

STRENGTHENING RISK MANAGEMENT STRATEGY TO IMPROVE INTERNAL CONTROL EFFECTIVENESS IN MINISTRIES/AGENCIES IN INDONESIA

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Abstract

This paper analyzes strategies to strengthen risk management in enhancing internal control effectiveness in Indonesian Ministries/Agencies. Although Government Regulation No 60 of 2008 mandates the application of the Government Internal Control System (SPIP), various challenges impede its effective implementation, including lack of human resource (HR) competence, weak risk culture, and limited use of technology. This study adopts a quantitative explanatory design using Structural Equation Modeling—Partial Least Squares (SEM-PLS), with a sample of 250 respondents from 30 institutions. The results indicate that ISO 31000—based risk management and SPIP have a significant impact on internal control effectiveness, while HR competence and organizational risk culture act as moderating factors. The paper contributes theoretically to public sector governance by proposing an integrated model and offers policy recommendations related to HR capacity building, digital governance, and strengthening risk-based accountability frameworks.

Keyword: Risk Management, Internal Control, ISO 31000, SPIP, Human Resource Competence, Public Sector

INTRODUCTION

Risk management has become an integral part of public sector governance in many countries, particularly in emerging economies striving to establish transparency and accountability within government institutions. In Indonesia, the issuance of Government Regulation No. 60 of 2008 has marked a significant shift toward embedding risk-based approaches within internal control systems across Ministries and Agencies (Kementerian dan Lembaga (K/L)). However, the implementation of this regulation, referred to as the Sistem Pengendalian Intern Pemerintah (SPIP), still faces considerable hurdles. These include inconsistent institutional commitment, lack of technical knowledge among staff, limited integration with performance planning, and insufficient monitoring mechanisms. The challenges are further amplified by decentralized administrative structures and varying levels of maturity among public institutions.

ISO 31000, an internationally recognized standard for risk management, provides comprehensive guidance for building effective risk governance in both public and private sectors. Its principles focus on value creation, integration with institutional processes, and continuous improvement. While some Indonesian Ministries have adopted ISO 31000 as a complement to SPIP, the extent to which it has improved internal controls remains under-researched. Studies such as Arena et al. (2020) and Aven (2016) highlight the strategic benefits of ISO 31000 implementation, yet empirical evidence from the Indonesian public sector remains fragmented. This gap raises questions about how regulatory frameworks like SPIP and voluntary standards like ISO 31000 can synergistically enhance internal control effectiveness.

The institutional capability to implement risk management strategies is closely tied to human resource competence and organizational risk culture. According to Ferreira et al. (2019), public sector employees must not only understand risk management concepts but also be equipped with the tools and authority to act. Similarly, Suhardjono et al. (2021) assert that a culture that embraces risk positively—rather than viewing it solely as a liability—can transform internal control into a strategic asset. In

Indonesia, however, many government employees still perceive risk management as a compliance obligation rather than an integral part of performance—based budgeting and service delivery.

Technological innovation offers a promising avenue for improving internal control mechanisms. The use of Artificial Intelligence (AI), Big Data, and digital dashboards enables institutions to detect anomalies, generate predictive insights, and automate monitoring. Research by Zhang et al. (2020) and Hair et al. (2019) supports the notion that digital tools can enhance responsiveness and accuracy in public governance. Nonetheless, digital transformation in the Indonesian public sector has been uneven, with some institutions adopting advanced systems while others continue to rely on manual processes. These disparities reflect gaps in infrastructure, digital literacy, and policy alignment.

Given this context, this study seeks to examine the effectiveness of ISO 31000 and SPIP implementation on internal control within Ministries/Agencies, moderated by HR competence and risk culture. The study contributes to both theoretical and practical discourses by integrating institutional, behavioral, and technological perspectives. It proposes a comprehensive model for strengthening internal controls and offers evidence-based policy recommendations for Ministries/Agencies seeking to build robust, accountable, and digitally enabled governance systems.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Risk management in the public sector has evolved from being a compliance requirement into a strategic governance function. The Enterprise Risk Management (ERM) framework developed by COSO (2017) outlines how risk management can be embedded into organizational objectives and performance monitoring systems. Governments around the world are increasingly adopting these frameworks to navigate the complexity of public services and fiscal accountability. According to Aven (2016), the structured integration of risk into public sector decision-making reduces uncertainty, improves responsiveness, and enhances trust in institutions. Risk management, therefore, serves not only to identify threats but also to uncover opportunities for innovations and efficiency.

