast amounts of text and data, it liberates auditors from tedious tasks such as information collection, collation, and preliminary screening, enabling the expansion of audit scope and acceleration of response speed. In the stages of pre-audit analysis, program implementation, and report generation, DeepSeek's intelligent assistance functions enhance the acuity of risk identification, the depth of evidence analysis, and the professionalism of conclusion expression, driving the transformation of audit mode from traditional sampling inspection to continuous and precise intelligent supervision.

However, the application process also requires attention to multiple risks: First, there is the risk of data security and confidentiality, necessitating the handling of sensitive audit information in a controlled environment. Second, the "illusion" of models may lead to factual or logical errors, requiring auditors to maintain professional skepticism and conduct cross-validation. Third, excessive reliance may weaken auditors' professional judgment ability and core skills. Fourth, existing models still have limitations in recognizing highly specialized and covert fraudulent patterns. Technical compliance and audit responsibility attribution also need to be clearly defined.

To effectively harness technology, it is recommended to establish a prudent application framework that clarifies the auxiliary positioning and usage boundaries of DeepSeek in the audit process. A "human-machine collaboration" operation mode should be constructed, with auditors' professional judgment as the leading factor and technical tools as the empowering means. Efforts should be made to strengthen the cultivation of composite talents, enhancing the technical comprehension and critical usage abilities of the audit team. Continuous application evaluation and iteration should be carried out, and the prompt engineering and output verification mechanisms should be optimized in combination with audit practices. The ultimate goal is to form a new type of audit capability that deeply integrates intelligent technology with audit professional wisdom.

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