

Literature Review: The Manifestation of Optimal Efficiency in PT. Kindo Asia Tama's Production through a Risk-Based Audit Framework

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ABSTRACT

Production efficiency is a fundamental element in the sustainability and competitiveness of a company, especially in a competitive industry such as PT. Kindo Asia Tama. This article aims to describe the application of a risk-based audit framework as a tool to achieve optimal efficiency in production. Through a literature review, this study explores the relationship between risk-based audit methodology and operational efficiency, discusses the challenges faced, and suggests effective implementation strategies. The study results indicate that risk-based audits optimize resource allocation to support productivity.

INTRODUCTION

Dynamic changes in the global market landscape have prompted manufacturing companies to continue to look for ways to stay competitive through increased operational efficiency and effectiveness. Economic uncertainty, fluctuations in raw material prices, and globalization pressures require companies to have a resilient and risk-oriented control system (Gitman, 2006).

In this context, production efficiency is not only understood as cost reduction, but as a systematic effort to optimize the use of resources by considering risks that can affect the sustainability of the production process. Therefore, traditional audit approaches that are routine and generalistic are considered to be less able to detect potential critical issues that have a major impact on organizational goals. Alternatively, the Risk-Based Audit (RBA) approach is beginning to be introduced as a more strategic and adaptive framework.

Risk-based auditing is a method developed and socialized by The Institute of Internal Auditors (IIA) since 2009. This method focuses audit resources on areas that have the highest level of risk in terms of probability of occurrence and impact on the organization. In other words, audits no longer only verify compliance, but also become part of an integral risk management process (IIA, 2009).

According to Spira and Page (2003), risk-based audits allow auditors to provide greater added value because the recommendations produced are strategic, relevant, and proactive. In the manufacturing scope, this means that internal auditors not only look at efficiency in terms of output and cost, but also evaluate risks such as supply chain disruptions, machine failures, product quality deviations, and the risk of compliance with industry regulations.

Studies by Arena and Azzone (2009) show that companies that have implemented risk-based audits tend to have more responsive internal control systems, as well as being able to identify and respond to operational risks more effectively. This is very relevant to the context of PT. Kindo Asia Tama as a manufacturing company oriented towards production efficiency and quality control.

By utilizing a risk-based audit framework, companies can map critical areas in the production process that have high risk potential, and then prioritize oversight and intervention in those areas. This creates a manifestation of optimal efficiency, where efficiency is achieved not only through cost cutting, but through smart and scalable risk management.

As an initial conclusion in this literature review, the risk-based audit approach offers an internal oversight paradigm that is not only reactive, but also strategic, that allows manufacturing organizations such as PT. Kindo Asia Tama to achieve sustainable production efficiency in the face of changing global complexities.

Scope of RBA

1. Identification: Collection of strategic, operational, financial, and compliance risk information (COSO, 2004).

2. Assessment: Measurement of the probability and impact of risk using quantitative (Boyton & Johnson, 2006) and qualitative (Mikes & Kaplan, 2014) methods.
3. Response: Development of control and mitigation recommendations based on risk priorities (Sawyer, 2003).

LITERATURE REVIEW

Product Efficiency Concept

Production efficiency is defined as a company's ability to produce maximum output with minimal inputs. Montgomery (2008) emphasized that efficiency improvement can be achieved by implementing continuous improvement and lean manufacturing to eliminate non-value-added activities. Meanwhile, Gitman (2006) views efficiency from a financial perspective, namely a decrease in total operational costs per production unit.

The Evolution of Risk-Based Audits

Traditional internal audits focus on compliance with financial transactions. However, since the issuance of COSO ERM (2004), the focus of audits has begun to expand to the identification and management of strategic and operational risks. According to IIA (2009), the adoption of RBA allows organizations to respond proactively to changes in the business environment.

RBA in the Manufacturing Industry

Castanheira et al. (2010) found that manufacturing companies that implemented RBA were able to reduce the frequency of machine breakdowns and product defects by up to 20%. Meanwhile, Mineri (2013) reported that RBA helped PT. Kindo Asia Tama identify three Critical Problem Areas—including the printing stage—which then became the focus of mitigation.

Research Gaps

Although many studies highlight the benefits of RBA, there are still few studies that integrate traditional efficiency metrics (such as waste rate, cycle time) with RBA-based risk indicators. Therefore, this study complements the literature by linking production efficiency metrics and the RBA process in a structured manner.

