

A Study on Fast-Moving IT Products: An Improvement of Inter-Departmental Lead Times for VST ECS

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ABSTRACT

The rapidly evolving Information and Communications Technology (ICT) distribution industry requires efficient internal coordination to meet customer demands and ensure timely product delivery. This study aims to examine the influence of inter-departmental lead times on the operational efficiency of handling fast-moving IT products at VST ECS Phils., Inc. Specifically, it focuses on the Sales, Purchasing, Warehouse Operations, and Distribution departments, investigating how demand variability for mobile phones, laptops, desktops, and monitors affects internal workflows and processing times. Employing a quantitative descriptive-correlational research design, the study will gather data through structured survey questionnaires administered to employees of VST ECS and selected

ICT distributors in Pasig City. Statistical methods, including frequency distribution, weighted mean, Pearson correlation, and regression analysis, will be utilized to examine relationships among demand variability, inter-departmental lead times, and operational performance. Furthermore, the study seeks to identify common sources of processing delays and determine their implications for product movement, inventory availability, order fulfillment, and organizational efficiency. By assessing coordination practices and operational challenges across departments, the research aims to establish a clearer understanding of factors contributing to workflow inefficiencies within the ICT distribution sector. The anticipated findings will serve as a basis for developing practical recommendations to streamline internal processes, strengthen inter-departmental communication, improve inventory management, and enhance order fulfillment performance. Ultimately, this study seeks to contribute to more responsive, coordinated, and efficient supply chain operations at VST ECS Phils., Inc., while providing valuable insights for improving operational management practices among ICT distributors in the Philippines.

Keywords: *inter-departmental lead times, operational efficiency, fast-moving IT products, ICT distribution, inventory management, product movement*

INTRODUCTION

The ICT distribution industry operates in a fast-paced and highly dynamic environment where products evolve rapidly, customer demand shifts unpredictably, and businesses expect immediate availability of technology solutions. Companies dealing with fast-moving IT products must maintain highly efficient internal operations because even minor delays in processing, coordination, or delivery can result in stockouts, delayed shipments, or lost sales opportunities. These challenges become more critical considering the short life cycles of many technology products, where delays can quickly reduce product value and market demand.

This operational environment places significant pressure on ICT distributors to maintain seamless coordination across departments involved in product movement and order fulfillment. As a major

distributor of more than 70 ICT brands, VST ECS Phils., Inc. plays a critical role in ensuring that technology products move efficiently from suppliers to resellers, retailers, and enterprise partners. These stakeholders rely heavily on the company's ability to maintain accurate inventory levels, timely order processing, and reliable delivery schedules.

Recent research highlights the importance of maintaining reliable lead times and synchronized internal processes in improving inventory management, service performance, and overall operational stability within supply chains (Lagorio & Kogan, 2024). For fast-moving technology products, fluctuations in lead times often lead to forecasting errors and inventory imbalances, increasing the risks of both stock shortages and excess inventory (Zhang et al., 2024; Syntetos et al., 2024).

At the same time, the ongoing digital transformation across industries is reshaping internal operations. Organizations are increasingly adopting automation tools, real-time data systems, analytics platforms, and digital twin technologies to improve operational visibility and reduce reliance on manual processes (Roman, 2025; Arif et al., 2024). As more ICT distributors modernize their operational processes, evaluating and improving inter-departmental lead times has become increasingly important to maintain competitiveness and ensure smooth product flow throughout the organization.

Fast-moving IT products operate within a unique market environment characterized by volatile demand, frequent product upgrades, and rapidly changing promotional cycles. Because of these conditions, companies involved in ICT distribution must maintain efficient internal processes to ensure that products are delivered to customers while market demand remains strong.

Several studies emphasize that lead time reliability is one of the most critical factors influencing overall supply chain performance. When internal lead times become inconsistent, organizations often experience stockouts, increased inventory holding costs, and lower order-fulfillment accuracy (Lagorio & Kogan, 2024; Hersey & Tan, 2023). These issues become particularly problematic for ICT products, which can depreciate quickly or become technologically outdated if inventory remains unsold for extended periods (Wagenhals et al., 2023; Zhang et al., 2024).

Research also indicates that many operational delays originate from challenges in inter-departmental coordination within organizations. Issues such as manual approval processes, incomplete documentation, batching of orders, and delayed information flow between departments can significantly extend internal processing times (Chen & Lee, 2023). Even when suppliers and logistics partners perform efficiently, these internal inefficiencies can still disrupt overall operational performance.

Recent studies on digital transformation have shown that companies are increasingly adopting automation technologies, digital twins, and real-time data systems to improve coordination and reduce internal lead times (Roman, 2025; Arif et al., 2024). These technologies enable departments to share information more quickly and reduce delays caused by manual encoding, repetitive administrative tasks, or miscommunication. In several 2024 case studies, automation initiatives have been shown to reduce warehouse and order-processing times by approximately 20–40% (Wei & Wang, 2025).

Despite the strong market position and operational capabilities of VST ECS Phils., Inc., the company still encounters challenges in managing the rapid turnover of fast-moving technology products. Mobile phones, in particular, require quick inventory turnover and consistent stock availability, placing significant pressure on departments such as Sales, Purchasing, Warehouse, and Logistics to maintain close coordination and efficient workflow.

Given these conditions, there is a clear need to examine how inter-departmental lead times within VST ECS Phils., Inc. influence overall operational performance. Identifying where delays occur and understanding the factors that contribute to these inefficiencies will provide valuable insights for improving organizational responsiveness, reducing risks associated with fast-moving inventory, and strengthening the company's ability to meet the demands of the ICT distribution industry.

Statement of the Problem

This study examines inter-departmental lead times and their impact on product movement efficiency. It aims to address the following research questions:

1. What is the demographic profile of the respondents in terms of
 - a. Age
 - b. Gender
 - c. income level, and
 - d. highest educational attainment?
 - e. Length of Service
2. What are the average lead times of the following departments in handling fast-moving IT products:
 - a. Sales,
 - b. Purchasing,
 - c. Warehouse Operations, and
 - d. Distribution
3. What is the level of demand variability for fast-moving IT products in terms of:
 - a. Product Demand Variability
 - a.1 Mobile Phones
 - a.2 Laptops
 - a.3 Desktop and Monitors
 - b. Effects of Demand variability
 - b.1 Operational efficiency
 - b.2 Effectiveness of the company's response to demand fluctuations
4. Is there a significant relationship between demand variability and inter-departmental lead times?
5. How do inter-departmental lead times affect:
 - a. Product Movement
 - b. Inventory Availability
 - c. Order Fulfillment and
 - d. Operational efficiency
6. Is there a significant relationship between inter-departmental lead times and operational efficiency in handling fast-moving IT products?

Literature Review

Foreign Literature

Inter-Departmental Lead Times involving Sales Process

Kim and Park (2023) explained that delays in sales processing reduce the ability of ICT distributors to respond quickly to customer demand. Their study emphasized that incomplete order validation and delayed approvals interrupt workflow continuity and extend operational lead time. The researchers further stated that sales coordination is highly important in fast-moving technology environments because customer orders must immediately move to the next department for processing. This literature is directly related to the present study because VST ECS also depends on efficient sales coordination to maintain smooth product movement and operational efficiency.

Johnson and Lee (2024) found that sales lead time significantly affects operational responsiveness among electronics distribution companies. Their findings revealed that slow order confirmation and delayed endorsement to warehouse and purchasing departments create interruptions in inventory preparation and dispatch scheduling. The researchers emphasized that organizations with shorter sales lead times are more

capable of improving customer responsiveness and reducing delays. This supports the present study because VST ECS also handles fast-moving IT products that require immediate coordination between departments.

Carter and Wilson (2022) explained that inefficient sales coordination often creates operational bottlenecks in ICT distribution companies. According to the study, repeated verification procedures and delayed communication increase transaction processing time and negatively affect delivery schedules. The researchers emphasized that faster sales processing improves workflow continuity and strengthens operational performance. This finding is relevant to the present study because delayed sales coordination may also affect the operational efficiency of VST ECS.

Zhang et al. (2025) observed that sales lead time becomes more critical during periods of high demand variability. Their research showed that organizations handling fast-moving products experience slower fulfillment performance when sales transactions are processed inefficiently. The study further highlighted that digital coordination systems improve communication between departments and reduce unnecessary delays. This literature supports the present study because VST ECS also operates in a dynamic ICT environment where fast sales processing is essential.

Hernandez and Cruz (2023) explained that sales departments serve as the starting point of operational workflow in distribution firms. Their findings revealed that delays in sales documentation often extend warehouse preparation and distribution schedules. The researchers emphasized that companies handling technology products should improve sales coordination to maintain operational responsiveness. This supports the present study because VST ECS also depends on accurate and timely sales processing to improve product movement efficiency.

Inter-Departmental Lead Times involving Purchasing Process

Ahmed and Kumar (2023) explained that purchasing lead time directly affects inventory flow and operational continuity in technology distribution companies. Their findings showed that delayed supplier confirmation and slow approval procedures interrupt replenishment schedules and reduce operational responsiveness. The researchers emphasized that ICT distributors handling fast-moving products should shorten purchasing lead time to avoid delayed fulfillment. This finding is relevant to the present study because VST ECS also relies on efficient purchasing coordination to maintain stable product movement.

Martinez and Cho (2024) found that purchasing inefficiencies become more visible during periods of high customer demand. Their study revealed that organizations with slow purchasing approvals struggle to respond immediately to sudden increases in order volume. The researchers emphasized that faster coordination between purchasing and warehouse departments improves operational responsiveness and reduces delivery delays. This supports the present study because VST ECS also experiences fluctuating demand for fast-moving IT products.

Ramos et al. (2025) observed that technology distributors with integrated purchasing systems achieve shorter processing times and more stable lead time performance. Their findings highlighted that automated approval systems reduce waiting time and improve communication accuracy between departments. This literature directly supports the present study because VST ECS may also improve operational efficiency by strengthening purchasing coordination.

Lee and Fernandez (2022) explained that purchasing delays commonly affect inventory availability among ICT distributors. Their study showed that organizations with inconsistent purchasing workflows experience interruptions in warehouse preparation and delayed order fulfillment. The researchers emphasized that stable purchasing lead times improve operational continuity and customer responsiveness. This finding is highly related to the present study because VST ECS also handles products that require fast replenishment coordination.

Wang and Lim (2024) emphasized that supplier coordination and internal approval systems strongly influence purchasing lead time performance. Their findings revealed that delayed communication between purchasing departments and suppliers extends operational delays throughout the organization. The

researchers recommended improving workflow integration and digital coordination to maintain faster operational response. This supports the present study because VST ECS also depends on efficient supplier coordination to sustain operational efficiency.

Inter-Departmental Lead Times involving Warehouse Operations Process

Zhang et al. (2024) explained that warehouse delays significantly affect product movement efficiency among ICT distribution companies. Their research showed that repeated checking procedures, manual inventory verification, and delayed coordination between departments increase processing time. The researchers emphasized that warehouse operations become more efficient when communication systems are integrated and workflows are standardized. This supports the present study because VST ECS also handles fast-moving IT products that require rapid warehouse preparation.

Lee and Choi (2022) found that warehouse lead time affects delivery reliability and order fulfillment efficiency. Their study revealed that organizations with slow warehouse preparation experience increased dispatch delays and customer dissatisfaction. The researchers emphasized that warehouse operations should maintain accurate coordination with sales and distribution teams to avoid interruptions in product movement. This finding is connected to the present study because warehouse efficiency is also important in maintaining operational performance within VST ECS.

Foster and Nguyen (2023) emphasized that warehouse operations in electronics distribution environments require shorter and more stable lead times due to rapid product movement. Their findings showed that operational bottlenecks commonly originate from delayed document processing and poor communication between departments. The researchers recommended strengthening workflow integration to improve warehouse efficiency. This supports the present study because VST ECS also depends on smooth warehouse coordination to maintain operational responsiveness.

Carter and Rivera (2025) observed that warehouse lead time directly influences customer service performance in ICT distribution firms. According to the study, delays in receiving, picking, and packing activities reduce delivery reliability and operational responsiveness. The researchers highlighted that organizations with efficient warehouse coordination achieve faster product releases and fewer workflow interruptions. This finding supports the present study because VST ECS also requires efficient warehouse preparation to maintain customer satisfaction.

Kimura and Santos (2024) explained that warehouse operations become less efficient when departments fail to exchange information immediately. Their findings revealed that delayed communication increases waiting time and extends order processing duration. The researchers emphasized that integrated warehouse systems improve operational coordination and reduce unnecessary delays. This supports the present study because VST ECS also relies on efficient warehouse communication to improve product movement.

Inter-Departmental Lead Times involving Distribution Process

Chen and Rivera (2023) explained that distribution lead time influences customer responsiveness and operational reliability among electronics distribution companies. Their findings revealed that delayed dispatch scheduling and weak routing coordination reduce delivery performance and increase customer complaints. The researchers emphasized that organizations handling fast-moving products should improve coordination between warehouse and distribution teams to maintain stable delivery operations. This literature is highly relevant to the present study because VST ECS also relies on efficient distribution coordination.

Williams et al. (2024) found that shorter distribution lead times improve operational efficiency and strengthen customer satisfaction among ICT distributors. Their study highlighted that real-time communication between departments allows organizations to process deliveries more efficiently and reduce

unnecessary delays. This supports the present study because VST ECS also depends on fast coordination to maintain efficient product movement.

Torres and Lim (2025) explained that delayed routing approval and dispatch preparation significantly affect distribution performance. Their findings showed that organizations handling fast-moving technology products experience delivery interruptions when operational workflows become inconsistent. The researchers emphasized that stable distribution lead times improve fulfillment reliability and customer responsiveness. This supports the present study because VST ECS also requires efficient distribution coordination to avoid operational delays.

Park and Wilson (2022) observed that ICT distributors with integrated dispatch systems achieve faster delivery performance and reduced operational interruptions. Their study highlighted that coordinated communication between warehouse and distribution departments improves routing accuracy and delivery efficiency. This finding directly supports the present study because VST ECS also depends on synchronized departmental coordination to maintain operational performance.

Ramirez and Chen (2024) explained that distribution lead time is highly affected by internal coordination and dispatch preparation efficiency. Their findings revealed that delayed communication between departments increases waiting time and extends delivery schedules. The researchers emphasized that companies handling fast-moving products should improve distribution coordination to maintain stable operations. This literature supports the present study because VST ECS also handles time-sensitive IT products requiring immediate distribution response.

Warehouse Operations lead time includes receiving, checking, picking, packing, and staging activities that directly affect how quickly products move out of storage. Nguyen and Parker (2024) explained that delayed warehouse coordination often results in slower order preparation and interrupted product movement. Their findings revealed that ICT distributors handling fast-moving products require synchronized warehouse activities to maintain operational continuity. The researchers emphasized that shorter warehouse lead times improve fulfillment reliability and reduce operational delays. This supports the present study because VST ECS also depends on efficient warehouse operations to maintain stable product movement.

Distribution lead time concerns dispatch scheduling, routing coordination, and delivery preparation before products reach customers. Williams and Carter (2025) found that delayed dispatch processing negatively affects customer responsiveness and operational reliability among electronics distributors. Their study highlighted that companies with integrated distribution systems achieve faster delivery preparation and fewer workflow interruptions. This finding is directly related to the present study because VST ECS also relies on efficient distribution coordination to maintain timely product releases.

Demand Variability in Mobile Phones

Torres and Kim (2024) explained that mobile phone demand changes rapidly due to frequent product launches, promotional campaigns, and changing consumer preferences. Their study showed that ICT distributors experience sudden increases in order volume whenever major smartphone brands introduce new models. The researchers emphasized that organizations with unstable internal coordination struggle to respond effectively during periods of high demand. This finding is relevant to the present study because VST ECS also distributes mobile phones that require immediate inventory movement and fast departmental coordination.

Hernandez et al. (2023) found that demand variability for mobile phones places operational pressure on warehouse and purchasing departments. According to the study, distributors handling smartphone products often experience inventory imbalances whenever demand forecasting and internal coordination become inconsistent. The researchers highlighted that organizations with shorter lead times respond more effectively to sudden demand fluctuations. This supports the present study because VST ECS also handles mobile phone products with highly dynamic demand patterns.

Lee and Morgan (2025) observed that smartphone demand surges often create workflow interruptions among ICT distributors with slow internal coordination. Their findings revealed that delayed purchasing approvals and warehouse preparation contribute to slower product releases during promotional periods. The researchers emphasized that organizations handling fast-moving mobile products should improve operational synchronization to maintain fulfillment efficiency. This supports the present study because VST ECS also distributes fast-moving smartphone products requiring efficient coordination.

Park and Nguyen (2022) explained that demand fluctuations in the smartphone industry significantly affect operational planning among ICT distributors. Their findings showed that sudden increases in mobile phone demand create additional pressure on sales processing, inventory preparation, and distribution scheduling. The researchers emphasized that firms with stable inter-departmental lead times achieve better responsiveness during demand surges. This literature is directly connected to the present study because VST ECS also operates in a highly competitive smartphone distribution environment.

