


Successful Implementation Model of Risk Management and Risk Based Internal Audit in Era Digital: A Systematic Literature Review

Angginun Juwita Sari Harahap¹, Iskandar Muda²

^{1,2}University of North Sumatra

Article Info	ABSTRACT
<p>Article history:</p> <p>Received July, 2025 Revised July, 2025 Accepted July, 2025</p>	<p>The advancement of digitization creates additional chances for the effective execution of risk management and risk-based internal auditing inside an agency. This research seeks to examine the practice of risk management and risk-based internal auditing in the public sector, analyze the implementation model of these practices, and identify the successful models for their execution. The preliminary study involved the analysis of information about risk management and risk-based internal audits sourced from the Scopus Database, published between 2021 and 2024. This study was executed utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. This study identified five domains of risk management and risk-based internal audit outcomes in the era of digitalization, specifically (1) Internal audit, (2) Risk Management, (3) Influential factors, (4) Audit committee, (5) Integrity system and (6) transformational technology. This research also found areas that need attention for future research, namely artificial intelligence which is part of the current development of digitalization.</p>
<p>Keywords:</p> <p>Risk Management, Risk Based Internal Audit, Public Sector, Digital Era.</p>	
<p>Corresponding Author:</p> <p>Name: Angginun Juwita Sari Harahap Institution: University of North Sumatra e-mail: angginunjuwitas@gmail.com</p>	<p><i>This is an open access article under the CC BY-SA license.</i></p> 

1. INTRODUCTION

In the era of growing digitalization, an organization will face an increasingly complex and dynamic environment. The importance of risk management to ensure the organization is able to achieve its goals or vision and mission while taking into account potential threats. In an era where digital transformation is changing the landscape of public sector operations, the role of risk management and risk-based internal audit has never been more important. Organizations that effectively implement a risk management framework can significantly reduce their operational risks [1]. This

highlights the need for public sector entities to adapt their internal audit functions to not only comply with regulatory demands but also to improve their overall governance and accountability.

Transitioning to a risk-based internal audit (RBIA) approach is critical for public sector organizations, especially in the context of increasing complexity and rapid technological advances. Research shows that the adoption of RBIA improves the effectiveness of the internal audit function by aligning audit activities with the organization's risk profile [2]. This alignment allows auditors to focus on high-risk areas,

thereby optimizing resource allocation and improving overall audit quality [3]. Furthermore, the integration of digital tools in the audit process can streamline operations, reduce costs, and improve risk assessment accuracy, ultimately leading to more informed decision-making [4].

However, the successful implementation of risk-based internal audit in the public sector is not without its challenges. Many internal auditors still struggle with traditional compliance focused audit tasks, which hinders their ability to engage in comprehensive risk assessments [5][6]. This gap underscores the need for continuous professional development and training in risk management practices for internal auditors to ensure they have the necessary skills to navigate the complexities of the digital age [7]. Additionally, the establishment of a robust risk management framework is essential, as this framework serves as the foundation for effective internal audit practices [8]. In conclusion, the integration of risk management and risk-based internal audit in this digital era is important. Implementing these practices serves to increase organizational resilience, ensure accountability, reduce errors and provide value in making decisions for stakeholders. It is important to commit to professional development with innovative technologies to address risks in the digital age.

This research aims to do a comprehensive evaluation of the literature concerning risk management and risk-based internal auditing. Another purpose is to identify common practices for risk management and risk-based internal auditing in the public sector throughout the years 2021-2024. The author performed a systematic literature review (SLR) utilizing 13 publications published between 2021 and 2024 that adhere to PRISMA principles. The articles were obtained from Scopus. A keyword co-occurrence analysis was performed with VOSviewer to accomplish this objective. This study's findings will significantly impact practitioners and scholars by providing insights into risk management and risk-based internal auditing in the public

sector within the present digitalization era. In addition, it can be used as a guideline in analyzing risks and making decisions from the identification results carried out by researchers as a whole.

2. LITERATURE REVIEW

Risk management and risk-based internal audit in the public sector are based on several key principles that emphasize accountability, transparency, and effective governance. As the public sector increasingly faces complex challenges, particularly in the context of digitalization, the integration of a robust risk management framework and internal audit practices is essential. Rasheed and Jothi Muni highlight that effective internal audit functions are integral to strengthening governance frameworks, as they promote transparency and accountability within public institutions [9]. This is in line with the principles of the New Public Governance paradigm, which emphasizes the importance of quality governance in public financial management [10]. The implementation of risk-based internal audit (RBIA) is a response to this governance challenge, allowing auditors to focus on areas of significant risk and thereby improve the overall effectiveness of public sector audits.

