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Relationship Between Inventory Management Practices and Customer Satisfaction in International Supply Chains

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Abstract

This research explored the correlation between inventory management practices and customer satisfaction in international supply chains. A descriptive-correlational research design was employed, with data collected from 100 participant representatives coming from various demographic and professional backgrounds in the logistics and supply chain industry. Four inventory management practice dimensions, namely information quality, order handling quality, physical distribution service quality, and timeliness, were evaluated by the study, together with various facets of customer satisfaction, namely service reliability, responsiveness, assurance, and trust, and overall satisfaction in terms of delivery performance. Generally, high to very high ratings were observed across most dimensions, with timeliness and order handling quality being best evaluated. It was evidenced by correlation analysis that all four inventory management dimensions significantly correlated positively with customer satisfaction, with the highest correlation observed for timeliness. From these results, an Inventory–Logistics Service Quality Optimization Framework has been constructed, harmoniously blending process improvements, adoption of technologies, and ongoing monitoring for the purpose of filling in observed gaps and strengthening observed strengths. Guiding international supply chain organizations in operation efficiency improvements and in building better, trust-based relationships with customers so as to gain a competitive advantage in the global marketplace is the purpose of the framework.

Keywords: Inventory Management, Customer Satisfaction, International Supply Chains, Logistics Service Quality, Timeliness

Introduction

Inventory management is a central determinant of supply chain performance because it balances product availability with operational efficiency under conditions of complexity and uncertainty. In the global marketplace, weak inventory control often leads to delays, stockouts, and dissatisfied customers, while robust practices enable timely deliveries and consistent service quality (Mentzer, Flint, & Kent, 1999). Effective systems—anchored in accurate forecasting, appropriate safety stock, and visibility of stock flows—are indispensable for building customer trust in international supply chains (Zhao & Tu, 2021).

International supply chains are inherently vulnerable to disruptions stemming from long lead times, customs clearance delays, and fluctuating demand patterns. Recent events such as the COVID-19 pandemic and geopolitical tensions exposed these vulnerabilities, forcing companies to rethink how inventory is managed to sustain resilience (Sriyanto et al., 2021; Yu, Wong, Chávez, Jacobs, & Nittala, 2023). As trade volumes rise, the World Trade Organization (2024) emphasized the growing need for agile, technology-enabled inventory systems that can adapt to shocks while maintaining service continuity.

Customer satisfaction, defined as the degree to which products or services meet or exceed expectations, is strongly influenced by order accuracy, timeliness, and responsiveness (Naini, Santoso, Andriani, & Claudia, 2022). In the logistics sector, these satisfaction drivers are operational outcomes of inventory management practices. Poorly executed processes often manifest as incomplete orders or delays, directly undermining the customer experience. Conversely, precise and timely fulfillment enhances loyalty, encourages repeat business, and reinforces brand reputation (Rahmayanti, Wirdianto, Arief, Zahra, & Ahmad, 2021).

The Logistics Service Quality (LSQ) model provides a theoretical foundation for linking back-end inventory decisions to front-end customer satisfaction. LSQ dimensions—information quality, order handling quality, physical distribution service quality, and timeliness—capture the service attributes most visible to customers (Thai, 2013). For example, providing accurate inventory information reduces uncertainty and fosters trust, while error-free order handling demonstrates reliability. Within international supply chains, timeliness consistently emerges as the most critical determinant of satisfaction (Holloway, 2024).

Technological innovations have further reshaped inventory management. Predictive analytics, the Internet of Things (IoT), and artificial intelligence enhance demand forecasting, enable real-time tracking, and streamline replenishment cycles (Adewusi et al., 2024; Özkan-Özen, 2023). These tools not only reduce the risk of stockouts and overstocks but also support more responsive service delivery. As Zhou, Wang, Li, Teo, and Yang (2023) note, digital transformation improves supply chain visibility and directly elevates customer satisfaction by aligning operations with real-time demand.

Despite advances, challenges persist. Empirical research shows that even a single stockout incident in high-demand sectors can have lasting effects on customer loyalty (Wang & Chen, 2022). In international operations, these risks are magnified by longer lead times and varied customer expectations across markets (Lubis et al., 2023). This highlights the need for companies to balance efficiency with resilience through proactive inventory strategies and collaboration with global partners (Tarurhor & Osazevbaru, 2021).

This study contributes to the literature by empirically examining the relationship between inventory management practices and customer satisfaction within international supply chains operating in the Philippines. By applying the LSQ model to capture both operational practices and customer perceptions, the research offers insights into which dimensions—information quality, order handling, physical distribution, or timeliness—most strongly drive satisfaction. The findings aim to guide managers in aligning inventory strategies with customer expectations, thereby improving service reliability, sustaining loyalty, and securing a competitive advantage in global markets.

