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# Using Artificial Intelligence in Inbound Logistics Decision-Making

*Uso de la inteligencia artificial en la toma de decisiones de la logística de entrada*

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## Abstract

In dynamic business environments, efficiency in inbound logistics decision-making emerged as a key factor for organizational competitiveness. In this context, artificial intelligence (AI) emerged as a strategic tool for optimizing procurement processes, inventory management, and resource planning. The objective of this study was to analyse the influence of artificial intelligence on inbound logistics decision-making in a private company located in Chimbote. The research was conducted using a quantitative approach, with a non-experimental and correlational design. The population consisted of 50 employees, and a census method was applied. Data were collected through a structured questionnaire using a five-point Likert scale, which achieved a Cronbach's alpha coefficient of 0.85, indicating high reliability. The results showed that 40% of employees considered the adoption of artificial intelligence important, while 36% rated it as very important, representing an overall positive assessment of 76%. Furthermore, more than 70% of respondents perceived improvements in supply planning, inventory management, and resource optimization. Inferential analysis revealed a moderate and statistically significant positive relationship between artificial intelligence and inbound logistics decision-making ($\rho = 0.545$; $p < 0.001$). It was concluded that the implementation of AI-based tools significantly contributed to improving operational efficiency, reducing uncertainty, and strengthening procurement management within the organization.

**Keywords**: artificial intelligence, inbound logistics, logistics decision-making, inventory management, operational efficiency.

## Resumen

En entornos empresariales dinámicos, la eficiencia en la toma de decisiones de la logística de entrada se constituyó como un factor clave para la competitividad organizacional. En este contexto, la inteligencia artificial (IA) emergió como una herramienta estratégica para optimizar procesos de abastecimiento,

gestión de inventarios y planificación de recursos. El objetivo de la investigación fue analizar la influencia de la inteligencia artificial en la toma de decisiones de la logística de entrada en una empresa privada de Chimbote. El estudio se desarrolló bajo un enfoque cuantitativo, con diseño no experimental y alcance correlacional. La población estuvo conformada por 50 trabajadores, aplicándose un censo poblacional. Para la recolección de datos se utilizó un cuestionario estructurado con escala tipo Likert de cinco niveles, cuya confiabilidad alcanzó un Alfa de Cronbach de 0.85. Los resultados evidenciaron que el 40% de los trabajadores consideró importante la adopción de inteligencia artificial y el 36% la calificó como muy importante, representando una valoración positiva del 76%. Asimismo, más del 70% percibió mejoras en la planificación del abastecimiento, gestión de inventarios y optimización de recursos. El análisis inferencial mostró una relación positiva moderada y significativa entre la inteligencia artificial y la toma de decisiones logísticas de entrada ($\rho = 0.545$; $p < 0.001$). Se concluyó que la implementación de herramientas basadas en inteligencia artificial contribuyó significativamente a mejorar la eficiencia operativa, reducir la incertidumbre y fortalecer la gestión del aprovisionamiento.

**Palabras clave:** Inteligencia artificial, logística de entrada, toma de decisiones logísticas, gestión de inventarios, eficiencia operativa.

## Introduction

Digital transformation has become a cornerstone of modern business management, driving process optimization and enabling more effective responses to dynamic environments. Castro-Santos et al. (2025) argued that organizations must integrate emerging technologies to manage resources efficiently and strengthen decision-making. Lau Li (2022) noted that digitalization facilitates the generation of organizational knowledge, while Meléndez Tamayo and Flores Rivera (2022) emphasized that such technologies are replacing traditional experience-based approaches. Similarly, Amoroso Castillo et al. (2025) contended that market complexity is accelerating the adoption of technological solutions to improve business performance.

