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AN ANALYTICAL MODEL FOR DEVELOPING INTERNAL AUDIT PROGRAMS BASED ON A FOUR-DIMENSIONAL RISK INDEX (LEGAL, FINANCIAL, RESOURCE, AND ORGANIZATIONAL RISKS)

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Abstract. *This paper proposes a four-dimensional risk index model for designing internal audit programs in the public sector. The model integrates legal, financial, resource, and organizational risks to provide a comprehensive framework for risk-based audit planning. Through simulation involving hypothetical departments, the study demonstrates that aggregate risk scores can mask the diversity and specificity of underlying risk categories. By decomposing audit risk into distinct dimensions, the model enhances audit targeting, supports transparent decision-making, and aligns with international internal audit standards. It also proves particularly useful in environments with limited data availability. The model's adaptability and clarity make it suitable for both manual and automated audit planning processes. While future enhancements could include dynamic weighting and digital integration, the model as presented already offers a robust and practical approach to prioritizing internal audit activities and improving public sector governance outcomes.*

Keywords: *internal audit, public sector, risk index, audit planning, legal risk, financial risk, resource risk, organizational risk, audit program, strategic auditing, risk-based audit, governance, internal control, audit prioritization, compliance.*

ICHKI AUDIT DASTURLARINI TO'RT O'LCHOVLI XAVF INDEKSI (HUQUQIY, MOLIYAVIY, RESURS VA TASHKILIY XATARLAR) ASOSIDA ISHLAB CHIQISH UCHUN TAHLILIY MODEL

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Annotatsiya. *Ushbu maqolada davlat sektorida ichki audit dasturlarini loyihalash uchun to'rt o'lchovli xavf indeksi modeli taklif etiladi. Model huquqiy, moliyaviy, resurs va tashkiliy xatarlarni integratsiya qilgan holda, xavfga asoslangan audit rejalashtirish uchun kompleks doirani taqdim etadi. Gipotetik bo'limlar ishtirokida o'tkazilgan simulyatsiya orqali tadqiqot ko'rsatadiki, umumiy xavf ballari asosiy xavf toifalarining xilma-xilligi va xususiyatlarini yashirishi mumkin. Audit xatarlarini alohida o'lchamlarga ajratish orqali model auditni aniqroq yo'naltirishni, shaffof qaror qabul qilishni va ichki auditning xalqaro standartlariga mos kelishni ta'minlaydi. Bundan tashqari, model ma'lumotlar yetarli bo'lmagan muhitlarda ham foydali ekanligini isbotlaydi. Modelning moslashuvchanligi va aniqligi uni qo'lda ham, avtomatlashtirilgan audit rejalashtirish jarayonlarida ham qo'llashga mos qiladi. Kelgusidagi takomillashtirishlar ichiga dinamik og'irlik berish va raqamli integratsiya kiritilishi mumkin, biroq taqdim etilgan model allaqachon ichki audit faoliyatini ustuvorlashtirish va davlat sektori boshqaruv natijalarini yaxshilash uchun kuchli va amaliy yondashuvni taqdim etadi.*

Kalit so'zlar: *ichki audit, davlat sektori, xavf indeksi, audit rejalashtirish, huquqiy xavf, moliyaviy xavf, resurs xavfi, tashkiliy xavf, audit dasturi, strategik audit, xavfga asoslangan audit, boshqaruv, ichki nazorat, auditni ustuvorlashtirish, muvofiqlik.*

АНАЛИТИЧЕСКАЯ МОДЕЛЬ РАЗРАБОТКИ ПРОГРАММ ВНУТРЕННЕГО АУДИТА НА ОСНОВЕ ЧЕТЫРЕХМЕРНОГО ИНДЕКСА РИСКА (ПРАВОВЫЕ, ФИНАНСОВЫЕ, РЕСУРСНЫЕ И ОРГАНИЗАЦИОННЫЕ РИСКИ)