ISO 31000 has emerged as a global standard offering practical guidelines for establishing, implementing, and maintaining effective risk management systems. The standard emphasizes a systematic approach that includes risk identification, assessment, mitigation, and communication. Hopkin (2018) highlights that ISO 31000 promotes principles such as value creation, integration with institutional processes, and continuous improvement. In the context of the Indonesian public sector, ISO 31000 aligns with the goals of SPIP by emphasizing accountability and process reliability. Nevertheless, as Juliani and Maciel (2024) assert, the translation of international standards into local governance practices requires contextual adaptation, political will, and organizational learning.

SPIP, or the Government Internal Control System, was introduced in Indonesia through Government Regulation No. 60 of 2008. It serves as the national framework for institutional risk control and includes five key components: control environment, risk assessment, control activities, information and communication, and monitoring. Mardiasmo (2019) observes that while SPIP has gained traction in administrative procedures, its integration with institutional strategy remains partial. Effective SPIP implementation depends on a clear governance structure, leadership commitment, and integration with performance budgeting. When SPIP is aligned with risk management frameworks such as ISO 31000, it can significantly enhance internal control effectiveness (Arena et al. 2020).

The success of risk-based internal control systems also hinges on human resource competence. Ferreira et al. (2019) found that risk literacy, training, and empowerment are critical for enabling staff to identify, assess, and respond to risks effectively. In public institutions, competency gaps often lead to rigid, rule-based interpretations of risk management, limiting its strategic function. Investment in professional development, certification, and cross-functional training is essential to building an agile public workforce capable of implementing ISO 31000 and SPIP comprehensively. Hossain (2024) adds that resilience in public systems depends on the capacity of human actors to adapt and make informed decisions under uncertainty.

Risk culture plays an equally important role in sustaining internal control systems. Suhardjono et al. (2021) define risk culture as the values, beliefs, and behaviors that shape how risk is perceived and acted upon within an organization. In high-performing institutions, risk culture is reinforced through leadership behavior, performance incentives, open communication, and accountability structures. Conversely, in bureaucratic settings, risk culture may be weak due to hierarchical rigidity, fear of punishment, or lack of ownership. Embedding risk culture within public sector governance requires deliberate interventions in leadership development, organizational design, and performance management.

Technological capability is a growing enabler of risk management innovation. Big Data analytics, AI, and real-time dashboards allow for early detection of anomalies, predictive analysis, and evidence-based decision-making. Zhang et al. (2020) and Hair et al. (2019) argue that digital transformation increases the speed, accuracy, and scalability of internal controls. However, Bleda and Krupnik (2024) caution that the effectiveness of digital tools is contingent upon institutional readiness, digital literacy, and ethical frameworks. In Indonesia, disparities in IT infrastructure and digital adoption among ministries pose challenges for uniform implementation of digital risk tools.

Based on the literature reviewed, the following hypotheses are formulated:

- H₁: Implementation of ISO 31000 has a positive effect on internal control effectiveness.**
- H₂: Implementation of SPIP has a positive effect on internal control effectiveness.**
- H₃: Human resource competence moderates the relationship between risk management and internal control effectiveness.**
- H₄: Risk culture moderates the relationship between risk management and internal control effectiveness.**

RESEARCH METHODS

This study adopts a quantitative approach with an explanatory research design to assess the relationship between risk management implementation and internal control effectiveness within Indonesian Ministries and Agencies (MAs). The primary objective is to empirically test how ISO 31000 and SPIP affect internal control systems and whether human resource competence and risk culture act as moderating variables. An explanatory design is appropriate because it allows the exploration of causal links among structured constructs using standardized instruments. This research framework is grounded in institutional theory and supported by risk management literature that posits internal control as a function of organizational structure, resources, and behavior.

The study population includes all central government institutions in Indonesia that have implemented SPIP and risk management standards. Using purposive sampling, 30 Ministries/Agencies were selected based on two criteria: (1) SPIP maturity level 3 or higher as published by the Financial and Development Supervisory Agency (BPKP), and (2) formal adoption or documented implementation of ISO 31000-based risk management practices. This purposive strategy ensures that respondents come from institutions with sufficient exposure to the constructs under investigation. From each institution, between 5 and 10 officials involved in risk control or auditing were selected, yielding a total sample of 250 valid responses.