Objectives of the Study

This study aimed to answer the following:

1. To describe the demographic and professional profile of the respondents.
2. To assess the level of inventory management practices in terms of information quality, order handling quality, physical distribution service quality, and timeliness.
3. To determine the level of customer satisfaction across reliability, responsiveness, assurance/trust, and overall delivery satisfaction.
4. To examine the relationships between the dimensions of inventory management practices and customer satisfaction.

Methodology

Research Design. A descriptive–correlational design was used to analyze perceptions of inventory practices and customer satisfaction among customers of firms operating within international supply chains in the Philippines.

Research Setting and Participants. One hundred respondents were targeted to obtain stable correlation estimates. Inclusion criteria: ≥18 years old; at least three international transactions with the same company in the last 12 months; B2B or B2C customers with direct experience of order placement, delivery, and communications related to logistics service quality.

Research Instruments. The main research instrument is a structured questionnaire divided into three sections. The first section gathers demographic data such as age, gender, educational attainment, organizational affiliation, and length of service. The second section measures inventory management practices across four dimensions—information quality, order handling quality, physical distribution service quality, and timeliness—using 25 items rated on a 4-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (4). The third section assesses customer satisfaction across four indicators—service reliability, responsiveness, assurance and trust, and overall delivery satisfaction—using 20 items rated on the same scale.

To establish validity, the questionnaire is subjected to expert review by specialists in logistics and supply chain management. A pilot test with 30 respondents is conducted to ensure clarity and comprehensibility of items, and reliability is assessed using Cronbach's alpha, with values of 0.70 and above considered acceptable.

Data Gathering Procedure. The data-gathering process begins with obtaining the necessary approvals from relevant organizations and securing informed consent from all participants. Respondents complete the survey either online or via printed copies, and their responses are collected over a period of four to six weeks. To ensure confidentiality, all personal identifiers are removed, and the anonymized responses are systematically organized in a statistical database for subsequent analysis.

Data Analysis. The data are analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Frequency counts and percentage distributions are used to describe the demographic characteristics of respondents, while weighted mean scores are computed to determine the level of inventory management practices and customer satisfaction. Finally, Pearson's correlation coefficient is employed to

test the strength and direction of the relationship between inventory management practices and customer satisfaction, with two-tailed tests conducted at a 0.05 level of significance.

Ethical Consideration. This study upholds ethical research standards by securing approval from academic authorities and obtaining informed consent from all respondents. Participation was voluntary, and respondents were informed of their right to withdraw at any time. Confidentiality and anonymity were strictly maintained by removing identifiers and securing data in password-protected files. The study posed no physical or psychological risks, and all findings were reported honestly in compliance with institutional and data privacy guidelines.

Results and Discussion

1. Profile of the Respondents

Table 1
Profile of the respondents

Age	Frequency	Percentage
26 years old – 32 years old	15	15
33 years old – 39 years old	21	21
40 years old – 47 years old	35	35
47 years old – 53 years old	17	17
54 years old and above	12	12
Sex		
Male	45	45
Female	55	55
Educational Attainment		
College Graduate	80	80
Master's Degree	20	20
Department		
Private	75	75
Government	25	25
Length of Service		
5 to 10 years	50	50
11 to 15 years	18	18
16 to 20 years	5	5
21 to 25 years	22	22
26 to 30 years	5	5

Table 1 flashes that most respondents were aged 40–47 years (35%), indicating a predominance of mid-career professionals with relevant industry experience. A slight majority were female (55%),

suggesting active participation of women in supply chain operations. In terms of education, 80% were college graduates and 20% held a master's degree, reflecting a workforce with adequate technical skills and a segment with advanced qualifications for leadership roles.

The majority were employed in private organizations (75%), highlighting the dominant role of private enterprises in international supply chains, while 25% came from government institutions that support regulatory functions. In terms of tenure, half of the respondents had 5–10 years of service, while 22% had more than 21 years, showing a mix of adaptable mid-tenure employees and highly experienced professionals. Overall, the demographic profile demonstrates a diverse and competent group, enhancing the reliability of their perspectives on inventory management and customer satisfaction.

