

Optimization of the Risk-Based Annual Supervision Work Program to Improve the Quality of Supervision Results at the Balikpapan City Inspectorate

Dyna Evi Septiana¹, Saipul², Harianti³

^{1,2,3} Departement Public Administration

Corresponding Author: yve.4.fs@gmail.com

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ABSTRACT

This study analyzes the strategic dimensions that influence the quality of risk-based supervision through a comprehensive examination of three interrelated domains: coordination and governance, human resources, and technology integration. The research employs a descriptive qualitative method supported by analytical visualization using a donut diagram to illustrate the proportional contributions of each domain to supervisory effectiveness. Findings reveal that coordination and governance play a dominant role in ensuring institutional coherence, accountability, and leadership alignment, while human resources emerge as the core determinant of adaptive and ethical audit performance. Technological integration functions as a transformative enabler that strengthens data-driven decision-making and operational transparency within the supervisory framework. The interaction among these three domains demonstrates that the success of risk-based supervision depends on systemic balance rather than isolated reforms. The study concludes that strengthening institutional coordination, investing in professional capacity, and advancing digital infrastructure are essential for building a sustainable, responsive, and accountable supervision system capable of addressing dynamic governance risks.

Keywords: Risk-Based Supervision; Governance Coordination; Human Resource Development; Technological Integration

INTRODUCTION

Public sector governance in the contemporary era demands systems of supervision that are not only regulatory but also adaptive and preventive. The transformation of government institutions toward good governance principles requires internal control mechanisms capable of detecting irregularities early, preventing inefficiency, and ensuring accountability in the use of public resources. Supervision is an essential management function that ensures every stage of governmental transformation remains aligned with predetermined objectives. Through effective supervision, deviations and inefficiencies can be identified early and corrective measures can be taken promptly, thereby preventing financial losses and administrative failures that could undermine institutional credibility.

Within Indonesia's decentralized administrative structure, the Aparat Pengawasan Intern Pemerintah or Government Internal Supervisory Apparatus plays a strategic role in strengthening integrity systems across all levels of government (Kopong et al., 2024; Mustaufiq et al., 2024; Permana & Bujana, 2024; Silaban et al., 2020). The regional inspectorates act as the operational arm of APIP at the local level, assisting governors, mayors, and regents in ensuring compliance, efficiency, and transparency in governance. The Balikpapan City Inspectorate, established under Mayor Regulation No. 1 of 2022, performs three central functions: assurance, consultancy, and anti-corruption activities. These functions are carried out through the Annual Monitoring Work Program or Annual Supervision Work Program, which serves as the blueprint for all internal audits, evaluations, and supervisory activities each fiscal year (Olivia et al., 2024; Petreanu, 2021; Sal-Sabilla Narita Kusrudi & Nanda Wahyu Indah Kirana, 2023).

To enhance the effectiveness of its oversight, the Balikpapan City Inspectorate has adopted a risk-based approach in designing its PKPT. Risk-based supervision enables internal auditors to prioritize high-risk areas where potential deviations are most likely to occur, thus maximizing the value of limited resources. This approach aligns with the principles of modern internal auditing and is consistent with the directives of the Ministry of Home Affairs concerning the planning and supervision of regional government administration (Dinata et al., 2025, 2025). The method ensures that supervision is not merely reactive but anticipatory, focusing on governance areas that are strategically significant and directly impact public welfare (Ahmadov, 2025; la Cour & Andersen, 2016).

However, the implementation of risk-based PKPT in Balikpapan faces several persistent challenges. The Inspectorate currently employs only twenty-seven auditors, significantly below the recommended sixty-six auditors required by the Financial and Development Supervisory Agency. Furthermore, the number of functional government supervisors is only three, far from the fifteen recommended by the Ministry of Administrative and Bureaucratic Reform (Gedeona & Trilestari, 2021; Insani et al., 2021; Kim & Han, 2015). This shortage of qualified human resources undermines the capacity of the Inspectorate to perform comprehensive audits, resulting in overlapping assignments, time constraints, and uneven workload distribution (Abrahams & Phesa, 2025b; Temizel & Aladağ, 2025). In addition, the mandatory allocation for supervisory spending—stipulated at a minimum of 0.5 percent of total regional expenditure—has not been fully met, limiting operational flexibility and the development of auditing competencies. Combined with excessive audit mandates from national ministries, these structural challenges restrict the Inspectorate's ability to deliver optimal performance.

The impact of these limitations extends beyond administrative inefficiency. Weak internal control systems increase the likelihood of recurring audit findings, reduce responsiveness to governance risks, and potentially enable corruption due to insufficient monitoring. Incomplete implementation of the risk-based PKPT undermines the quality of oversight, diminishes the

accuracy of audit conclusions, and impairs the overall credibility of the Inspectorate. Thus, enhancing the PKPT framework is essential not only for improving audit quality but also for strengthening institutional accountability and public trust.