METHODOLOGY

This literature review method is systematically designed to ensure comprehensive and relevant coverage of risk-based audits and production efficiency. The first step begins with determining the core keywords, namely "Risk-Based Audit," "Production Efficiency," and "Manufacturing Audit," which are then used to search academic databases such as Google Scholar, ScienceDirect, ProQuest, and university library repositories. The search is focused on publications between 2000 and 2024 to capture the evolution of audit methodologies and the latest developments in industry practices.

After initial collection, the articles and textbooks found were selected based on inclusion criteria: (1) peer-reviewed articles that discuss the concept or

implementation of risk-based auditing, (2) case study reports in manufacturing companies, and (3) professional standards and guidebooks such as COSO (2004) and IIA (2009) publications. Irrelevant documents, such as those that only discuss financial audits without any aspect of risk, are issued.

The next stage is data extraction, where each source is analyzed to identify key variables including risk identification, risk assessment, mitigation response, as well as efficiency metrics such as productivity, downtime, production costs, and product quality. The information is organized in a matrix of findings, recording research methods, industry samples, as well as key empirical results.

Finally, the synthesis of findings is carried out by comparing and contrasting the results of various studies. Quantitative and qualitative approaches are combined to create a solid conceptual framework. The results of this synthesis are presented in the section on variables, relationships between variables, and empirical case studies of PT. Kindo Asia Tama. Variables and Definitions.

Table 1. Variables, Definitions & Indicators

Category	Variabel	Definitions & Indicators	Source
RBA	Identify Risks	Strategic, operational, and compliance risk mapping processes. Indicators: the number of process areas identified as high-risk.	COSO (2004); Castanheira et al. (2010)
	Risk Assessment	Measurement of the probability and impact of risk. Indicators: risk score (probability × impact) on a scale of 1-25.	Boyton & Johnson (2006)
	Response & Mitigation	Recommendations for internal control measures. Indicator: the percentage of recommendations implemented by management.	Sawyer (2003)
Efficiency	Productivity	Ratio of output per unit of input (labor, machinery). Indicator: percent increase in output per hour worked.	Gitman (2006)
	Downtime	Total engine hours are not operating per month. Indicator: average downtime reduction (%).	Reider (2002)
	Production Costs	Total operating costs (raw materials, labor, utilities) per period. Indicator: the percentage decrease in costs compared to the previous period.	Francis (1998); Gitman (2006)
	Product Quality	The percentage of products that pass the first quality control (First Pass Yield).	Montgomery (2008)

Researcher Source (Data processed 2025)

Relationships Between Variables

1. Identification of Risk → Productivity: Critical risk mapping allows audits to focus resources on problematic processes, resulting in increased productivity by up to 15% (Arens et al., 2008).
2. Risk Assessment → Downtime: Prioritizing machine and process risk reduces downtime by up to 30% (Mineri, 2013).
3. Response → Production Costs: Implementation of audit recommendations brings cost savings of an average of 10%–12% (Sawyer, 2003).

4. Overall RBA → Product Quality: Proactive approach lowers scrap rate from 8% to 3% (IIA, 2009).

RESEARCH RESULT

Referring to the audit data in 2013 (Mineri, 2013), the following is a summary before and after the implementation of RBA:

Table 2. Audit Results Using RBA

Metric	Before the RBA	After RBA	Change (%)
Productivity (units/hour)	50	58	+16%
Downtime (hours/month)	120	84	-30%
Production Cost (Rp/month)	1.200.000.000	1.050.000.000	-12,5%
First Pass Yield (%)	92	97	+5%

Researcher Source (Data processed 2025)

Table 3. Opportunities and Challenges

Challenge	Description	Recommendations
Internal Audit Competency	Lack of expertise in qualitative and quantitative risk assessment techniques (Siahaan, 2009).	Ongoing training and CIA/CRMA certification.
Organizational Culture	Resistance to changes in traditional audit methods (Tampubolon, 2005).	Change management and internal communication programs.
Limitations of Information Systems	Production and risk data are not integrated, hindering analysis (COSO, 2004).	ERP/BI implementation for real-time data synchronization.
Management Support	Lack of commitment at the top level in adopting audit recommendations (Mineri, 2013).	Executive engagement through the risk KPI dashboard.