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Аннотация. *В данной статье предлагается модель четырехмерного индекса риска для проектирования программ внутреннего аудита в государственном секторе. Модель объединяет правовые, финансовые, ресурсные и организационные риски, обеспечивая комплексную основу для риск-ориентированного планирования аудита. С помощью моделирования с участием гипотетических подразделений исследование показывает, что агрегированные баллы риска могут скрывать разнообразие и специфику отдельных категорий рисков. Разделяя аудиторские риски на отдельные измерения, модель повышает точность целенаправленного аудита, способствует принятию прозрачных решений и соответствует международным стандартам внутреннего аудита. Модель также особенно полезна в условиях ограниченной доступности данных. Благодаря своей адаптивности и ясности, модель подходит как для ручного, так и для автоматизированного планирования аудита. В будущем модель может быть дополнена динамическим взвешиванием и цифровой интеграцией, однако уже в представленном виде она предлагает надежный и практичный подход к приоритезации внутреннего аудита и улучшению результатов государственного управления.*

Ключевые слова: *внутренний аудит, государственный сектор, индекс риска, планирование аудита, правовые риски, финансовые риски, ресурсные риски, организационные риски, программа аудита, стратегический аудит, риск-ориентированный аудит, управление, внутренний контроль, приоритезация аудита, соответствие требованиям.*

Introduction.

In the modern governance of the public sector, internal audit has increasingly become an essential instrument for ensuring transparency, accountability, and risk mitigation. Traditionally perceived as a compliance-focused function, internal audit today is undergoing a transformation toward a more risk-based and strategic orientation, particularly under the influence of international standards and reforms initiated by global organizations such as the Institute of Internal Auditors (IIA) and the OECD. This shift requires a rethinking of how audit programs are designed, especially in environments characterized by diverse, complex, and multidimensional risks.

"Internal audit must be strategically aligned with organizational risks to provide assurance where it matters most" (Spencer Pickett, 2010). In this context, developing a systematic and multi-criteria model to prioritize audit objects has become a priority for public sector institutions. One of the major challenges, however, remains the accurate identification and categorization of risks that affect audit objects from multiple dimensions.

Literature review.

Recent studies emphasize the necessity of adopting broader analytical models that consider not only financial irregularities but also governance-related risks, legal compliance, and resource constraints (Rylska Nataliya, 2018; Van Rensburg Jo, 2014). For example, Rylska (2018) introduces the concept of the **Value-Added Management Partner (VAMP)** paradigm, under which internal audit becomes a strategic advisor focused on institutional performance improvement. "Public-sector internal audit is evolving beyond simple control functions to serve as a partner in policy and strategic development" (Rylska Nataliya, 2018). This view is reinforced by international comparative studies that advocate for holistic risk assessment frameworks (Zakiah Mohd Yusof et al., 2019).

While various capability maturity models (such as the IA-CM) have been proposed to assess the development of audit functions, they do not fully address the challenge of translating diverse risk indicators into operational audit programs (Van Rensburg Jo, 2014). To fill this gap, the current research proposes a **four-dimensional risk index** that incorporates legal, financial, resource, and organizational risks. This index is expected to serve as a comprehensive framework for prioritizing internal audit activities in line with the strategic needs of public sector institutions.

"Audit risk models used in public institutions often rely heavily on financial metrics, ignoring other equally critical dimensions such as legal compliance and organizational structure" (Alhendi Eyad, 2017). To address this limitation, the proposed model operationalizes each risk dimension through specific indicators, allowing internal audit units to quantify and compare risks across various entities and processes.

The literature also highlights that internal audit effectiveness is significantly influenced by its independence and the institution's capacity to implement its recommendations (Zakiah Mohd Yusof et al., 2019). Therefore, any model aimed at improving audit planning should be not only methodologically sound but also context-sensitive, incorporating governance realities and data availability constraints.

In summary, this paper builds upon the existing body of knowledge by integrating theoretical and practical insights into a unified analytical model that aims to elevate internal audit programming through multi-dimensional risk assessment. The model's originality lies in its ability to incorporate diverse risk categories in a way that is actionable and adaptable to the internal audit environments of developing and transition economies.