Previous studies have shown that the effectiveness of government internal supervision is largely determined by human resource competence, institutional support, and the integration of risk management principles. Isnaini and Murtaza (2025) in the research (Prima et al., 2025) emphasize that the development of auditor capacity directly influences internal audit performance, while Dilapanga et al. (2023) argue that adequate budget allocation and infrastructure investment are crucial to realizing accountability within government institutions. (El Husein et al., 2025; Nibel et al., 2025) highlight that despite policy frameworks supporting internal supervision, regional inspectorates often encounter challenges such as limited personnel, constrained budgets, and lack of technological integration. However, research focusing specifically on the optimization of risk-based PKPT implementation at the municipal level remains scarce, leaving a significant gap in understanding how theoretical frameworks of risk-based auditing translate into local administrative practices.

This study aims to fill that gap by analyzing how the Balikpapan City Inspectorate implements the risk-based PKPT, identifying existing barriers, and proposing strategies to optimize its execution to improve the quality of supervision outcomes. The research adopts a qualitative descriptive approach to capture the dynamics of internal audit practices, human resource management, and organizational decision-making within the framework of risk-based supervision. By exploring the intersection between risk management, audit planning, and accountability, this study seeks to contribute both theoretically and practically to the discourse on local governance reform and public sector innovation in Indonesia.

Literature Review

The theoretical foundation of this research is built upon four main conceptual pillars: internal supervision, risk management, accountability, and good governance. Each concept provides a distinct but complementary lens for understanding how risk-based supervision contributes to improving the quality of public sector oversight.

The concept of internal supervision is rooted in control theory, which posits that effective organizational performance depends on systematic monitoring and corrective mechanisms. According to (Manik et al., 2024; Surjono, 2022), supervision in the public sector is designed not only to detect deviations but also to guide institutions toward achieving administrative efficiency and transparency. The Aparat Pengawasan Intern Pemerintah (APIP) serves as an internal assurance provider that assists management in identifying potential risks, evaluating compliance, and improving operational procedures. Within regional governments, this role is operationalized through the Inspectorate, which ensures that local governance adheres to regulatory standards while maintaining fiscal discipline. Previous studies, such as those by (Maisyarah & Wahyu, 2025), found that while regional inspectorates have improved their performance in oversight, they continue to face challenges related to human resource constraints and limited access to audit tools.

Risk management serves as the theoretical foundation for the design of risk-based PKPT. (Bromiley et al., 2015) defines risk management as a systematic process that enables organizations to identify, assess, and mitigate potential uncertainties that may hinder the achievement of objectives. In the public sector, risk management is not solely financial but also operational and strategic, encompassing factors such as policy implementation, service delivery, and stakeholder coordination. A risk-based supervision model integrates these dimensions into the audit planning process, allowing internal auditors to focus on areas that pose the greatest

threats to organizational integrity and effectiveness. Maundri and Wondabio (n.d.) emphasize that risk-based supervision enhances the relevance of internal audits by aligning audit activities with the organization's strategic objectives. Their study on ministerial inspectorates revealed that while most institutions have successfully implemented risk-based audit planning, structural and organizational changes often disrupt consistency, requiring continuous adaptation by APIP (Laku et al., 2025).

The principle of accountability is another central theoretical construct in this study. Accountability refers to the obligation of public officials to justify their actions and decisions to stakeholders, ensuring that resources are managed efficiently and ethically. According to (Sari & Muslim, 2023) accountability in the context of government supervision is achieved through transparent reporting, adherence to regulations, and the demonstration of measurable performance outcomes. The strengthening of accountability mechanisms within inspectorates is often associated with the implementation of performance-based audits, improved auditor competence, and digitalized monitoring systems (Syah et al., 2025). Further demonstrated that human resource quality and work motivation significantly affect the performance of internal supervisors, suggesting that accountability is not only institutional but also behavioral, shaped by individual capacity and professional ethics (Koeswayo et al., 2024; WULANINGRUM et al., 2020).

The broader framework for these concepts is provided by the theory of good governance, which has been widely recognized as the ultimate goal of administrative reform. The United Nations Development Programme (UNDP, 1997) outlines several core principles of good governance, including participation, rule of law, transparency, responsiveness, equity, efficiency, and accountability. These principles are mutually reinforcing and collectively ensure that public institutions serve the interests of citizens while minimizing corruption and misuse of power (Kaur, 2024; Ndidiamaka Okoye et al., 2024). Within Indonesia's governance context, good governance serves as the normative reference for all reform initiatives, including the modernization of internal audit systems (Abbas et al., 2022). The implementation of risk-based PKPT by regional inspectorates reflects the operationalization of these principles, as it aims to strengthen accountability, improve efficiency, and enhance responsiveness to emerging risks.

A review of relevant empirical studies indicates that despite policy frameworks supporting internal supervision reform, significant challenges remain in achieving optimal performance. Found that the primary obstacles faced by regional inspectorates include limited auditor competence, insufficient audit infrastructure, and inadequate coordination among agencies (Mustakim et al., 2025). Similarly, identified both internal and external factors—such as budget reductions and bureaucratic rigidity—that hinder the effectiveness of supervisory activities. On the other hand, (Homaidi et al., 2022) highlight the potential of technological solutions to improve audit planning through the integration of information systems that streamline the PKPT process. These studies collectively emphasize that optimization requires not only regulatory frameworks but also institutional readiness and innovation.

