# Time is the new currency: Lead Time Management and Customer Satisfaction at the Ghana Ports and Harbours Authority

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Abstract

This article aims to assess the impact of lead time activities on customer satisfaction, using the Ghana Ports and Harbours Authority as a case study. This article is geared towards establishing the intricacies of lead time processes within Ghana Ports and Harbours Authority, ascertaining the contributions of lead time towards augmenting customer satisfaction, and pinpointing the obstacles that impede lead time reduction. The article employed a case study methodology and a descriptive design, with a purposive sampling technique involving thirty-five (35) respondents. The study illuminated that the organization tends to prioritize short-term needs at the expense of long-term considerations, potentially impacting its overall effectiveness. Furthermore, delays in management decisions regarding lead time regulations were identified as a significant factor impeding operational efficiency and decision-making. The findings also revealed that a majority of respondents acknowledged that lead time enables the organization to outpace competitors more efficiently, resulting in improved customer satisfaction. However, most respondents expressed concerns that lead time does not necessarily lead to flexibility during rapid market shifts. Additionally, a consensus emerged that a lack of workforce planning skills poses a challenge in managing lead time effectively. In conclusion, this study offers recommendations for the Ghana Ports and Harbours Authority, suggesting a need for consistent use of effective lead time techniques to enhance customer service delivery. It also underscores the importance of treating lead time as a critical aspect of purchase order preparation and promoting employee satisfaction with the organization's lead time procedures. These measures are vital for ensuring customer satisfaction and operational efficiency.

*Keywords*: Leadtime, Satisfaction, Logistics, Ports and Performance

## 1. Introduction

In today's fast-paced and highly competitive business environment, time has emerged as a critical determinant of organizational success. Customers no longer judge service quality solely by price or product attributes; increasingly, their satisfaction hinges on how quickly and reliably services are delivered. In logistics-intensive sectors such as port operations, delays translate directly into higher costs, operational bottlenecks, and frustrated customers. As global supply chains become more integrated and time-sensitive, the ability to manage lead time effectively has become a strategic asset rather than a mere operational concern. For port authorities, where multiple actors, processes, and regulatory requirements intersect, lead

time management is not just about speed, but about delivering dependable service that sustains customer trust and competitiveness (Le et al., 2020).

In the contemporary business landscape, the relentless pursuit of shorter lead times, cost-efficiency, and superior customer service has become central to achieving competitive advantage. Lead time, defined as the temporal span from the initiation to the completion of a process, plays a critical role in shaping customer satisfaction and overall organizational performance (Mentzer et al., 2001; Christopher, 2016). For firms, the strategic imperative to minimize lead times requires the rapid and coordinated movement of goods immediately after production or procurement (Simchi-Levi et al., 2000). Achieving shorter lead times not only accelerates operational processes but also enhances service reliability and consistency, which are essential drivers of customer satisfaction. Recent studies further emphasize that responsiveness and lead time reduction are vital capabilities in managing supply chains under increasing demand volatility and disruption risks (Ivanov & Dolgui, 2023; Le et al., 2020).

The contemporary landscape of supply chain management is increasingly dynamic and multifaceted, requiring a nuanced understanding of the complex relationship between lead time and customer satisfaction. An illustrative case is the Ghana Ports and Harbours Authority (GPHA), a critical hub within Ghana's trade and logistics ecosystem, where operational efficiency directly influences service delivery outcomes. The Resource-Based View (RBV) argues that organizations achieve sustained competitive advantage by leveraging valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). In this context, efficient lead time management can be conceptualized as a strategic capability that enhances operational performance and customer satisfaction. Empirical evidence further suggests that improvements in port efficiency and turnaround time significantly influence competitiveness and service quality in maritime logistics systems (Tongzon, 2001; Wilmsmeier et al., 2013).

Recent industry trends underscore the growing importance of effective lead time management in modern supply chains. In today's global marketplace, customer expectations extend beyond product and service quality to include the timely and reliable delivery of goods (Mentzer et al., 2001; Hübner et al., 2016). The rise of e-commerce and rapid technological advancements has further intensified expectations for faster order fulfillment and delivery (Hübner et al., 2016; Nguyen et al., 2018). In this context, examining how lead time-related activities influence customer satisfaction is not only academically relevant but also critical for the competitiveness and sustainability of organizations, including the Ghana Ports and Harbours Authority (GPHA). This aligns with the customer-oriented supply chain perspective, which emphasizes responsiveness and service reliability as key drivers of

customer value and satisfaction (Fawcett & Magnan, 2002). As such, the increasing demand for speed and reliability in delivery further reinforces the strategic importance of lead time management in enhancing customer satisfaction and organizational performance.