Recent literature recognizes intelligent technologies and data analytics as essential components for strengthening organizational competitiveness. Culot et al. (2024) asserted that digital transformation represents a determining factor for increasing business competitiveness. Kosasih et al. (2024) maintained that integrating intelligent systems enhances internal process efficiency. Silva Carmo et al. (2025) highlighted that technological innovation strengthens organizational adaptation to competitive scenarios, while Cannas et al. (2024) pointed out that advanced analytical tools optimize planning and control processes.

In Latin America, digitalization processes have advanced considerably, though structural limitations persist in consolidating intelligent business systems. Moreira and Villao (2023) argued that many organizations face technological and financial constraints in implementing advanced digital solutions, while Morillo Revelo et al. (2020) identified challenges related to modernizing management processes. Dubey et al. (2021) asserted that technology adoption is fundamental to strengthening organizational resilience. In the Peruvian context, Sharma and Tomar (2026) noted that operational modernization increases business efficiency, while Singh and Pandey (2024) emphasized that emerging technologies optimize resources and strengthen organizational management.

Data-driven decision-making has become essential for improving operational efficiency. According to Striseo Martínez (2024), organizations require reliable information to respond promptly to environmental challenges. Helo and Hao (2022) noted that data analytics generates relevant information for organizational planning and control. Zhang et al. (2022) maintained that analyzing large volumes of information facilitates the identification of strategic patterns, while Dalain et al. (2025) emphasized that evidence-based decisions contribute to improved operational and financial performance.

In this scenario, artificial intelligence has acquired a determining role in supply chain management. Toorajipour et al. (2021) asserted that AI enables process automation and resource optimization through

advanced algorithms. Complementarily, Hao et al. (2025) highlighted that information-based management strengthens business competitiveness and improves decision quality. Samuels (2025) noted that predictive models contribute to optimizing procurement and control activities, while Teixeira et al. (2025) maintained that machine learning facilitates efficient inventory and resource management.

The integration of artificial intelligence into the supply chain also strengthens responsiveness to uncertain scenarios. Harrir and Triqui Sari (2025) pointed out that intelligent tools enable risk anticipation and reduce the impact of unexpected events. Sánchez Cruz (2025) argued that digitalization strengthens logistical adaptability. Zaid et al. (2026) emphasized that artificial intelligence helps ensure operational continuity during supply disruptions, thereby reinforcing organizational resilience.

The growing availability of information from enterprise systems and digital platforms has facilitated the development of intelligent solutions for logistics management. Daios et al. (2025) highlighted that intelligent systems generate strategic information to support operational decisions and promote organizational sustainability. Jackson et al. (2024) demonstrated that these tools contribute to reducing uncertainty in dynamic environments. Consequently, organizations can improve operational efficiency and strengthen logistics planning and control processes.

Within this context, inbound logistics acquires strategic importance by integrating procurement activities, inventory management, and supplier coordination. Layode et al. (2024) argued that digital tools improve coordination and traceability in logistics processes. Farro Acosta et al. (2026) emphasized that artificial intelligence has significant potential to improve logistics decision quality through information analysis and more accurate predictions. These capabilities enable resource optimization, reduction of operational errors, and improved responsiveness to demand fluctuations.

International evidence shows that artificial intelligence significantly improves supply chain management by increasing operational efficiency, optimizing inventory control, and strengthening procurement planning. Suescum Coelho et al. (2025) maintained that AI application in inbound logistics optimizes processes such as supplier selection, inventory management, and demand planning. However, adoption still faces barriers related to resistance to change, staff training, and investment limitations, underscoring the need to strengthen organizational capabilities to improve business competitiveness.

Given this framework, analyzing the influence of artificial intelligence on inbound logistics decision-making at a private company is pertinent for generating empirical evidence to understand its impact on operational efficiency and procurement process optimization.

This study employed a quantitative approach with a non-experimental, correlational design, aimed at examining the relationship between AI tool usage and efficiency in inbound logistics decision-making. The population comprised 50 employees from a private company in Chimbote, all of whom were included as the study sample. The general objective was to analyze the influence of artificial intelligence on inbound logistics decision-making, contributing to strengthening operational management and improving business competitiveness.