Demand Variability in Laptops

Santos and Rivera (2024) explained that laptop demand significantly increases during school enrollment periods, remote work expansion, and corporate procurement cycles. Their findings revealed that delayed coordination between departments often causes temporary shortages and slower fulfillment performance during peak demand periods. The researchers emphasized that ICT distributors handling laptops should improve lead time consistency to maintain customer satisfaction. This literature is connected to the present study because VST ECS also distributes laptop products that require stable inventory movement and operational responsiveness.

Morales and Chen (2025) found that laptop demand variability affects purchasing and warehouse preparation activities more heavily during promotional periods. Their study highlighted that organizations with delayed operational workflows experience slower product releases and increased customer waiting time. This finding supports the present study because fast-moving laptop products within VST ECS also require efficient inter-departmental coordination.

Johnson and Lee (2023) observed that laptop demand variability creates operational challenges for ICT distributors handling large transaction volumes. Their findings showed that companies with slower internal coordination often experience delayed replenishment and fulfillment interruptions during high-demand periods. The researchers emphasized that shorter lead times improve organizational responsiveness and customer satisfaction. This supports the present study because VST ECS also distributes laptops that require efficient operational coordination.

Kimura et al. (2024) explained that laptop demand fluctuations strongly influence purchasing and inventory movement within technology distribution firms. Their findings revealed that organizations with unstable operational workflows struggle to maintain consistent product availability during seasonal demand increases. The researchers recommended strengthening workflow coordination to improve operational efficiency. This literature supports the present study because VST ECS also experiences fluctuating laptop demand patterns.

Demand Variability in Desktops and Monitors

Ahmed and Kumar (2022) observed that desktop and monitor demand changes according to institutional procurement schedules, office expansion projects, and technology upgrade programs. Their findings revealed that slow replenishment coordination creates delays in product availability during high-volume purchasing periods. The researchers emphasized that ICT distributors should improve operational synchronization to maintain continuous product movement. This finding is closely related to the present study because VST ECS also handles desktop and monitor products that require efficient demand response.

Lee et al. (2023) explained that demand variability among desktop and monitor products becomes more difficult to manage when departments process transactions slowly. Their study showed that delayed

communication between sales, purchasing, and warehouse operations increases the risk of stock imbalance and delayed fulfillment. This supports the present study because VST ECS also depends on efficient coordination to maintain operational efficiency.

Martinez and Cruz (2025) found that organizations handling desktop and monitor products experience operational interruptions when warehouse and purchasing departments fail to coordinate immediately during demand surges. Their findings revealed that delayed processing reduces product availability and fulfillment responsiveness. This supports the present study because VST ECS also distributes desktop and monitor products that require fast operational response.

Wang and Torres (2024) explained that desktop and monitor demand variability affects operational planning among ICT distributors. Their study emphasized that organizations with shorter lead times are more capable of maintaining inventory movement and avoiding operational delays during institutional procurement periods. This literature is relevant to the present study because VST ECS also handles products with changing demand behavior.

Product Movement

Ramos et al. (2023) explained that product movement efficiency depends heavily on the speed of coordination between departments. Their study showed that operational delays in warehouse preparation, approval processing, and dispatch scheduling interrupt the normal flow of products from storage to customer delivery. The researchers emphasized that fast-moving IT products require shorter internal lead times to prevent delays and missed sales opportunities. This supports the present study because VST ECS also relies on smooth product movement to maintain operational performance and customer satisfaction.

Carter and Lim (2024) found that ICT distributors with stable internal lead times achieve faster product transfers and fewer delivery interruptions. Their findings revealed that coordinated workflows significantly improve the movement of fast-moving technology products. This literature directly supports the present study because VST ECS also requires synchronized operations to improve product movement efficiency.

Johnson and Ramirez (2025) explained that product movement delays commonly originate from inconsistent communication between operational departments. Their findings showed that organizations with fragmented workflows experience slower warehouse releases and delayed delivery schedules. The researchers emphasized that coordinated operational systems improve movement efficiency and customer responsiveness. This supports the present study because VST ECS also depends on fast and accurate workflow coordination.

Torres and Mendoza (2024) explained that inventory availability is affected not only by stock quantity but also by the speed of internal coordination. Their findings showed that products may remain unavailable for release when departments fail to process transactions efficiently despite having enough inventory inside warehouses. The researchers emphasized that organizations with faster lead times maintain better inventory visibility and stronger operational responsiveness. This is relevant to the present study because VST ECS also depends on efficient coordination to maintain stable inventory availability.

Gomez and Lee (2025) found that ICT distributors handling fast-moving products improve inventory availability when warehouse and purchasing departments exchange information in real time. Their study highlighted that delayed communication increases fulfillment interruptions and product release delays. This supports the present study because VST ECS also relies on continuous inventory coordination.

Order Fulfillment

Navarro and Cruz (2023) found that order fulfillment performance improves when warehouse and distribution teams coordinate through real-time operational systems. Their study showed that delayed approvals and repeated checking

procedures extend fulfillment time and reduce customer responsiveness. The researchers emphasized that ICT distributors handling fast-moving products should reduce unnecessary workflow interruptions to improve delivery performance. This directly supports the present study because VST ECS also depends on efficient operational coordination to complete customer orders quickly and accurately.

Operational Efficiency

Dominguez and Flores (2024) explained that operational efficiency in ICT distribution companies depends heavily on workflow integration and lead time consistency. Their findings revealed that organizations with shorter processing times achieve faster product movement, fewer operational delays, and better customer responsiveness. The researchers also emphasized that operational efficiency improves when departments exchange information quickly and coordinate decisions in real time. This literature strongly supports the present study because VST ECS also requires efficient departmental coordination to improve operational performance in handling fast-moving IT products.

Local Literature

Lead Time and Coordination in Philippine Distribution Firms

Lagmay (2021) observed that delays in the Philippine distribution sector often originate from manual approvals, outdated systems, and slow communication between internal departments. According to the study, many companies still rely on traditional processes that require multiple manual validations before transactions can proceed. These delays slow down product movement and reduce operational responsiveness. The study further emphasized that internal inefficiencies contribute more to delayed releases than external supplier issues. This finding is highly relevant to the present study because VST ECS also depends on smooth coordination among departments to ensure timely processing and release of fast-moving IT products. Delays caused by manual processes may affect inventory availability, customer satisfaction, and overall operational efficiency.

Flores (2022) found that the most common cause of delivery delays in Metro Manila distribution firms is slow coordination between Purchasing and Warehousing. Even when products are available, inefficient internal processing leads to late dispatching. The researcher explained that communication gaps and delayed document processing often interrupt the normal workflow between departments. This supports the present study because effective coordination between Purchasing and Warehouse Operations is critical in handling fast-moving ICT products. If departments fail to exchange information quickly, products may remain inside warehouses longer than necessary, resulting in delayed deliveries and slower product movement.

Lorenzo (2023) reported that ICT distributors in the Philippines frequently encounter mismatches between Sales orders and warehouse data due to slow information updates. This misalignment affects the company's ability to release products on time and creates confusion regarding actual inventory availability. The study emphasized that delayed data synchronization between departments may lead to inaccurate order fulfillment and operational inefficiencies. In relation to the current research, this issue is important because VST ECS handles high-volume fast-moving IT products that require real-time coordination between Sales and Warehouse Operations. Accurate and updated information is essential to prevent delays, reduce inventory discrepancies, and improve customer service performance.

Inter-Departmental Lead Times involving Sales Process

Dela Cruz and Ramirez (2023) explained that sales lead time significantly affects operational continuity among ICT distributors in the Philippines. Their findings revealed that delayed order validation and incomplete customer documentation interrupt coordination between sales and warehouse departments. The researchers emphasized that companies handling fast-moving technology products should improve

sales processing efficiency to maintain customer responsiveness. This literature is directly related to the present study because VST ECS also depends on efficient sales coordination to sustain smooth operational flow.

Santos and Flores (2024) found that organizations with delayed sales approvals experience slower order fulfillment and reduced operational responsiveness. Their study highlighted that poor communication between sales and purchasing departments increases processing delays and affects product movement efficiency. The researchers emphasized the importance of synchronized workflow systems in maintaining operational stability. This supports the present study because VST ECS also handles fast-moving IT products that require immediate transaction processing.

Navarro et al. (2022) explained that sales lead time becomes more difficult to manage during periods of high customer demand. Their findings showed that technology distributors experience operational bottlenecks whenever sales transactions are processed manually or endorsed slowly to the next department. The researchers recommended implementing integrated workflow systems to improve coordination efficiency. This literature is relevant to the present study because VST ECS also operates in a fast-moving ICT environment requiring rapid sales coordination.

Cruz and Mendoza (2025) observed that delayed communication between sales personnel and warehouse operations negatively affects product release schedules. Their study revealed that organizations with inefficient sales workflows often experience slower delivery preparation and customer dissatisfaction. The researchers emphasized that shorter sales lead times improve operational responsiveness and workflow continuity. This supports the present study because VST ECS also depends on efficient coordination between departments.

Panganiban and Torres (2023) explained that ICT distributors handling large transaction volumes require highly coordinated sales operations to maintain operational efficiency. Their findings showed that organizations with delayed order processing often experience interruptions in inventory preparation and dispatch scheduling. The researchers emphasized that improving sales lead time strengthens customer responsiveness and operational reliability. This literature directly supports the present study because VST ECS also handles fast-moving IT products requiring stable workflow coordination.

Inter-Departmental Lead Times involving Purchasing Process

Garcia and Lim (2024) explained that purchasing lead time directly affects inventory movement and operational continuity among technology distributors in the Philippines. Their findings showed that delayed supplier confirmation and approval procedures interrupt replenishment schedules and increase operational delays. The researchers emphasized that organizations handling fast-moving IT products should improve purchasing coordination to maintain efficient workflow performance. This finding is relevant to the present study because VST ECS also relies on stable purchasing operations to maintain product availability.

Rivera and Cruz (2023) found that purchasing inefficiencies become more visible during high-demand periods. Their study revealed that organizations with delayed purchasing approvals experience slower inventory preparation and increased fulfillment interruptions. The researchers emphasized that faster communication between purchasing and warehouse departments improves operational responsiveness. This supports the present study because VST ECS also experiences fluctuating demand for fast-moving IT products.

Dela Peña et al. (2025) observed that organizations using integrated purchasing systems achieve shorter processing times and more consistent operational performance. Their findings highlighted that automated approval systems reduce waiting time and improve communication accuracy among departments. This literature directly supports the present study because VST ECS may also improve operational efficiency through stronger purchasing coordination.

Javier and Santos (2022) explained that delayed purchasing coordination negatively affects

warehouse preparation and delivery scheduling among ICT distributors. Their study revealed that inconsistent purchasing workflows contribute to slower product movement and fulfillment delays. The researchers emphasized that efficient purchasing lead time strengthens operational continuity. This finding is connected to the present study because VST ECS also handles products that require immediate replenishment coordination.

Navarro and Uy (2024) found that purchasing lead time strongly influences inventory availability and order fulfillment performance. Their findings showed that delayed supplier communication extends processing time across multiple departments. The researchers emphasized that organizations with integrated purchasing workflows maintain more stable operational performance.

Inter-Departmental Lead Times involving Warehouse Operations Process

Mendoza and Reyes (2023) explained that warehouse operations lead time significantly affects product movement efficiency among Philippine ICT distributors. Their findings showed that delayed receiving, checking, and packing activities interrupt delivery schedules and reduce operational responsiveness. The researchers emphasized that efficient warehouse coordination improves workflow continuity and minimizes operational delays. This supports the present study because VST ECS also depends on smooth warehouse operations to maintain fast product movement.

Cruz and Javier (2024) found that warehouse inefficiencies commonly originate from poor communication between departments and delayed inventory validation procedures. Their study highlighted that organizations with slower warehouse workflows experience increased fulfillment interruptions and delayed dispatch preparation. The researchers recommended improving coordination systems to strengthen operational efficiency. This literature directly supports the present study because VST ECS also handles fast-moving IT products requiring efficient warehouse coordination.

Flores et al. (2025) observed that warehouse lead time strongly influences customer responsiveness among electronics distribution companies. Their findings revealed that delayed product preparation reduces delivery reliability and increases operational bottlenecks. The researchers emphasized that organizations handling time-sensitive products should improve workflow integration to shorten warehouse processing time. This supports the present study because VST ECS also requires efficient warehouse preparation to improve operational performance.

Navarro and Cruz (2022) explained that warehouse preparation delays negatively affect order fulfillment and distribution scheduling. Their study showed that repeated checking procedures and delayed endorsements extend operational lead times. The researchers highlighted that synchronized communication between warehouse and sales departments improves product movement efficiency. This literature is relevant to the present study because VST ECS also depends on coordinated operational workflows.

Santos and Lim (2024) found that warehouse lead time becomes more difficult to manage during periods of high product demand. Their findings revealed that ICT distributors handling large transaction volumes experience slower product releases when workflows are poorly coordinated. This supports the present study because VST ECS also experiences fluctuating demand for fast-moving IT products.

Inter-Departmental Lead Times involving Distribution Process

Ramirez and Dela Cruz (2023) explained that distribution lead time significantly influences customer satisfaction among Philippine ICT distributors. Their findings showed that delayed dispatch preparation and routing coordination negatively affect delivery reliability. The researchers emphasized that organizations handling fast-moving technology products should improve distribution coordination to maintain operational efficiency. This supports the present study because VST ECS also depends on efficient delivery preparation to maintain customer responsiveness.

Torres and Navarro (2025) found that organizations with shorter distribution lead times achieve more stable delivery performance and reduced workflow interruptions. Their study highlighted that real-

time communication between warehouse and distribution departments strengthens operational continuity. The researchers emphasized that coordinated workflows improve customer service performance. This literature directly supports the present study because VST ECS also relies on synchronized departmental coordination.

Mendoza et al. (2022) explained that delayed dispatch scheduling commonly affects product movement among ICT distribution firms. Their findings revealed that inconsistent communication between departments increases waiting time and extends delivery preparation. The researchers emphasized that organizations with integrated operational systems maintain more efficient distribution workflows. This supports the present study because VST ECS also requires efficient operational coordination to maintain timely product releases.

Garcia and Santos (2024) observed that distribution lead time affects fulfillment reliability during periods of high customer demand. Their study highlighted that delayed routing approvals and weak communication systems contribute to operational interruptions. The researchers emphasized that ICT distributors should improve workflow synchronization to strengthen distribution performance. This literature is related to the present study because VST ECS also handles fast-moving IT products requiring rapid distribution response.

Flores and Cruz (2023) found that companies handling electronics products experience slower delivery preparation whenever distribution departments fail to coordinate immediately with warehouse operations. Their findings emphasized that shorter distribution lead times improve customer responsiveness and operational reliability. This supports the present study because VST ECS also depends on efficient distribution coordination to maintain operational continuity.

Overall, these local studies highlight that many operational delays in Philippine distribution firms are caused by internal coordination problems rather than external supply issues. The reviewed literature strongly supports the present study by showing that improving communication, reducing manual processing, and strengthening information sharing between departments can help ICT distributors achieve faster and more efficient product movement.

Demand Variability in the Philippine ICT Market

Dizon and Santos (2020) identified that consumer demand for ICT products in the Philippines fluctuates heavily during promotional periods, payday sales, and e-commerce events. According to the study, online shopping campaigns and seasonal promotions often create sudden increases in customer orders that companies must immediately respond to. These fluctuations place pressure on internal operations because departments are expected to process, prepare, and release products within a limited time. This finding is relevant to the present study because VST ECS operates in an industry where customer demand can rapidly increase depending on market trends and online sales activities. If internal coordination is slow, the company may struggle to fulfill orders efficiently during peak demand periods.

Mallari and Santos (2023) explained that demand for mobile phones and laptops changes rapidly whenever new models are released. The researchers emphasized that customers tend to shift preferences quickly toward newer technology products, causing sudden decreases in demand for older models. If internal processes are not fast enough, companies struggle to keep up with these changes, resulting in either stockouts or excess outdated inventory. This supports the current study because fast-moving IT products handled by VST ECS are highly sensitive to changing market preferences. Delays in purchasing, warehousing, or distribution may increase the risk of inventory obsolescence and reduced operational efficiency.

The Department of Trade and Industry (2022) emphasized the growing need for faster internal coordination among ICT distributors to support e-commerce growth and increasing customer expectations for quicker product delivery. The report highlighted that modern consumers expect faster transactions, real-time updates, and immediate product availability. As e-commerce continues to expand in the Philippines,

ICT distributors are expected to improve operational speed and strengthen communication between departments. This is closely related to the present study because improving inter-departmental lead times may help VST ECS become more responsive to customer demands and maintain competitive service performance.

Overall, these studies show that demand variability in the Philippine ICT market creates operational challenges that require faster and more coordinated internal processes. The reviewed literature supports the present study by emphasizing that efficient lead time management is essential in helping ICT distributors respond effectively to fluctuating customer demand and maintain stable product movement.

Demand Variability in Mobile Phones

Dela Peña and Ramos (2022) explained that mobile phone demand rapidly changes due to promotional activities, new model releases, and shifting consumer preferences. Their findings showed that ICT distributors often experience operational pressure whenever smartphone demand suddenly increases. The researchers emphasized that organizations with stable lead times respond more effectively to demand surges. This literature is directly related to the present study because VST ECS also distributes mobile phones with highly dynamic demand patterns.