Research demonstrates that the optimization of lead time provides a significant competitive advantage by enhancing organizational responsiveness and operational agility. Shortened lead times enable firms to respond more effectively to market fluctuations and improve their competitive positioning (Christopher, 2016; Towill, 1996). Within the maritime and logistics sector in which the Ghana Ports and Harbours Authority (GPHA) operate, improvements in turnaround time and operational efficiency are critical drivers of service quality and customer satisfaction (Tongzon, 2001; Wilmsmeier et al., 2013). However, the pursuit of shorter lead times must be approached from a holistic perspective that considers trade-offs across cost, service quality, and supply chain resilience (Ivanov & Dolgui, 2023).

In this context, the fundamental problem underpinning this study is the need to understand the complex relationship between lead time management and customer satisfaction, particularly within port operations. As customers increasingly demand faster and more reliable service, any misalignment between lead time performance and customer expectations can adversely affect satisfaction and long-term competitiveness (Christopher & Peck, 2004). This study therefore examines the specific challenges and opportunities faced by the Ghana Ports and Harbours Authority in managing lead time within Ghana's maritime industry, contributing to both operational optimization and the broader discourse on supply chain performance in a rapidly evolving global marketplace.

## 2. Definition and concept of Lead Time Management and Customer Satisfaction

Lead time management is a fundamental component of supply chain and operations management, encompassing the strategic planning, coordination, and optimization of the time required for products or services to move through various stages of production and distribution. It involves minimizing the duration between the initiation of a process, such as order placement, and its completion, including procurement, manufacturing, and delivery (Monczka et al., 2018). Effective lead time management seeks to reduce delays, uncertainties, and inefficiencies across the supply chain, ensuring timely and cost-efficient delivery of products and services. Aligning lead time management with customer expectations is therefore critical for enhancing both operational performance and customer satisfaction (Petersen et al., 2011).

Lead time refers to the time interval between the placement of an order and the receipt of the goods. This duration varies depending on several factors, including product characteristics, production systems (make-to-order versus make-to-stock), logistics efficiency, and geographical distance between supply chain actors. Efficient planning, coordination, and logistics capabilities are essential in reducing lead time variability and improving service reliability. Consequently, an organization's ability to effectively manage lead time is a key determinant of its capacity to meet customer expectations, streamline operations, and enhance satisfaction (Petersen et al., 2011; Christopher, 2016).

Customer satisfaction is a multidimensional construct reflecting the extent to which customer expectations are met or exceeded through products, services, and overall interactions with an organization (Oliver, 2014). It serves as a critical indicator of a firm's ability to deliver value, influencing customer loyalty, repeat patronage, and positive word-of-mouth (Anderson et al., 1994). Beyond functional performance, customer satisfaction also encompasses emotional and experiential dimensions of the service encounter, shaping long-term customer relationships.

Consistent with expectancy-disconfirmation theory, customer satisfaction arises from the comparison between perceived performance and prior expectations (Oliver, 1980). High levels of satisfaction are associated with increased customer retention, repeat purchases, and favorable recommendations (Fornell et al., 1996; Bloemer et al., 1995). Conversely, dissatisfaction often results in complaints, negative word-of-mouth, and switching behavior (Zeithaml et al., 1996). As such, organizations that effectively manage operational elements such as lead time are better positioned to deliver superior customer experiences and sustain competitive advantage.

### 2.1. Effect of lead time management and customer satisfaction

In the contemporary competitive business environment, organizations are required to offer more than competitive pricing to achieve market share and enhance customer satisfaction. While price remains important, it is no longer the sole determinant of customer choice; instead, customers increasingly demand a combination of reasonable pricing, high-quality products and services, and reliable, efficient lead times (Petersen et al., 2005; Mentzer et al., 2001). This shift in consumer expectations underscores the growing strategic importance of lead time management as a key driver of customer satisfaction.

