

Preliminary Plan for Implementing Intelligent Audit Platform in University Internal Audits under the Background of Overall Intelligence Governance

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Abstract:

The “overall intelligence governance” requirement for internal audit work was proposed in the “Zhejiang Province Internal Audit Regulations” issued in 2022. This study combines the current status of data collection in university audits, trends and status of intelligent audit platform construction, and advanced experiences in intelligent audit platform construction in other industries. It proposes a preliminary plan for constructing an intelligent audit platform for university internal audits, targeting issues such as outdated internal audit information systems, insufficient investment in audit funds, and low information technology skills of internal auditors. The plan includes three aspects: first, promoting information system construction through data submission mechanisms to strengthen audit data governance; second, building a convenient and visual audit data analysis and modeling platform on the basis of data governance; third, achieving the requirement of “overall intelligence governance” for the intelligent audit platform through centralized and layered management, warning transfer and joint investigation mechanisms, and sharing audit results.

Keywords:

Overall Intelligence Governance, University Internal Audit, Intelligent Audit Platform

1. Introduction

With the rapid development of information technology and the widespread adoption of intelligent systems, internal audit work in universities is facing new challenges and opportunities. In the context of overall intelligence governance, the construction of an intelligent audit platform for university internal audits has become an important means to improve audit efficiency, optimize audit processes, and strengthen risk control. The implementation of an intelligent audit platform will bring revolutionary changes to internal audit work in universities, enhancing the quality and level of audits. Through this research, our aim is to provide a feasible implementation path

and reference for the intelligent transformation of internal audits in universities, promoting modernization and improvement in internal audit work. Additionally, we hope to provide some guidance and inspiration for the construction of intelligent audit platforms in other fields.

2. Requirements of “Overall Intelligence Governance” for Intelligent Audit Platforms in Universities

2.1. The “triple” requirements of the “overall smart governance” for intelligent audit platforms in universities

In January 2022, the Zhejiang Provincial Audit Office proposed to enhance transformative power through digital reform and improve audit quality and efficiency through digital empowerment. In February 2022, the Zhejiang Provincial Audit Work Conference pointed out the need to improve the mechanism of “overall intelligence governance” in audits and achieve an acceleration of digital transformation in audits. At the same time, the “Zhejiang Provincial Internal Audit Regulations” issued in 2022 have provided relatively clear requirements for the “three requirements” of internal audit in terms of “precision supervision, intelligent application scenarios, and collaborative supervision force,” aiming to enhance the effectiveness of audit results application and promote result sharing[1]. Therefore, in the construction of intelligent audit platforms in universities, it is necessary to design the architecture and functions of the platform based on the requirements of the “three requirements” to achieve the effect of “overall intelligence governance.”

2.2. The Basic Requirements of “Overall Intelligence Governance” for Intelligent Audit Platforms in Universities

From 2021 to 2023, the normalization mechanism for data collection and submission in Zhejiang Province’s universities has gradually improved, and the Audit Office has established a relatively complete “Zhejiang Province Higher Education Institution Audit Data Plan” to empower intelligent audits through the “multiplier effect” of data. At the same time, the Zhejiang Provincial Audit Office also proposed to fully utilize existing data resources, think about new risk scenarios and risk points in combination with the concerns of the Party Central Committee, the Provincial Party Committee and Government, and the higher-level authorities, and continuously develop and improve new data application scenarios based on the “Methodological System for Economic Responsibility Audits in Higher Education Institutions.” The normalization of data submission has laid a foundation for intelligent audit platforms. However, during the submission process, issues such as data gaps, incomplete system construction, and the use of written explanations to replace missing data have been identified in some universities. Therefore, the objective foundation for the construction of intelligent audit platforms in universities still needs further improvement. Therefore, the requirements of “overall intelligence governance” call for strengthening data governance and improving data usability at the “4V” level[2].