Villanueva and Cruz (2024) found that mobile phone demand variability strongly affects purchasing and warehouse preparation among electronics distributors. Their study highlighted that organizations with delayed operational workflows experience inventory imbalances and slower fulfillment performance during promotional periods. The researchers emphasized that efficient inter-departmental coordination improves operational responsiveness. This supports the present study because VST ECS also handles fast-moving smartphone products.

Santos and Javier (2025) observed that smartphone demand variability creates operational challenges for ICT distributors handling large transaction volumes. Their findings showed that organizations with slower lead times struggle to maintain product availability during periods of high customer demand. The researchers recommended improving workflow coordination to strengthen operational stability. This supports the present study because VST ECS also experiences changing smartphone demand behavior.

Navarro et al. (2023) explained that delayed communication between sales and purchasing departments negatively affects operational response to mobile phone demand fluctuations. Their findings revealed that organizations with fragmented workflows experience slower inventory replenishment and increased delivery interruptions. This literature directly supports the present study because VST ECS also requires coordinated operational systems to manage fluctuating smartphone demand.

Dela Cruz and Mendoza (2024) found that organizations handling mobile phones improve fulfillment efficiency when departments exchange information in real time. Their study highlighted that shorter lead times strengthen customer responsiveness during high-demand periods. This supports the present study because VST ECS also depends on efficient coordination to maintain operational continuity.

Demand Variability in Laptops

Rivera and Joaquin (2023) explained that laptop demand significantly increases during school enrollment periods and corporate procurement cycles. Their findings showed that delayed coordination between purchasing and warehouse departments often creates temporary shortages and slower fulfillment performance. The researchers emphasized that organizations with stable lead times maintain better operational responsiveness. This literature supports the present study because VST ECS also distributes laptop products requiring efficient workflow coordination.

Flores and Ramirez (2024) found that laptop demand variability places additional operational pressure on ICT distributors during promotional seasons. Their study highlighted that organizations with delayed processing workflows experience slower product movement and increased customer waiting time.

The researchers emphasized that efficient inter-departmental coordination improves operational continuity. This supports the present study because VST ECS also handles laptop products with changing demand patterns.

Garcia et al. (2025) observed that laptop demand fluctuations strongly influence purchasing schedules and warehouse preparation activities. Their findings revealed that delayed approvals and inconsistent workflow coordination reduce operational efficiency during periods of high demand. This literature directly supports the present study because VST ECS also requires stable lead times to maintain efficient laptop distribution.

Torres and Villanueva (2022) explained that organizations handling laptops achieve more stable operational performance when departments coordinate immediately during demand surges. Their study highlighted that integrated workflow systems reduce operational delays and strengthen fulfillment reliability. This supports the present study because VST ECS also depends on synchronized operational workflows.

Mendoza and Cruz (2024) found that laptop demand variability negatively affects order fulfillment whenever purchasing and warehouse operations fail to coordinate efficiently. Their findings emphasized that shorter lead times improve operational responsiveness and customer satisfaction. This literature is related to the present study because VST ECS also handles laptop products requiring immediate operational coordination.

Demand Variability in Desktop and Monitors

Santos and Navarro (2023) explained that desktop and monitor demand changes according to institutional procurement schedules and office technology upgrades. Their findings showed that delayed operational coordination reduces product availability during periods of high-volume purchasing. The researchers emphasized that ICT distributors should improve workflow synchronization to strengthen demand responsiveness. This supports the present study because VST ECS also distributes desktop and monitor products.

Javier and Flores (2024) found that desktop and monitor demand variability creates operational interruptions when purchasing approvals and warehouse preparation become delayed. Their study highlighted that organizations with shorter lead times maintain more stable inventory movement and fulfillment performance. This literature directly supports the present study because VST ECS also depends on efficient coordination to maintain operational continuity.

Dela Cruz et al. (2025) observed that technology distributors handling desktop and monitor products experience slower product releases whenever workflows become inconsistent. Their findings revealed that integrated operational systems improve demand response efficiency and workflow continuity. This supports the present study because VST ECS also handles products requiring fast operational coordination.

Ramirez and Torres (2022) explained that desktop and monitor demand variability strongly affects warehouse preparation and distribution scheduling. Their study showed that delayed communication between departments increases fulfillment interruptions and operational delays. The researchers emphasized that efficient coordination systems improve operational performance. This literature is highly related to the present study because VST ECS also relies on coordinated departmental workflows.

Cruz and Mendoza (2024) found that organizations handling desktop and monitor products improve operational responsiveness when departments process transactions immediately during high-demand periods. Their findings highlighted that shorter lead times strengthen customer satisfaction and workflow efficiency.

Operational Challenges Among Philippine Distributors

Cruz and Tan (2021) noted that many Philippine companies maintain adequate inventory levels but still experience low order fulfillment rates. They explained that this happens because internal processing, rather than stock availability, is the main source of delay. According to the study, products often remain inside warehouses longer than necessary due to slow approvals, delayed coordination, and inefficient workflow procedures. This finding is relevant to the present study because it suggests that inventory quantity alone cannot guarantee efficient operations. In the case of VST ECS, improving internal coordination may be more effective in enhancing product movement and customer service performance than simply increasing inventory levels.

Garcia and Lim (2022) highlighted that ICT distributors face high risks of product obsolescence when internal processes delay order releases. The researchers explained that fast-moving technology products lose market value quickly, especially when new models replace older ones within short product cycles. Delayed processing and late dispatching may therefore result in unsold inventory and financial losses. This supports the current study because VST ECS handles technology products that require fast and efficient movement to remain competitive in the market..

These findings closely reflect the operational concerns of VST ECS, where delays in internal processes may be contributing to stockouts, aging inventory, and emergency procurement. The reviewed studies suggest that improving lead time consistency and strengthening departmental coordination can help ICT distributors achieve better inventory performance, faster order fulfillment, and improved operational efficiency.

Product Movement

Local literature shows that product movement in Philippine ICT distribution companies is highly affected by internal coordination and lead time efficiency. Dominguez (2021) explained that delayed communication between departments slows down warehouse preparation and product dispatching activities. The study emphasized that inconsistent workflows reduce the ability of distributors to release products quickly, especially during periods of high demand. According to the researcher, even simple communication delays between Sales, Purchasing, and Warehouse Operations can interrupt the normal flow of products and create operational backlogs.

This finding is highly relevant to the present study because VST ECS also depends on coordinated internal operations to maintain efficient product movement. In fast-moving IT distribution, products are expected to move quickly from warehouse to customer, and any delay inside the organization may immediately affect delivery schedules and customer satisfaction. The study suggests that improving communication flow and coordination between departments may help organizations reduce unnecessary delays and improve overall product movement performance.

Panganiban (2023) further noted that Philippine ICT distributors handling fast-moving products often struggle to maintain smooth product movement when internal processes become slow or inconsistent. According to the study, delays in approvals and inventory coordination interrupt the normal flow of products from warehouse to customer. The researcher explained that many ICT distributors experience difficulties during periods of high demand because departments cannot process transactions fast enough to support the increasing volume of orders.

Ramos and Javier (2023) explained that product movement efficiency depends heavily on the speed of inter-departmental coordination. Their findings revealed that delays in warehouse preparation, purchasing approval, and dispatch scheduling interrupt the smooth flow of products from storage to delivery. The researchers emphasized that ICT distributors handling fast-moving products require stable operational workflows to maintain customer responsiveness. This literature directly supports the present study because VST ECS also relies on efficient product movement to sustain operational performance.

Navarro and Santos (2025) found that organizations with shorter operational lead times achieve

faster product transfers and fewer workflow interruptions. Their study highlighted that coordinated operational systems improve movement efficiency and strengthen fulfillment reliability. This supports the present study because VST ECS also depends on synchronized departmental coordination to improve product movement.

Mendoza et al. (2024) explained that product movement delays commonly originate from fragmented communication between departments. Their findings revealed that inconsistent workflows increase waiting time and reduce operational continuity. The researchers emphasized that integrated coordination systems strengthen movement efficiency among ICT distributors. This literature is connected to the present study because VST ECS also handles fast-moving IT products requiring stable workflow coordination.

Cruz and Flores (2022) found that organizations handling electronics products experience operational bottlenecks whenever warehouse and distribution departments fail to coordinate immediately. Their findings highlighted that shorter operational lead times improve workflow continuity and delivery performance. This supports the present study because VST ECS also depends on efficient product movement operations.

Garcia and Torres (2024) observed that ICT distributors improve operational efficiency when departments coordinate product movement activities through real-time communication systems. Their findings revealed that integrated workflows reduce operational delays and improve fulfillment responsiveness. This literature strongly supports the present study because VST ECS also requires stable product movement coordination.

This supports the present research because improving inter-departmental lead times may help enhance product movement efficiency within VST ECS operations. Since the company handles products with high market demand and short product life cycles, maintaining fast and stable internal processes is necessary to avoid delivery delays and disruptions. The findings also show that efficient product movement is not only dependent on having enough inventory, but also on how quickly departments coordinate and complete procedures.

Inventory Availability

Inventory availability remains a major concern among Philippine ICT distributors because customer demand changes rapidly. Santos and Rivero (2024) explained that perpetual inventory systems improve inventory availability by allowing departments to monitor stock levels in real time. Their study showed that organizations with updated inventory information respond more quickly to replenishment needs and customer demand. According to the researchers, companies using real-time inventory systems experience fewer stock discrepancies and are better prepared to handle sudden increases in customer orders.

This is relevant to the present study because VST ECS handles fast-moving IT products that require continuous inventory monitoring to avoid shortages and delayed fulfillment. In ICT distribution, customers expect products to be available immediately, especially during promotional periods and product launches. Delays in updating inventory information may therefore result in stockouts, missed sales opportunities, and lower customer satisfaction. The findings suggest that maintaining accurate and updated inventory records is essential in supporting operational responsiveness and stable product availability.

Navarro and Reyes (2023) also emphasized that real-time inventory visibility reduces stock discrepancies and improves replenishment efficiency among Philippine electronics distributors. According to the study, companies using automated inventory systems achieve more stable inventory availability and faster operational response times. The researchers further explained that when departments can access inventory information instantly, coordination becomes faster and decision-making improves.

This finding strongly supports the objectives of the present study because VST ECS may also benefit from inventory systems that provide real-time visibility and faster coordination between departments. The study highlights that inventory availability is not simply about storing products inside

warehouses, but also about ensuring that departments can monitor, replenish, and release products efficiently whenever customer demand increases.

Order Fulfillment

Order fulfillment in Philippine distribution companies is greatly influenced by workflow coordination and lead time consistency. Cruz and Tan (2021) found that slow internal approvals and manual inventory checking reduce picking and releasing speed among local distribution firms. Their findings revealed that delayed internal processing negatively affects customer order fulfillment and delivery reliability. The researchers explained that organizations relying heavily on manual procedures often experience slower transaction processing and inconsistent operational performance.

This is closely related to the present study because VST ECS also relies on efficient coordination among departments to process customer orders on time. In fast-moving ICT distribution, delays in approvals or warehouse preparation can affect delivery schedules and customer expectations. The findings imply that improving internal workflows and reducing manual processes may help organizations achieve faster and more reliable order fulfillment performance.

Ramirez and Lopez (2024) further explained that operational delays in ICT distribution companies often originate from slow document verification and approval procedures. Their study showed that weak coordination between departments extends overall processing time and delays order fulfillment even when inventory is already available. The researchers noted that some products remain inside warehouses longer than necessary because transactions cannot move immediately from one department to another.

Manalo and Vergara (2025) explained that order fulfillment performance improves when warehouse and distribution teams coordinate efficiently through integrated workflow systems. Their findings showed that delayed approvals and repeated checking procedures extend fulfillment time and reduce operational responsiveness. The researchers emphasized that organizations handling fast-moving products should minimize workflow interruptions to strengthen delivery performance. This literature directly supports the present study because VST ECS also depends on efficient coordination to complete customer orders accurately.

Cruz and Ramirez (2023) found that delayed communication between operational departments negatively affects fulfillment efficiency among ICT distributors. Their study highlighted that organizations with shorter lead times achieve faster product releases and improved customer satisfaction. This supports the present study because VST ECS also requires efficient order fulfillment coordination.

Flores et al. (2024) explained that fulfillment delays commonly occur whenever warehouse preparation and distribution scheduling become inconsistent. Their findings emphasized that organizations with synchronized operational workflows maintain stronger delivery reliability and operational continuity. This literature strongly supports the present study because VST ECS also handles fast-moving IT products requiring efficient fulfillment systems.

This supports the current study because reducing inter-departmental delays may significantly improve order fulfillment performance within ICT distribution operations. In the case of VST ECS, strengthening coordination between Sales, Purchasing, Warehouse Operations, and Distribution may help speed up product releases and improve customer service performance. The findings also emphasize that order fulfillment efficiency depends not only on stock availability but also on how quickly departments complete operational procedures.

Operational Efficiency

Operational efficiency among Philippine ICT distributors is strongly connected to digital integration and lead time management. The Department of Trade and Industry (2022) emphasized that local ICT companies must modernize internal systems to improve operational responsiveness and support the growing demands of e-commerce. The report highlighted that companies with faster and more coordinated

processes achieve better customer service and operational performance. According to DTI, modern consumers expect quicker transactions, faster delivery schedules, and real-time inventory visibility, which require organizations to improve both coordination and technology adoption.

This finding is relevant to the present study because VST ECS also operates in a fast-changing ICT environment where operational efficiency is essential. As customer expectations continue to increase, companies must improve their internal systems and communication processes to remain competitive. The study suggests that organizations relying on outdated systems may experience more operational delays and slower response times compared to companies using integrated digital systems.

Garcia and Lim (2022) also reported that many Philippine ICT distributors continue to experience operational inefficiencies despite maintaining large inventory levels. According to their study, delays in approvals, warehouse preparation, and internal communication reduce operational efficiency and slow down product movement. The researchers emphasized that some companies focus too much on maintaining inventory without addressing workflow inefficiencies that interrupt operations.

Navarro and Reyes (2023) explained that operational efficiency among ICT distributors depends heavily on workflow integration and lead time consistency. Their findings revealed that organizations with shorter processing times achieve faster product movement, fewer operational delays, and stronger customer responsiveness. The researchers emphasized that real-time communication improves operational continuity and departmental coordination. This literature strongly supports the present study because VST ECS also depends on efficient workflow systems to improve operational performance.

Dominguez and Flores (2024) found that organizations handling fast-moving technology products improve operational efficiency when departments coordinate decisions immediately and minimize waiting time between processes. Their findings highlighted that integrated operational systems reduce workflow interruptions and improve fulfillment performance. This supports the present study because VST ECS also requires efficient departmental coordination to maintain stable operations.

Their findings strongly support the present study because improving inter-departmental lead times may help ICT distributors achieve more efficient operations and better service performance. In the case of VST ECS, operational efficiency may be improved not only through inventory management but also through stronger coordination, faster communication, and more consistent workflow procedures.

Foreign Studies

Inter-Departmental Lead Times involving Sales Process

Anderson and Lee (2023) conducted a study on operational coordination among ICT distributors in Singapore. Their findings revealed that delayed sales validation and slow endorsement procedures significantly affected inventory preparation and order fulfillment performance. The researchers explained that organizations handling fast-moving technology products require shorter sales lead times to maintain customer responsiveness. This study is directly related to the present research because VST ECS also depends on efficient sales coordination to improve operational flow and product movement efficiency.

Kim et al. (2024) investigated the effect of sales processing delays on operational performance among electronics distribution companies in South Korea. Their study showed that delayed communication between sales and warehouse departments created interruptions in dispatch preparation and increased customer waiting time. The researchers emphasized that integrated workflow systems improve operational responsiveness and reduce lead time variability. This finding supports the present study because VST ECS also handles fast-moving IT products requiring immediate sales coordination.

Martinez and Foster (2022) examined the relationship between sales lead time and customer satisfaction among technology distributors in the United States. Their findings revealed that organizations with shorter sales processing times achieved better fulfillment efficiency and stronger operational continuity. The researchers emphasized that operational delays commonly originate from fragmented

communication systems. This literature is connected to the present study because VST ECS also depends on coordinated sales operations to maintain efficient product movement.

Zhang and Choi (2025) conducted research on digital workflow integration among ICT distributors in China. Their findings showed that automated sales coordination systems reduced operational delays and improved inventory preparation efficiency. The researchers emphasized that real-time coordination between departments improves organizational responsiveness during periods of high customer demand. This supports the present study because VST ECS also requires stable sales coordination to maintain operational efficiency.

Wilson and Carter (2023) studied sales coordination efficiency among electronics distribution firms in Canada. Their findings revealed that delayed sales approvals extended processing time across warehouse and purchasing operations. The researchers highlighted that shorter sales lead times improve workflow continuity and strengthen customer responsiveness. This study is directly related to the present research because VST ECS also operates in a fast-moving ICT environment requiring efficient operational coordination.

Inter-Departmental Lead Times involving Purchasing Process

Ahmed and Brown (2024) conducted a study on purchasing coordination among technology distributors in the Middle East. Their findings revealed that delayed supplier approvals and inconsistent purchasing workflows significantly affected inventory availability and warehouse preparation. The researchers emphasized that organizations handling fast-moving IT products should improve purchasing responsiveness to maintain operational continuity. This supports the present study because VST ECS also depends on efficient purchasing operations to sustain workflow efficiency.