Internal audit's role in risk management is multifaceted. Internal auditing involves not only assessing regulatory compliance, but also includes evaluating the effectiveness of risk management processes. Preventive controls are critical in reducing the risk of fraud, which underscores the importance of integrating risk management into internal audit practices [11]. Internal audit effectiveness is closely linked to governance structures within public sector organizations, specifically the role of audit committees in overseeing risk management practices [12]. The theoretical framework for risk based internal audit also incorporates elements of risk assessment and management. Identifying and assessing the risk of material misstatement in financial statements allows auditors to adjust their

audit procedures, thereby reducing audit risk to an acceptable level [13]. These factors have a significant impact on RBIA implementation, highlighting the need for a supportive organizational culture that prioritizes risk management [14].

Digital transformation has fundamentally changed the risk management landscape. The role of information technology auditing has evolved due to the complexities posed by digital transformation, which requires a comprehensive understanding of new technologies and a proactive attitude toward risk mitigation [15]. On the other hand, the internal audit function is increasingly drawing a digital profile to meet the demands of the digital business environment, which highlights the need for specialized skills in risk assessment and management [16]. These technological advances are important in the public sector, where transparency and accountability are paramount. Digital auditing can thus significantly improve audit efficiency and effectiveness, enabling faster data transmission and better performance metrics [1].

3. METHODS

The employed methodology is a Systematic Literature Review (SLR), entailing a structured approach for reviewing and

selecting pertinent publications concerning risk management and risk-based internal auditing. The chosen literature is meticulously examined through qualitative methods, including thematic analysis, focusing on the strategies and solutions offered in risk management and risk-based internal audit processes during the 2021-2024 period [17],[18]. The literature review approach identifies, assesses, and analyzes all study findings pertinent to certain themes and subjects to address research inquiries.

This research used meta-synthesis to integrate information from several investigations, resulting in a thorough overview and theoretical framework. A meticulous scientific methodology guarantees that the evaluation is thorough, impartial, and based on established information, offering valuable insights for practitioners, researchers, and policymakers (Xiao & Watson, 2019). Consequently, trustworthy sources and methodical procedures have been employed to gather data in this research. This research was performed during the data screening phase utilizing content analysis in accordance with the established Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. In accordance with PRISMA guidelines, the authors developed a protocol at the research planning stage, as detailed in Table 1. It was structured according to PRISMA principles.

Table 1. Review Protocol

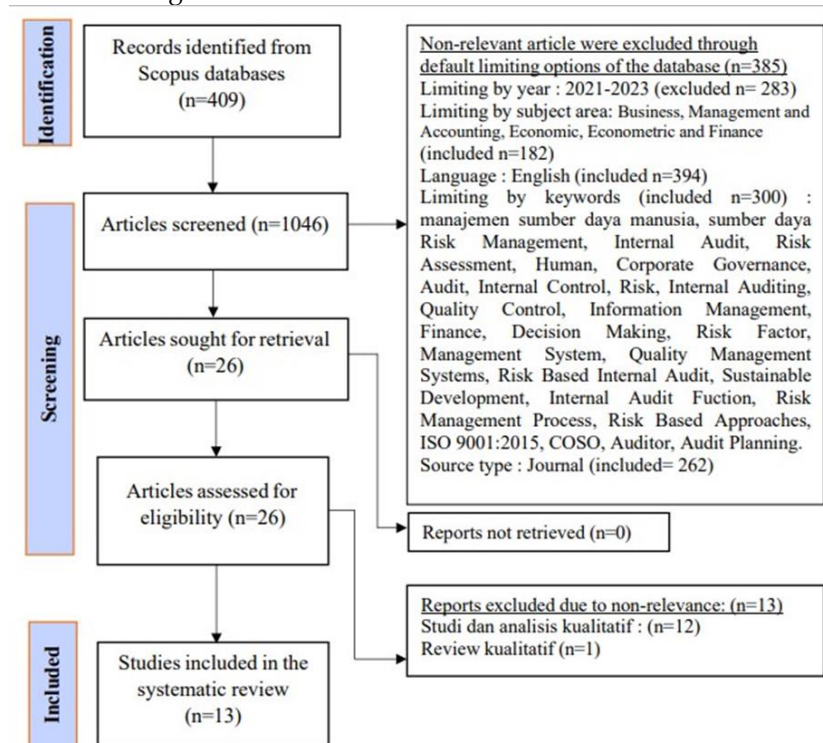
Article selection method	PRISMA Guidelines
Search term	"Risk Management" "Risk Based Internal Audit"
Criteria for article inclusion	<ol style="list-style-type: none"> 1. Range of years: 2021 - 2024 2. Field of study: Business, Management and Accounting, Economics, Econometrics and Finance. 3. Article language: English 4. Keywords: Risk Management, Internal Audit, Risk Assessment, Human, Corporate Governance, Audit, Internal Control, Risk, Internal Auditing, Quality Control, Information Management, Finance, Decision Making, Risk Factor, Management System, Quality Management Systems, Risk Based Internal Audit, Sustainable Development, Internal Audit Function, Risk