2. Inventory Management Practices

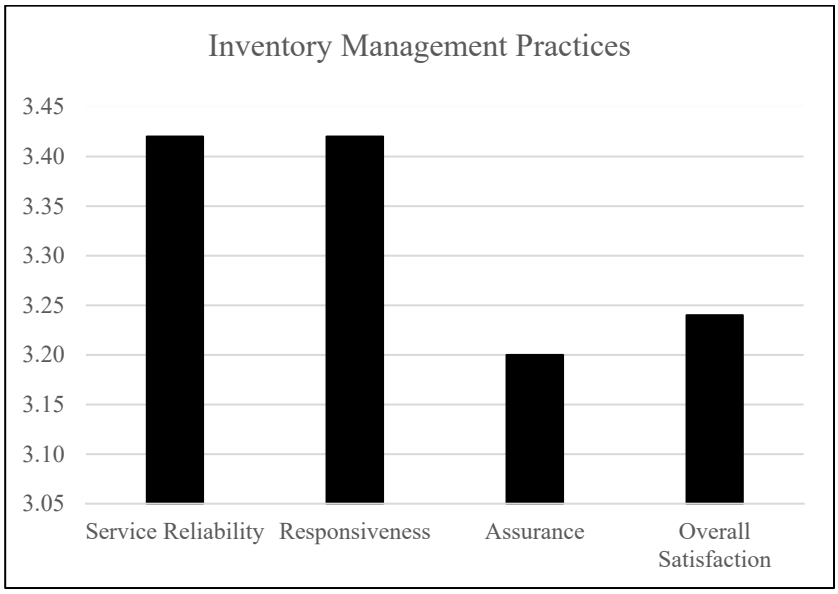

Figure 1 shows the perceived inventory management practices of the respondents

Figure 1 presents the mean scores of inventory management practices. The results reveal that Order Handling Quality (M = 3.42, SD = 0.72) and Timeliness (M = 3.42, SD = 0.72) were rated very high, underscoring that customers are most satisfied when their orders are delivered accurately, securely, and within the promised timeframe. This is consistent with the Logistics Service Quality (LSQ) model, which emphasizes order accuracy and delivery timeliness as the strongest predictors of customer satisfaction (Mentzer, Flint, & Kent, 1999; Thai, 2013). In practice, these findings highlight that precise stock control, careful packaging, and efficient scheduling are critical operational strengths in international supply chains. The importance of timeliness is further reinforced by research showing that on-time delivery is one of the most influential factors shaping customer perceptions in global logistics, especially in industries with time-sensitive demands (Holloway, 2024).

Information Quality was rated high (M = 3.20, SD = 0.88), reflecting that while customers appreciated the availability of accurate and timely updates, they also perceived inconsistencies in communication and

stock visibility. This suggests that real-time information systems and reliable communication channels remain areas for further improvement. Zhao and Tu (2021) emphasized that information accuracy and transparency reduce customer uncertainty and enhance trust, making it a vital component of customer satisfaction in complex supply chains. Finally, Physical Distribution Service Quality obtained the lowest mean (M = 2.89, SD = 0.99), indicating that while delivery was generally dependable, customers noted weaknesses in consistency and security of shipments. This finding echoes concerns in prior studies that global logistics is often hindered by risks in transit, customs procedures, and handling practices, which can undermine service reliability (Holloway, 2024; Lubis et al., 2023).

3. Customer Satisfaction

Figure 2. Customer Satisfaction as perceived by the respondents

Figure 2 illustrates the results for customer satisfaction. Service Reliability (M = 3.42, SD = 0.72) and Responsiveness (M = 3.42, SD = 0.72) both scored very high, showing that customers strongly valued the company's ability to deliver on promises and address concerns promptly. This supports findings by Rahmayanti et al. (2021), who demonstrated that responsiveness and reliability are central to building customer trust and long-term loyalty in service industries. The ability to resolve problems quickly and provide consistent service performance also reflects well-developed customer service systems and responsive feedback mechanisms.

Assurance and Trust (M = 3.20, SD = 0.72) was rated high but not very high, signaling that while customers recognized professionalism and delivery capability, their confidence was limited by concerns about the accuracy of information provided by the company. As Zhao and Tu (2021) stressed, inaccurate or incomplete information reduces customer confidence even when operational performance is strong. This suggests that inventory-related communication must be improved to achieve higher trust ratings. Overall Satisfaction (M = 3.24, SD = 0.88) was also rated high, showing that customers are generally satisfied with delivery services and are likely to continue their business relationships. However, perceptions of long-term partnership reliability were less strong, suggesting that customers may remain cautious about fully committing loyalty unless communication and distribution challenges are addressed.

Taken together, the findings show a clear alignment between inventory management practices and customer satisfaction outcomes. The very high scores in timeliness and order handling quality correspond with equally high satisfaction ratings in service reliability and responsiveness, demonstrating how operational excellence directly translates into positive customer experiences. Conversely, the relatively lower scores in physical distribution service quality and assurance/trust indicate areas where improvements are needed. This pattern reflects the argument of Thai (2013) that logistics service quality is multidimensional, and weaknesses in even one dimension can constrain overall customer satisfaction.