In synthesis, the literature reveals that the success of risk-based PKPT implementation depends on three interrelated conditions: the capacity of human resources, the adequacy of financial and technological support, and the commitment of leadership to institutional reform. The interaction of these factors determines the extent to which internal supervision can transition from a compliance-oriented function to a value-added management tool. Despite the growing body of research on internal supervision in Indonesia, empirical evidence focusing on municipal-level implementation remains limited. Therefore, this study contributes to filling that gap by providing an in-depth analysis of how the Balikpapan City Inspectorate applies risk-based PKPT principles, the challenges it faces, and the potential pathways for optimization to enhance the quality of supervision outcomes and support the realization of good governance in regional administration.

Method

The present study employs a qualitative descriptive research design aimed at exploring the implementation, challenges, and optimization strategies of the risk-based Program Kerja Pengawasan Tahunan (PKPT) within the Balikpapan City Inspectorate. This methodological approach is appropriate for understanding complex social and administrative phenomena in their natural context, allowing the researcher to capture the depth of experiences, perceptions, and institutional dynamics related to internal supervision practices (Cappellaro, 2017). Data collection relies on both primary and secondary sources. Primary data are obtained through in-depth interviews with key informants, including the Balikpapan City Inspector, assistant inspectors, auditors, and planning officers, selected purposively based on their involvement and expertise in the PKPT process. Secondary data are gathered from official documents, regulations, and policy reports such as audit plans, evaluation results, and government decrees related to internal supervision. Data analysis follows the interactive model of Miles and Huberman (1984) in the research by (Asipi et al., 2022), encompassing three concurrent phases: data reduction, data display, and conclusion drawing or verification. Data reduction involves organizing and simplifying raw information into thematic categories; data display presents the analyzed findings in a structured, narrative form; and conclusion drawing verifies patterns and relationships emerging from the data. Triangulation of sources and methods is used to ensure data validity, while the researcher maintains reflexivity throughout the process to minimize bias. The research process includes stages of preparation, field data collection, interpretation, and validation, conducted over several months to ensure saturation of information. Through this approach, the study seeks to generate a comprehensive understanding of how risk-based PKPT is applied within the framework of local governance, revealing the institutional, technical, and human factors that influence its effectiveness in improving the quality of internal supervision.

Results And Discussion

The results and discussion of this study provide a comprehensive analysis of how the Balikpapan City Inspectorate implements, manages, and seeks to optimize its risk-based Program Kerja Pengawasan Tahunan (PKPT) as an essential mechanism for ensuring accountability and good governance. The findings are presented thematically to highlight the interrelation between institutional practices, structural challenges, and strategic opportunities that influence the effectiveness of internal supervision. This approach allows for a holistic understanding of how the risk-based PKPT functions not only as an administrative requirement but also as a transformative framework for modernizing public sector oversight at the local level (Otia & Bracci, 2022).

The first part of the discussion explores the actual implementation process of the risk-based PKPT. It examines how the Inspectorate of Balikpapan has adopted risk-oriented principles in structuring its annual supervision activities, the extent to which these principles have been internalized across organizational units, and how they contribute to achieving targeted governance outcomes. This section emphasizes that while the formal procedures of risk-based supervision have been established, the practical integration of risk assessment into daily auditing activities remains gradual and uneven (Almgrashi & Mujalli, 2024, 2024; Noch, 2024). Understanding this implementation dynamic is crucial because it reflects the degree of institutional readiness and administrative maturity in translating national audit reform policies into local governance realities (Ilori, 2024; Noch & Sonjaya, 2024).

The second and third parts focus on the internal and external conditions that shape the performance of the risk-based PKPT. The discussion of structural and operational challenges identifies factors such as human resource shortages, limited financial support, and the absence of technological integration that constrain the Inspectorate's ability to execute comprehensive audits (Abrahams & Phesa, 2025a). Conversely, the final section elaborates on strategies to optimize these conditions through institutional strengthening, technological adaptation, and collaborative governance. Collectively, these findings illuminate both the constraints and possibilities inherent in the transformation of internal supervision systems and underscore the need for continuous innovation to ensure that risk-based oversight genuinely enhances the quality of public sector governance.

Implementation of the Risk-Based Annual Supervision Work Program (PKPT)

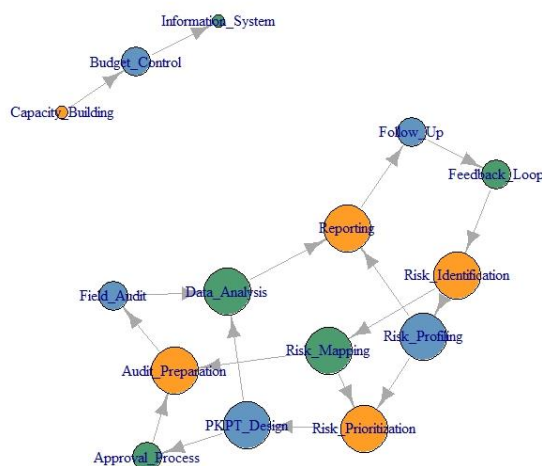
The implementation of the Risk-Based Annual Supervision Work Program (PKPT) at the Balikpapan City Inspectorate represents a progressive effort to institutionalize modern principles of public sector oversight and accountability. Traditionally, internal supervision within local governments in Indonesia was carried out using a routine and compliance-oriented approach, where audit activities were determined primarily by administrative procedures rather than by risk priorities. The introduction of a risk-based PKPT marks a shift from that conventional model toward a more strategic and anticipatory system of control. By integrating risk assessment into the planning process, the Inspectorate aims to focus its limited resources on the most critical areas that pose potential threats to the achievement of government objectives. This approach is aligned with the national agenda for bureaucratic reform, which emphasizes efficiency, transparency, and the prevention of corruption as key pillars of good governance (Muslim & Mais, 2023).

