

Risk-Based Internal Audit in the Digital Era: Trends, Implications, and Challenges

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Abstract

This study examines risk-based internal audit (RBIA) in the context of digitalization, implications and future challenges. Technologies such as big data analytics, artificial intelligence (AI) and blockchain can improve operational efficiency but also create new, more complex risks such as cybersecurity, data misuse and technology-based fraud. This study uses qualitative research methods with a literature review approach to identify, evaluate and synthesize literature on risk-based internal audit, including journal articles, papers and other academic documents about digital trends, their implications and challenges. This study shows that risk-based internal audit (RBIA) has moved from periodic, sample-based inspections to a continuous, data-driven audit process that is integrated with the organization's risk management. Audit procedures become faster and easier with digital RBIA. Technological issues, human resource competencies, cultural resistance to change, regulatory components and standards, and cross-functional collaboration limitations must be overcome to successfully implement RBIA in the digital era.

Keywords: Internal Audit, Digital, Technology, Risk

A. INTRODUCTION

Digitalization has become a prevailing trend affecting almost all aspects of human life. Technology is increasingly utilized as a tool to simplify and accelerate human activities across various fields. The economic and financial sectors are among those experiencing the most rapid advancement in digital technology. Business transactions that were previously conducted manually have now largely adopted digitalized processes. The implementation of digital technology involves the use of big data analytics, artificial intelligence (AI), blockchain, and cloud computing, which not only enhance operational efficiency but also introduce new and more complex types of risks, such as cybersecurity threats, data misuse, and technology-based fraud (Aryani & Risman, 2025). In an era characterized by accelerated digital transformation and systemic uncertainty, cybersecurity has transcended traditional boundaries to become a fundamental pillar of organizational resilience. The cybersecurity landscape continues to evolve, with a significant increase in cyberattacks in 2025, and new threats and vulnerabilities emerging on a daily basis (Deloitte, 2025).

In response to these changes, business organizations must adapt their internal control mechanisms to survive and remain competitive in the industrial environment. Intense industry competition requires companies to demonstrate strong performance, which constitutes management's responsibility to stakeholders. Management undertakes various efforts to maintain or enhance the firm's competitive position, a task that closely involves collaboration between management and the internal control function, particularly internal audit. Internal auditing, which previously focused primarily on compliance, has evolved into Risk-Based Internal Auditing (RBIA), adopting a more proactive approach to identifying, assessing, and managing risks that may hinder the achievement of organizational objectives (Anugraheni, Setiawati, & Trisnawati, 2022). According to the definition issued by The Institute of Internal Auditors (IIA), the concept of control has shifted toward a risk-oriented perspective.

Consequently, the focus of audit planning, testing, and reporting is no longer limited to internal control systems but extends to risk exposure and the alignment of risk management practices (Anon et al., 2020). This article examines the current state of risk-based internal auditing, its implications for strengthening good corporate governance, and the challenges likely to be encountered in the future.

B. LITERATURE REVIEW

Concept of Internal Auditing

Digitalization has become a dominant trend influencing nearly all dimensions of contemporary life. Technology functions as a critical enabler in improving efficiency and effectiveness across diverse sectors. The economic and financial sectors, in particular, have experienced significant advancements in digital technology. Business transactions that were once conducted manually are now predominantly digitalized. This transformation entails the application of big data analytics, artificial intelligence (AI), blockchain, and cloud computing, which enhance operational efficiency while simultaneously generating new and complex risks, including cybersecurity threats, data abuse, and technology-driven fraud (Aryani & Risman, 2025). In the context of rapid digital acceleration and systemic uncertainty, cybersecurity has emerged as a core element of organizational resilience. The cybersecurity threat landscape continues to evolve, with a growing number of cyber incidents reported in 2025 and new vulnerabilities arising continuously (Deloitte, 2025).

As a result of these developments, business organizations must adjust their control mechanisms to ensure sustainability and competitiveness. Intense competition necessitates high organizational performance, which is a fundamental responsibility of management toward stakeholders. Management endeavors to sustain or improve the company's market position, a responsibility that underscores the strategic role of internal audit as part of the internal control system. Internal auditing has shifted from a traditional compliance-oriented approach to a risk-based internal audit (RBIA) framework, which emphasizes proactive risk identification, assessment, and management to support the achievement of organizational goals (Anugraheni et al., 2022). According to the IIA's definition, the focus of internal auditing has transitioned from control-centric to risk-centric perspectives. Accordingly, audit activities now concentrate not only on evaluating internal control systems but also on assessing risk exposure and the effectiveness of risk management alignment (Anon et al., 2020). This article explores the extent to which RBIA has been implemented, its implications for strengthening good corporate governance, and the challenges that may arise in the future.

Risk-Based Internal Auditing

Risk-Based Internal Auditing (RBIA) is an audit approach that prioritizes organizational risks in the planning, execution, and reporting of internal audit activities (Sawyer et al., 2012). Unlike conventional internal audits that emphasize compliance, RBIA focuses on identifying, evaluating, and prioritizing areas with the highest risk to achieving organizational objectives. Consequently, audit attention is directed toward issues that are most critical to business sustainability, allowing audit resources to be allocated more efficiently and audit findings to deliver strategic value to management (Anugraheni et al., 2022).