## Methodology

The research employed a quantitative approach with a non-experimental, cross-sectional, correlational design, aimed at analyzing the influence of artificial intelligence on inbound logistics decision-making at a private company in Chimbote. This approach allowed observation of variables in their natural context without direct manipulation. Toorajipour et al. (2021) noted that quantitative studies are appropriate for examining relationships between variables through objective statistical procedures. Kosasih et al. (2024) emphasized that they facilitate measurement of organizational phenomena through observable indicators. Similarly, Culot et al. (2024) and Sharma and Tomar (2026) highlighted their utility in evaluating digital transformation processes and business management.

The population consisted of 50 employees from a private company engaged in logistics and operational activities. Due to the small population size, a census was applied, including all employees who

met the selection criteria. Inclusion criteria encompassed workers with active employment status, direct participation in procurement, purchasing, warehousing, inventory management, or inbound logistics processes, and a minimum tenure of six months with the organization. Employees on probationary periods, those on extended leave, and workers without direct involvement in logistics activities were excluded.

The data collection technique was a survey, and the instrument used was a structured questionnaire with a five-point Likert scale, where 1 represented "strongly disagree" and 5 "strongly agree." Castro-Santos et al. (2025) maintained that this type of instrument allows objective measurement of organizational perceptions. Farro Acosta et al. (2026) highlighted its utility for evaluating decision-making processes, while Dalain et al. (2025) and Hao et al. (2025) emphasized its application in studies on digital transformation and technology adoption.

The questionnaire comprised 24 items distributed across two variables. The artificial intelligence use variable included 12 items organized into three dimensions: process automation, data analytics, and decision support, with four items each. The inbound logistics decision-making variable also consisted of 12 items, distributed across four dimensions: supply planning, inventory management, resource optimization, and uncertainty reduction, with three items per dimension. This structure enabled comprehensive evaluation of the relationship between both variables.

Content validity was established through expert judgment and review of specialized scientific literature. Helo and Hao (2022) emphasized the importance of ensuring correspondence between indicators and theoretical constructs. Cannas et al. (2024) noted that adequate operationalization increases result precision, while Teixeira et al. (2025) highlighted the need to verify measurement instrument consistency beforehand.

Subsequently, a pilot test was conducted with participants sharing characteristics similar to the target population. Results allowed evaluation of item clarity and questionnaire internal consistency. Reliability analysis yielded a Cronbach's alpha coefficient of 0.85, indicating a high level of reliability for instrument application.

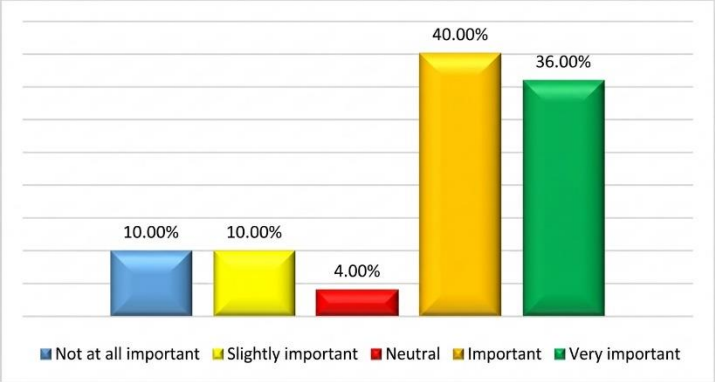
Data collection proceeded in four stages: institutional authorization, informing participants about study objectives and ethical aspects, in-person questionnaire administration with voluntary participation, and instrument review for subsequent coding. Throughout the process, information confidentiality and exclusively academic use of collected data were guaranteed.