Primary data were collected through a structured questionnaire distributed online and via printed forms. The instrument consisted of five main sections: demographic information, ISO 31000 implementation, SPIP implementation, HR competence, risk culture, and internal control effectiveness. Each construct was measured using validated indicators adapted from prior studies (e.g., Ferreira et al., 2019; Arena et al., 2020; Suhardjono et al., 2021). Responses were rated using a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.” Before full deployment, the questionnaire underwent expert review and a pilot test with 30 respondents to refine item clarity and test internal consistency.

Secondary data were obtained from official government reports and audit summaries published by BPK, SPIP evaluation reports from BPKP, and internal documents such as risk registers, audit working papers, and organizational risk maps. These documents provided a broader context for interpreting the survey findings and allowed triangulation of reported perceptions with actual implementation status. Institutional documents were also reviewed to confirm the presence of risk policies, risk communication mechanisms, and documented use of digital tools in control processes.

Data analysis was conducted using Structural Equation Modeling with the Partial Least Squares method (SEM-PLS), using Smart-PLS 4.0 software. This method was selected due to its capacity to handle complex models involving latent variables, moderating effects, and relatively small sample sizes. SEM-PLS allows simultaneous estimation of measurement (outer) and structural (inner) models. The measurement model was assessed for indicator reliability (outer loadings), internal consistency reliability (Cronbach's alpha, composite reliability), convergent validity (Average Variance Extracted/AVE), and discriminant validity (HTMT ratio).

To evaluate the structural model, the study examined path coefficients, R^2 values, and the predictive relevance of the model (Q^2). Path significance was assessed using bootstrapping with 5,000 resamples. The moderation effects of HR competence and risk culture were tested by introducing interaction terms and evaluating their influence on the relationship between ISO 31000/SPIP implementation and internal control effectiveness. Multicollinearity was checked using the Variance Inflation Factor (VIF), with all values falling below the acceptable threshold of 5.

Classical assumption tests were applied to validate the appropriateness of the data for SEM-PLS analysis. Normality was checked through skewness and kurtosis statistics, and no significant deviations were detected. Homoscedasticity and linearity were also tested using scatterplot analysis. Outliers were screened using Mahalanobis distance, and five cases were excluded from the original 255 responses to ensure model robustness.

Finally, ethical considerations were addressed by obtaining informed consent from all participants. Anonymity and confidentiality of responses were guaranteed, and participation was entirely voluntary. The research protocol complied with academic standards for research involving human subjects and received approval from the institutional research ethics committee. The comprehensive methodology employed ensures reliability, validity, and replicability of the study's findings and lays a strong foundation for data interpretation in the subsequent section.

RESULTS AND DISCUSSION

The descriptive analysis of the demographic profile of the respondents showed that most of the participants were officials in charge of internal audit units, risk management divisions, or financial control sections. Approximately 62% had more than five years of experience in public sector governance, and 74% held at least a bachelor's degree in accounting, public administration, or law. This indicates that the respondents had sufficient familiarity with institutional control mechanisms. In terms of institutional maturity, 40% of the participating ministries had achieved SPIP maturity level 3, while the remaining 60% had reached level 4 or 5, reflecting a relatively advanced implementation status. These characteristics increase the credibility of the data and the reliability of the responses provided.

The SEM-PLS analysis confirmed that the measurement model was reliable and valid. All constructs achieved composite reliability above 0.8, Cronbach's Alpha above 0.7, and AVE values above the threshold of 0.5, confirming internal consistency and convergent validity. Discriminant validity was also established, as all HTMT ratios were below 0.85. The outer loading values for each indicator ranged between 0.71 and 0.91, showing a strong contribution to their respective latent variables. This suggests that the items accurately represented the constructs of ISO 31000 implementation, SPIP adherence, HR competence, risk culture, and internal control effectiveness.