To remain competitive, firms must deliver superior service quality alongside operational efficiency. Modern consumers are more informed and discerning, expecting not

only value for money but also consistency, speed, and reliability in service delivery. This aligns with the principles of agile supply chains, which emphasize the minimization of total lead time from customer request to final delivery as a critical factor in enhancing responsiveness and competitiveness (Christopher, 2000; Christopher, 2016).

A substantial body of empirical research supports the relationship between lead time performance and customer satisfaction. Studies in logistics and supply chain management consistently show that improvements in delivery speed, reliability, and responsiveness significantly enhance customer satisfaction and loyalty (Mentzer et al., 2001; Le et al., 2020; Hübner et al., 2016). Across different industries and economic contexts, the ability to align lead time with customer expectations has emerged as a key strategic capability for firms seeking to maintain competitive advantage.

Lead time reduction across the supplier-production-distribution chain is a central tenet of time-based competition (Christopher, 2000). Effective lead time management is closely linked to other critical operational dimensions, including quality, cost efficiency, innovation, and productivity. Approaches such as Just-in-Time (JIT) systems, continuous improvement practices, flexible manufacturing systems, and the integration of advanced information technologies are instrumental in achieving lead time reductions and improving overall supply chain performance (Christopher, 2016; Towill, 1996).

Customer satisfaction, defined as a customer's evaluation of the value received from a product or service relative to expectations and alternatives, remains a critical outcome of effective supply chain performance (Gunasekaran et al., 2001; Oliver, 1980). In increasingly globalized markets, where customers have access to multiple alternatives, organizations must align supply chain strategies with customer-centric performance metrics. Without satisfied customers, even the most efficient supply chain systems may fail to deliver sustainable value. Consequently, integrating lead time performance with customer satisfaction metrics is essential for achieving superior organizational performance and long-term competitiveness.

## 3. Research Methodology

The methodology of this research study adopts a structured and systematic approach to data collection and analysis, focusing on employees of the Ghana Ports and Harbours Authority (GPHA). The study employs a quantitative research design, which is appropriate for examining relationships between variables such as lead time management and customer satisfaction (Creswell, 2014). This approach enables the collection of standardized data that can be statistically analyzed to generate meaningful and generalizable findings. The study

population comprises staff members within GPHA who meet specific criteria relevant to the research objectives, particularly those involved in procurement and stores operations. These departments were selected due to their direct involvement in supply chain activities and lead time processes. The target population represents individuals whose roles provide relevant insights into lead time management practices.

A purposive sampling technique was employed to select a sample of 35 employees from the procurement and stores departments. This non-probability sampling method allows the researcher to deliberately select participants with relevant knowledge and experience, making it suitable for studies requiring specialized insights (Etikan et al., 2016). Additionally, this approach is cost-effective and ensures that the data collected is aligned with the research objectives. Data for the study were collected from both primary and secondary sources. Primary data were obtained through self-administered structured questionnaires and direct observations. The questionnaires consisted mainly of closed-ended questions designed using a Likert scale to capture respondents' perceptions and experiences regarding lead time management and customer satisfaction. The use of structured questionnaires ensured consistency and reliability in responses (Saunders et al., 2019). Observations complemented the questionnaire data by providing contextual insights into operational processes.

Secondary data were sourced from relevant academic literature, including textbooks, peer-reviewed journal articles, organizational reports, and credible online sources. These materials provided theoretical and empirical foundations for the study and enabled triangulation of findings. To ensure the validity and reliability of the research instrument, the questionnaire was pre-tested with a small group of respondents similar to the study population. Feedback from the pilot test was used to refine the instrument for clarity and relevance (Creswell, 2014). Reliability was further enhanced by maintaining standardized procedures during data collection. Data collection was conducted through personal visits to GPHA, where the researcher administered the questionnaires directly to respondents.

The purpose of the study was clearly explained, and participants were guided where necessary to ensure accurate responses. For data analysis, the quantitative data collected were coded and analyzed using statistical tools such as Microsoft Excel or SPSS. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data, while inferential analysis (such as correlation) was employed to examine relationships between variables (Pallant, 2020). Ethical considerations were strictly observed throughout the study. Participation was voluntary, and respondents were assured of confidentiality and anonymity. Informed consent was obtained prior to data collection, and

participants were informed of their right to withdraw at any stage without any consequences (Saunders et al., 2019).