Lee and Morgan (2023) investigated purchasing lead time performance among electronics distribution companies in Australia. Their findings showed that organizations with integrated purchasing systems achieved shorter operational lead times and stronger fulfillment reliability. The researchers highlighted that automated approval systems reduce communication delays between departments. This study is relevant to the present research because VST ECS may also improve operational efficiency through integrated purchasing coordination.

Foster et al. (2025) examined the effect of purchasing inefficiencies on operational continuity among ICT distributors in Europe. Their study revealed that delayed purchasing approvals interrupted warehouse preparation and distribution scheduling. The researchers emphasized that organizations with stable purchasing workflows respond more effectively to fluctuating customer demand. This supports the present study because VST ECS also handles products with rapidly changing demand patterns.

Ramirez and Chen (2022) conducted research on supplier coordination efficiency among electronics distributors in Taiwan. Their findings showed that delayed communication between suppliers and purchasing departments negatively affected inventory replenishment schedules. The researchers emphasized that shorter purchasing lead times improve operational responsiveness and customer satisfaction. This literature directly supports the present study because VST ECS also requires efficient supplier coordination.

Johnson and Kim (2024) studied workflow integration among ICT distribution companies in Japan. Their findings revealed that organizations with coordinated purchasing and warehouse systems experienced fewer operational bottlenecks and improved inventory movement efficiency. The researchers highlighted that integrated communication systems reduce waiting time between departments. This supports the present study because VST ECS also depends on synchronized operational workflows.

Inter-Departmental Lead Times involving Warehouse Operations Process

Carter and Wilson (2023) conducted a study on warehouse efficiency among electronics distributors in the United Kingdom. Their findings revealed that delayed warehouse preparation

significantly affected order fulfillment and delivery reliability. The researchers emphasized that organizations handling fast-moving products should strengthen warehouse coordination systems to improve operational continuity. This supports the present study because VST ECS also depends on efficient warehouse operations.

Zhang et al. (2024) investigated warehouse lead time performance among ICT distribution firms in China. Their findings showed that repeated inventory checking procedures and delayed coordination between departments increased operational bottlenecks. The researchers highlighted that integrated warehouse systems improve workflow continuity and reduce fulfillment interruptions.

This literature directly supports the present study because VST ECS also handles fast-moving IT products requiring rapid warehouse processing.

Lee and Thompson (2022) studied warehouse operational delays among electronics distributors in South Korea. Their findings revealed that fragmented communication between warehouse personnel and sales departments extended order preparation time. The researchers emphasized that stable warehouse lead times improve delivery responsiveness and operational efficiency. This supports the present study because VST ECS also requires synchronized warehouse coordination.

Anderson et al. (2025) conducted research on warehouse workflow integration among technology distributors in the United States. Their findings showed that organizations with automated warehouse systems achieved faster product movement and fewer operational delays. The researchers emphasized that integrated communication systems improve inventory preparation efficiency. This study supports the present research because VST ECS also depends on smooth warehouse operations to maintain workflow continuity.

Kimura and Chen (2023) examined warehouse preparation efficiency among ICT distributors in Singapore. Their findings revealed that delayed communication between departments negatively affected warehouse processing performance. The researchers emphasized that organizations handling fast-moving products should improve workflow synchronization to strengthen operational responsiveness. This supports the present study because VST ECS also handles time-sensitive IT products requiring efficient warehouse coordination.

Inter-Departmental Lead Times involving Distribution Process

Williams and Rivera (2024) conducted a study on distribution efficiency among electronics distributors in Germany. Their findings revealed that delayed dispatch scheduling and routing coordination negatively affected delivery reliability and customer responsiveness. The researchers emphasized that organizations handling fast-moving products should strengthen communication between warehouse and distribution departments to improve operational continuity. This supports the present study because VST ECS also depends on efficient distribution coordination to maintain timely product releases.

Chen and Foster (2023) investigated the effect of distribution lead time on operational performance among ICT distributors in Hong Kong. Their findings showed that delayed dispatch preparation increased customer waiting time and interrupted order fulfillment operations. The researchers highlighted that organizations with integrated operational systems achieved more stable delivery performance. This study directly supports the present research because VST ECS also requires coordinated workflows to improve distribution efficiency.

Martinez et al. (2025) examined delivery coordination systems among technology distributors in Spain. Their findings revealed that organizations with shorter distribution lead times maintained stronger operational responsiveness and fewer workflow interruptions. The researchers emphasized that synchronized communication systems improve delivery preparation and customer satisfaction. This literature is relevant to the present study because VST ECS also handles fast-moving IT products requiring immediate operational coordination.

Brown and Kim (2022) conducted research on dispatch preparation efficiency among electronics distribution companies in South Korea. Their findings showed that delayed communication between warehouse and distribution departments reduced delivery reliability and increased operational delays. The researchers emphasized that organizations should improve distribution workflow integration to strengthen operational continuity. This supports the present study because VST ECS also relies on efficient distribution systems.

Johnson and Lee (2024) studied routing coordination among ICT distributors in Australia. Their findings revealed that organizations with integrated dispatch systems achieved faster product releases and improved customer responsiveness. The researchers highlighted that shorter distribution lead times improve operational efficiency and workflow continuity. This study strongly supports the present research because VST ECS also depends on synchronized departmental coordination.

Demand Variability in Mobile Phones

Kim and Torres (2024) conducted a study on smartphone demand variability among ICT distributors in South Korea. Their findings revealed that rapid changes in customer preferences and frequent product launches significantly affected inventory preparation and purchasing schedules. The researchers emphasized that organizations with shorter operational lead times responded more effectively to demand surges. This supports the present study because VST ECS also distributes fast-moving mobile phone products.

Foster and Williams (2023) investigated operational response to smartphone demand fluctuations among electronics distributors in the United States. Their findings showed that delayed communication between departments increased inventory shortages and fulfillment interruptions during promotional periods. The researchers highlighted that coordinated workflow systems improve demand responsiveness and operational continuity. This study directly supports the present research because VST ECS also experiences fluctuating smartphone demand patterns.

Zhang et al. (2025) examined the effect of mobile phone demand variability on warehouse operations among ICT distributors in China. Their findings revealed that organizations with inconsistent workflows struggled to maintain inventory availability during periods of high customer demand. The researchers emphasized that integrated operational systems improve workflow responsiveness and reduce fulfillment delays. This supports the present study because VST ECS also handles products with highly dynamic demand behavior.

Anderson and Cruz (2022) conducted research on smartphone distribution efficiency among technology firms in Canada. Their findings showed that organizations with delayed purchasing approvals and warehouse coordination experienced slower operational response during demand surges. The researchers emphasized that shorter lead times strengthen customer responsiveness and fulfillment performance. This literature is connected to the present study because VST ECS also depends on efficient coordination to manage mobile phone demand fluctuations.

Lee and Ramirez (2024) studied demand variability management among ICT distributors in Singapore. Their findings revealed that organizations handling smartphone products achieved better operational stability when departments exchanged information in real time. The researchers highlighted that stable workflow coordination improves inventory movement and customer satisfaction. This supports the present study because VST ECS also requires efficient operational synchronization.

Demand Variability in laptops

Carter and Morgan (2023) conducted a study on laptop demand variability among electronics distributors in the United Kingdom. Their findings showed that seasonal demand increases significantly affected purchasing schedules and warehouse preparation. The researchers emphasized that organizations with integrated workflow systems maintained stronger operational responsiveness during high-demand

periods. This supports the present study because VST ECS also distributes laptop products requiring stable operational coordination.

Kimura et al. (2025) investigated laptop demand fluctuations among ICT distributors in Japan. Their findings revealed that delayed operational workflows increased customer waiting time and reduced fulfillment reliability.

The researchers emphasized that efficient communication systems improve demand response efficiency and workflow continuity. This literature directly supports the present study because VST ECS also handles laptops with rapidly changing demand patterns.

Chen and Foster (2022) studied the relationship between laptop demand variability and operational responsiveness among technology distributors in Taiwan. Their findings showed that organizations with shorter lead times maintained more stable inventory movement and stronger fulfillment performance. The researchers emphasized that synchronized departmental coordination improves operational efficiency. This supports the present study because VST ECS also depends on efficient workflows to manage laptop demand fluctuations.

Brown and Lee (2024) examined the operational effects of fluctuating laptop demand among ICT distributors in Australia. Their findings revealed that delayed warehouse preparation and purchasing approvals interrupted product movement during promotional periods. The researchers emphasized that organizations should strengthen workflow integration to improve operational continuity. This supports the present study because VST ECS also requires stable lead times to manage fluctuating laptop demand.

Williams et al. (2023) conducted research on laptop fulfillment efficiency among electronics distributors in the United States. Their findings showed that organizations with coordinated purchasing and warehouse systems achieved faster operational response and reduced workflow interruptions during periods of high demand. This literature strongly supports the present study because VST ECS also handles laptop products requiring synchronized operational coordination.

Demand Variability in desktops and monitors

Ahmed and Wilson (2024) conducted a study on desktop and monitor demand variability among ICT distributors in the Middle East. Their findings revealed that institutional procurement schedules and office technology upgrades significantly affected operational planning and inventory movement. The researchers emphasized that organizations with shorter operational lead times maintained more stable fulfillment performance. This supports the present study because VST ECS also distributes desktop and monitor products.

Martinez and Chen (2023) investigated the relationship between desktop demand variability and warehouse coordination among electronics distributors in Spain. Their findings showed that delayed communication between departments increased operational interruptions and reduced product availability. The researchers emphasized that integrated workflow systems improve operational responsiveness during demand surges. This study directly supports the present research because VST ECS also requires efficient departmental coordination.

Foster et al. (2025) examined monitor demand fluctuations among ICT distributors in Europe. Their findings revealed that organizations with fragmented workflows experienced slower product releases and fulfillment interruptions during institutional purchasing periods. The researchers highlighted that shorter lead times improve customer responsiveness and workflow continuity. This supports the present study because VST ECS also handles monitor products requiring stable operational coordination.

Lee and Morgan (2022) conducted research on desktop inventory movement among electronics distribution firms in South Korea. Their findings showed that delayed purchasing approvals and warehouse preparation negatively affected operational efficiency during periods of high demand. The researchers emphasized that synchronized communication systems improve demand response efficiency. This literature supports the present study because VST ECS also depends on coordinated operational workflows.

Johnson and Carter (2024) studied demand variability management among ICT distributors in Canada. Their findings revealed that organizations handling desktop and monitor products achieved stronger operational performance when departments processed transactions immediately during high-demand periods. This supports the present study because VST ECS also relies on stable inter-departmental coordination.

Product Movement

Zhang and Wilson (2023) conducted a study on product movement efficiency among ICT distributors in China. Their findings revealed that operational delays commonly originated from inconsistent communication between warehouse, purchasing, and distribution departments. The researchers emphasized that organizations with shorter lead times maintained smoother product transfers and fewer workflow interruptions. This supports the present study because VST ECS also depends on coordinated departmental workflows to improve product movement efficiency.

Kim and Foster (2024) investigated workflow synchronization among electronics distribution companies in South Korea. Their findings showed that delayed operational coordination negatively affected product releases and delivery preparation. The researchers highlighted that integrated workflow systems improve movement continuity and operational responsiveness. This literature directly supports the present study because VST ECS also requires stable product movement coordination.

Anderson et al. (2025) examined the relationship between inter-departmental communication and product movement efficiency among ICT distributors in the United States. Their findings revealed that organizations with fragmented workflows experienced slower product transfers and delayed fulfillment performance. The researchers emphasized that coordinated operational systems improve workflow continuity and customer responsiveness. This supports the present study because VST ECS also handles fast-moving IT products requiring efficient operational synchronization.

Brown and Ramirez (2022) conducted research on product movement interruptions among electronics distributors in Australia. Their findings showed that delayed approvals and warehouse preparation commonly created operational bottlenecks. The researchers emphasized that shorter operational lead times improve movement efficiency and reduce delivery interruptions.

This literature supports the present study because VST ECS also relies on coordinated workflow systems.

Chen and Morgan (2024) studied product movement coordination among ICT distributors in Singapore. Their findings revealed that organizations with integrated operational systems achieved faster inventory transfers and improved order fulfillment reliability. The researchers highlighted that efficient communication between departments strengthens workflow continuity and operational efficiency. This supports the present study because VST ECS also depends on smooth product movement operations.

Inventory Availability

Lee and Carter (2023) conducted a study on inventory availability among ICT distributors in South Korea. Their findings revealed that inventory accessibility depends not only on stock quantity but also on the efficiency of operational coordination between departments. The researchers emphasized that organizations with shorter lead times maintain more stable inventory visibility and fulfillment reliability. This supports the present study because VST ECS also relies on efficient coordination to maintain inventory availability.

Foster and Johnson (2024) investigated inventory coordination systems among electronics distribution companies in Canada. Their findings showed that delayed communication between purchasing and warehouse departments negatively affected product availability and operational responsiveness. The researchers emphasized that integrated workflow systems improve inventory accessibility and reduce

operational delays. This literature directly supports the present study because VST ECS also handles fast-moving IT products requiring efficient inventory coordination.

Zhang et al. (2025) examined inventory movement efficiency among ICT distributors in China. Their findings revealed that organizations with fragmented workflows experienced slower replenishment schedules and delayed product releases. The researchers highlighted that synchronized operational systems strengthen inventory visibility and workflow continuity. This supports the present study because VST ECS also depends on coordinated departmental operations.

Williams and Kim (2022) conducted research on inventory responsiveness among technology distributors in Japan. Their findings showed that organizations with integrated communication systems achieved faster inventory preparation and stronger operational continuity. The researchers emphasized that stable lead times improve fulfillment efficiency and inventory accessibility. This literature supports the present study because VST ECS also requires efficient inventory coordination.

Martinez and Lee (2024) studied inventory availability management among electronics distributors in Spain. Their findings revealed that delayed warehouse preparation and purchasing approvals reduced operational responsiveness and fulfillment reliability. The researchers emphasized that organizations should strengthen operational synchronization to maintain inventory continuity. This supports the present study because VST ECS also handles products requiring stable inventory operations.

Order Fulfillment

Anderson and Kim (2023) conducted a study on order fulfillment efficiency among ICT distributors in the United States. Their findings revealed that organizations with shorter operational lead times achieved faster product releases and improved customer satisfaction. The researchers emphasized that coordinated communication between warehouse and distribution departments strengthens fulfillment performance. This supports the present study because VST ECS also depends on efficient operational workflows to complete customer orders accurately.

Wilson and Chen (2025) investigated fulfillment interruptions among electronics distribution companies in Hong Kong. Their findings showed that delayed approvals and fragmented operational workflows negatively affected delivery reliability and customer responsiveness. The researchers emphasized that integrated operational systems reduce workflow interruptions and improve fulfillment continuity. This literature directly supports the present study because VST ECS also handles fast-moving IT products requiring efficient order processing.

Brown et al. (2024) examined order fulfillment coordination among ICT distributors in Australia. Their findings revealed that organizations with synchronized warehouse and distribution operations maintained stronger delivery performance and fewer operational bottlenecks. The researchers highlighted that shorter lead times improve customer responsiveness and operational efficiency. This supports the present study because VST ECS also requires stable workflow coordination.

Operational Efficiency

Kimura and Foster (2023) conducted a study on operational efficiency among technology distributors in Japan. Their findings revealed that organizations with integrated workflow systems achieved faster product movement, reduced waiting time, and improved customer responsiveness. The researchers emphasized that operational efficiency improves when departments exchange information in real time. This supports the present study because VST ECS also depends on coordinated departmental operations to improve efficiency in handling fast-moving IT products.

Carter and Zhang (2025) investigated operational workflow integration among ICT distributors in Singapore. Their findings showed that organizations with shorter lead times experienced fewer operational delays and stronger fulfillment performance. The researchers emphasized that synchronized communication systems improve operational continuity and customer satisfaction. This literature strongly

supports the present study because VST ECS also requires efficient inter-departmental coordination to maintain operational performance.

Local Studies

Inter-Departmental Lead Times involving Sales Process

Parilla (2021) conducted a study on operational coordination among ICT distributors in Metro Manila. The findings revealed that delayed sales validation and slow endorsement procedures significantly affected warehouse preparation and order fulfillment efficiency. The researcher emphasized that organizations handling fast-moving technology products require shorter sales lead times to maintain operational continuity. This study is directly related to the present research because VST ECS also depends on efficient sales coordination to improve product movement efficiency.

Garcia and Lim (2023) investigated sales processing efficiency among electronics distribution companies in the Philippines. Their findings showed that delayed communication between sales and purchasing departments created interruptions in inventory preparation and dispatch scheduling. The researchers emphasized that integrated workflow systems improve customer responsiveness and operational performance. This supports the present study because VST ECS also handles fast-moving IT products requiring immediate departmental coordination.

Ramirez and Torres (2024) examined operational bottlenecks caused by delayed sales approvals among ICT distributors in Quezon City. Their findings revealed that organizations with fragmented workflows experienced slower order fulfillment and reduced operational continuity. The researchers highlighted that synchronized communication systems improve workflow responsiveness and reduce operational delays. This literature directly supports the present study because VST ECS also relies on coordinated sales operations.