The structural model evaluation demonstrated significant relationships among key variables. The path coefficient from ISO 31000 implementation to internal control effectiveness was 0.412 (p

< 0.001), and from SPIP implementation it was 0.376 ($p < 0.001$), confirming H1 and H2. This supports the assertion by Arena et al. (2020) that risk management frameworks aligned with international standards enhance public sector accountability and operational efficiency. Ministries with well-documented risk registers, structured mitigation plans, and routine risk evaluations reported fewer audit findings and stronger compliance levels.

The moderating effect of HR competence was significant (interaction term $\beta = 0.189$, $p = 0.015$), validating H3. Institutions that had invested in risk management training, workshops, or certification programs showed a stronger link between risk management practices and control outcomes. This aligns with Ferreira et al. (2019), who found that risk-aware public employees were more likely to proactively identify and manage risks. On the other hand, ministries with minimal investment in HR development showed weak internal control, even when ISO 31000 was adopted formally.

The analysis also confirmed the moderating role of organizational risk culture (interaction term $\beta = 0.231$, $p = 0.004$), supporting H4. Ministries where risk discussions were embedded in leadership meetings, budget planning, and performance evaluation processes showed higher internal control effectiveness. This finding supports Suhardjono et al. (2021), who argued that risk culture plays a transformative role in shifting control from reactive to proactive. Conversely, institutions that maintained a compliance-oriented culture showed less improvement, despite formal adoption of SPIP and ISO 31000.

Interestingly, while the overall use of technology was not modeled as a direct variable, qualitative data from institutional documents and open-ended responses revealed that digital tools such as dashboards, risk information systems, and audit-trail software were more prevalent in high-performing ministries. These institutions leveraged AI-assisted fraud detection, real-time monitoring, and data visualization to enhance risk responsiveness. This finding is consistent with Zhang et al. (2020) and Bleda & Krupnik (2024), who emphasize the enabling role of technology in modern risk governance.

Nevertheless, several implementation challenges persist. Respondents highlighted limitations such as fragmented regulatory frameworks, overlapping mandates, lack of integration between risk and performance systems, and insufficient budget allocation for risk initiatives. These issues undermine the institutionalization of risk management, especially in ministries with traditional bureaucratic structures. In addition, fear of audit sanctions and lack of incentives for risk reporting were cited as cultural barriers.

In sum, the findings demonstrate that ISO 31000 and SPIP frameworks contribute significantly to internal control effectiveness when supported by competent human resources and strong risk culture. The results also suggest that without meaningful investment in human and technological capacity, regulatory compliance alone is insufficient. Ministries and Agencies must go beyond checkbox implementation and foster an environment where risk is embraced strategically and managed systematically.

CONCLUSION

This study examined the impact of ISO 31000-based risk management and the Government Internal Control System (SPIP) on internal control effectiveness within Ministries and Agencies in Indonesia. The results confirmed that both ISO 31000 and SPIP significantly influence the quality and functionality of internal control systems. Moreover, the moderating roles of human resource competence and organizational risk culture were found to strengthen these relationships, suggesting that internal control is not merely a product of regulatory compliance but also of institutional capability and behavioral readiness. These findings underscore the need to view risk management as a strategic management function, rather than a procedural requirement.

The theoretical contribution of this study lies in its integration of structural and behavioral dimensions in explaining internal control effectiveness. By combining institutional frameworks (ISO

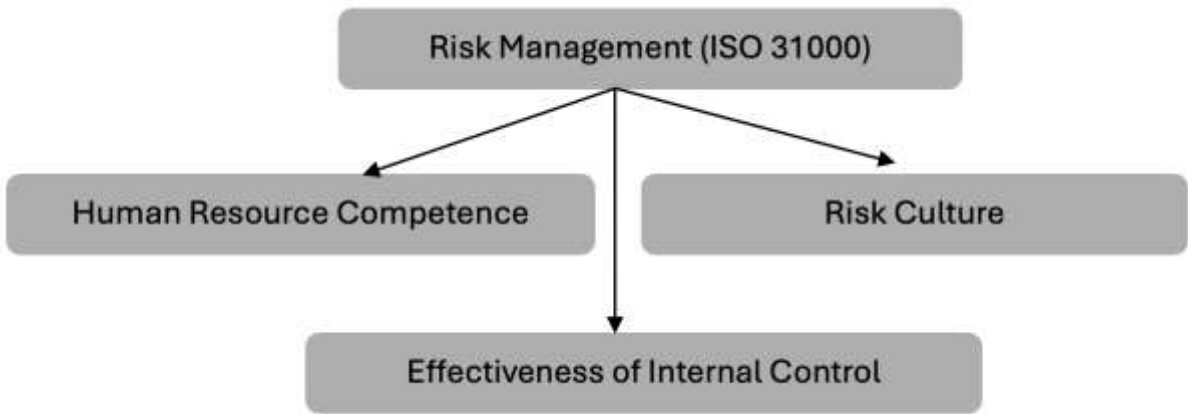
31000, SPIP) with individual and cultural factors (HR competence, risk culture), the study presents a holistic model for risk governance in the public sector. It also confirms prior theories suggesting that the successful adoption of risk management depends not only on technical standards but also on the actors and systems that support implementation. The study enriches the literature by providing empirical evidence from a developing country context, which remains underrepresented in risk governance scholarship.