Researcher Source (Data processed 2025)

DISCUSSION

Interaction of RBA Variables and Operational Efficiency

The findings suggest that the risk identification process affects the effectiveness of risk assessments. Without an accurate risk map, companies risk overlooking critical areas. Therefore, the RBA should start with a comprehensive mapping and update it regularly.

Impact of Quantitative Risk Assessment

Numerical risk score measurement helps the inclusion of historical data – such as the frequency of machine failures – into audit priorities. PT. Kindo Asia Tama uses a scale of 1–25, according to Boyton & Johnson (2006), which facilitates the communication of audit results to management.

Effectiveness of Mitigation Response

Audit recommendations, such as routine maintenance scheduling and operator training, have been shown to lower downtime and scrap rates. However, management support barriers can delay implementation. The study emphasizes the importance of creating a risk dashboard that engages executives to accelerate mitigation decisions.

CONCLUSIONS AND RECOMMENDATIONS

Based on the literature review and empirical case studies, it can be concluded that the implementation of Risk-Based Audit (RBA) makes a significant contribution to the manifestation of optimal efficiency in the production of PT. Kindo Asia Tama.

1. First, the RBA strengthens the risk identification process so that companies can map the most vulnerable areas – such as the printing stage – and allocate audit resources appropriately.
2. Second, quantitative and qualitative risk assessments clarify mitigation priorities, so that machine downtime (downtime) is successfully reduced by 30% and productivity increases above 15%.
3. Third, the audit response focused on internal control and staff training reduced production costs by an average of 10%–12% and improved product quality (First Pass Yield) from 92% to 97%.
4. Fourth, the successful implementation of RBA at PT. Kindo Asia Tama emphasizes the importance of integration between audit methodologies and operational performance metrics, where RBA variables (identification, assessment, response) interact with each other to produce continuous improvement. Furthermore, the study highlights the need for top management support and integrated information systems as key supporting factors bridging the gap between audit recommendations and their implementation.

For PT. Kindo Asia Tama

The implementation of Risk-Based Audit (RBA) within PT. Kindo Asia Tama is not enough only through the restructuring of the internal supervisory function. A comprehensive approach is needed that includes investment in technology infrastructure and strengthening human resource competencies. Specifically, the use of an Enterprise Resource Planning (ERP) system is an important element because it allows the integration of data across functions and business processes, allowing auditors to access production, financial, and logistics data in real-time to conduct more accurate risk assessments. In addition, internal auditor training with a focus on RBA methodologies, quantitative risk assessment, and an understanding of manufacturing systems is key so that the audit process is not only administrative, but can actually influence strategic decision-making.

For Manufacturing Industry in General

This conceptual framework also provides high applicative value for other manufacturing companies. RBA can be adapted to a more contextual approach, namely by including sectoral efficiency indicators, such as waste rate (rate of material waste), cycle time (production duration), yield per batch, and machine uptime. This means that the implementation of RBA in the manufacturing sector is not generic, but must be tailor-made according to the characteristics and challenges of each sector. Thus, risk-based audits are not only a control tool, but can also be transformed into a driving system for operational efficiency.

Strategic Recommendations

1. Internal Audit Competency Strengthening: Intensive certification and training programs related to RBA.

2. Data Digitization and Integration: Adoption of ERP and Business Intelligence for real-time risk analysis.
3. Change Management: Internal campaigns to support a risk-based audit culture.
4. Executive Dashboard: Periodic monitoring of efficiency and risk metrics by top management.

ADVANCED RESEARCH

Limitations

A review of the existing literature still shows that the implementation of RBA in the manufacturing sector is still largely in the form of a single case study, with a descriptive and retrospective approach. This makes it difficult to draw causal conclusions or generalize the long-term impact of the implementation of RBA on the efficiency or competitiveness of the company. In addition, there are limitations in documenting non-financial risks (such as reputation or occupational safety), which are often difficult to quantify but have a major impact on the production process.

Advanced Research Opportunities

More experimental or quasi-experimental research is needed to compare the effectiveness of the RBA approach with conventional internal audits. In addition, the development of analytics and big data technology opens up opportunities to integrate real-time data in the risk assessment process, for example through predictive algorithms that can identify anomalies in the supply chain, machine failures, or production overcapacity. This kind of research will expand the relevance of the RBA towards more proactive predictive audits, and not just reactive to past events.

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