In practice, the preparation of the PKPT begins with identifying potential risks within each regional apparatus organization (Ab Ghani et al., 2021; Maulana et al., 2024). Each department is required to provide a risk profile that highlights operational, financial, and compliance risks that may hinder program performance. These risk profiles are then analyzed collectively by the Inspectorate to determine which entities or programs require prioritized supervision. Once the priorities are established, the Inspectorate formulates the PKPT document, which outlines the specific objectives, methodologies, and timelines of audit activities for the fiscal year (Haryanto et al., 2024). The finalized plan is formalized through mayoral and inspector decrees, ensuring that each activity has legal legitimacy and institutional authority. Through this process, the Balikpapan City Inspectorate demonstrates a growing institutional capacity to transform oversight from a procedural task into a risk-responsive governance instrument.

Despite this structured planning process, the implementation of the risk-based PKPT still faces significant limitations in practice (Ab Rahim et al., 2025; Nugraha et al., 2025). Data collected from field interviews reveal that risk assessments are often qualitative and subjective due to the lack of standardized risk measurement tools and analytical software. Auditors rely heavily on their experience and judgment rather than data-driven metrics when evaluating risk levels (Beckley, 2025; Dang et al., 2025; Wang et al., 2025). Furthermore, coordination between the Inspectorate and regional departments remains inconsistent, particularly in data sharing and verification. These challenges lead to gaps between planned and actual supervision activities, reducing the overall effectiveness of the risk-based approach (Myshko & Titor, 2021). Nevertheless, the Inspectorate has made noticeable progress in institutionalizing a risk-oriented mindset among auditors and local officials, signifying a gradual cultural shift toward proactive supervision.

Another critical component of the PKPT implementation is its alignment with both national and local development priorities. The 2025 PKPT, for instance, emphasizes audit focus areas that correspond to the Asta Cita Presidential priorities and the national thematic agenda for sustainable and inclusive economic growth (Bonić et al., 2024; Febrianto et al., 2024). These include oversight of performance achievements related to poverty reduction, education, healthcare, food security, and environmental management. The inclusion of these thematic priorities ensures that the PKPT does not operate in isolation but contributes directly to the broader goals of regional development and public welfare (Mulyawan et al., 2025). Moreover, the integration of risk-based supervision allows the Inspectorate to act as a strategic partner for the local government in achieving policy outcomes rather than merely serving as a compliance enforcer. Although challenges persist in resource allocation and technical implementation, the risk-based PKPT provides a solid foundation for the continuous improvement of internal audit practices and the advancement of accountable, performance-driven local governance.

Implementation Network: Risk-Based PKPT (fallback)



**Figure 1 Implementation Network Risk-Based
Source Data Processed by the Author 2025**

Figure 1 illustrates the functional network for the Annual Risk-Based Supervisory Work Program (PKPT). This figure represents a complex system of interconnected nodes, symbolizing the sequential and interactive stages of internal oversight within the Balikpapan City Inspectorate. Each node serves as a distinct phase in the PKPT process, beginning with initial risk identification and culminating in the feedback and capacity building phase. The network adopts a directed graphic structure, emphasizing a unidirectional process flow that reflects the logical and procedural order of governance mechanisms. The arrangement of nodes and arrows highlights the transformation of audit management from traditional checklist-based oversight to a more analytical and preventative approach centered on risk mitigation (van Wyk & Rudman, 2019).

The central placement of nodes in the network, such as Risk Identification, Risk Profiling, Risk Mapping, and Risk Prioritization, demonstrates the fundamental role of risk assessment as the backbone of the PKPT framework. The interconnectedness of these components demonstrates that the identification and evaluation of potential threats to governance integrity are not isolated actions, but rather integrated processes that influence every subsequent oversight activity. The node labeled PKPT_Design marks the transition from the diagnostic phase to the planning phase, which serves as an institutional mechanism that consolidates risk analysis findings into a structured audit program. The edges leading from PKPT_Design to Audit_Preparation and Field_Audit illustrate how the strategic plan is operationalized through systematic audit activities. The thickness of the connecting lines visually expresses the intensity of procedural interactions, reflecting the interdependencies between phases and the concentration of supervisory attention on key risk areas (Zhao et al., 2025).

The bottom of the network depicts the execution phase, which includes Audit_Preparation, Field_Audit, Data_Analysis, and Reporting. These phases represent the practical dimension of supervision where policy frameworks are transformed into empirical assessments. The Field Audit node represents the physical examination of evidence, while Data Analysis signifies the interpretive process of translating raw findings into meaningful conclusions (Malsch & Salterio, 2016; Marian Carcary, 2021). The arrow from Data_Analysis to Reporting highlights the shift from internal review to formal communication, culminating in the Follow-Up and Feedback Loop nodes, which represent the accountability cycle. The connectivity between these nodes suggests that the PKPT model functions not as a linear audit system, but rather as an iterative feedback-oriented governance mechanism designed to strengthen organizational learning (Hubbart, 2024; Raut et al., 2025).