Cruz et al. (2025) conducted research on sales workflow integration among electronics firms in the Philippines. Their findings showed that organizations with shorter sales lead times achieved more stable inventory preparation and stronger customer responsiveness. The researchers emphasized that operational efficiency improves when departments coordinate transactions immediately. This supports the present study because VST ECS also requires efficient sales coordination.

Navarro and Flores (2022) studied sales lead time variability among technology distributors in Manila. Their findings revealed that delayed documentation and repeated transaction verification negatively affected operational efficiency and product movement. The researchers emphasized that shorter sales processing times improve organizational responsiveness. This literature supports the present study because VST ECS also handles time-sensitive IT products.

Inter-Departmental Lead Times involving Purchasing Process

Santos and Uy (2022) conducted a study on purchasing coordination among ICT distributors in the Philippines. Their findings revealed that delayed supplier approvals negatively affected inventory replenishment and warehouse preparation efficiency. The researchers emphasized that organizations with efficient purchasing workflows maintain stronger operational continuity. This supports the present study because VST ECS also depends on effective purchasing coordination to sustain product movement efficiency.

Pua (2023) investigated purchasing lead time management among electronics distributors in Metro Manila. The findings showed that fragmented communication between purchasing and warehouse departments extended processing time and reduced fulfillment reliability. The researcher emphasized that integrated operational systems improve workflow responsiveness and operational stability. This study directly supports the present research because VST ECS also requires synchronized departmental coordination.

Javier and Mendoza (2024) examined the operational effects of delayed purchasing approvals among ICT distributors in the Philippines. Their findings revealed that inconsistent purchasing workflows increased operational bottlenecks and interrupted inventory movement. The researchers emphasized that shorter purchasing lead times strengthen operational efficiency and customer responsiveness. This supports the present study because VST ECS also handles products requiring immediate replenishment coordination.

Dela Cruz and Ramirez (2025) conducted research on supplier coordination efficiency among technology firms in Quezon City. Their findings showed that organizations with integrated purchasing systems achieved faster transaction processing and improved operational continuity. The researchers highlighted that workflow synchronization strengthens inventory preparation and fulfillment performance. This literature supports the present study because VST ECS also depends on stable purchasing coordination.

Flores and Navarro (2023) studied purchasing workflow interruptions among electronics distribution companies in Manila. Their findings revealed that delayed communication between departments extended processing time and reduced operational responsiveness. The researchers emphasized that organizations should improve purchasing coordination to maintain stable operational performance. This supports the present study because VST ECS also relies on efficient purchasing workflows.

Inter-Departmental Lead Times involving Warehouse Operations Process

Dominguez (2021) conducted a study on warehouse preparation efficiency among ICT distributors in the Philippines. The findings revealed that delayed receiving and checking procedures negatively affected fulfillment reliability and dispatch preparation. The researcher emphasized that organizations handling fast-moving technology products require stable warehouse operations to maintain operational continuity. This supports the present study because VST ECS also depends on efficient warehouse coordination.

Sansaluna (2024) investigated warehouse workflow efficiency among electronics distribution companies in Metro Manila. The findings showed that delayed communication between warehouse personnel and operational departments extended product preparation time and increased workflow interruptions. The researcher emphasized that synchronized operational systems improve warehouse responsiveness and product movement efficiency. This literature directly supports the present study because VST ECS also handles fast-moving IT products.

Ramirez and Flores (2025) examined warehouse lead time variability among technology distributors in Quezon City. Their findings revealed that organizations with fragmented workflows experienced delayed product releases and reduced customer responsiveness. The researchers highlighted that shorter warehouse lead times strengthen operational continuity and fulfillment efficiency. This supports the present study because VST ECS also relies on coordinated warehouse systems.

Garcia et al. (2023) conducted research on warehouse coordination systems among ICT distributors in the Philippines. Their findings showed that organizations with integrated operational workflows achieved faster inventory preparation and reduced operational delays. The researchers emphasized that stable warehouse operations improve delivery reliability and workflow continuity. This supports the present study because VST ECS also depends on efficient warehouse preparation.

Santos and Mendoza (2022) studied warehouse bottlenecks among electronics distribution firms in Manila. Their findings revealed that repeated inventory checking procedures and delayed approvals negatively affected operational responsiveness. The researchers emphasized that workflow synchronization improves warehouse efficiency and customer satisfaction. This literature supports the present study because VST ECS also requires efficient warehouse operations.

Inter-Departmental Lead Times involving Distribution Process

Panganiban (2023) conducted a study on distribution workflow efficiency among ICT distributors in Metro Manila. The findings revealed that delayed dispatch preparation and routing coordination negatively affected delivery reliability and customer responsiveness. The researcher emphasized that organizations handling fast-moving technology products require efficient distribution systems to maintain operational continuity. This supports the present study because VST ECS also depends on effective distribution coordination to improve product movement efficiency.

Javier and Cruz (2024) investigated delivery coordination among electronics distributors in the Philippines. Their findings showed that delayed communication between warehouse and distribution departments increased operational interruptions and fulfillment delays. The researchers emphasized that integrated workflow systems strengthen delivery preparation and customer satisfaction. This study directly supports the present research because VST ECS also relies on synchronized departmental coordination.

Ramirez et al. (2025) examined dispatch preparation efficiency among ICT distributors in Quezon City. Their findings revealed that organizations with shorter distribution lead times achieved more stable operational performance and fewer workflow bottlenecks. The researchers highlighted that coordinated operational systems improve workflow continuity and delivery reliability. This supports the present study because VST ECS also handles fast-moving IT products requiring rapid distribution response.

Flores and Santos (2022) conducted research on distribution coordination systems among technology firms in the Philippines. Their findings showed that delayed routing approvals negatively affected customer responsiveness and operational efficiency. The researchers emphasized that organizations with integrated communication systems maintain stronger delivery performance. This literature supports the present study because VST ECS also depends on efficient distribution workflows.

Navarro and Garcia (2024) studied delivery workflow interruptions among electronics distributors in Metro Manila. Their findings revealed that fragmented communication between operational departments extended dispatch preparation and reduced fulfillment reliability. The researchers emphasized that synchronized workflow systems improve operational continuity and customer satisfaction. This supports the present study because VST ECS also requires stable distribution coordination.

Demand Variability in Mobile Phones

Borja and Ramirez (2023) conducted a study on mobile phone demand variability among ICT distributors in the Philippines. Their findings revealed that smartphone promotions and new product launches significantly affected inventory preparation and operational planning. The researchers emphasized that organizations with shorter operational lead times responded more effectively to sudden demand increases. This supports the present study because VST ECS also distributes mobile phones with highly dynamic demand behavior.

Dela Cruz et al. (2024) investigated operational response to smartphone demand fluctuations among electronics firms in Metro Manila. Their findings showed that delayed communication between departments increased inventory shortages and slowed fulfillment efficiency during high-demand periods. The researchers emphasized that integrated workflow systems strengthen operational responsiveness. This study directly supports the present research because VST ECS also handles fast-moving smartphone products.

Santos and Flores (2025) examined demand variability management among ICT distributors in Quezon City. Their findings revealed that organizations with fragmented operational workflows experienced slower inventory movement and delayed product releases during smartphone demand surges. The researchers highlighted that stable inter-departmental coordination improves operational continuity. This supports the present study because VST ECS also relies on coordinated operational systems.

Mendoza and Cruz (2022) conducted research on smartphone inventory responsiveness among technology distributors in Manila. Their findings showed that organizations with shorter lead times

maintained stronger fulfillment reliability and customer responsiveness during promotional periods. The researchers emphasized that synchronized workflows improve demand response efficiency. This literature supports the present study because VST ECS also depends on stable operational coordination.

Ramirez and Navarro (2024) studied mobile phone demand fluctuations among electronics distributors in the Philippines. Their findings revealed that delayed purchasing approvals and warehouse preparation negatively affected operational responsiveness during high-demand periods. The researchers emphasized that efficient departmental coordination improves inventory movement and customer satisfaction. This supports the present study because VST ECS also handles fast-moving smartphone products.

Demand Variability in laptops

Rivera and Joaquin (2023) conducted a study on laptop demand variability among ICT distributors in Metro Manila. Their findings showed that seasonal demand increases significantly affected purchasing schedules and warehouse preparation activities. The researchers emphasized that organizations with integrated workflow systems maintain stronger operational responsiveness during periods of high customer demand. This supports the present study because VST ECS also distributes laptop products requiring stable operational coordination.

Flores et al. (2024) investigated laptop fulfillment responsiveness among electronics firms in the Philippines. Their findings revealed that delayed communication between departments increased customer waiting time and interrupted inventory movement during promotional periods. The researchers emphasized that synchronized workflow systems improve operational continuity and customer satisfaction. This study directly supports the present research because VST ECS also handles laptop products with fluctuating demand patterns.

Garcia and Mendoza (2025) examined the operational effects of laptop demand fluctuations among technology distributors in Quezon City. Their findings showed that organizations with delayed purchasing approvals and warehouse preparation experienced slower product releases during periods of high demand. The researchers highlighted that integrated operational systems improve workflow efficiency and fulfillment reliability. This supports the present study because VST ECS also depends on stable lead time performance.

Santos and Cruz (2022) conducted research on laptop inventory movement among ICT distributors in Manila. Their findings revealed that organizations with shorter operational lead times achieved stronger fulfillment efficiency and customer responsiveness. The researchers emphasized that workflow synchronization improves operational continuity during demand surges. This literature supports the present study because VST ECS also requires coordinated departmental workflows.

Navarro and Flores (2024) studied laptop demand responsiveness among electronics distributors in the Philippines. Their findings showed that organizations with fragmented workflows experienced operational bottlenecks and delayed order fulfillment during peak demand periods. The researchers emphasized that integrated communication systems strengthen workflow continuity and inventory preparation efficiency. This supports the present study because VST ECS also handles fast-moving laptop products.

Demand Variability in desktops and monitors

Ramirez and Torres (2023) conducted a study on desktop and monitor demand variability among ICT distributors in the Philippines. Their findings revealed that institutional procurement schedules and office technology upgrades significantly affected operational planning and warehouse preparation. The researchers emphasized that organizations with stable operational lead times maintain stronger fulfillment reliability. This supports the present study because VST ECS also distributes desktop and monitor products.

Dela Cruz and Navarro (2024) investigated monitor demand fluctuations among electronics firms in Metro Manila. Their findings showed that delayed operational coordination negatively affected product availability and customer responsiveness during periods of high demand. The researchers emphasized that integrated workflow systems improve inventory movement efficiency. This study directly supports the present research because VST ECS also depends on synchronized departmental coordination.

Garcia et al. (2025) examined desktop inventory preparation among ICT distributors in Quezon City. Their findings revealed that organizations with fragmented communication systems experienced slower product releases and increased operational interruptions. The researchers highlighted that shorter operational lead times improve workflow continuity and fulfillment efficiency. This supports the present study because VST ECS also requires efficient operational synchronization.

Santos and Ramirez (2022) conducted research on desktop demand response efficiency among electronics distributors in Manila. Their findings showed that organizations with coordinated warehouse and purchasing systems achieved more stable inventory availability and operational responsiveness. The researchers emphasized that workflow integration improves demand response performance. This literature supports the present study because VST ECS also handles desktop products requiring stable coordination systems.

Flores and Mendoza (2024) studied monitor inventory movement among technology distributors in the Philippines. Their findings revealed that delayed communication between departments negatively affected fulfillment reliability and operational continuity. The researchers emphasized that synchronized workflow systems strengthen product movement and customer responsiveness.

Product Movement

Dela Cruz and Javier (2023) conducted a study on product movement efficiency among ICT distributors in Metro Manila. Their findings revealed that delayed warehouse preparation and dispatch coordination interrupted the smooth transfer of products from storage to delivery. The researchers emphasized that organizations handling fast-moving IT products require synchronized workflows to maintain operational continuity. This supports the present study because VST ECS also depends on efficient product movement systems to improve operational performance.

Navarro et al. (2024) investigated workflow coordination among electronics distribution companies in the Philippines. Their findings showed that fragmented communication between purchasing, warehouse, and distribution departments significantly affected movement efficiency and fulfillment reliability. The researchers emphasized that integrated operational systems improve workflow continuity and reduce operational bottlenecks. This study directly supports the present research because VST ECS also relies on synchronized departmental coordination.

Ramirez and Flores (2025) examined product transfer delays among technology distributors in Quezon City. Their findings revealed that organizations with delayed approvals and inconsistent communication systems experienced slower inventory movement and reduced customer responsiveness. The researchers highlighted that shorter operational lead times strengthen movement continuity and operational efficiency. This supports the present study because VST ECS also handles fast-moving IT products requiring efficient workflow coordination.

Santos and Garcia (2022) conducted research on operational workflow interruptions among electronics firms in Manila. Their findings showed that delayed warehouse processing and distribution scheduling negatively affected product movement and order fulfillment performance. The researchers emphasized that stable inter-departmental coordination improves operational continuity and delivery reliability. This literature supports the present study because VST ECS also depends on efficient product movement coordination.

Flores and Navarro (2024) studied product movement efficiency among ICT distributors in the Philippines. Their findings revealed that organizations with integrated workflow systems achieved faster

inventory transfers and fewer operational delays. The researchers emphasized that synchronized communication improves customer responsiveness and workflow continuity. This supports the present study because VST ECS also requires coordinated departmental operations.

Inventory Availability

Javier and Torres (2024) conducted a study on inventory availability among ICT distributors in Metro Manila. Their findings revealed that product accessibility depends heavily on the speed of operational coordination between departments. The researchers emphasized that delayed communication negatively affects inventory preparation and fulfillment reliability even when stock levels are sufficient. This supports the present study because VST ECS also relies on efficient departmental coordination to maintain inventory availability.

Ramirez and Cruz (2025) investigated inventory workflow systems among electronics distribution firms in the Philippines. Their findings showed that fragmented operational communication caused delayed product releases and interruptions in inventory movement. The researchers highlighted that organizations with integrated workflow systems maintain stronger operational continuity and fulfillment efficiency. This study directly supports the present research because VST ECS also handles fast-moving IT products requiring stable inventory coordination.

Santos and Mendoza (2023) examined inventory preparation efficiency among technology distributors in Quezon City. Their findings revealed that organizations with shorter operational lead times achieved more stable inventory accessibility and improved operational responsiveness. The researchers emphasized that synchronized warehouse and purchasing systems strengthen inventory continuity. This supports the present study because VST ECS also depends on coordinated workflow systems.

Garcia et al. (2022) conducted research on inventory visibility management among ICT distributors in Manila. Their findings showed that delayed warehouse preparation and inconsistent communication systems negatively affected inventory movement and order fulfillment reliability. The researchers emphasized that integrated operational coordination improves inventory accessibility and workflow continuity. This literature supports the present study because VST ECS also relies on efficient operational systems.

Flores and Navarro (2024) studied inventory coordination among electronics distribution firms in the Philippines. Their findings revealed that organizations with synchronized departmental workflows experienced fewer operational interruptions and improved product availability. The researchers emphasized that stable operational lead times strengthen inventory management

efficiency and customer responsiveness. This supports the present study because VST ECS also handles products requiring efficient inventory coordination.

Order Fulfillment

Manalo and Vergara (2025) conducted a study on order fulfillment efficiency among ICT distributors in Metro Manila. Their findings revealed that organizations with integrated warehouse and distribution systems achieved faster delivery preparation and improved customer satisfaction. The researchers emphasized that delayed approvals and fragmented communication negatively affect fulfillment continuity. This supports the present study because VST ECS also depends on efficient operational workflows to complete customer orders accurately.

Cruz and Ramirez (2023) investigated fulfillment workflow interruptions among electronics firms in the Philippines. Their findings showed that delayed warehouse preparation and routing coordination reduced delivery reliability and customer responsiveness. The researchers emphasized that synchronized departmental workflows improve operational continuity and fulfillment efficiency.

This study directly supports the present research because VST ECS also handles fast-moving IT products requiring stable order processing systems.

Santos et al. (2024) examined order fulfillment coordination among technology distributors in Quezon City. Their findings revealed that organizations with shorter lead times achieved stronger operational performance and fewer workflow bottlenecks. The researchers highlighted that integrated operational systems improve delivery reliability and workflow continuity. This supports the present study because VST ECS also relies on efficient order fulfillment coordination.

Operational Efficiency

Navarro and Reyes (2023) conducted a study on operational efficiency among ICT distributors in the Philippines. Their findings revealed that organizations with integrated workflow systems achieved faster product movement, reduced operational delays, and improved customer responsiveness. The researchers emphasized that operational efficiency improves when departments exchange information immediately and coordinate processes effectively. This supports the present study because VST ECS also depends on synchronized departmental operations to improve workflow performance.

Dominguez and Flores (2024) investigated workflow integration among electronics distribution companies in Metro Manila. Their findings showed that organizations with shorter operational lead times experienced fewer workflow interruptions and stronger fulfillment reliability. The researchers emphasized that stable communication systems improve operational continuity and customer satisfaction. This literature strongly supports the present study because VST ECS also requires efficient inter-departmental coordination to maintain operational efficiency in handling fast-moving IT products.