2.3. The Practical Requirements for Intelligent Audit Platform of Universities under the “Overall Intelligence Governance”

Internal auditors in universities are familiar with the method system and business process risk analysis methods of economic responsibility audits, and possess professional audit thinking. However, due to limitations in department and staffing

numbers, internal auditors in universities are generally in management positions or specialized technical positions such as accounting, auditing, and engineering, lacking personnel who are skilled in both audit business and information technology. In practice, only by combining the internal audit thinking of non-information technology professionals with the usability of intelligent audit platforms, and based on university risk cases and institutional rules, can a series of audit models be constructed to fully leverage the “overall intelligence governance” function of intelligent audit platforms. Due to changes in important decision-making deployments at higher levels, an increase in university risk cases, and changes in university institutional rules, auditors need to flexibly construct audit models, update audit models, and adjust relevant model parameters. This requires internal auditors in universities to continuously improve their ability to apply intelligent audit platforms in practice [3].

2.4. The Intelligent Requirements of “Overall Intelligence Governance” for Intelligent Audit Platforms in Universities

Due to objective reasons such as data collection and system construction limitations, sampling audits are still the main audit method for universities to conduct economic responsibility audits. The limitations of sampling audits lie in the fact that audit findings are concentrated on sampled individuals, making it difficult to achieve full coverage of the same problems discovered; the point-to-face problem correction in audit rectification relies on self-examination and self-correction by the audited unit, making it difficult to achieve full coverage of rectification; and the promotion of audit results is difficult to achieve the forward shift of audit checkpoints and difficult to incorporate into real-time audit supervision systems. “Overall intelligence governance” requires intelligent audit platforms in universities to achieve functions such as proactive audits, real-time audits, and full-coverage audits [4].

3. Current status of research on Intelligent Audit Platforms

3.1. Development Trends and Issues of Internal Audit Intelligent Platforms in Universities

Yang Yunyi and Lv Tianyang (2018) pointed out that strengthening the governance of audit data, realizing the standardized collection of audit data, establishing a good foundation for big data auditing, and solving the problem of the differentiation of the data existing in different audit objects is an important support for the strong audit of science and technology. The collection of standardized data forms a data warehouse, laying the material foundation for intelligent audit platforms. Wang Yakun (2020) and Wang Yang (2021) argued that the further development of university auditing relies on the construction of internal audit informatization in universities.. Xia Xingyu (2020) proposed that relying solely on traditional internal audit sampling inspections can no longer meet the requirements for comprehensive and precise audits. Non-site audits have become a necessary choice for internal auditors due to their wide coverage, real-time nature, and low audit costs. Feng Qin (2021) and Kang Changan (2022) combined the trends of informationization of audit objects, expansion of funding scale, and complexity of economic operations in universities to illustrate the higher requirements imposed by the Party and the state on audit supervision. Internal audit in universities needs to possess higher-level audit concepts, more intelligent audit methods, and more sophisticated audit management mechanisms. However, there are still problems with the late start, insufficient funding, and low level of attention to the

informationization of internal audit in universities. Moreover, there is a lack of talent who can integrate audit thinking with information technology. Yi Can (2021) pointed out that non-site audits in universities are still limited to Excel data analysis stage, which is relatively backward compared to non-site audit methods and technologies in the financial industry and large corporations. Due to insufficient budget, it is difficult to customize audit software according to audit needs [5].

3.2. Development Status of Intelligent Audit Platforms in Other Industries

In 2016, the China Banking Regulatory Commission (CBRC) issued the “Guidelines for Internal Audit of Commercial Banks”. Article 7 of Chapter 2, titled “Organizational Structure”, states that “commercial banks should establish an independent and vertical internal audit system.” For instance, the five major state-owned banks have established a vertical “centralized management of the head office” and internal audit branch offices. This organizational structure provides a solid institutional foundation for the top-level design, centralized and unified design, and research and development of the internal audit platform.

With the determined organizational structure, two models have emerged for the development of the audit platform. The first model involves directly using SQL and other computer data analysis languages to extract data from the data warehouse and establish an audit model. Ke Zhiwei et al. (2017) explored the off-site audit of the “three public” funds and used SQL statements to collate data and identify areas of suspicion. However, this model requires a high level of information technology proficiency from auditors, which may not align with the existing internal audit teams in universities [6].