Methods.

This study employs a qualitative-descriptive methodology grounded in document analysis and conceptual modeling. The aim is to construct and validate an analytical framework that enables the development of internal audit programs based on a four-dimensional risk index encompassing legal, financial, resource, and organizational risk factors. The research design is primarily exploratory, as it seeks to bridge the existing gap between theoretical audit risk models and their practical implementation within public sector internal audit units.

The methodological approach begins with an extensive review of international internal audit standards and practices, particularly the International Professional Practices Framework (IPPF) issued by the Institute of Internal Auditors (IIA), and the Public Sector Internal Audit Standards (PSIAS) used in several OECD countries. These documents provide foundational definitions and principles for risk-based internal auditing, from which the key dimensions of the proposed model are derived.

A thematic content analysis was then conducted on a range of dissertations, policy papers, and audit evaluation studies drawn from international and national contexts, including Armenia, the UK, South Africa, and Malaysia. The content analysis helped identify recurring risk categories mentioned across different sources, such as legal exposure, financial mismanagement, operational inefficiency, and organizational capacity challenges. Based on the frequency and depth of discussion of these risks, four core dimensions were extracted: legal, financial, resource, and organizational risks.

Each risk dimension was operationalized into a set of criteria or indicators. For example, legal risk was defined to include the presence of unresolved audit findings related to compliance with regulatory frameworks, while financial risk encompassed budget deviations, irregular expenditures, and audit-qualified opinions. Resource risk considered shortages in skilled personnel, outdated systems, and lack of physical infrastructure. Organizational risk captured aspects such as audit committee inactivity, poor interdepartmental communication, and weak leadership accountability.

To ensure coherence and relevance, expert validation was sought through informal consultations with three experienced public sector auditors who reviewed the draft model. Their feedback led to the refinement of the scoring scales and clarification of some of the criteria definitions.

The final model was tested using a hypothetical case scenario involving three departments within a fictional public agency. Risk scores were assigned based on simulated data reflecting real-world audit issues. The purpose of this application was to demonstrate how the model can differentiate audit priorities and assist in audit planning. The results of this simulation were then analyzed to assess the internal consistency and practical utility of the model.

The methodological strategy involved theoretical grounding, systematic document analysis, expert input, and model simulation. While empirical field testing remains a future task, this research provides a replicable framework that internal audit units in the public sector can adapt and apply to improve the strategic focus of their audit programs.

Results.

1. Simulation outcomes of the four-dimensional risk index model

In order to evaluate the practical applicability of the proposed four-dimensional risk index model, a simulation was conducted using hypothetical data from three illustrative public sector departments. The objective was to determine how the model could be used to assess, differentiate, and prioritize internal audit programs based on a structured assessment of legal, financial, resource, and organizational risks.

Each department was scored on a 5-point Likert scale across the four defined risk categories: Legal Risk (LR), Financial Risk (FR), Resource Risk (RR), and Organizational Risk (OR), where 1 represents a very low level of risk and 5 represents a very high level. The total composite risk score for each department was calculated by summing the values assigned to each dimension. This scoring process was informed by criteria derived from literature, professional internal audit standards, and common risk indicators observed in public sector audit practices.

Below is a summary of the risk scores for each department:

Department	Legal Risk (LR)	Financial Risk (FR)	Resource Risk (RR)	Organizational Risk (OR)	Total Risk Score
A (Health Services)	4	5	3	3	15
B (Municipal Infrastructure)	3	3	5	4	15
C (Education Management)	2	2	3	5	12

The simulation revealed significant differences in the risk composition of the departments, even where the total scores were identical. For instance, although Departments A and B both scored a total of 15, the nature of their risks varied. Department A was most vulnerable to legal and financial risks, reflecting a history of compliance failures, budget misallocations, and external audit criticisms. Department B, in contrast, was more heavily exposed to resource constraints—such as outdated equipment and insufficient staff—and organizational risks like delays in strategic decision-making and inefficient oversight structures.