Data processing employed descriptive and inferential statistics. Frequencies, percentages, means, and standard deviations were initially calculated to identify response trends. Subsequently, Spearman's rho coefficient was applied to determine the relationship between artificial intelligence use and inbound logistics decision-making. Toorajipour et al. (2021) noted that this statistic is appropriate for variables measured on ordinal scales. Zhang et al. (2022) and Samuels (2025) highlighted its utility in organizational and logistics research. The significance level was set at 0.05, and analysis was performed using specialized statistical software.

## Results and discussion

Results revealed a favorable perception among personnel regarding artificial intelligence use in inbound logistics processes. Overall, workers recognized that AI-based tool implementation contributes to improving decision-making efficiency related to procurement and inventory management. This pattern is consistent with recent studies highlighting the positive influence of artificial intelligence on logistics process optimization and operational efficiency improvement (Cannas et al., 2024; Zhang et al., 2022; Daios et al., 2025; Harrir & Triqui Sari, 2025).

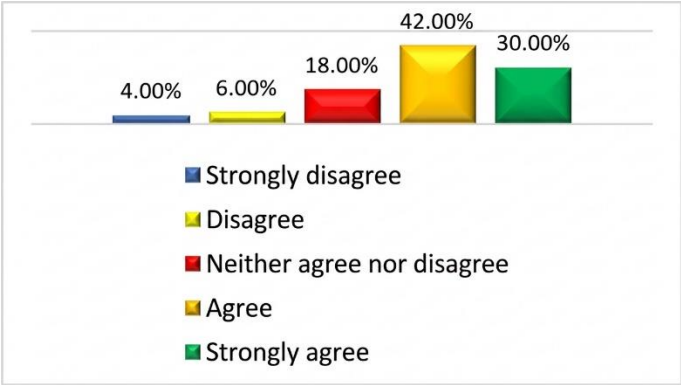
**Figure 1.** *Importance of artificial intelligence adoption in the company.*




**Note.** Data obtained from the questionnaire administered to 50 employees.

According to the results, 40% of employees considered AI adoption important, while 36% rated it as very important, representing a combined positive assessment of 76%. This result demonstrates high acceptance of artificial intelligence as a strategic tool for improving logistics processes. These findings align with research indicating that intelligent technology adoption generates favorable perceptions of organizational performance and strengthens decision-making in dynamic environments (Sharma & Tomar, 2026; Singh & Pandey, 2024; Samuels, 2025; Layode et al., 2024).

**Figure 2.** *Impact of artificial intelligence on inbound logistics decisions.*




**Note.** Results based on employee perceptions (n = 50).

Over 70% of employees perceived that artificial intelligence improves efficiency in inbound logistics decisions, particularly in supply planning and inventory management. This finding demonstrates that AI-based tool implementation enables optimization of key procurement-related processes, contributing to better resource utilization and reduced uncertainty in operational decision-making. These results align with recent studies demonstrating that artificial intelligence improves logistics planning accuracy and inventory management efficiency through predictive models (Toorajipour et al., 2021; Helo & Hao, 2022; Kosasih et al., 2024; Hao et al., 2025).

**Table 1.** *Spearman's Rho Correlation between artificial intelligence and inbound logistics decisions.*

| | | | ARTIFICIAL INTELLIGENCE | INBOUND LOGISTICS DECISIONS |
|---|---|---|---|---|
| | ARTIFICIAL INTELLIGENCE | Correlation coefficient | 1,000 | ,545** |
| | | Sig. (2-tailed) | . | <.001 |

| | | | | |
|---|---|---|---|---|
| SPEARMAN'S RHO | | N | 50 | 50 |
| | INBOUND LOGISTICS DECISIONS | Correlation coefficient | ,545** | 1,000 |
| | | Sig. (2-tailed) | <.001 | . |
| | | N | 50 | 50 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Note.** Correlation is significant at the 0.01 level (2-tailed).