RBIA integrates organizational strategy, audit planning, and risk mapping. Internal auditors are required to understand the organization's risk profile and business context comprehensively. This risk-focused approach ensures alignment between auditors' perspectives and management's objectives. Clearly defined risks and the systematic testing of mitigation measures through internal audit processes facilitate the achievement of corporate goals (Anon et al., 2020). The implementation of RBIA strengthens the position of internal auditors as strategic partners to management. Auditors are no longer perceived merely as fault-finders but as internal consultants who provide objective insights into risks and opportunities faced by the organization (Joyce, 2015). Effective RBIA implementation requires comprehensive auditor expertise in risk management, internal controls, and external factors influencing the business. Its effectiveness is highly dependent on the integration of auditor competence, the maturity of the risk management framework, and strong support from organizational leadership (Romadoni & Situmeang, 2023).

C. METHODOLOGY OF RESEARCH

This study employs a qualitative research method using a literature review approach. This method is selected to identify, evaluate, and synthesize a wide range of scholarly literature on Risk-Based Internal Auditing (RBIA), including journal articles, conference papers, and other academic documents that discuss trends, challenges, and implications in the digital era. Data collected from the selected body of literature are analyzed descriptively and systematically to illustrate the current state of RBIA

practices, identify existing challenges, and develop implications for the implementation of risk-based internal auditing.

The literature review approach enables researchers to identify research gaps that may serve as a foundation for future studies, while also providing a comprehensive and in-depth understanding of the research topic based on previous scholarly findings. Accordingly, this approach not only offers theoretical and practical insights into risk-based internal auditing but also facilitates the formulation of relevant recommendations for the advancement of academic knowledge and practical implementation in this field (Nugroho et al., 2023).

D. RESULT AND DISCUSSION

Trends in Risk-Based Internal Auditing in the Digital Era

In recent years, there has been a clear paradigmatic shift in the practice of Risk-Based Internal Auditing (RBIA). Audit activities that were previously periodic and sample-based have evolved into continuous, data-driven, and enterprise risk-integrated audit processes. This methodological transformation of RBIA is driven by rapid technological adoption, including big data analytics, artificial intelligence (AI) for anomaly detection, robotic process automation (RPA) for automating routine control testing, and blockchain technology to ensure tamper-resistant audit trails (Anthony et al., 2023).

Rapid technological advancements—particularly the evolution of artificial intelligence—have transformed the digital risk environment by increasing system interconnectivity, accelerating regulatory changes, and intensifying global geopolitical disruptions, thereby amplifying complexity. Significant technological transformations anticipated from 2025 onward include the emergence of generative and agent-based AI (GenAI), the expansion of the Internet of Things (IoT), increasingly sophisticated cyberattacks, and vulnerabilities within global supply chains (Deloitte, 2025).

Another notable trend is the evolving role of internal auditors as trusted advisors who provide assurance and strategic insights derived from predictive risk analytics, thereby aligning the audit function more closely with managerial decision-making and enterprise risk management integration (Fraser, Quail, & Simkins, 2021). Organizations are required to balance the use of technology for competitive advantage with enhanced risk management, particularly in areas related to IT governance, operational resilience, and third-party risk. In this context, risk-based internal audit functions play a critical role in risk mitigation, regulatory compliance, and aligning innovation with established risk principles.

RBIA provides pragmatic guidance that aligns with evolving regulatory frameworks, including thematic cybersecurity standards issued by The Institute of Internal Auditors (IIA), and promotes proactive strategies to address continuously emerging technological threats in order to ensure long-term sustainability (Deloitte, 2025). Furthermore, an increasingly prominent trend is the utilization of risk intelligence to prioritize audit areas based on real-time assessments of risk likelihood and impact. Risk intelligence and data-driven risk monitoring are essential for adaptive and strategic audit decision-making (KPMG, 2024). From a governance perspective, alignment among standards and practices is imperative. The integration of COSO, Enterprise Risk Management (ERM), and IIA guidelines is necessary to strengthen good corporate governance. This alignment enables the digitalization of RBIA while emphasizing the harmonization of global internal audit standards with sectoral flexibility and emerging technologies (IIA & KPMG, 2023).

Implications of RBIA Implementation in the Digital Era

The implementation of Risk-Based Internal Auditing (RBIA) in the digital era carries significant strategic implications for auditors, organizations, and regulators. For internal auditors, digitalization substantially alters the nature of audit risk and the challenges they face (Karimallah & Drissi, 2024). Internal auditors are no longer expected to function solely as compliance examiners but also as strategic risk analysts capable of interpreting large-scale data, identifying predictive risk trends, and delivering evidence-based recommendations. Auditors are increasingly tasked with guiding organizations through volatile technology risk landscapes characterized by rapid AI adoption, sophisticated cyber threats, and regulatory complexity.