The top-left cluster, consisting of Capacity Development, Budget Control, and Information Systems, illustrates the supporting infrastructure necessary for sustainable risk-based supervision. These nodes demonstrate that successful implementation of the PKPT depends not only on procedural design but also on institutional resources, financial adequacy, and technology integration. The connections between these supporting components highlight the interdependence of human resources, resource management, and digital systems in achieving audit effectiveness. The presence of Capacity Development linked to Budget Control implies a cyclical relationship where financial investment in human resource development strengthens institutional competencies, thereby improving audit quality.

The color distribution in the diagram symbolizes the categorical differentiation between planning, implementation, and evaluation functions (Setlur & Stone, 2016). Nodes in warm colors, such as orange, represent planning activities that emphasize proactive risk identification and prioritization (Mishra et al., 2017). Blue nodes represent implementation processes, signifying operational audit tasks. Green nodes indicate evaluation and feedback mechanisms that support

continuous supervisory improvement (Minelli & Ruffini, 2018). Color-coded groupings create visual boundaries that define thematic clusters while maintaining systemic connectivity through cross-colored links, reinforcing the interdependent nature of risk-based supervision.

The spatial organization of nodes and their directional alignment collectively convey the conceptual evolution of PKPT as a governance innovation that emphasizes prevention over correction. The figure demonstrates that each stage of oversight serves not as an endpoint, but rather as a link in an adaptive cycle of continuous improvement. Feedback connections return to the risk identification phase of the Inspectorate's learning process, where audit results inform future risk assessments and strategic adjustments (Lindgren, 2015; Soobaroyen et al., 2019). The dynamic interaction between nodes, edges, and hierarchical positions symbolizes the shift from bureaucratic audit practices to a data-driven oversight model aligned with modern principles of transparency and accountability.

This figure summarizes the essence of the risk-based PKPT framework as a multidimensional system integrating policy formulation, operational execution, and strategic evaluation. Its circular and interconnected structure demonstrates that public sector oversight operates within a complex, adaptive system, rather than a rigid procedural hierarchy. The placement of nodes with numerous inbound and outbound connections reflects the distributed nature of decision-making, where effectiveness depends on coordination, communication, and institutional learning. Ultimately, this diagram depicts PKPT implementation as a living mechanism capable of self-correction, fostering resilience in local governance, and ensuring that audit interventions are responsive to evolving administrative risks.

Structural and Operational Challenges in the Implementation Process

Structural and operational challenges in the implementation of the risk-based Annual Supervision Work Program (PKPT) emerge as fundamental barriers that influence the overall effectiveness of internal control and oversight within local governance. The structure of the Inspectorate, which serves as the backbone of supervision at the municipal level, remains constrained by limited institutional capacity and organizational complexity. The inadequacy of human resources, particularly the shortage of certified and competent auditors, generates a substantial imbalance between workload and personnel capability. The Balikpapan City Inspectorate currently operates with a significantly smaller number of auditors compared to the recommended standard, resulting in inefficiencies in task distribution and time management. This condition hinders the ability to conduct in-depth and comprehensive supervision, leading to potential oversight gaps in high-risk areas. The absence of a specialized unit dedicated to risk management further complicates the process of integrating risk-based approaches into daily audit planning and execution. The existing bureaucratic hierarchy often prolongs decision-making processes and limits the flexibility required to respond promptly to emerging administrative risks (Pacheco-Cubillos et al., 2024).

Financial and logistical constraints exacerbate these structural weaknesses. The budget allocated for supervision activities remains below the recommended proportion of the total regional expenditure, reducing the capacity to conduct extensive audits, procure modern tools, and invest in continuous auditor training. Limited financial resources restrict the Inspectorate's ability to implement advanced audit methodologies or digital monitoring systems that could enhance accuracy and efficiency (Al-Omush et al., 2025). The operational dependence on manual documentation and fragmented data management systems reflects an underdeveloped technological infrastructure that impedes real-time tracking of audit progress (Courage Oko-Odion & Onyenum Ruth Udoh, 2024). The lack of integrated data sharing across regional

departments reduces transparency and prevents auditors from accessing relevant information promptly. The pressure of mandatory supervision tasks from central ministries and national oversight bodies further complicates local operational scheduling, often forcing the Inspectorate to prioritize externally imposed audits at the expense of locally strategic programs (A.C Nwachukwu, 2024). This imbalance disrupts the coherence of the annual PKPT agenda, diminishing the Inspectorate's autonomy and its ability to conduct risk-driven supervision aligned with local priorities.

Managerial challenges also persist in the form of coordination gaps and inconsistent internal communication. The absence of a unified risk assessment framework leads to variations in how different audit teams perceive and categorize risk factors, producing inconsistencies in audit quality and reporting standards (Babalola et al., 2022; Graham et al., 2018; Porcuna-Enguix et al., 2021). Communication barriers among divisions within the Inspectorate hinder information flow and collective decision-making, resulting in redundant activities and incomplete evaluations. The absence of systematic performance indicators for audit teams prevents the organization from accurately measuring progress and identifying areas requiring improvement. The limited application of audit management software or digital platforms creates inefficiencies in documentation and follow-up processes, weakening the traceability of audit findings and corrective actions. The cumulative impact of these structural and operational challenges reduces the strategic value of the PKPT, as the Inspectorate becomes more reactive than preventive in addressing governance risks. Strengthening institutional design, optimizing resource allocation, and adopting integrated technological solutions are therefore essential to transform the Inspectorate into a dynamic and adaptive oversight entity capable of fulfilling its mandate effectively.