Practically, the findings suggest that policy efforts must go beyond formal adoption of risk management frameworks and focus on strengthening the underlying drivers of implementation. Ministries and Agencies must invest in training programs, build risk awareness campaigns, and align performance incentives with risk mitigation outcomes. Additionally, risk culture must be embedded into strategic planning processes, organizational values, and leadership practices. Without these enablers, risk management systems risk becoming symbolic tools with limited operational impact.

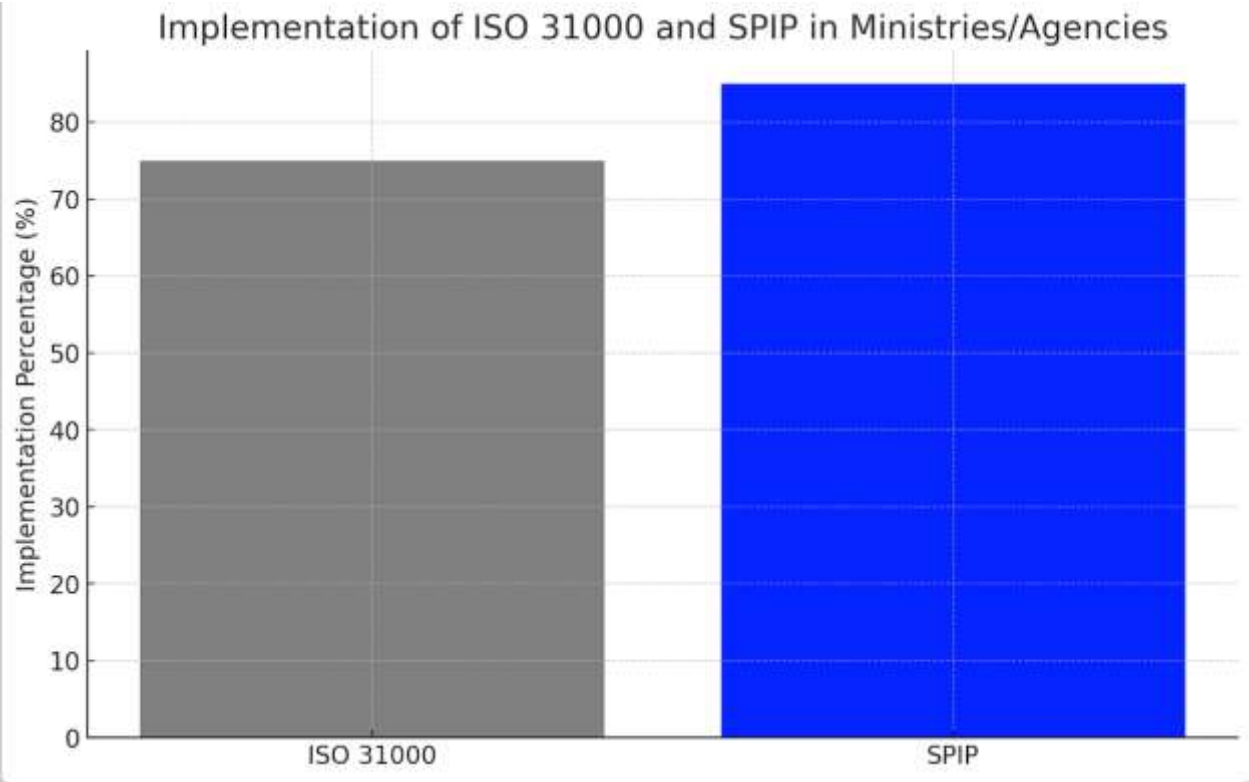
Digital transformation also emerged as a cross-cutting enabler of internal control effectiveness. Although not modeled quantitatively, qualitative insights indicated that ministries using digital dashboards, real-time audit trails, and predictive analytics had better performance in risk identification and mitigation. This finding implies that future risk governance models should integrate technological readiness as a core component. National policies must prioritize IT infrastructure investment and digital literacy programs, especially in ministries lagging in technology adoption.