	Management Process, Risk Based Approaches, ISO 9001:2015, COSO, Auditor, Audit Planning.
	5. Publication source type: Journal
	6. Research type: Empirical article
	7. Methodological quality: Articles that follow quantitative methodology
Analysis method	PRISMA Guidelines
Reporting structure	PRISMA Guidelines

Based on PRISMA requirements, there are three steps in selecting articles, namely identification, screening, and inclusion. The identification process is carried out through the Scopus database using the search term "Risk Management" "Risk-Based

Internal Audit". In the screening process is done automatically. Automatic screening is carried out against criteria 1 - 5 in Table 1 by using the default restriction options from the Scopus database. Articles that do not meet criteria 1 - 5 will be excluded.

Figure 1. PRISMA Article selection for flowchart



Following the automated screening of the articles, the complete versions of the remaining articles were obtained for eligibility evaluation. The authors independently evaluated the publications based on criteria 6 and 7 outlined in Table 1. At this juncture, subsequent to prior investigations employing minimal acceptable standards for methodological rigor and article classification. According to Meline's [20] criteria, the minimum acceptable standard

established was for publications that adhered to the empirical article type as per criterion 6 and employed a quantitative technique as outlined in criterion 7. Consequently, only empirical publications employing a quantitative technique were incorporated, while others were omitted.

The analysis method in this study uses a VOSviewer-based tool because it is designed to analyze the content and structure of articles [21]; [22]. VOSviewer is a widely

used tool for visualizing and analyzing networks in scientometric studies, allowing the creation of networks using citation relationships, co-occurrence of words, and coauthorship relationships [23];[24]. The usefulness of VOSviewer in utilizing multiple databases in one study. The tool does two forms of analysis: first, performance analysis, which examines article performance and productivity; second, scientific mapping, which assesses article structure, development, and pertinent contributors [25]. Maps are produced using bibliometric networks, utilizing multiple units of analysis, such keywords, phrases, authors, citations, countries of publishing, or source types [26].

4. RESULTS AND DISCUSSION

According to the employed study methodologies. Table 2 presents the comprehensive details of the papers. Consequently, the study encompasses 13 publications published between 2021 and 2024. This indicates that we possess extensive coverage of articles. A total of 409 references and 28 keywords were included. Figure 2 illustrates the total rise in article articles, indicating that the majority of the research was done in 2023. Figure 3 illustrates the originating journals of pertinent publications. It indicates all journals containing referenced papers. Consequently, the magazine Problems and Perspectives in Management has the greatest number of publications, with two articles. Furthermore, just a single paper has been published by the remaining journals depicted in Figure 3.

Table 2. Overall information of the article collection

Description	Results
Time span	2021-2024
Country	16
Journal Article	13
Author's keywords	51
Author	11