Table 1 Struktural and Operational Challenges in the Implementation Process

Challenge	Severity Index (%)		Frequency	Average Impact	Category	Weighted Score
	Structural Severity	Operational Severity				
Manual Processes	77.4	88.3	15	82.8	High	82.8
Mandates Overload	78.0	70.2	15	74.1	High	74.1
Data Access Issues	91.4	71.4	13	81.4	High	70.5
Budget Shortfall	76.7	74.9	11	75.8	High	55.6
Lack of Continuous Training	64.5	85.0	10	74.8	High	49.9
IT Infrastructure Deficit	87.3	77.9	9	82.6	High	49.6
Human Resource Shortage	85.6	77.6	9	81.6	High	49.0
Coordination Gaps	77.6	55.8	5	66.7	Moderate	22.2

Source Data Processed by the Author 2025

Table 1 presents a network of constraints affecting the efficiency and responsiveness of the Annual Risk-Based Supervision Work Program (PKPT) in regional government inspectorates. This presentation adopts a two-dimensional approach by evaluating structural and operational severity, allowing for a comprehensive understanding of how systemic and procedural challenges interact and undermine the quality of governance oversight. The use of quantitative indicators, expressed as percentage severity scores, provides a measurable framework for assessing the depth and persistence of each challenge. Highlighted categories such as Manual Processes, Mandate Overload, and Data Access Issues demonstrate structural weaknesses reflecting outdated institutional mechanisms unable to adapt to the complexities of modern audit requirements. The dominance of these challenges in the upper range of the table underscores the central role of administrative modernization and digital transformation in the effectiveness of risk-based oversight.

The severity index column provides a visual narrative of the institutional imbalance between structural and operational performance. A score exceeding 80 percent indicates acute difficulties that directly impact audit planning, execution, and reporting. The lack of standardized operating procedures, fragmented communication, and inadequate automation collectively slow the audit cycle and weaken the Inspectorate's ability to identify irregularities before they escalate. The color gradient in the severity column intuitively communicates the intensity of each challenge, while darker shades indicate critical stress points within the organizational framework. The consistency of high severity scores across categories indicates that weaknesses are not isolated but interdependent, forming systemic patterns that perpetuate inefficiencies. The high magnitude of operational severity compared to structural severity further indicates that process-related deficiencies rather than institutional design are the primary impediments to optimal PKPT implementation (Zhaahir et al., 2025).

The Average Impact Score integrates structural and operational dimensions into a unified metric, allowing for direct comparisons across challenges. A high average score reflects not only the difficulty of addressing the issue but also its cascading impact across the audit system. For example, Manual Processes and Data Access Issues exhibit high average impacts because they hinder timely information flow, data accuracy, and cross-departmental coordination. Categorizing challenges into High and Medium levels provides a qualitative layer of interpretation that complements the numerical data, indicating that most barriers require immediate managerial and policy responses. The absence of a "Low" category in the data set visually reinforces the notion that the Inspectorate operates in a high-risk environment, where nearly every operational component is subject to significant constraints. This reinforces the need for continuous institutional learning and adaptive management within the Inspectorate's operational culture (Hall, 2017; Joana & De Carvalho, 2024; Joshua, 2025).

The Frequency column introduces another analytical dimension, emphasizing how frequently these challenges arise during routine oversight activities. The recurring occurrence of certain obstacles, particularly those related to human resource shortages and coordination gaps, suggests that these obstacles are not random or situational, but rather embedded in the institution's routine functioning. High-frequency challenges consume substantial administrative energy, forcing the Inspectorate to shift attention from preventive and strategic oversight to corrective and reactive measures. This combination of high frequency and high impact results in persistent inefficiencies that accumulate over time, eroding the institution's credibility and reducing public confidence in the audit process. This accumulated operational burden reflects the limited resilience of the existing system to accommodate evolving regulatory demands and the dynamic nature of regional governance risks (Craig et al., 2017; Monstadt & Schmidt, 2019; Roberts, 2023).

The Weighted Score column synthesizes several dimensions severity, frequency, and systemic impact into a single comparative indicator that ranks challenges based on their overall significance. The visual distribution of the weighted scores indicates that operational deficiencies, such as those related to information management and coordination, dominate the upper end of the scale. This pattern suggests that while structural reforms are important, their effectiveness will remain limited unless operational processes are modernized and integrated through digital systems. The gap between structural and operational scores further highlights the uneven pace of institutional adaptation, where policy adjustments often outpace the organization's technical capacity to implement them effectively (Pemer & Skjølsvik, 2018; Tezano, 2024). This misalignment contributes to repeated audit findings, delayed follow-up, and inconsistent implementation of corrective recommendations.