The second model, as mentioned by Xu Jing (2017), upgrades the off-site auditing process from auditors manually editing SQL statements and setting up checking items to establishing a data model that automatically identifies and extracts areas of regulatory concern. This mode is easier to operate compared to the direct extraction and analysis of data in the data warehouse. Yanqing Liu (2022) proposed the use of visual widgets in the big data audit platform, which replaces SQL ticking and screening statements, enhancing the data analysis and integration abilities of auditors who may not specialize in information technology and reducing audit costs.

The Nanjing Branch of Internal Audit of Industrial and Commercial Bank of China (2020) introduced the concept of “risk scenarios” to address the fragmentation of internal auditors’ auditing abilities and data analysis and modeling technologies. Qian Jin et al. (2011) conducted a detailed case study on the knowledge transfer model involved in the off-site audit system of commercial banks, providing valuable insights for improving the level of results sharing in the process of building intelligent audit platforms for internal auditing in colleges and universities.

Based on the development trends and existing issues of intelligent audit platforms in universities, this study analyzes and draws lessons from advanced experiences in other industries to preliminarily construct an intelligent audit platform for internal auditing in universities, aiming to achieve the requirements of “holistic intelligent governance.”

4. Building the Path of Intelligent Audit Platforms under the Concept of “Holistic Intelligent Governance”

4.1. Strengthening Data Governance in Universities through Reporting Mechanisms

Under the background of information technology construction, various departmental business systems in universities are gradually improving, addressing issues such as lack of overall management in information system construction, fragmented and decentralized systems, disjointed business systems, severe information silos, low data quality, and incomplete data interfaces. At the same time, in coordination with the normalization mechanism for audit data collection and submission established by the Zhejiang Provincial Audit Office, universities have intensified their efforts in data governance, resolving issues related to the quality of audit data collection while promoting the establishment and improvement of their own information systems. Data from various university business systems are centralized into a data warehouse. University auditors can analyze risk points in financial responsibility audits, submit modeling and data extraction requirements to the university's information center, and identify audit suspicions. During this stage, auditors in financial responsibility audits rely on the collaboration with the Information Technology Center, which may pose risks such as slow progress, information leakage, and insufficient timeliness of audit results. Taking the example of audit data submission in universities, the improvement of 20 systems and 59 forms, including the campus card system, academic management system, and asset management system, enables direct connection of data from various systems to the data warehouse. The data forms stored in the data warehouse are classified according to levels and updated in real-time, with T+0, T+1, weekly, or monthly updates. In addition to specialized audit projects, new data forms are incorporated to enrich the pool of audit data resources[7].

4.2. Establishing a Big Data Audit Platform based on Standardized Data Warehouse

With the availability of data resources, the development of a big data auditing platform that is easy for auditors to operate and weakens the computer language writing requirements for auditors is the key to improving the big data auditing business capabilities of internal auditors in universities. Each business data formatted as a visual component can be modeled by drag and drop or visual data processing tools for fetching numbers. Auditors can master data modeling skills and realize the combination of audit thinking and data modeling after simple training and understanding of simple computer language and data collocation.

4.3. Realizing the Requirements of "Holistic Intelligent Governance" in the Intelligent Audit Platform

Achieving Precision in Audit Supervision:

Based on the intelligent audit platform, there are three steps to achieve precision in audit supervision. Firstly, conducting business process penetration testing enables the analysis of risk points in university operations, facilitating risk-oriented audits. This establishes a group of intelligent audit models that bring suspicious data into audited units, thereby improving the efficiency of on-site audits. Secondly, carefully studying higher-level policies and regulations, planning model strategies, and entering data

forms for new business areas help establish new models to identify audit suspicions. Lastly, adjusting model parameters, thresholds, and reconciliation relationships according to changes in the risk environment allows for the optimization and upgrading of the models. Please refer to Figure 1 for more details [8].