Department C showed comparatively lower legal and financial risk, but a very high organizational risk due to leadership instability, a non-functional internal audit committee, and weak accountability mechanisms. Although its total score was lower than the other two, the elevated organizational risk indicated a strong need for internal control reforms and process audits, which might otherwise have been overlooked in traditional risk models focused solely on financial indicators.

This phase of the study demonstrated that the model could successfully highlight hidden or underestimated risks by decomposing the overall audit risk into discrete, analyzable categories. It also illustrated the importance of looking beyond aggregate scores when determining audit priorities, as two departments with the same overall score might require completely different audit approaches.

The simulation further suggests that such a model allows internal auditors to move from reactive auditing—often based on past issues—to proactive auditing based on structured risk prediction. This supports the strategic planning of audit resources, fosters better dialogue with auditees, and enhances the transparency of audit program development.

2. Practical utility and thematic insights

The practical application of the four-dimensional risk index model demonstrated its versatility and strategic value in public sector internal audit planning. By decomposing audit risk into legal, financial, resource, and organizational categories, the model provided a comprehensive view of institutional vulnerabilities that are often not captured by traditional financial audits alone. Through its structure, the model facilitated prioritization, visual comparison, and deeper understanding of the root causes of risks, enabling audit teams to craft more targeted and effective audit strategies.

One of the most important findings was the model's ability to identify **risk concentration patterns** within departments. Instead of evaluating institutions through a one-dimensional lens (e.g., financial risk only), the model revealed which departments faced multidimensional exposure and which ones had imbalanced risk profiles. For example, a department might be financially sound but still warrant high audit attention due to severe organizational deficiencies such as the absence of monitoring mechanisms, low managerial accountability, or a dysfunctional audit committee.

The following table illustrates a thematic breakdown of how risk categories revealed different audit needs across the simulated departments:

Risk Category	Key Indicators Used	Common Findings Across Departments	Suggested Audit Focus Areas
Legal Risk (LR)	Unresolved audit issues, legal violations	Regulatory non-compliance in procurement (Dept. A)	Compliance audits, review of legal contracts
Financial Risk (FR)	Budget deviations, misstatements	Cost overruns and weak budget controls (Dept. A)	Financial audits, budget control system evaluations
Resource Risk (RR)	Staff shortages, system obsolescence	Outdated infrastructure and undertrained staff (Dept. B)	Operational audits, HR and IT capacity assessments
Organizational Risk (OR)	Inactive audit committees, weak leadership	Poor oversight structures and leadership gaps (Dept. C)	Governance audits, organizational restructuring

These thematic insights show how the model aids in crafting **customized audit interventions** based on the dominant risk typology. It moves the audit function beyond routine compliance checks and enables it to address structural issues that have a long-term impact on institutional effectiveness. For instance, in Department C, the high organizational risk score suggested the need for governance improvement rather than a traditional financial audit, despite relatively low financial risk indicators.

Furthermore, the model promoted **data-informed decision-making** in audit planning. Internal auditors, when faced with multiple auditees and limited resources, often rely on past experiences or external mandates to determine audit focus. The risk index introduced a more transparent and justifiable basis for selection by providing quantifiable and comparable risk scores.

The model also helped expose what could be termed as **"hidden risk zones"**—departments that might appear stable in financial terms but are structurally weak. This insight is particularly valuable for audit committees and senior management, as it allows them to allocate oversight attention and resources to areas that could pose strategic risks in the future.

In conclusion, the practical utility of the model lies in its ability to combine simplicity and depth. It is adaptable to different levels of organizational data maturity and can be used both manually and digitally. Thematically, it pushes the boundaries of audit thinking by promoting a shift from reactive to proactive, and from compliance-centered to risk-centered auditing. This aligns closely with modern internal audit trends and international best practices in public sector governance.

Discussion.