Operational Delays among ICT Distributors in Metro Manila

Ramirez and Lopez (2024) studied operational delays among ICT distributors in Metro Manila and found that slow internal approvals significantly affected product release schedules. Their research showed that even when inventory was already available inside warehouses, delays in document verification and purchasing confirmation extended overall lead times. The researchers explained that weak coordination between departments contributes to slower order fulfillment and customer dissatisfaction.

The study further highlighted that organizations relying on manual approval systems experience longer processing times because transactions must pass through several validation stages before products can be released. This is relevant to the present study because VST ECS also depends on multiple departments to process and release products efficiently. Delays in one department may eventually affect warehouse preparation, dispatch schedules, and overall operational efficiency.

The researchers recommended improving workflow integration and adopting automated approval systems to strengthen operational responsiveness. Their findings support the present study by emphasizing the importance of reducing internal delays and improving coordination to achieve faster product movement and more efficient ICT distribution operations.

Synthesis of Related Literature

The reviewed foreign and local literature and studies consistently emphasized that inter-departmental lead times significantly affect operational efficiency among organizations handling fast-moving IT products. Most researchers explained that delays in sales processing, purchasing coordination, warehouse preparation, and distribution scheduling create workflow interruptions that reduce operational responsiveness and fulfillment reliability (Kim & Park, 2023; Garcia & Lim, 2024; Carter & Wilson, 2023; Navarro & Reyes, 2023). The literature further highlighted that organizations with shorter and more stable lead times achieve faster product movement, improved inventory availability, and better customer satisfaction (Williams et al., 2024; Dominguez & Flores, 2024).

Several foreign and local studies also emphasized the importance of integrated communication systems and synchronized operational workflows in improving departmental coordination. Researchers explained that delayed communication between Sales, Purchasing, Warehouse Operations, and Distribution departments commonly results in operational bottlenecks, delayed product releases, and slower delivery preparation (Zhang et al., 2024; Ramirez & Torres, 2024; Anderson et al., 2025). Organizations that implemented real-time coordination systems were found to achieve more efficient workflow continuity, improved order fulfillment performance, and stronger operational stability (Lee & Morgan, 2023; Flores & Navarro, 2024).

In terms of demand variability, the reviewed literature revealed that mobile phones, laptops, desktops, and monitors experience rapid and unpredictable changes in customer demand due to promotional activities, new product launches, institutional procurement schedules, and changing consumer preferences (Torres & Kim, 2024; Rivera & Joaquin, 2023; Ahmed & Wilson, 2024). Foreign and local studies consistently showed that organizations with unstable operational workflows struggle to respond effectively during periods of high demand (Borja & Ramirez, 2023; Kimura et al., 2025). Delayed purchasing approvals, slow warehouse preparation, and fragmented communication systems often lead to inventory shortages, fulfillment interruptions, and reduced customer responsiveness (Garcia & Mendoza, 2025; Zhang et al., 2025).

The reviewed studies also highlighted that product movement efficiency depends heavily on operational coordination and lead time consistency. Researchers explained that delays in inventory preparation, warehouse processing, and dispatch scheduling interrupt the smooth flow of products from storage to customer delivery (Ramos et al., 2023; Dela Cruz & Javier, 2023). Organizations with synchronized departmental workflows achieved faster inventory transfers, fewer operational delays, and stronger delivery reliability (Chen & Morgan, 2024; Flores & Navarro, 2024).

Furthermore, the literature emphasized that inventory availability and order fulfillment are not only affected by stock quantity but also by the efficiency of internal operational coordination. Studies showed that organizations with integrated workflow systems maintain better inventory visibility, faster product accessibility, and improved fulfillment continuity (Lee & Carter, 2023; Javier & Torres, 2024). Delayed communication between departments was identified as one of the major causes of slower product releases and operational inefficiencies (Foster & Johnson, 2024; Ramirez & Cruz, 2025).

The reviewed foreign and local studies also consistently concluded that operational efficiency improves when departments exchange information immediately and coordinate workflows effectively. Organizations with integrated operational systems experienced fewer workflow interruptions, reduced waiting time, faster product movement, and improved customer responsiveness (Kimura & Foster, 2023; Carter & Zhang, 2025; Navarro & Reyes, 2023). This indicates that efficient inter-departmental coordination is highly important in maintaining operational continuity among ICT distribution companies handling fast-moving products.

Although numerous studies discussed logistics coordination, demand variability, inventory movement, and operational efficiency, only limited research specifically focused on the combined relationship between demand variability and inter-departmental lead times in handling fast-moving IT products within ICT distribution companies. Moreover, few studies examined how Sales, Purchasing, Warehouse Operations, and Distribution departments collectively influence operational efficiency in a single organizational setting.

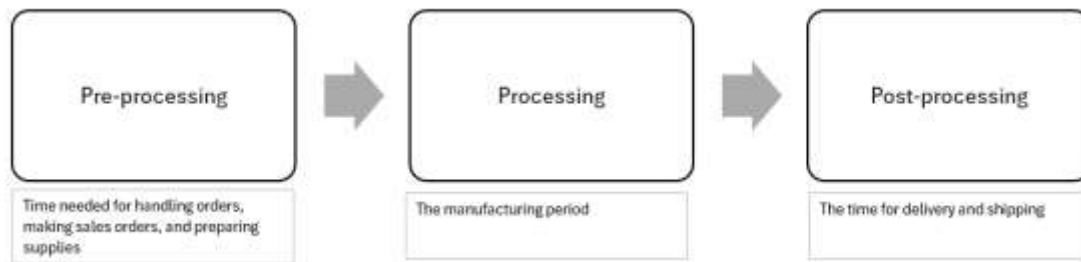
Therefore, the present study differs from previous studies because it specifically examines the relationship between demand variability and inter-departmental lead times, as well as the effect of lead times on operational efficiency in handling fast-moving IT products at VST ECS Phils., Inc.. The study focuses on how operational coordination among Sales, Purchasing, Warehouse Operations, and Distribution

departments affects product movement, inventory availability, order fulfillment, and overall operational efficiency.

Theoretical Framework

This study is supported by several theories that help explain why internal timing, coordination, and demand behavior are important in managing fast-moving IT products within a company like VST ECS. These theories guide the understanding of how inter-departmental lead times influence overall operations.

Lead Time Theory



Total Lead Time model. Source: International Journal of Supply Chain Management ISSN 2518-4709 (Online) Vol.9, Issue 6, No.3, pp 25-39, 2024
 Figure 1. Lead Time Framework Diagram

Lead Time Theory emphasizes the importance of the total time required for a process to move from initiation to completion. In supply chain and operations management, lead time refers to the elapsed time between order placement and final delivery. Recent studies highlight that shorter and more predictable lead times significantly improve organizational responsiveness, reduce operational uncertainty, and enhance customer satisfaction.

For instance, Mohammed and Mandal (2024) explain that lead time variability directly affects inventory levels, service performance, and overall supply chain efficiency. When lead times are inconsistent, companies tend to hold excess safety stock, which increases operational costs and reduces flexibility. Conversely, minimizing lead time variability enables better planning, smoother workflow coordination, and faster response to customer demand.

This perspective can be further understood through the Total Lead Time Model, which divides lead time into three major stages: pre-processing, processing, and post-processing. The pre-processing stage includes activities such as handling orders, preparing sales documentation, and organizing required supplies. The processing stage refers to the actual operational or production period where orders are fulfilled. Finally, the post-processing stage covers delivery, shipping, and distribution to customers. Variability in any of these stages contributes to fluctuations in total lead time. For example, delays in order preparation (pre-processing), bottlenecks during order fulfillment (processing), or slow delivery arrangements (post-processing) can extend the overall lead time and negatively impact service performance.

Therefore, managing variability across all three stages of the total lead time cycle is essential to maintaining efficiency, controlling inventory levels, and ensuring reliable order fulfillment.

This theoretical perspective is highly relevant to VST ECS in handling fast-moving IT products. The movement of these products relies heavily on coordination among Sales, Purchasing, Warehouse Operations, and Distribution. Each department contributes to the total order fulfillment lead time. When one department experiences delays, the overall workflow slows down, affecting delivery schedules and customer satisfaction. Applying Lead Time Theory provides a strong foundation for analyzing inter-

departmental processes and identifying areas where delays can be minimized to improve operational efficiency and service performance.

Demand Variability Theory

Demand Variability Theory explains how fluctuations in customer demand whether sudden increases or decreases affect inventory levels, operational planning, and internal processes within an organization. Recent studies emphasize that industries dealing with fast-moving and technology-driven products frequently experience unpredictable demand patterns due to rapid innovation cycles, promotional activities, seasonality, and shifting consumer preferences.

According to Ivanov (2023), demand variability significantly influences supply chain stability, particularly in high-velocity markets where short product life cycles and rapid technological changes are common. When demand changes are not accurately anticipated, operational disruptions such as stockouts, excess inventory, and delayed fulfillment are more likely to occur. Similarly, Dolgui and Ivanov (2023) highlight that organizations operating in dynamic environments must develop flexible and responsive internal processes to absorb demand fluctuations without compromising service performance.

In the context of ICT and fast-moving IT products, demand can shift rapidly due to new product releases, promotional campaigns, and evolving customer preferences. If internal processes such as procurement, warehousing, and distribution cannot adjust quickly to these changes, companies may face imbalances in inventory levels, resulting in overstocks or shortages. Therefore, efficient and adaptable inter-departmental lead times are essential to maintaining operational stability under demand uncertainty.

Conceptual Framework

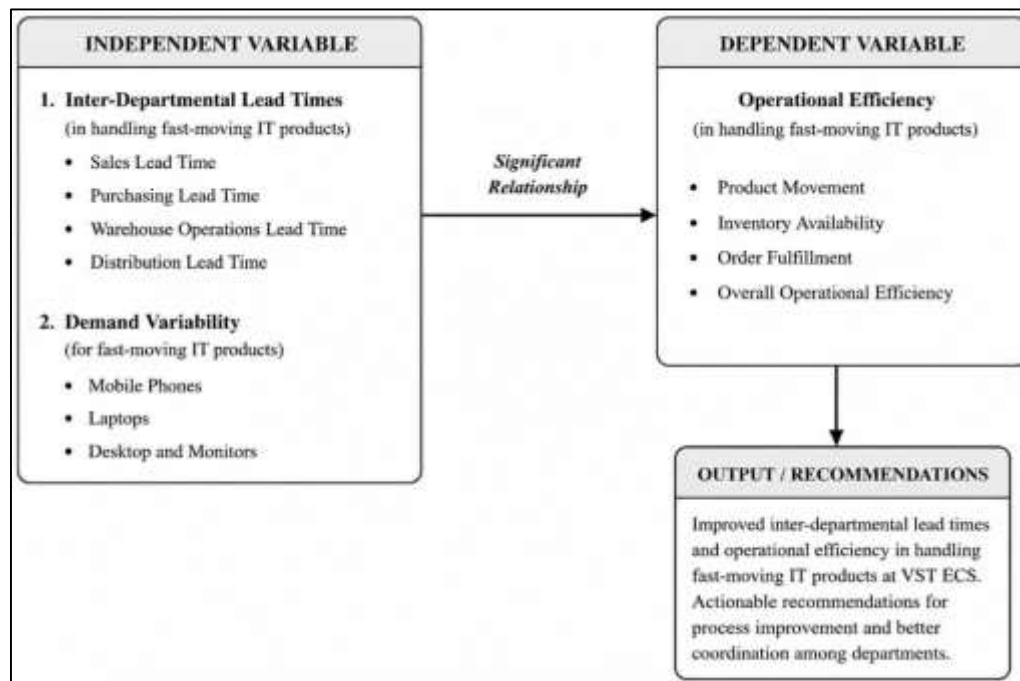


Figure 2. IV-DV Conceptual Diagram

This study adopts an IV–DV conceptual framework to explain how inter-departmental lead times and demand variability influence operational efficiency in handling fast-moving IT products at VST ECS. The framework highlights the relationship between internal operational activities and the company’s ability

to maintain efficient inventory movement, timely order fulfillment, and reliable customer service in a fast-paced distribution environment.

As presented in the conceptual framework, the independent variables of the study consist of inter-departmental lead times and demand variability. Inter-departmental lead times refer to the time consumed as transactions move across Sales, Purchasing, Warehouse Operations, and Distribution. These lead times include order processing, purchasing coordination, warehouse handling, and product dispatching activities. Demand variability, on the other hand, refers to fluctuations in customer demand for fast-moving IT products such as mobile phones, laptops, desktops, and monitors. Frequent changes in demand volume and product preference create operational uncertainty and may affect the company's responsiveness and inventory planning. Studies show that lead time variability and fluctuating demand directly affect inventory performance, stock availability, and order fulfillment efficiency (Mohammed & Mandal, 2023).

The dependent variable of the study is operational efficiency in handling fast-moving IT products. This includes inventory availability, order fulfillment, inventory accuracy, customer satisfaction, and overall process efficiency. Operational efficiency is influenced by how effectively departments coordinate their activities and how quickly operational processes are completed. Efficient coordination among departments helps minimize delays, maintain accurate stock levels, and support timely deliveries to customers. Recent studies emphasize that effective inventory management and accurate demand forecasting contribute significantly to operational efficiency and service reliability (Kusuma & Nugroho, 2025).

Overall, the framework explains that inter-departmental lead times and demand variability can significantly influence the operational efficiency of VST ECS. When lead times are prolonged and demand changes are not properly managed, operational inefficiencies such as delayed deliveries, inventory imbalance, and fulfillment issues may occur. Through this framework, the study aims to determine how improvements in process coordination, inventory systems, and inventory management practices may help enhance operational efficiency and support the effective handling of fast-moving IT products at VST ECS.

METHODS

Research Design

This study uses a *descriptive–correlational mixed-method research design* consisting of both quantitative and qualitative approaches.

The *descriptive component* is used to identify and describe the actual inter-departmental lead times of the Sales, Purchasing, Warehouse Operations, and Distribution departments, as well as the level of demand variability of fast-moving IT products.

The *correlational component* determines whether there is a significant relationship between demand variability and inter-departmental lead times, including their effects on product movement, inventory availability, order fulfillment, and operational efficiency.

The *qualitative component* is used to gather insights, experiences, and observations from employees regarding operational delays, workflow challenges, and coordination issues between departments.

A *mixed-method approach* is appropriate because the study involves both measurable operational data and actual workplace experiences. Quantitative data can be analyzed statistically, while qualitative data helps explain the causes of delays and operational challenges encountered by the departments.

Population of the study

Based on available business listings and industry data, Pasig City having a projected 2025 population of 755,300+ residents hosts approximately 5 IT distributor companies, including firms similar in operations to VST ECS. These

companies handle ICT products such as smartphones, laptops, networking equipment, and related accessories.

The population for this study includes operational employees from these 5 companies who directly influence inter-departmental lead times. This includes personnel from:

- Sales Departments
- Purchasing Departments
- Warehouse Operations
- Logistics and Distribution Departments

These departments were selected because they are directly involved in the end-to-end internal process flow, from order initiation to final delivery. Employees from non-operational departments such as Human Resources, Finance, and Administration were excluded, as they do not directly influence lead time performance.

Based on projected staffing patterns of approximately 15–35 operational employees per distributor, the estimated combined population across the five companies is approximately $N = 175$ operational employees. This estimate is supported by company workforce structures and industry norms within the ICT distribution sector.

Sample Size

This study uses the Central Limit Theorem (CLT) as the statistical basis for determining the adequacy of the sample size.

The Central Limit Theorem states that when the sample size is sufficiently large (generally $n \geq 30$), the sampling distribution of the mean will approximate a normal distribution, regardless of the shape of the population distribution. In practical research applications, larger sample sizes increase the stability, reliability, and precision of statistical estimates.

Given the estimated population of $N = 175$ operational employees, this study aims to obtain a sufficiently large sample to ensure that, the sampling distribution approximates normality. And the results are statistically reliable and generalizable within the identified companies thus departmental comparisons can be meaningfully analyzed.

Following established statistical standards for social science research, the study will utilize the entire population of 175 respondents as the sample size. Since all members of the population are included, the study employs a total population sampling approach, which eliminates sampling error associated with selecting only a portion of the population and provides a more comprehensive representation of the target group.

The chosen sample size of 175 respondents is statistically justified because:

- a. It includes the entire operational population of the study, ensuring complete representation of all respondents.
- b. The sample size exceeds the minimum threshold of 30 required under the Central Limit Theorem (CLT), thereby supporting statistical stability and reliability of the analysis.
- c. Using the whole population strengthens the accuracy of descriptive and inferential results by minimizing bias and maximizing data coverage.
- d. It improves the accuracy of estimated means related to inter-departmental lead times.
- e. It enhances the reliability of comparisons among Sales, Purchasing, Warehouse, and Distribution departments.
- f. It strengthens the validity of conclusions regarding lead time improvement strategies.

By applying the Central Limit Theorem, the study ensures that the sample mean of responses regarding inter-departmental lead times will approximate a normal distribution. This allows the use of parametric statistical analyses and

increases confidence that the findings accurately reflect operational realities within IT distributor companies in Pasig City.