The aesthetically pleasing table presentation reinforces the analytical narrative by infusing meaning into color, typography, and numerical sequence. Darker, more saturated cells indicate zones of institutional fragility, while lighter colors highlight areas of relative stability. The visual hierarchy allows for quick understanding of complex data relationships, helping policymakers and managers identify intervention priorities. The table goes beyond its descriptive purpose by serving as a decision-support tool, offering a foundation for designing targeted reforms that address systemic and procedural deficiencies (Ferretti & Montibeller, 2016; Talukder, 2025, 2025). The integration of severity, frequency, and weight indicators provides a holistic framework for policy evaluation, allowing the Inspectorate to track progress over time and assess the effectiveness of reform interventions.

The broader implications of the data presented in this table lie in its reflection on the adaptive challenges facing governance institutions. The numerical symmetry between structural and operational dimensions symbolizes the interdependence between organizational architecture and day-to-day administrative behavior. Robust institutional structures cannot produce effective results without the operational capacity to efficiently execute complex tasks. The persistent emergence of high-impact issues demonstrates the need for a transformative approach, rather than incremental improvements. Thus, this table encapsulates the ongoing tension between bureaucratic rigidity and managerial innovation in the realm of public oversight. By translating complex governance phenomena into measurable and interpretable data, this visualization reinforces the principle that effective risk-based oversight depends equally on human competence, resource adequacy, and technological sophistication.

Strategies for Optimizing the Quality of Risk-Based Supervision

Strategies for optimizing the quality of risk-based supervision emphasize the importance of strengthening institutional capacity through a comprehensive approach that integrates human resources, technology, and governance reform. The foundation of an effective supervision system lies in the professional competence and ethical integrity of the auditors who execute it. A consistent program of capacity development, including continuous professional education, specialized certification, and training in modern risk management techniques, is crucial for improving analytical and decision-making abilities. The establishment of structured mentorship mechanisms within the Inspectorate encourages knowledge transfer among senior and junior auditors, fostering a culture of learning and accountability. The implementation of competency-based assessments ensures that audit assignments align with the specific skills of auditors, reducing errors and improving the accuracy of risk evaluation. The government's investment in human capital, coupled with performance-based incentives, enhances motivation and commitment among supervisory personnel, thereby strengthening institutional resilience in managing complex oversight tasks.

Optimization also requires the integration of technological innovation to ensure that risk-based supervision operates efficiently and transparently. The use of digital audit management systems enables real-time data collection, automated risk profiling, and systematic tracking of follow-up actions. The adoption of information technology allows auditors to transition from manual documentation toward data-driven analysis, improving both the speed and accuracy of decision-making (Dako et al., 2020; Mirwali Azizi et al., 2024). The development of centralized databases facilitates data sharing across departments, eliminating redundancy and minimizing the risk of missing critical information. Advanced data visualization tools can identify patterns of irregularities and predict emerging risks before they evolve into systemic problems. The digital transformation of the Inspectorate's processes not only enhances technical performance but also

reinforces public trust through transparent reporting and accessible audit outcomes. The integration of technology must, however, be accompanied by adequate digital literacy training to ensure that auditors are capable of utilizing new tools effectively (Leocádio et al., 2025, 2025).

Strengthening inter-organizational coordination and policy coherence forms the third pillar of optimization. The success of risk-based supervision depends on continuous collaboration between the Inspectorate, local government departments, and external oversight institutions such as the Financial and Development Supervisory Agency (BPKP). Establishing regular coordination meetings, joint risk assessment workshops, and standardized communication protocols can harmonize supervisory objectives and methodologies. Such collaborative governance reduces duplication of efforts and aligns audit priorities with strategic development goals. The introduction of performance-based monitoring frameworks ensures that audit results are linked to measurable governance improvements, making supervision an integral component of public sector reform. A supportive policy environment—marked by strong leadership commitment, sufficient funding, and legislative reinforcement—creates a sustainable foundation for institutionalizing these strategies. The implementation of these integrated approaches transforms risk-based supervision into a proactive, adaptive, and learning-oriented system capable of safeguarding public resources while promoting transparency and accountability in local governance.

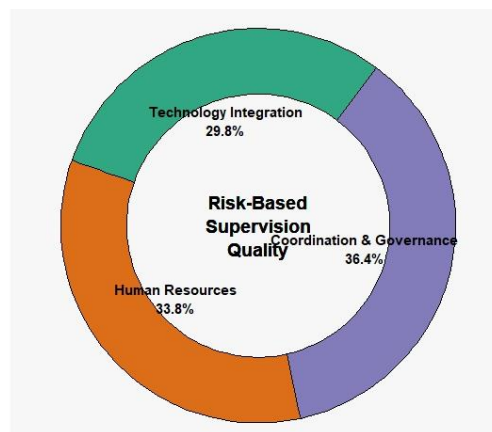


Figure 2 Strategies for Optimizing the Quality of Risk-Based Supervision
 Source Data Processed by the Author 2025

Figure 2 represents the proportional distribution of strategic domains that collectively determine the quality and readiness of risk-based supervision within the institutional governance framework. Each colored segment depicts a specific strategic pillar: Human Resources, Technology Integration, and Coordination & Governance. The circular shape conveys the idea of continuity and interdependence, where no domain operates in isolation. The main text, "Quality of Risk-Based Supervision," serves as the focal point, symbolizing the integrated results of all three domains working cohesively. The outer circle quantifies their relative contributions through the percentage values assigned to each sector. The figure emphasizes that improving supervision quality does not depend on a single reform dimension, but rather on a balanced orchestration of human capacity, technological innovation, and systemic coordination mechanisms. The subtle color gradient further reinforces the sense of harmony, reflecting the need for integration among these institutional dimensions.