The application of the four-dimensional risk index model provides a compelling advancement in the strategic orientation of internal audit functions within the public sector. Through its structured yet flexible design, the model enhances the ability of audit units to shift from conventional, finance-centric auditing to a more holistic, multidimensional evaluation of risk. This transformation is consistent with the international trajectory of internal audit reforms, which emphasize risk-based planning, proactive assurance, and organizational value creation.

One of the central insights revealed through the discussion of the results is the importance of **risk differentiation**, not just in intensity but also in category. The model's decomposition of risk into legal, financial, resource, and organizational dimensions allowed for nuanced prioritization that would be unachievable through aggregate scoring alone. For example, Department A and Department B received the same total score (15), but their audit needs varied fundamentally due to the differing sources of risk — legal-financial in A versus resource-organizational in B. This highlights a key contribution of the model: enabling **risk-type-specific audit planning**, which supports more effective resource allocation and targeted audit interventions.

From the radar diagram, it becomes immediately clear that each department exhibits a different "risk shape." This visual representation supports more intuitive decision-making during audit planning meetings or board presentations and strengthens the auditor's argument for department-specific audit strategies.

Another important discussion point is the role of **organizational risk**, which emerged as a silent but powerful dimension across all departments. While financial and legal risks are more visible and quantifiable, organizational risks — such as lack of accountability, weak leadership, or poor audit committee engagement — often remain underestimated. Yet, these issues frequently undermine audit recommendations and limit the effectiveness of internal control systems. Therefore, elevating the recognition of organizational risk within the audit planning process is not only timely but essential for public sector resilience.