Spearman's Rho correlation analysis revealed a moderate positive relationship between artificial intelligence and inbound logistics decision-making ($\rho = 0.545$; $p < 0.001$). This result indicates that higher levels of AI-based tool implementation are associated with greater efficiency in supply planning, inventory management, and resource optimization. These findings are consistent with research highlighting that artificial intelligence strengthens organizational decision-making through advanced analytics and large-volume data processing (Culot et al., 2024; Dalain et al., 2025).

Furthermore, the statistical significance value confirms that the relationship found is highly significant, allowing acceptance of the research hypothesis and affirming that artificial intelligence substantially influences the improvement of inbound logistics processes in the analyzed company.

The results confirm that artificial intelligence plays a fundamental role in inbound logistics optimization, particularly in improving decisions related to procurement and inventory management. Empirical evidence demonstrates that intelligent tool integration reduces uncertainty and improves operational efficiency in key supply chain processes. This position is consistent with contemporary studies emphasizing that artificial intelligence enables logistics management optimization and strengthens organizational efficiency in dynamic environments (Zhang et al., 2022; Teixeira et al., 2025; Jackson et al., 2024).

These findings align with recent research demonstrating that artificial intelligence improves operational efficiency through predictive and analytical models. Furthermore, AI integration into the supply chain has been shown to improve planning and responsiveness to demand changes (Toorajipour et al., 2021; Helo & Hao, 2022).

The results also revealed that artificial intelligence contributes to improving inventory management and supply planning, consistent with recent studies highlighting the impact of data analytics on organizational performance. In this regard, artificial intelligence enables decision optimization by reducing uncertainty and improving accuracy in operational processes (Sánchez Cruz, 2025; Sharma & Tomar, 2026).

Thus, the present study's findings demonstrate that artificial intelligence not only impacts operational efficiency but also contributes to more strategic inbound logistics management. This reinforces the notion that intelligent technology adoption constitutes a key factor for business competitiveness in uncertainty-prone environments (Silva Carmo et al., 2025; Cannas et al., 2024).

Overall, the findings support the assertion that AI implementation constitutes a key factor for improving inbound logistics processes, facilitating more efficient decision-making, reducing uncertainty, and optimizing resource use. These results coincide with current trends positioning artificial intelligence as a strategic tool for digital transformation and organizational performance improvement (Samuels, 2025; Daios et al., 2025).

## Conclusions

Study results allow concluding that artificial intelligence tool implementation at a private company in Chimbote shows significant acceptance levels in inbound logistics processes. Favorable employee perceptions demonstrate that digital transformation is not limited to task automation but extends to operational management improvement, strengthening supply planning and inventory optimization. This

confirms that artificial intelligence positions itself as a strategic component in business logistics management modernization (Toorajipour et al., 2021; Cannas et al., 2024).

A positive and statistically significant relationship was determined between artificial intelligence use and efficiency in inbound logistics decision-making. The obtained correlation coefficient ($\rho = 0.545$; $p < 0.001$) demonstrates that higher technology implementation levels are associated with greater improvement in supply planning, inventory management, and resource optimization. This finding empirically validates the relevance of integrating intelligent systems into logistics management, demonstrating that data-based decision-making contributes to strengthening operational efficiency in organizations (Castro-Santos et al., 2025; Farro Acosta et al., 2026).

The study confirms that inbound logistics constitutes a critical area within digital transformation processes in companies, especially in contexts characterized by demand uncertainty and the need to optimize resources. Artificial intelligence not only facilitates process automation but also improves predictive capability and decision-making accuracy, fundamental elements for ensuring operational efficiency and business competitiveness (Helo & Hao, 2022; Sánchez Cruz, 2025).

Finally, this research provides quantitative evidence that contributes to strengthening the analysis of artificial intelligence applied to inbound logistics in local business contexts. Obtained results align with international trends related to data-based optimization, demonstrating that companies can significantly improve their logistics processes through intelligent technology adoption. Consequently, it is recommended to strengthen organizational strategies oriented toward AI implementation, promote staff training in technological tool use, and develop future research extending the analysis to other productive sectors.

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