Proactive, risk-based audit planning aligned with evolving regulatory requirements is therefore critical. Effective planning further necessitates enhanced cross-functional collaboration among internal audit, information technology, cybersecurity, compliance functions, and business leaders. Audit functions must incorporate advanced analytics and continuous monitoring to strengthen risk detection and assurance capabilities (Deloitte, 2025).

For organizations, the digital implementation of RBIA accelerates and simplifies audit processes. Technological support enables real-time auditing, facilitating earlier detection of anomalies and potential

fraud compared to conventional methods. This capability contributes to the development of internal control systems that are better aligned with digital risks while enhancing stakeholder confidence and organizational integrity. Moreover, digital RBIA supports organizations in strengthening IT governance and integrating enterprise risk management (ERM) with audit processes, thereby enabling more holistic risk management (Ilori, 2024).

Digital transformation also influences RBIA from regulatory and professional perspectives, necessitating revisions to audit standards, professional guidelines, and regulatory frameworks that account for technological advancements. To ensure that digital RBIA practices are conducted ethically and reliably, regulations concerning data security, privacy, and the use of algorithms in audit processes must be strengthened (Syam et al., 2025). Furthermore, significant implications arise in education and professional development, requiring updates to accounting and auditing curricula to meet digital-era demands, such as incorporating courses on audit data analytics and IT risk management (Mohd Nadzari & Yussof, 2024).

Overall, the implications of implementing Risk-Based Internal Auditing in the digital era are transformative. Digital RBIA reshapes audit practices, enhances organizational competitiveness, and generates increased demand for professional education and regulatory adaptation. As organizations navigate an era marked by heightened complexity and uncertainty, digitalization—when effectively leveraged—has the potential not only to enhance the effectiveness of internal audit functions but also to improve governance quality and organizational sustainability.

Key Challenges in Implementing RBIA in the Digital Era

While digitalization presents substantial opportunities to enhance the effectiveness of Risk-Based Internal Auditing (RBIA), it also introduces several fundamental challenges that must be addressed to ensure optimal implementation. Technological factors constitute the primary challenge, as many organizations struggle to fully adopt technologies such as artificial intelligence, robotic process automation, and big data analytics due to cost constraints, limited digital infrastructure readiness, and the complexity of integrating new technologies with legacy systems (KPMG, 2024). As systems become increasingly complex, they also become more difficult to fully understand and audit, thereby increasing the risk of oversight or error (Anomah, Ayeboafio, & Aduamoah, 2021). Although system integration and business process automation can enhance efficiency, they may also introduce algorithmic errors or excessive reliance on technology, leading to new forms of risk. Consequently, risk trends are heavily influenced by the level of digital maturity, and potential audit-related risks and their organizational impact must be incorporated into the audit scope (Li, 2024).

The second major challenge concerns human resource competencies. Despite possessing strong foundations in traditional accounting practices, internal auditors often exhibit deficiencies in data analytics, digital literacy, and understanding of information technology-related risks. This results in a significant gap between the skills required for modern auditing and the competencies currently held by auditors (Deloitte, 2025). Additionally, organizational resistance to change presents another obstacle, as many senior managers and auditors perceive digital auditing as a threat to conventional roles, thereby slowing the adoption of innovative practices (Angeles et al., 2023). Organizations are also frequently reluctant to commit financial resources to audit transformation, viewing such initiatives as additional costs rather than strategic investments.

Regulatory and standard-setting issues pose further challenges, as not all regulatory frameworks and professional guidelines adequately address digital risks, particularly in areas related to data security, privacy, and the use of algorithms in auditing (Adelakun, 2022). Finally, limited cross-functional collaboration among risk management units, internal audit functions, and information technology (IT) departments—often operating as separate entities—remains a critical challenge (Deloitte, 2025). This fragmentation hampers the comprehensive integration of digital risk management across organizations..

E. CONCLUSIONS

Praktik audit internal berbasis risiko (RBIA) telah mengalami evolusi substansial di era digital. Teknologi digital seperti *big data analytics*, *artificial intelligence*, dan *robotic process automation* tidak hanya mempercepat proses audit, tetapi juga membuat analisis risiko lebih menyeluruh dan luas. Perubahan ini menegaskan bahwa RBIA modern telah berkembang menjadi instrumen strategis dalam mendukung efektivitas tata kelola organisasi dan pengambilan keputusan. RBIA tidak lagi terbatas pada fungsi pengawasan tradisional. Keberhasilan implementasi ini sangat bergantung pada kesiapan teknologi, kapabilitas auditor, dukungan budaya organisasi, serta keberadaan kerangka regulasi yang adaptif. Penyelesaian tantangan ini harus dilakukan secara bertahap melalui strategi yang komprehensif

seperti investasi teknologi yang tepat guna, program *upskilling* dan *reskilling* auditor, penerapan *best practices* audit digital, serta penguatan regulasi dan kerangka kerja professional. Hal ini untuk membangun fondasi yang berkelanjutan bagi audit internal berbasis resiko di era digitalisasi.

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