The segment representing Coordination & Governance occupies the largest portion of the circle, reaching 36.4 percent of the total composite. This dominance reflects the critical role of organizational alignment, policy coherence, and managerial coordination in ensuring efficient and accountable supervision processes. The significant contribution of this domain demonstrates that effective governance practices create a conducive environment in which a risk-based approach can function optimally. The coordination aspect ensures synchronization between supervisory units, while governance provides the institutional discipline necessary to maintain procedural integrity and ethical compliance. The visual prominence of this segment illustrates that the policy framework and leadership structure are key drivers of successful risk-based supervision. A well-coordinated institutional ecosystem reduces duplication, increases transparency, and builds mutual trust among internal and external stakeholders, all of which are essential prerequisites for sustained audit quality (Shonibare et al., 2023).

The Human Resources segment, accounting for 33.8 percent, comes next, representing the indispensable human dimension of risk-based supervision. The nearly equal proportion compared to governance underscores that even the most structured system fundamentally relies on human judgment, professionalism, and ethical consistency. This allocation demonstrates that continuous learning, certification programs, and performance-based incentives are central to maintaining adaptive and competent audit personnel. The strategic significance of this domain lies in its ability to translate technical frameworks into effective practices. The human factor determines how risk assessments are interpreted, how audit findings are contextualized, and how recommendations are communicated. This segment's visual distinction demonstrates that investment in human resources is both a preventative and developmental strategy, serving to maintain institutional agility in an evolving risk environment. The Inspectorate's commitment to human resource development directly impacts its credibility and capacity to conduct complex audits in a dynamic governance landscape (Labolo et al., 2025).

Technology Integration, which accounts for 29.8 percent, highlights the transformative potential of digital innovation in optimizing supervisory performance. This moderate but substantial share demonstrates that while technology plays an enabler role, its effectiveness depends on how it is embedded in organizational routines and human competencies. This proportion reflects the increasing, but still maturing, emphasis on digital tools for risk profiling, data analytics, and audit management. Information system integration not only accelerates anomaly identification but also facilitates data-driven decision-making, ensuring that supervision becomes predictive rather than reactive. The visual design of this segment, presented in a cooler tone, symbolizes the rational and analytical aspects of governance modernization. The steady expansion of technology adoption in the supervisory function reflects the ongoing institutional shift from traditional compliance audits toward an evidence-based, integrated supervisory system capable of managing complex governance risks.

The overall composition of the diagram demonstrates the balance and interdependence among the three domains, with none alone guaranteeing optimal supervisory outcomes. The nearly proportional distribution across sectors suggests that strengthening one area without considering the others will only yield limited benefits. The visual harmony reinforces the conceptual message that the quality of risk-based supervision emerges from systemic interactions, rather than isolated initiatives. The central label placement unifies the triadic structure, reminding viewers that human competence, technological capacity, and governance coordination converge toward a single institutional goal. The aesthetic symmetry between shapes and colors reflects the theoretical balance required for real-world implementation. Thus, the

chart serves not only as a quantitative representation of strategic contributions but also as an analytical metaphor for the holistic nature of effective institutional supervision.

The three analytical domains—Coordination and Governance, Human Resources, and Technology Integration—collectively depict an interrelated framework that defines the institutional maturity of risk-based oversight. The prominence of the coordination and governance domains underscores that managerial synchronization, regulatory coherence, and institutional accountability remain key drivers of effective oversight. The strong contribution of the human resources domain reveals that auditors' technical competence, ethical commitment, and adaptive capacity are equally crucial in ensuring that oversight practices remain credible and responsive to evolving risks. The technology dimension, although slightly smaller in proportion, represents a catalytic factor that transforms procedural routines into data-driven, efficient, and transparent audit systems. The combined interpretation of these domains suggests that the success of risk-based oversight depends on the alignment of human expertise, systemic governance, and technological infrastructure. The integrated operation of these three pillars creates a dynamic environment in which risk identification, monitoring, and mitigation can occur continuously and accurately, ensuring that oversight institutions evolve from compliance-oriented entities to learning organizations that anticipate and proactively manage governance challenges.

CONCLUSION

The overall findings illustrate that the quality of risk-based supervision is the result of an integrated interaction between governance coherence, human resource competency, and technological innovation, with each domain mutually reinforcing the other in shaping institutional performance. The dominance of coordination and governance suggests that clear structures, leadership alignment, and policy consistency provide the foundation for strategic implementation, while the presence of strong human resources highlights that skilled and ethically grounded auditors are instrumental in transforming procedures into impactful results. The contribution of technology integration demonstrates that digitalization acts as both a driver and a multiplier of efficiency, accuracy, and transparency in the supervisory process. The synthesis of these three dimensions confirms that continuous improvement in audit quality and risk management requires a balanced approach that aligns organizational reform, professional capacity development, and technological modernization within an integrated institutional framework.

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