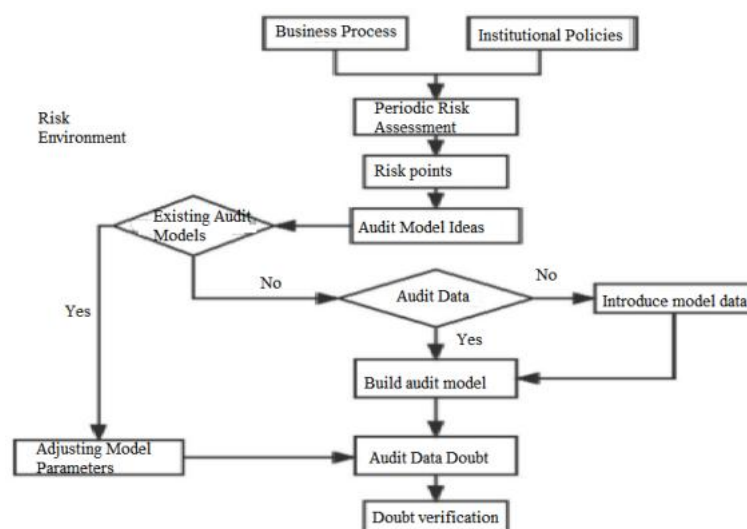


Figure 1. Realizing the Intelligence of Application Scenarios.

With the increasing maturity of artificial intelligence and machine learning technologies, it is possible to embed automatic learning code into the audit platform through corresponding programming methods. This allows machines to proactively learn risk cases, analyze policy systems, evaluate risks, determine audit focus areas and key risks, and establish and automatically adjust optimized audit models. However, on this basis, auditors cannot rely solely on artificial intelligence and must review and control critical links and parameters. Please refer to Figure 2 for the specific process.

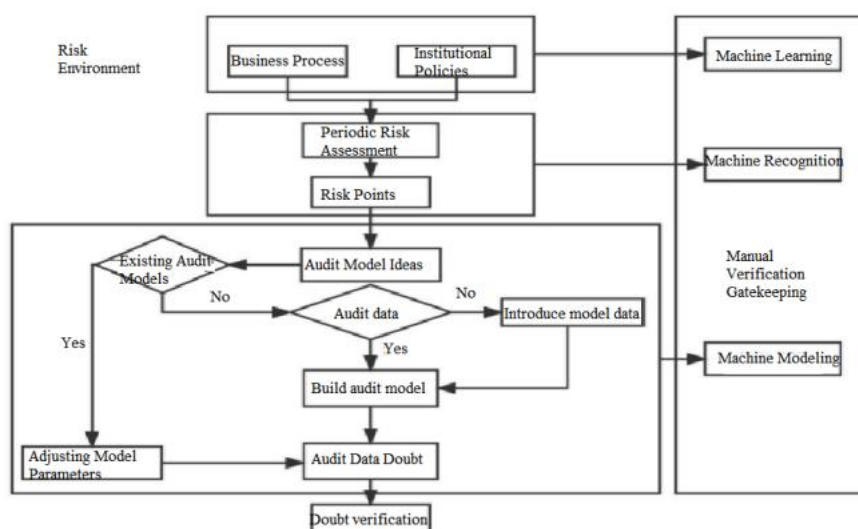


Figure 2. Realizing the Collaboration of Supervisory Forces.

(1) Centralized and hierarchical management system: Due to financial constraints, individual universities may find it difficult to independently develop intelligent audit platforms. Therefore, it is necessary to have a top-level design for the construction of intelligent audit platforms in universities. The higher-level supervisory authorities can coordinate and plan the platform construction, operation, and personnel training. By

taking the lead, the supervisory authorities can accelerate the transformation of business systems in subordinate universities. The supervisory authorities grant corresponding platform permissions to auditors in universities, allowing them to mine and query data within their own universities. Each auditor in different universities has their respective permissions. When the supervisory authorities assign auditors from subordinate universities to conduct audits, they can temporarily grant partial permissions to the assigned auditors, which will be closed after the completion of the work [9].

(2) Early warning reassignment and joint investigation mechanism: After embedding relevant real-time monitoring models into the intelligent audit platform, suspicious data identified by the system can be investigated and verified by the supervisory authorities based on risk levels. Alternatively, they can be reassigned to the corresponding universities for verification and feedback. This represents the collaboration between national and internal audits [10].