Sampling Technique

The study employed a total population sampling technique, wherein all 175 employees from the operational departments of the five participating companies were included as respondents. Since the entire population was utilized, no sampling or random selection procedure was required.

This approach ensured complete representation of all operational departments involved in the supply chain process, specifically Sales, Purchasing, Warehouse, and Distribution. By including the entire population, the study minimized sampling error and enhanced the reliability and comprehensiveness of the data gathered regarding supply chain lead times.

Description of Respondents

The respondents of this study consist of 175 operational employees from various IT distributor companies located in Pasig City. These respondents were selected because they are directly involved in the internal workflow and movement of fast-moving IT products, where inter-departmental lead times occur and accumulate.

The respondents come from four key operational departments commonly found across the 5 IT distributor companies in the city:

- Sales – initiates customer orders and transmits requirements to other departments
- Purchasing – processes purchase requests and purchase orders needed to replenish stocks
- Warehouse Operations – handles receiving, storage, picking, packing, and releasing of items
- Logistics/Distribution – manages dispatching, routing, and delivery scheduling

The respondents include sales officers, purchasing staff, warehouse supervisors, inventory handlers, pickers, checkers, dispatch coordinators, and logistics personnel. Their daily responsibilities involve tasks such as order entry, document preparation, stock checking, receiving of goods, picking and packing items, coordinating releases, and preparing deliveries. As such, they have firsthand experience with the timing, coordination, and workflow issues that influence how quickly products move internally.

Overall, the respondents represent the core operational functions of IT distributor companies in Pasig City. Their involvement in day-to-day product handling makes them well suited to provide reliable and meaningful data for assessing inter-departmental lead times and identifying areas for process improvement.

Research Instrument

This study uses three research instruments, combining both perceptual and objective operational data.

1. Structured Questionnaire

The structured questionnaire gathers quantitative data from employees who are directly involved in the handling of fast-moving IT products. This includes personnel from Sales, Purchasing, Warehouse Operations, and Logistics/Distribution across the 19 IT distributor companies in Pasig City.

The questionnaire gathers data on:

- a) Inter-departmental processing time
- b) Communication flow and handover speed
- c) Occurrence of delays
- d) Inventory system used (Periodic or Perpetual)
- e) Inventory type practiced (Cycle, Buffer, Seasonal)
- f) Perceived demand variability

A *four-point Likert scale* was used in this study to assess the respondents' level of agreement and observations regarding operational processes. The use of a 1–4 scale allows respondents to provide more definite answers since no neutral option is included. This helps the study capture clearer perceptions on inter-departmental lead times, workflow coordination, and operational efficiency. In addition, the four-point scale keeps the questionnaire simple and easy to answer while still providing enough variation for reliable statistical analysis (Joshi & Ahluwalia, 2022).

Rating Scale	Range	Verbal Descriptions	Verbal Interpretations
4	3.26 – 4.00	Strongly Agree	The respondents are very much in favor of the statement in question
3	2.51 – 3.25	Agree	The respondents are in favor of the statement in question
2	1.76 – 2.50	Disagree	The respondents are not in favor of the statement in question
1	1.00 – 1.75	Strongly Disagree	The respondents were extremely disapproved of the statement in question

Figure 3. *4-point Likert scale*

2. Lead Time Mapping Sheet

This instrument records the actual time a transaction spends in each department. It captures:

- a) Total processing time per department
- b) Overall inter-departmental lead time
- c) Variations and recurring delay points

It does not *measure individual micro-activities but focuses on the entire processing duration* to show each department's contribution to total lead time.

3. Process Observation and Documentation Checklist

This checklist validates the actual workflow used by the companies. It documents:

- a) Actual step-by-step processes
- b) Waiting times and queuing instances

- c) Communication flow
- d) Approval requirements
- e) Inconsistencies across companies

This confirms whether reported lead times match real operational practices.

Integration and Purpose of the Instruments

Together, the three instruments create a triangulated data set:

The *structured questionnaire* captures employee experiences and their insights on internal timing.

The *lead time mapping worksheet* offers numerical, measurable evidence of actual lead times.

The *process observation checklist* confirms real-world workflow practices and handover behavior.

This combination ensures that the study does not rely solely on perceptions or system records, but gathers a balanced mix of subjective and objective information. The multi-instrument approach enhances the credibility of findings and enables a more complete understanding of how inter-departmental lead times influence the handling of fast-moving IT products among IT distributors in Pasig City.

Data Gathering Procedure

The data collection followed five structured steps:

Step 1: Approval and Coordination

Formal permission was obtained from each company. Department heads coordinated the identification of eligible respondents and access to workflow information.

Step 2: Selection of Respondents

Using a total population sampling approach, all 175 employees from the four operational units were included as respondents in the study. This ensured complete representation of the operational departments involved in the supply chain process.

Step 3: Administration of Questionnaire

The questionnaire was distributed in printed or digital form. Participation was voluntary, anonymous, and for academic purposes only.

Step 4: Lead Time Mapping and Workflow Observation

Transactions were traced through the internal process stages:

- a) Sales order initiation
- b) PR/PO preparation
- c) Warehouse receiving, picking, releasing
- d) Dispatch scheduling

Actual processing times were recorded and workflow practices were observed.

Step 5: Data Encoding and Verification

All responses and lead time data were encoded, checked for completeness, and prepared for statistical analysis.

Ethical Considerations

Throughout the data collection process, ethical guidelines were strictly observed. Respondent anonymity was preserved, no identifying information was recorded, and no company-specific results were disclosed. All data were handled confidentially and used exclusively for research purposes in accordance with ethical standards recommended by Saunders, Lewis, and Thornhill (2019).

Statistical Treatment of Data

The data collected in this study were analyzed using appropriate descriptive and inferential statistical techniques aligned with operations management research. Statistical analysis was conducted using standard statistical software to ensure accuracy, consistency, and reliability.

The choice of techniques follows established guidelines recommended by Sekaran and Bougie (2020), Hair et al. (2021), and Saunders et al. (2019).

Descriptive Statistics

Descriptive statistics were used in this study to present a clear picture of how fast-moving IT products are handled within the participating companies. Because the research focuses on understanding current inter-departmental lead times, demand variability levels, and the inventory practices used by different teams, descriptive statistics provide a simple way to summarize these operational conditions before applying comparative and correlational tests.

Descriptive statistics were used to summarize:

- Demographic profile (frequency and percentage)
- Departmental lead times (simple tabulation)
- Demand variability levels
- Inventory system and inventory type used

Reliability Analysis

Cronbach's alpha was used to test the reliability of the structured questionnaire. A value of 0.70 or higher was considered acceptable, indicating that the instrument consistently measured respondents' perceptions regarding inter-departmental lead times and workflow coordination (Nunnally & Bernstein, 1994).

Correlation Analysis

Correlation analysis was employed to determine whether a significant relationship exists between demand variability and inter-departmental lead times in handling fast-moving IT products. Correlational analysis examines the degree and direction of association between variables without manipulating them, allowing researchers to identify patterns within observed operational data (Creswell & Creswell, 2023).

In this study, the **Pearson Product–Moment Correlation Coefficient (Pearson r)** was used to measure the strength and direction of the relationship between demand variability and the lead times experienced across the operational departments of Sales, Purchasing, Warehouse Operations, and Distribution. Pearson correlation is widely applied in quantitative research to analyze the linear relationship between two continuous variables measured on interval or ratio scales (Field, 2024).

The formula is:

$$r = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum(X - \bar{X})^2 \sum(Y - \bar{Y})^2}}$$

Where:

- X = values of variable 1 (e.g., demand variability)
- Y = values of variable 2 (e.g., lead times)
- $\bar{X}$ = mean of X
- $\bar{Y}$ = mean of Y
- r = Pearson correlation coefficient

ANOVA / t-Test

ANOVA and t-tests were used to identify whether departmental lead times differ significantly based on the type of inventory system (Periodic vs. Perpetual) and the type of inventory practiced (Cycle, Buffer, Seasonal). These tests help assess whether certain inventory approaches lead to faster or slower processing across departments.:

- a) Periodic vs. Perpetual inventory system
- b) Cycle vs. Buffer vs. Seasonal inventory types

A one-way ANOVA determines whether there are significant differences between the means of three or more independent groups. The formula is based on comparing between-group variance and within-group variance.

$$F = MSB / MSW$$

Where:

- F = ANOVA test statistic
- MSB (Mean Square Between Groups) =

$$MSB = \frac{SSB}{k - 1}$$

- MSW (Mean Square Within Groups) =

$$MSW = \frac{SSW}{N - k}$$

Definitions:

SSB = Sum of Squares Between Groups

SSW = Sum of Squares Within Groups

k = number of groups

N = total number of observations

A larger F-value relative to its critical value indicates a significant difference between group means.

An independent samples *t*-test compares the means of two independent groups (Periodic vs. Perpetual inventory system).

$$t = (\bar{X}_1 - \bar{X}_2) / \sqrt{[(s_1^2 / n_1) + (s_2^2 / n_2)]}$$

Where:

- t = t-test statistic
- $\bar{X}_1, \bar{X}_2$ = group means
- s_1^2, s_2^2 = group variances
- n_1, n_2 = sample sizes of each group

RESULTS AND DISCUSSION

Demographic Profile

Table 1. *Frequency and Percentage Distribution of respondents by age*

Age	Frequency	Percentage
20 to 25 years old	20	10%
26 to 30 years old	59	32%
31 to 35 years old	37	20%
36 to 40 years old	21	11%
41 years old and above	50	27%
Total	187	100%

Table 1 shows the distribution of respondents according to their age. Initially, there are 20 respondents who are 20 to 25 years old. Then, there are 59 respondents who are 26 to 30 years old. This is followed by 37 respondents who are 31 to 35 years old. There are 21 respondents who are 36 to 40 years old. Lastly, there are 50 respondents who are 41 years old and above. Thus, most of the respondents in this study are 26 to 30 years old, comprising 59 respondents or 32% of the total sample.

Table 2. *Frequency and Percentage Distribution of respondents by gender*

Gender	Frequency	Percentage
Female	39	21%
Male	148	79%
Total	187	100%

Table 2 presents the distribution of respondents when grouped according to their sex. As seen above, there are 148 respondents who are male then there are 39 respondents who are female. Hence, more than half of the sampling population are male respondents.

Table 3. *Distribution of respondents according to Monthly Income*

Monthly Income	Frequency	Percentage
P15,000-P20,000	98	52%
P21,000-P30,000	49	26%
P31,000 and above	40	21%
Total	187	100%

Table 3 reveals the distribution of respondents when grouped according to their Monthly Income.

Remarkably, 98 respondents or 52% of the total sample have a monthly income ranging from ₱15,000 to ₱20,000. On the other hand, 49 respondents or 26% have a monthly income between ₱21,000 and ₱30,000. Lastly, 40 respondents or 21% have a monthly income of ₱31,000 and above. Thus, the majority of the respondents in this study have a monthly income ranging from ₱15,000 to ₱20,000,

comprising 98 respondents or 52% of the total sample.

Table 4. *Distribution of respondents according to Educational Background*

Educational Background	Frequency	Percentage
Bachelor Graduate	169	90%
College Undergrad	11	6%
High School Graduate	1	1%
Masters Graduate	6	3%
Total	187	100%

Table 4 illustrates the distribution of respondents when grouped according to their Educational Background.

Primarily, there are 169 respondents who are Bachelor's Degree graduates. Then, there are 11 respondents who are college undergraduates. This is followed by six (6) respondents who have attained a Master's Degree. Finally, only one (1) respondent is a High School graduate. Thus, the majority of the respondents in this study are Bachelor's Degree graduates, comprising 169 or 90% respondents of the total sample.

Table 5. *Distribution of respondents according to Length of Service*

Length of Service	Frequency	Percentage
1 to 3 years	45	24%
10 years above	25	13%
4 to 6 years	53	28%
7 to 10 years	56	30%
Less than 1 year	8	4%
Total	187	100%

Table 5 shows the distribution of respondents according to their Length of Service.

As displayed above, there are eight (8) respondents who have less than one (1) year of service. Then, there are 45 respondents who have 1 to 3 years of service. This is followed by 53 respondents who have 4 to 6 years of service. Next, there are 56 respondents or 30% who have 7 to 10 years of service. Lastly, 25 respondents or 13% have 10 years and above of service. Thus, the majority of the respondents in this study have 7 to 10 years of service, comprising 56 respondents or 30% of the total sample.

Perceived Effectiveness of Inter-Departmental Lead Times

Table 6. Respondents perceived effectiveness of inter-departmental lead times in terms of Sales Department

Sales Department	WM	Verbal Interpretation
1. Sales orders are processed promptly.	3.22	Agree
2. Sales personnel coordinate effectively with other departments.	3.34	Strongly Agree
3. Customer order information is transmitted accurately and	3.19	Agree

on time.		
Total	3.25	Agree
<i>Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)</i>		

Table 6 displays the respondent's perceived effectiveness of inter-departmental lead times in terms of Sales Department. Initially, the statement with the highest weighted mean ($\bar{x} = 3.34$), "Sales personnel coordinate effectively with other departments," obtained a verbal interpretation of Strongly Agree. This indicates that respondents perceived inter-departmental coordination within the sales department as highly effective, allowing smooth communication and collaboration with other functional units. On the other hand, the statement with the lowest weighted mean ($\bar{x} = 3.19$), "Customer order information is transmitted accurately and on time," received a verbal interpretation of Agree. Although still positively rated, this suggests that respondents perceive some opportunities to further improve the accuracy and timeliness of transmitting customer order information.

Overall, the respondents obtained an overall weighted mean of 3.25, with a verbal interpretation of Agree. This indicates that the respondents generally perceive the effectiveness of inter-departmental lead times in terms of the Sales Department to be satisfactory. The findings suggest that sales operations are generally efficient in processing customer orders, maintaining coordination with other departments, and communicating customer order information, all of which contribute to effective organizational workflow.

Table 6 reveals that respondents positively assessed the effectiveness of inter-departmental lead times in the Sales Department. Among the indicators, effective coordination with other departments received the highest evaluation, implying that collaboration between sales and other functional units is a major strength of the organization. Effective cross-functional coordination minimizes delays, improves decision-making, and enables organizations to respond more efficiently to customer demands.

The slightly lower rating for the timely and accurate transmission of customer order information indicates that while respondents are generally satisfied, there remains room for improvement in information flow. Delays or inaccuracies in communicating customer orders may affect inventory management, production scheduling, and customer satisfaction. Therefore, organizations should continuously strengthen communication systems and adopt integrated digital platforms to ensure real-time sharing of customer information across departments.

These findings are consistent with the study of Mubarak and Petraite (2022), who emphasized that effective cross-functional collaboration significantly enhances organizational performance by improving operational efficiency, reducing process delays, and enabling faster decision-making. Likewise, Rane, Choudhary, and Rane (2022) highlighted that organizations with strong inter-departmental communication and integrated information systems experience improved supply chain responsiveness and customer service performance because information flows more accurately and efficiently across departments.

Furthermore, Nugroho, Pramono, and Hidayat (2022) found that timely order processing and effective coordination among departments contribute significantly to reducing lead times and increasing customer satisfaction. Their study emphasized that sales departments play a crucial role in ensuring accurate communication of customer requirements, which directly influences operational performance and service quality.

Overall, Table 6 demonstrates that the Sales Department performs effectively in managing inter-departmental lead times. The respondents' positive assessment suggests that collaboration and order processing practices are generally well established. However, continuous improvement in the accuracy and timeliness of customer order information transmission remains essential to further enhance organizational efficiency and customer satisfaction.

Table 7. Respondents perceived effectiveness of inter-departmental lead times in terms of the Purchasing Department

Purchasing Department	WM	Verbal Interpretation
1. Purchase requests are processed efficiently.	3.23	Agree
2. Coordination between Purchasing and Warehouse is effective.	3.22	Agree
3. Purchasing activities help prevent stock shortages.	3.20	Agree
Total	3.22	Agree

Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)

Table 7 illustrates the respondent's perceived effectiveness of inter-departmental lead times in terms of the Purchasing Department.

Initially, the statement with the highest weighted mean ($\bar{x} = 3.23$), "Purchase requests are processed efficiently," received a verbal interpretation of Agree. This indicates that respondents generally perceive the Purchasing Department as effective in processing purchase requests promptly, which contributes to the timely acquisition of materials and supports smooth organizational operations. Meanwhile, the statement with the lowest weighted mean ($\bar{x} = 3.20$), "Purchasing activities help prevent stock shortages," also obtained a verbal interpretation of Agree. Although positively evaluated, this suggests that respondents believe there is still room for improvement in purchasing practices to further minimize stock shortages and ensure uninterrupted business operations.

Altogether, the overall weighted mean for the respondents' perceived effectiveness of inter-departmental lead times in terms of the Purchasing Department is 3.22, with a verbal interpretation of Agree. Table 7 demonstrates that the respondents have a favorable perception of the Purchasing Department's effectiveness in managing inter-departmental lead times. The highest-rated indicator, efficient processing of purchase requests, highlights the department's capability to facilitate procurement activities that ensure the timely availability of materials needed for organizational operations. Efficient purchasing processes reduce procurement delays and contribute to the continuity of production and service delivery.