In conclusion, improving internal control effectiveness requires a multidimensional strategy that integrates regulation, human capital, culture, and technology. The study recommends: (1) strengthening the mandate for ISO 31000 adoption in public institutions; (2) institutionalizing HR development programs for risk management; (3) embedding risk culture into governance practices; (4) promoting digital tools for real-time control monitoring; and (5) reinforcing SPIP evaluation with behavioral and technological metrics. These recommendations provide actionable pathways for policymakers and public managers committed to building transparent, accountable, and resilient public sector institutions in Indonesia.

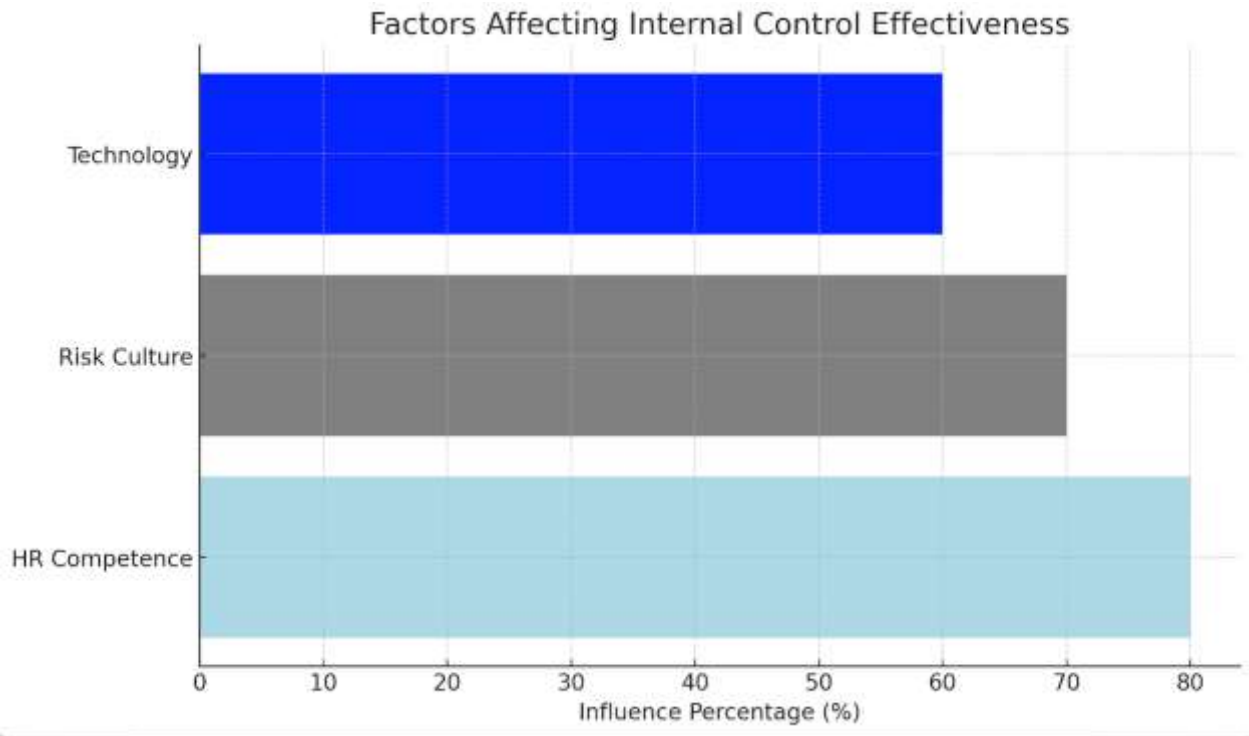
1. Figures and Tables



Picture 1. Conceptual Framework of The Study



Source: Primary Research Data, processed by the Author (2025)



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