(3) Promotion and application of audit achievements: Auditors construct intelligent audit models based on risk orientation and run batch processing on suspicious data. Models with high precision can be formalized and submitted to the higher-level supervisory authorities for promotion, establishing a model library. Auditors in universities can select and modify applicable models from the library according to their own university's situation or optimize models based on changes in the risk environment [11]. The mining and application of valuable data: Auditors in universities can import personalized data corresponding to risk scenarios encountered in daily audits. If the data has application value, it can be reported with unified data standards and included in the database for real-time updates and application. This enables the horizontal and vertical coordination between internal audits in universities, national audits, and internal audits within universities. Please refer to Figure 3 for specifics [12].

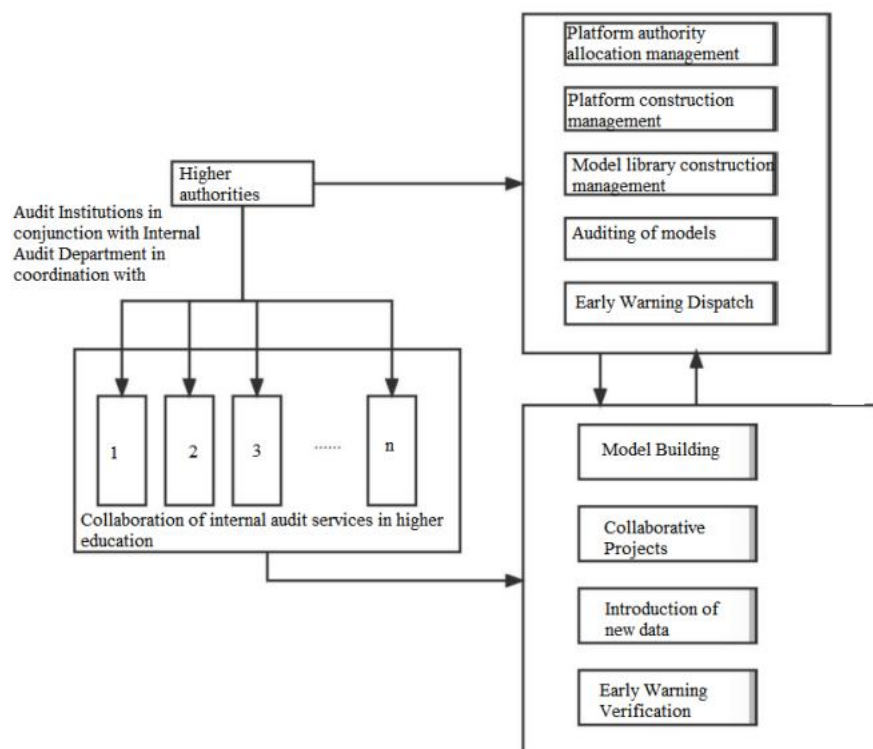


Figure 3. Intelligent audit model.

5. Conclusions

The construction of intelligent audit platforms in universities still faces challenges such as insufficient information systems to meet audit data requirements, inadequate investment in audit funds, and insufficient digital literacy among internal auditors. In light of these difficulties, this study proposes a concept for the construction of intelligent audit platforms based on the requirements of “integrated intelligent governance.” This concept is developed by considering the current status of audit data submission, the situation of information system construction, and the development trends of intelligent audit platforms in universities. It also draws on the mature experience of audit platform construction in the banking and financial industry. The proposed construction of intelligent audit platforms includes three aspects: leveraging data submission mechanisms to promote information system construction and strengthen audit data governance, establishing a convenient and visualized platform for audit data analysis and modeling based on data governance, and meeting the requirements of “integrated intelligent governance” by constructing intelligent audit platforms that enable precise audit supervision, intelligent application scenarios, and collaborative supervisory forces. Based on the construction of intelligent audit platforms, a risk-oriented audit approach is applied to decompose various modules of audit business in universities, establish a group of intelligent audit models for common issues, and develop personalized models for specific audit points, thus conducting a comprehensive analysis of the application of intelligent audit platforms at the operational level. In terms of organizational structure, a centralized and hierarchical management system is established with the leadership of the competent department. A vertical early warning reassignment and joint investigation mechanism is implemented between the higher-level competent department and universities, achieving synergy between national audits and internal audits and improving the overall level of intelligent governance in internal audits in universities.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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