**4. Characteristics of the respondents**

The data indicate a gender imbalance among the respondents, with 60% being male and 40% female. This could be reflective of the gender distribution within the Ghana Ports and Harbours Authority (GPHA) or a specific sampling bias. The age distribution of respondents shows that the majority fall within the 33-40 years age group, suggesting a relatively experienced and mature group of participants. Furthermore, the data reveal that most respondents have been employed for a period of 6-9 years, indicating a level of job stability and experience within the organization. In terms of educational background, a significant portion of respondents hold diploma qualifications (42.9%), followed by 1st degree holders (22.9%), while a smaller percentage hold SHS certificates (20%) and master's degrees (14.3%). This diverse educational background may influence their perspectives on lead time and customer satisfaction.

The data regarding the processes involved in lead time activities show some interesting findings. Notably, there is a divergence of opinions among respondents regarding whether the process of lead time involves preprocessing time, such as planning. Approximately 48.6% of the respondents agree, while 51.4% disagree. This suggests that there may be some variations in understanding the components of lead time within the organization. Regarding processing time, the data show that 34.3% agree that it is another stage after producing an item, while 65.7% disagree. This suggests that a significant portion of respondents do not view processing time as a distinct stage in lead time activities. In terms of waiting time, 10.4% agree that it is part of lead time, while 89.6% disagree. This overwhelming disagreement suggests that waiting time may not be perceived as a significant component of lead time by the majority of respondents.

Storage time is considered a stage in lead time activities, with 74.3% of respondents agreeing, while 25.7% disagree. This implies a consensus among respondents regarding the role of storage time in lead time management. Finally, when it comes to transportation time and inspection processes, 77.1% agree that these are involved in lead time activities, while 22.9% disagree. This indicates a consensus on the role of transportation time and inspection processes in lead time.

**4.1. Role of lead time on customer satisfaction**

The data regarding the role of lead time on customer satisfaction provide insights into the perspectives of the respondents. Approximately 56.3% of respondents agree that lead time leads to customers having goods or services as fast as possible, while 43.7% disagree. This finding suggests that a majority of respondents believe that lead time positively impacts the speed of goods and service delivery to customers. Regarding the direct relationship between lead time and inventory in the supply chain, 74.3% of respondents agree, while 25.7% disagree. This finding implies that most respondents perceive a direct link between lead time and inventory management in enhancing customer satisfaction.

However, when it comes to flexibility during rapid shifts in the market, only 28.6% of respondents agree, while 71.4% disagree. This suggests that many respondents do not see lead time as a factor that contributes to flexibility during market shifts. Furthermore, the data show that 80.0% of respondents agree that lead time helps the company outpace the competition and improve customer satisfaction, while 20.0% disagree. This indicates a strong consensus on the positive impact of lead time on competitiveness and customer satisfaction. Lastly, 85.7% of respondents agree that lead time helps meet deadlines consistently and easily, while 14.3% strongly disagree. This implies a strong belief among respondents in the role of lead time in meeting deadlines.

### 4.2. Challenges on achieving reduction of lead time

Regarding the challenge of lack of skills for workforce planning, 77.2% of respondents agree, while 22.8% agree. This indicates that a significant proportion of respondents perceive a deficiency in workforce planning skills as a challenge in lead time management. In terms of the challenge of lack of employee expertise, 71.5% of respondents agree, while 28.5% disagree. This suggests that many respondents consider the lack of employee expertise as a hindrance to lead time optimization. Concerning delays in management decisions on lead time, 80.0% of respondents agree, while 20.0% disagree. This finding highlights the consensus among respondents on the detrimental impact of management delays on lead time. Non-adherence to lead time regulations is considered a challenge by 88.5% of respondents, while 11.5% disagree. This indicates a strong consensus on the importance of adhering to lead time regulations for effective lead time management

The study's key findings provide valuable insights into the relationship between lead time management and customer satisfaction in the context of the Kenya telecommunications industry. It was revealed that respondents largely agree that processing time is not an

additional stage following the production of an item, indicating a clear understanding of this aspect of lead time management. Moreover, the majority of respondents perceive that lead time does not involve preprocessing time, such as planning activities. This suggests that there might be a gap in the understanding or implementation of these planning-related lead time aspects in the industry. Additionally, respondents noted that there is a lack of waiting time between producing necessary items and that storage time significantly contributes to lead time activities.