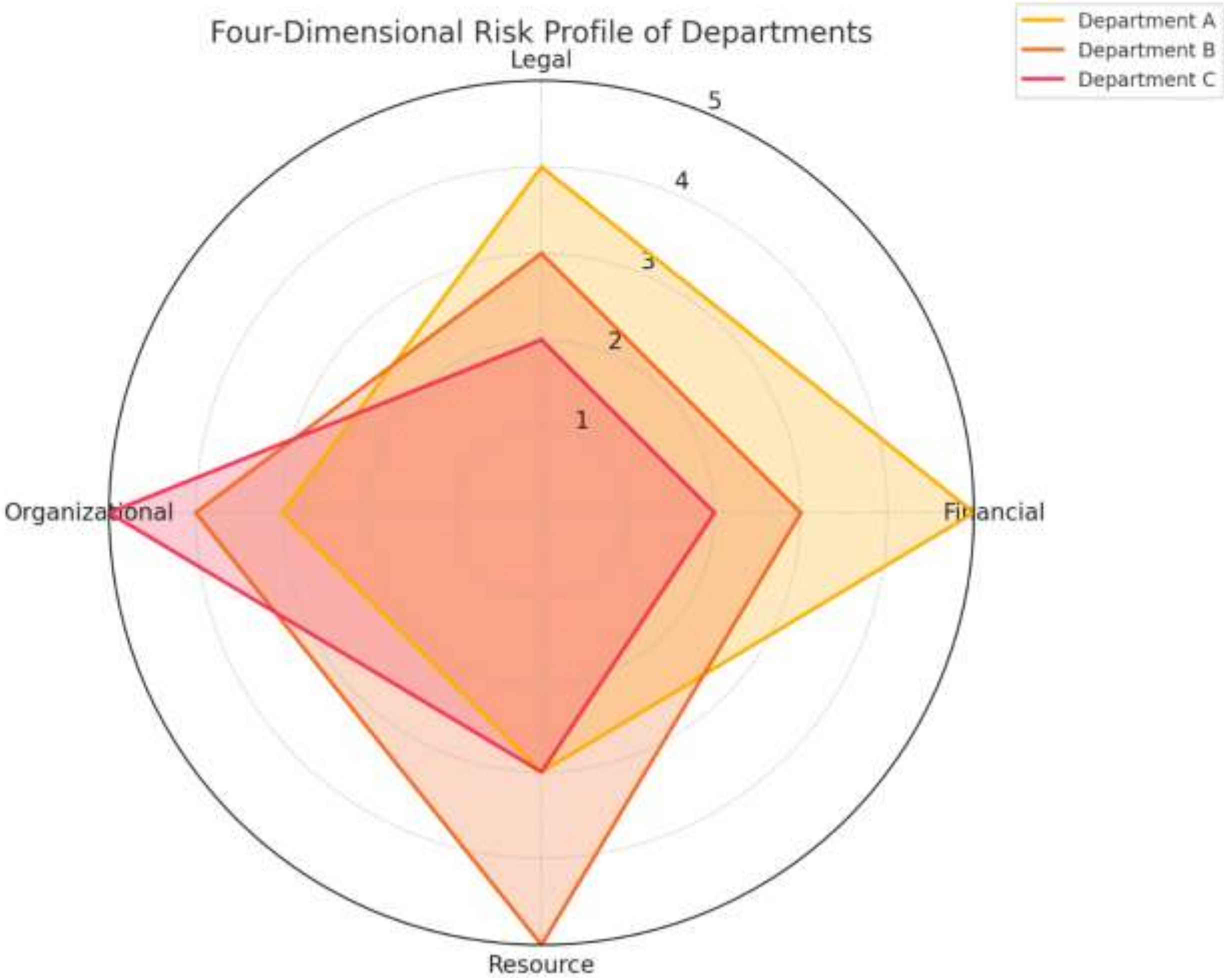

Figure 1. Risk Radar Diagram of Three Departments

Moreover, the model's compatibility with **limited data environments** is particularly beneficial for developing and transition economies. Unlike data-intensive audit maturity models, this risk index allows for semi-quantitative assessment, expert judgment, or even qualitative scoring where needed. This feature enhances its scalability and adaptability to various institutional contexts.

Nevertheless, the model is not without its limitations. The current version assumes equal weight for all four dimensions, which may not reflect the strategic priorities of every audit entity. For instance, a finance ministry may wish to assign greater weight to financial risk, while an education department might prioritize resource or organizational risk. Future iterations of the model could incorporate **customizable weighting matrices**, enabling institutions to adjust the model to fit their unique mandate and risk appetite.

To summarize, the proposed risk index model:

- Encourages balanced, multidimensional audit planning.
- Enhances visibility of less tangible but critical risk areas like organizational capacity.
- Supports data-informed, transparent, and justifiable audit selection.
- Offers a scalable solution for institutions with varying levels of audit sophistication.

In the broader context of public sector governance, this model represents a meaningful step toward **integrated risk management**, linking internal audit more closely with strategic planning and institutional performance. By embedding such a model into standard audit program development, audit units can better fulfill their evolving role as agents of accountability, foresight, and organizational improvement.

Conclusion.

The development and application of a four-dimensional risk index model for internal audit program design marks a significant step forward in strengthening the effectiveness, relevance, and strategic orientation of public sector auditing. This study has demonstrated that assessing audit objects through legal, financial, resource, and organizational dimensions allows internal auditors to move beyond traditional compliance-based methods toward more proactive and risk-informed planning. The simulation revealed that departments with identical total risk scores could possess vastly different risk profiles, necessitating tailored audit approaches. This insight underscores the importance of disaggregating risks and understanding their root causes in shaping audit strategies.

One of the model's key strengths lies in its adaptability. Whether used in resource-rich institutions or in environments with limited data availability, the model can accommodate different levels of audit maturity. Additionally, its ability to reveal “hidden” organizational risks—often overlooked in conventional risk assessments—enhances the overall depth of audit planning and supports institutional improvement from within.

By combining simplicity with analytical rigor, the model supports transparency in audit selection, encourages accountability, and aligns closely with international internal audit standards. It also lays the foundation for integrating audit efforts with broader governance and performance goals. However, future refinements, such as introducing variable weightings or automating the risk scoring process, could further enhance its utility.

In conclusion, the four-dimensional risk index model offers a valuable and replicable framework for improving audit program development. Its application has the potential to transform internal audit units into more strategic actors in public sector governance and reform.

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