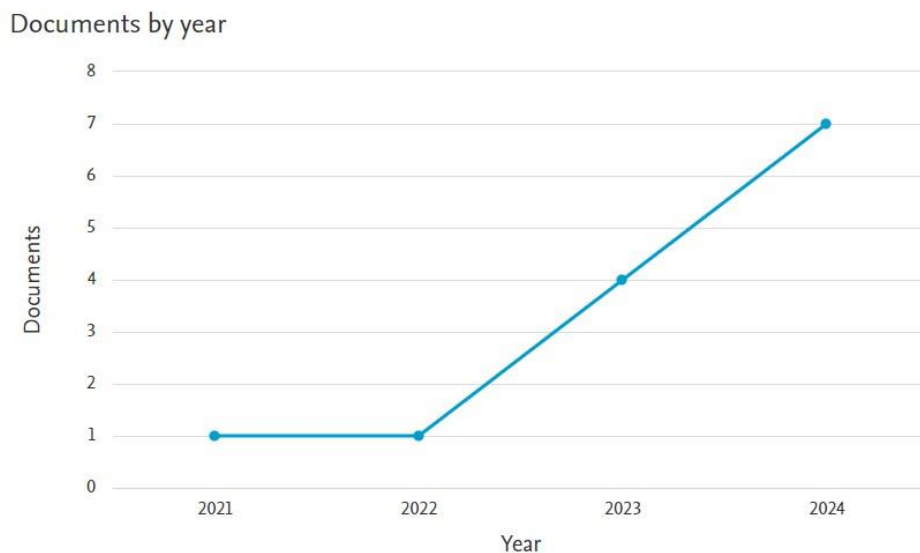


Figure 2. Annual Article Publication

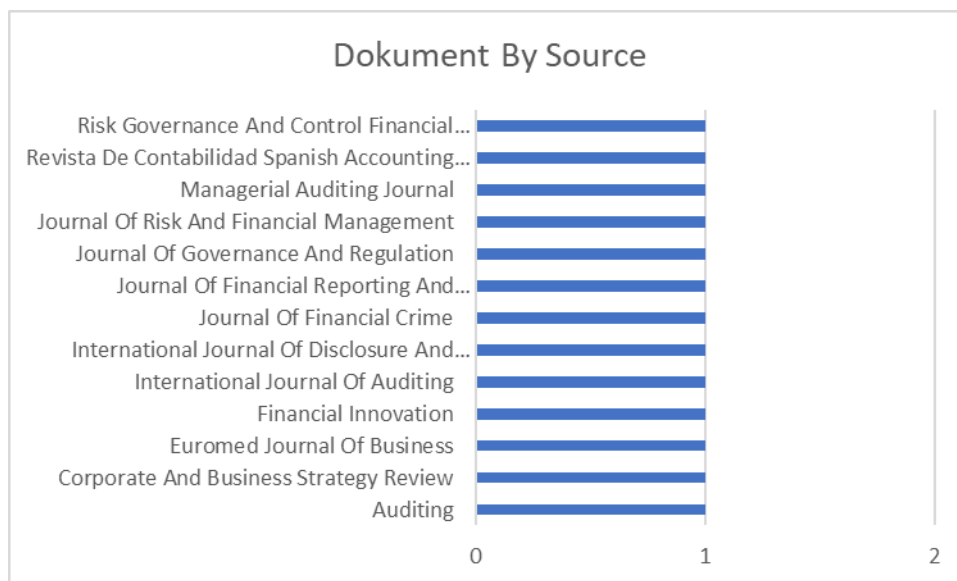


Figure 3. Journal Article Source

Table 4. All keywords in the article

Keyword	Genesis
Internal Audit	5
Risk Management	3
Audit Risk	3
Risk Based Internal Audit	2
Internal Audit Function	1
Internal Audit Role	1
Internal Control	1
Fraud Awareness	1
Fraud Prevention	1
RBIA Effectiveness	1