The implications are particularly important for international supply chains. Customers increasingly expect not only fast and accurate delivery but also transparent and reliable information throughout the logistics process. As Zhou et al. (2023) observed, digital transformation and real-time data visibility enhance both efficiency and customer confidence. Integrating predictive analytics, IoT, and AI can therefore help companies strengthen information accuracy, improve shipment visibility, and mitigate risks in physical distribution (Adewusi et al., 2024; Özkan-Özen, 2023). Moreover, long-tenured employees and private-sector respondents, as revealed in the demographic profile, may play a pivotal role in sustaining high performance by combining operational experience with new technological tools.

The results confirm that inventory management practices—especially order handling and timeliness—are critical drivers of customer satisfaction in international supply chains. However, to achieve stronger perceptions of trust and partnership reliability, companies must invest in enhancing physical distribution consistency and ensuring accuracy in all inventory-related communications. By doing so, organizations can not only sustain customer satisfaction but also build long-term loyalty and competitive advantage in global markets (Yu et al., 2023; World Trade Organization, 2024).

4. Relationship between Perceived Inventory Management Practices and Customer Satisfaction

Table 2
Relationship between Inventory Management Practices and Customer Satisfaction

Variables	*r*-value	Sig. value	Decision on H_o	Interpretation
Information Quality	0.25	0.03	Reject H_o	Significant
Order Handling Quality	0.43	0.02	Reject H_o	Significant
Physical distribution service quality	0.32	0.01	Reject H_o	Significant
Timeliness	0.50	0.05	Reject H_o	Significant

Table 2 presents the correlation analysis between inventory management practices and customer satisfaction. The results show that all four dimensions of inventory management practices have a significant positive relationship with customer satisfaction at the 0.05 level of significance.

Information Quality recorded an r-value of 0.25 ($p = 0.03$), indicating a low but positive correlation with customer satisfaction. This suggests that the accuracy, timeliness, and reliability of inventory-related information meaningfully contribute to customer perceptions of service quality. Although the relationship is weaker compared to other dimensions, it highlights the importance of accurate and transparent communication in sustaining customer trust (Zhao & Tu, 2021).

Order Handling Quality showed a stronger correlation with an r-value of 0.43 ($p = 0.02$), which indicates a moderate positive relationship. This finding demonstrates that correct quantities, secure packaging, and error-free processing are crucial to enhancing customer satisfaction. The result validates the

LSQ framework's emphasis on order accuracy as a fundamental determinant of customer service quality (Mentzer, Flint, & Kent, 1999; Thai, 2013).

Physical Distribution Service Quality also displayed a moderate positive correlation with customer satisfaction, reflected in an r-value of 0.32 ($p = 0.01$). This implies that consistent and secure delivery operations play a significant role in shaping customer perceptions of reliability. Customers value dependable handling during transit, and weaknesses in this area can reduce satisfaction even if other processes are effective (Holloway, 2024).

The strongest correlation was observed in Timeliness, with an r-value of 0.50 ($p = 0.05$), signifying a moderate to strong positive relationship. This confirms that on-time delivery, effective back-order management, and the ability to meet urgent requests are the most influential factors in customer satisfaction. This finding aligns with previous studies showing that timeliness consistently ranks as one of the most critical dimensions of logistics service quality (Thai, 2013; Yu et al., 2023).

Overall, the results demonstrate that improvements in inventory management practices directly enhance customer satisfaction. While all dimensions are significant, timeliness and order handling quality emerge as the strongest drivers of positive customer experiences, reinforcing the principle that reliability in delivery and precision in order fulfillment are central to sustaining loyalty in international supply chains. On the other hand, the relatively weaker association of information quality underscores the need for companies to strengthen communication accuracy and system visibility to further boost customer confidence.

Conclusions

The study concludes that inventory management practices significantly affect customer satisfaction in international supply chains. Timeliness and order handling quality are the strongest drivers of satisfaction, while information quality and physical distribution service quality also contribute, but need improvement. These findings confirm the applicability of the LSQ framework and highlight the need for both operational efficiency and transparent communication to sustain customer trust and loyalty.

Recommendations

It is recommended that companies strengthen order handling processes and timeliness through technology adoption and standardized procedures. Information quality should be improved by enhancing communication systems and real-time tracking, while physical distribution service quality can be reinforced through reliable handling and secure delivery practices. Future research may explore sustainability and cost-efficiency dimensions to broaden the understanding of inventory management impacts on customer satisfaction.

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