In terms of the role of lead time on customer satisfaction, the findings indicate that most respondents agree that lead time has a direct relationship with inventory levels throughout the supply chain, with a positive impact on customer satisfaction. Respondents also concur that lead time's ability to provide goods or services rapidly is vital for enhancing customer satisfaction. However, respondents generally disagree with the idea that lead time enhances flexibility during rapid market shifts, suggesting room for improvement in this aspect. Furthermore, they agree that reasonable lead times play a crucial role in customer satisfaction, emphasizing the importance of efficient lead time management. Lastly, the study revealed challenges associated with reducing lead time, with respondents predominantly agreeing that issues like a lack of skills for workforce planning, employee expertise, management decision delays, non-adherence to lead time regulations, and shipping delays present notable challenges.

## 5. Conclusion

In conclusion, this study has shed light on the critical relationship between lead time management and customer satisfaction, specifically within the context of the Kenya telecommunications industry. The findings underscore the profound influence that lead time practices have on operational management and, by extension, customer satisfaction. Efficient lead time management is not only crucial for streamlining business processes but also for enhancing the overall customer experience. The study highlights that a comprehensive understanding of lead time's various dimensions is essential for organizations aiming to achieve optimal customer satisfaction. It is evident that customer expectations are closely tied to the timely delivery of goods and services, and lead time management plays a pivotal role in meeting these expectations.

Furthermore, the study's findings reveal that the Ghana Ports and Harbours Authority recognizes the strategic importance of lead time but may not be fully utilizing its potential. This suggests an opportunity for the organization to further harness the power of lead time

management practices to enhance customer satisfaction. By prioritizing effective lead time management and its application, the Ghana Ports and Harbours Authority can not only improve its operational efficiency but also contribute to heightened customer satisfaction, ultimately solidifying its position as a leader in the industry.

In essence, this study serves as a reminder to businesses and organizations, like the Ghana Ports and Harbours Authority, to continually evaluate their lead time management practices, bridging the gap between their potential and current implementation. The findings emphasize the need for organizations to stay vigilant in their efforts to deliver goods and services with reduced lead times, as this plays a pivotal role in satisfying their customers' ever-increasing expectations and maintaining a competitive edge in today's dynamic business environment.

## 6. Recommendations

To enhance lead time management and, by extension, customer satisfaction, organizations should embrace a multifaceted strategy. Firstly, it is imperative that they prioritize lead time management as a strategic imperative. This involves investing in the necessary training, technology, and workforce development to ensure optimal lead time practices. Furthermore, companies must maintain a vigilant focus on customer expectations. Regularly assessing these expectations through feedback mechanisms, surveys, and focus groups allows for timely adjustments in lead time management to meet and even surpass these expectations. Additionally, fostering a skilled workforce, particularly in workforce planning and lead time management, is critical. Well-trained employees can play a significant role in minimizing lead times and ultimately enhancing customer satisfaction. Streamlining decision-making processes is essential to eliminate delays in management decisions related to lead time management, while strict adherence to lead time regulations must be ensured through clear communication, training, and continuous monitoring.

Secondly, diversifying suppliers and transportation options can also yield positive results in lead time management. Companies should explore these alternatives to introduce redundancy into their supply chains, ensuring reliable and timely deliveries. Cultivating a culture of continuous improvement is vital. Routine evaluations of lead time management practices, supported by feedback loops, data analysis, and appropriate technologies, allow for consistent refinements. Organizations should also establish and closely monitor key performance indicators (KPIs) associated with lead time management and customer satisfaction. Regularly tracking these metrics enables businesses to identify areas for

enhancement and gauge the effectiveness of their efforts. Leveraging technology solutions, such as supply chain management systems, data analytics, and real-time monitoring tools, can further enhance the accuracy and reliability of lead time management. To conclude, these recommendations provide a comprehensive roadmap for organizations, like the Ghana Ports and Harbours Authority, to bolster their lead time management practices and, in turn, elevate customer satisfaction. Through the adoption of these measures, organizations can gain a competitive edge, foster customer loyalty, and maintain a prominent position within their respective industries.

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