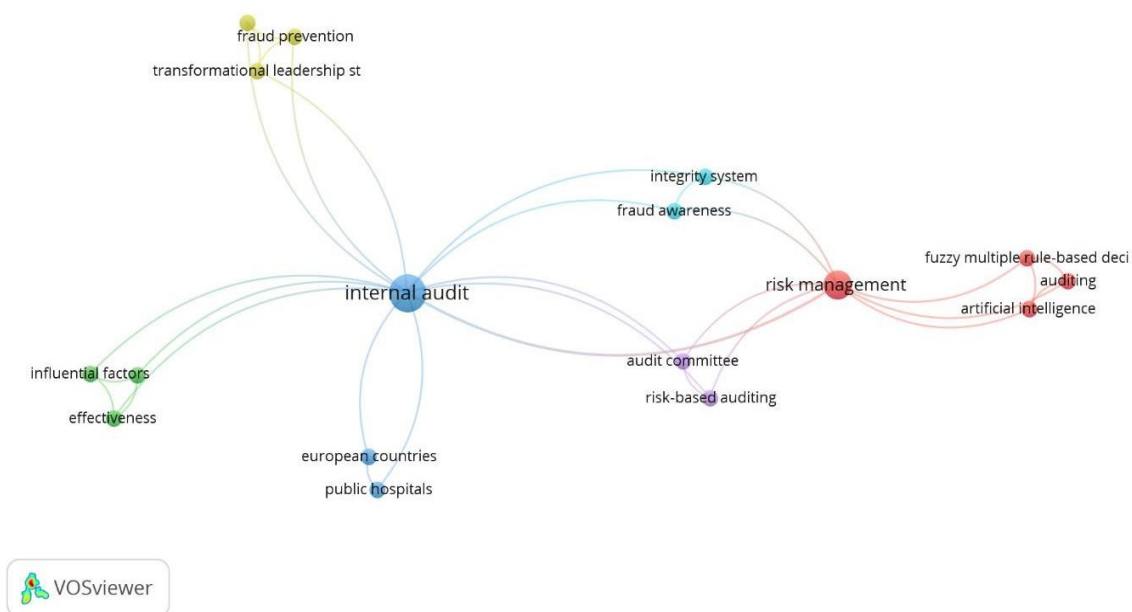


Figure 4. Keywords co-occurrence network visualization

The line thickness in Figure 4 signifies the degree of the correlation between the terms. The dimensions of the nodes signify the frequency of occurrence. An increased frequency signifies a greater node size. Thus, the human resource management strategy in the era of disruption, precisely in 2021-2023, has a strong relationship with competitive advantage. Because it is connected with a thicker line and the largest node. The keyword Human resource management strategy is not included in the selected cluster, because the keyword Human resource management strategy is related to all articles. Furthermore, additional linkages in Figure 5 were examined with terms categorized by distinct colors. VOSviewer has categorized the terms into several groups based on their frequency of occurrence. Grouping keywords indicates their interconnectedness and origin from a singular phenomenon. Consequently, Table 6 presents five prevalent themes that arose from the five clusters. They are; (1) Internal audit, (2) Risk Management, (3) Influential factors, (4) Audit committee, (5) Integrity system and (6) transformational technology.

DISCUSSION

This research used the systematic literature review (SLR) methodology to synthesize risk management and risk-based internal audit methods in empirical studies conducted throughout the digitalization period, namely from 2021 to 2024. In accordance with the goals for advancing risk management and risk-based internal audit practices from 2021 to 2024, there are specific areas requiring focus in these domains, as well as the enhancement of capabilities in risk management and risk-based internal auditing amidst digitalization.

The results indicate that internal audit, audit committee, and stakeholder collaboration have a substantial and favorable impact on risk-based auditing. The RBA underscores the significance of risk analysis and management, enhancing the quality and efficiency of audits while delivering critical insights on risk identification to stakeholders. The internal audit's function in guaranteeing the efficacy of risk management and internal

control is essential for facilitating the RBA process [27]. Internal audit functions that focus on risk management and regulatory compliance significantly contribute to the increase in Internet financial reporting. Internal audit functions that play a role in risk management have also been shown to be important in ensuring the quality of corporate governance and audits [28];[29]. The reliability of risk management-focused internal audits is considered to improve the quality of external audits (Barr-Pulliam, D., et al., 2024). Improvements in internal audit procedures and efficient internal monitoring systems will significantly reduce risks that impede organizational objectives and improve the accuracy of financial reporting [31].

Furthermore, internal audit serves to monitor and improve the effectiveness of the risk management process, which helps the organization achieve its goals by identifying risks and correcting weaknesses in control procedures [32];[33]. In connection with the era of digitalization, it was found that effective application of AI can improve audit efficiency and risk management. The fuzzy multiple rule-based decision-making model used helps internal auditors identify and manage complex risks in an increasingly dynamic business environment [34]. RBIA is affected by autonomy. Independence entails the availability of communication and access to information across all divisions or departments within the organization, hence enhancing the internal audit function and increasing its efficacy [35]. Risk management directly affects system integrity and fraud awareness mediates the relationship between risk management and system integrity [37]. In addition, this study found gaps related to training for auditors that are still not running optimally.

5. CONCLUSION

This research seeks to examine the evolution of risk management and risk-based internal audit practices from 2021 to 2024, identify areas requiring enhancement in these practices, and enhance capabilities in risk

management and risk-based internal auditing within the context of digitalization. The systematic literature review methodology in accordance with PRISMA guidelines is able to reveal these objectives by following the article selection criteria so that there are 13 articles from Scopus for review. There are five results of risk management and risk-based internal audit in the digitalization era, namely (1) Internal audit, (2) Risk Management, (3) Influential factors, (4) Audit committee, (5) Integrity system and (6) transformational technology. This study also found areas that need attention for future research, namely artificial intelligence which is part of the current development of digitalization. With

the results obtained, it will facilitate and improve the application of risk management and risk base in internal audit in the digitalization era to increase effectiveness or detect fraud.

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