The findings also show that coordination between the Purchasing and Warehouse Departments was positively assessed, indicating that collaboration between these departments supports effective inventory management.

Meanwhile, the relatively lower rating on preventing stock shortages suggests that although purchasing activities are generally effective, organizations should continue strengthening demand forecasting, procurement planning, and inventory monitoring to further minimize supply disruptions.

These findings are supported by Dolgui, Ivanov, and Sokolov (2023), who emphasized that efficient procurement processes and strong coordination among supply chain departments significantly improve organizational responsiveness, reduce lead times, and enhance operational performance. Their study explained that timely purchasing decisions and integrated communication among departments enable organizations to maintain continuous operations and respond effectively to changing customer demands.

Similarly, Alzoubi, Alshurideh, Kurdi, and Salloum (2023) found that effective procurement management, supported by digital integration and cross-functional collaboration, enhances inventory availability, minimizes operational disruptions, and improves overall supply chain performance.

Moreover, Bag, Gupta, and Kumar (2023) reported that organizations adopting collaborative procurement practices and integrated inventory management achieve greater supply chain resilience by improving purchasing efficiency, reducing procurement cycle times, and ensuring consistent material availability.

Overall, Table 7 indicates that the Purchasing Department effectively contributes to inter-departmental lead time management through efficient procurement processes and coordination with the Warehouse Department. Although respondents expressed agreement with all indicators, further enhancement of inventory planning and purchasing strategies may further reduce stock shortages and

improve organizational efficiency.

Table 8. *Respondents perceived effectiveness of inter-departmental lead times in terms of the Warehouse Operations*

Warehouse Operations	WM	Verbal Interpretation
1. Products are prepared and released on time.	3.23	Agree
2. Inventory records are updated accurately.	3.22	Agree
3. Warehouse workflow supports fast product movement.	3.20	Agree
Total	3.22	Agree

Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)

Table 8 presents the respondents perceived effectiveness of inter-departmental lead times in terms of Warehouse Operations. Initially, the statement with the highest weighted mean ($\bar{x} = 3.23$), “Products are prepared and released on time,” obtained a verbal interpretation of Agree. This indicates that respondents perceive the warehouse as effective in ensuring the timely preparation and release of products, thereby supporting the smooth flow of organizational operations. On the other hand, the statement with the lowest weighted mean ($\bar{x} = 3.20$), “Warehouse workflow supports fast product movement,” also received a verbal interpretation of Agree. Although respondents generally agreed with this statement, the relatively lower rating suggests that improvements in warehouse workflow could further enhance product movement and operational efficiency.

To sum up, the overall weighted mean for the respondents perceived effectiveness of inter-departmental lead times in terms of Warehouse Operations is 3.22, with a verbal interpretation of Agree. This indicates that respondents generally perceive warehouse operations as effective in facilitating timely product preparation, maintaining accurate inventory records, and supporting efficient product movement throughout the organization.

Table 8 demonstrates that respondents have a positive perception of the effectiveness of warehouse operations in supporting inter-departmental lead times. The highest-rated indicator, the timely preparation and release of products, suggests that warehouse personnel are generally able to meet operational schedules, thereby reducing delays in the distribution process. Efficient warehouse operations contribute significantly to maintaining the continuity of production and ensuring customer satisfaction by delivering products on time.

Likewise, respondents agreed that inventory records are updated accurately, indicating that inventory management practices are generally reliable. Accurate inventory records are essential for preventing discrepancies, improving stock visibility, and supporting informed purchasing and production decisions. Although the indicator concerning warehouse workflow supporting fast product movement received the lowest mean, it still reflects a favorable evaluation, suggesting that respondents recognize the effectiveness of current warehouse processes while acknowledging opportunities for further improvement in workflow optimization.

These findings are supported by Ivanov and Dolgui (2022), who emphasized that efficient warehouse operations play a crucial role in improving supply chain resilience by reducing lead times, increasing inventory visibility, and ensuring the timely movement of goods across organizational functions. They further explained that effective warehouse management enhances coordination among departments and minimizes operational disruptions.

Similarly, Bag, Gupta, and Kumar (2022) found that warehouse operational efficiency significantly influences organizational performance through accurate inventory management, streamlined material handling, and effective coordination with procurement and distribution functions. Their study concluded that organizations implementing efficient warehouse processes experience shorter lead times, lower operational costs, and improved customer satisfaction.

Moreover, Kembro, Danielsson, and Smajli (2022) highlighted that digital warehouse management systems improve inventory accuracy, order fulfillment, and warehouse productivity by providing real-time

inventory information and supporting faster product movement. These technologies enable organizations to enhance operational efficiency while reducing inventory-related errors and processing delays.

Overall, Table 8 indicates that warehouse operations effectively contribute to managing inter-departmental lead times. The respondents' positive assessment demonstrates that timely product preparation, accurate inventory recording, and effective warehouse processes support organizational efficiency. Nevertheless, continuous improvement in warehouse workflow and the adoption of modern warehouse management technologies may further strengthen operational performance and accelerate product movement.

Table 9. *Respondents perceived effectiveness of inter-departmental lead times in terms of the Distribution Department*

Distribution Department	WM	Verbal Interpretation
1. Delivery schedules are followed efficiently.	3.09	Agree
2. Distribution activities support timely product delivery.	3.26	Strongly Agree
3. Product dispatching delays are minimized.	3.18	Agree
Total	3.18	Agree

Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)

Table 4.9 presents the respondents perceived effectiveness of inter-departmental lead times in terms of the Distribution Department.

Initially, the statement with the highest weighted mean ($\bar{x} = 3.26$), "Distribution activities support timely product delivery," obtained a verbal interpretation of Strongly Agree. This indicates that respondents highly perceive the Distribution Department as effective in ensuring that products are delivered to customers within the expected time frame. On the other hand, the statement with the lowest weighted mean ($\bar{x} = 3.09$), "Delivery schedules are followed efficiently," received a verbal interpretation of Agree. Although respondents positively assessed this indicator, the relatively lower rating suggests that delivery scheduling could still be further improved to achieve greater operational efficiency.

Overall, the weighted mean for the respondents perceived effectiveness of inter-departmental lead times in terms of the Distribution Department is 3.18, with a verbal interpretation of Agree. This finding indicates that respondents generally perceive the Distribution Department as effective in managing delivery schedules, supporting timely product delivery, and minimizing product dispatch delays, thereby contributing to the organization's overall operational performance.

Table 9 shows that respondents have a favorable perception of the Distribution Department's effectiveness in managing inter-departmental lead times. The highest-rated indicator, timely product delivery, suggests that the department successfully fulfills its responsibility of delivering products to customers within the required schedule. Timely distribution is essential in maintaining customer satisfaction, reducing delivery lead times, and improving the overall performance of the supply chain.

Although respondents agreed that delivery schedules are followed efficiently and that dispatch delays are minimized, these indicators received slightly lower ratings than timely product delivery. This implies that while current distribution practices are generally effective, organizations may further enhance scheduling systems, route planning, and coordination with other departments to reduce delays and improve delivery reliability.

These findings are supported by Ivanov and Dolgui (2022), who emphasized that efficient distribution operations are fundamental to supply chain resilience because they enable organizations to reduce lead times, improve delivery reliability, and respond more effectively to changing customer demands. They further noted that close coordination between distribution and other departments enhances operational continuity and minimizes disruptions throughout the supply chain.

Similarly, Bag, Gupta, and Kumar (2022) reported that effective logistics and distribution management significantly improve organizational performance by ensuring timely deliveries, reducing transportation delays, and enhancing customer satisfaction. Their findings suggest that organizations with

well-coordinated distribution systems are better equipped to maintain consistent service quality and operational efficiency.

Furthermore, Queiroz, Ivanov, and Dolgui (2022) highlighted that digital logistics technologies, including transportation management systems and real-time shipment monitoring, improve distribution performance by increasing delivery visibility, optimizing routing decisions, and minimizing dispatch delays. The adoption of these technologies enables organizations to strengthen coordination among departments and improve overall supply chain effectiveness.

Overall, Table 9 indicates that the Distribution Department effectively supports inter-departmental lead times through timely product delivery and efficient distribution practices. While respondents generally agreed with all indicators, strengthening delivery scheduling, transportation planning, and digital logistics capabilities can further enhance distribution performance and improve customer service.

Respondents' Level of Demand Variability for Fast-Moving IT Products

Table 10. Respondents Level of Demand Variability for Fast-Moving IT Products in terms of their Mobile Phones

Mobile Phones	WM	Verbal Interpretation
1. Demand for mobile phones changes frequently	3.26	Strongly Agree
2. Sales of mobile phones increase during promotional periods.	3.31	Strongly Agree
3. Customer preferences for mobile phone models change rapidly.	3.33	Strongly Agree
4. The company experiences sudden increases in mobile phone demand.	3.25	Agree
5. Seasonal trends affect the demand for mobile phones.	3.30	Strongly Agree
Total	3.29	Strongly Agree

Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)

Table 10 presents the respondents' level of demand variability for fast-moving IT products in terms of mobile phones. Initially, the statement with the highest weighted mean ($\bar{x} = 3.33$), "Customer preferences for mobile phone models change rapidly," obtained a verbal interpretation of Strongly Agree. This indicates that respondents strongly perceive customer preferences as rapidly changing, reflecting the dynamic nature of the mobile phone market where consumers continuously seek newer models and advanced technological features. On the other hand, the statement with the lowest weighted mean ($\bar{x} = 3.25$), "The company experiences sudden increases in mobile phone demand," received a verbal interpretation of Agree. Although respondents agreed that sudden demand increases occur, the slightly lower rating suggests that these demand surges are less frequent compared to other aspects of demand variability.

Overall, the weighted mean for the respondents' level of demand variability for fast-moving IT products in terms of mobile phones is 3.29, with a verbal interpretation of Strongly Agree. This finding indicates that respondents strongly perceive the demand for mobile phones as highly variable, influenced by rapidly changing customer preferences, promotional activities, seasonal trends, and frequent fluctuations in market demand.

Table 10 demonstrates that respondents strongly agree that demand variability is a significant characteristic of the mobile phone market. The highest-rated indicator, rapid changes in customer preferences for mobile phone models, reflects the fast-paced technological environment in which consumers frequently seek products with improved features, enhanced performance, and innovative designs. This dynamic market behavior requires organizations to maintain flexible inventory management and responsive supply chain strategies to meet changing consumer demands.

Similarly, respondents strongly agreed that promotional periods and seasonal trends significantly influence mobile phone sales. Promotional campaigns, product launches, and holiday seasons often

stimulate customer purchasing behavior, leading to fluctuations in demand that require careful planning and forecasting. Although sudden increases in demand received the lowest rating among the indicators, respondents still agreed that unexpected demand surges occur, emphasizing the need for organizations to remain agile in responding to market changes.

These findings are supported by Ivanov and Dolgui (2022), who emphasized that demand variability is one of the primary challenges in modern supply chain management, particularly in industries characterized by rapid technological innovation. They explained that organizations must develop agile and resilient supply chains capable of responding quickly to changing customer preferences and unpredictable market conditions to maintain competitive performance.

Likewise, Christopher (2022) argued that organizations operating in highly dynamic markets should adopt demand-driven supply chain strategies that improve forecasting accuracy, inventory flexibility, and customer responsiveness. Effective demand management enables companies to minimize stock shortages and excess inventory while maintaining high levels of customer satisfaction.

Furthermore, Wamba, Dubey, and Queiroz (2022) found that digital technologies, including big data analytics and artificial intelligence, significantly improve demand forecasting accuracy by enabling organizations to analyze consumer behavior, promotional effects, and seasonal purchasing patterns. Their study concluded that technology-driven forecasting systems help organizations better manage demand variability and optimize inventory decisions.

Overall, Table 10 indicates that respondents strongly perceive mobile phone demand as highly variable due to changing customer preferences, promotional activities, seasonal demand, and market fluctuations. These findings highlight the importance of adopting agile supply chain practices, accurate demand forecasting, and technology-driven inventory management systems to effectively respond to the dynamic nature of the fast-moving IT products market.

Table 11. *Respondents Level of Demand Variability for Fast-Moving IT Products in terms of their Laptops*

Laptops	WM	Verbal Interpretation
1. Demand for laptops varies depending on customer needs.	3.25	Agree
2. Laptop sales fluctuate during school and work seasons.	3.18	Agree
3. New laptop releases influence customer demand.	3.11	Agree
4. The company experiences unpredictable demand for laptops.	3.03	Agree
5. Demand for laptops changes due to technological advancements.	3.23	Agree
Total	3.16	Agree

Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)

Table 11 presents the respondents' level of demand variability for fast-moving IT products in terms of laptops. Initially, the statement with the highest weighted mean ($\bar{x} = 3.25$), "Demand for laptops varies depending on customer needs," obtained a verbal interpretation of Agree. This indicates that respondents generally perceive customer needs as the primary factor influencing fluctuations in laptop demand. On the other hand, the statement with the lowest weighted mean ($\bar{x} = 3.03$), "The company experiences unpredictable demand for laptops," also received a verbal interpretation of Agree. Although respondents acknowledged that unpredictable demand exists, the relatively lower mean suggests that such fluctuations are less prominent than other factors affecting laptop demand.

Overall, the weighted mean for the respondents' level of demand variability for fast-moving IT products in terms of laptops is 3.16, with a verbal interpretation of Agree. This indicates that respondents generally perceive laptop demand as variable due to changing customer needs, school and work seasons, technological advancements, and new product releases.

Table 11 reveals that respondents generally agree that laptop demand is influenced by several market-related factors. The highest-rated indicator, demand varying according to customer needs, suggests that purchasing decisions are largely driven by consumers' academic, professional, and personal

requirements.

Unlike other fast-moving IT products, laptop purchases are often need-based, making customer preferences a significant determinant of market demand.

Respondents also agreed that school and work seasons contribute to fluctuations in laptop sales. Enrollment periods, work-from-home arrangements, and business procurement cycles often lead to increased demand for laptops. In addition, respondents recognized that technological advancements and the release of new laptop models influence consumer purchasing behavior, as customers tend to upgrade their devices to obtain improved performance, features, and specifications. Although unpredictable demand received the lowest mean, respondents still agreed that sudden changes in demand occur, emphasizing the importance of effective forecasting and inventory management.

These findings are consistent with Ivanov and Dolgui (2022), who emphasized that demand variability in technology-driven industries is strongly influenced by changing consumer preferences, innovation cycles, and market uncertainty. They explained that organizations must develop agile supply chains and flexible inventory systems to respond effectively to fluctuations in customer demand while maintaining operational efficiency.

Similarly, Christopher (2022) stated that customer demand has become increasingly volatile due to rapid technological development and changing consumer expectations. He emphasized that organizations should adopt demand-driven supply chain strategies supported by accurate forecasting and responsive inventory management to effectively manage fluctuations in product demand and improve customer satisfaction.

Furthermore, Wamba, Dubey, and Queiroz (2022) found that the application of big data analytics and digital forecasting technologies enables organizations to better understand customer purchasing behavior, anticipate seasonal demand patterns, and improve demand forecasting accuracy. Their study concluded that technology-enabled forecasting enhances inventory planning and allows firms to respond more effectively to demand variability in highly competitive markets.

Overall, Table 11 indicates that respondents perceive laptop demand as moderately variable, with customer needs, seasonal demand, technological advancements, and new product releases serving as the primary drivers of demand fluctuations. These findings highlight the importance of implementing accurate demand forecasting, agile inventory management, and flexible supply chain strategies to effectively respond to changing market conditions and maintain organizational competitiveness.

Table 12. Respondents' Level of Demand Variability for Fast-Moving IT Products in terms of their Desktop and Monitor

Desktop and Monitors	WM	Verbal Interpretation
1. Demand for desktops and monitors changes regularly.	3.00	Agree
2. Customer demand for desktops and monitors increases during business operations expansion.	3.21	Agree
3. Technological upgrades affect the demand for desktops and monitors.	3.13	Agree
4. The company experiences fluctuations in desktop and monitor sales.	3.01	Agree
5. Demand for desktops and monitors is affected by market competition.	3.16	Agree
Total	3.10	Agree

Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)

Table 12 presents the respondents' level of demand variability for fast-moving IT products in terms of desktops and monitors. Initially, the statement with the highest weighted mean ($\bar{x} = 3.21$), "Customer demand for desktops and monitors increases during business operations expansion," obtained a verbal

interpretation of Agree. This indicates that respondents generally perceive that organizations tend to purchase desktops and monitors when expanding their business operations, increasing workforce capacity, or upgrading office facilities. On the other hand, the statement with the lowest weighted mean ($\bar{x} = 3.00$), “Demand for desktops and monitors changes regularly,” also received a verbal interpretation of Agree. Although respondents acknowledged that demand changes over time, the relatively lower mean suggests that fluctuations are more stable compared to other fast-moving IT products.

Overall, the weighted mean for the respondents’ level of demand variability for fast-moving IT products in terms of desktops and monitors is 3.10, with a verbal interpretation of Agree. This indicates that respondents generally perceive the demand for desktops and monitors as moderately variable, influenced by business expansion, technological advancements, market competition, and organizational purchasing requirements.

Table 12 indicates that respondents generally agree that demand variability exists for desktops and monitors, although the fluctuations appear to be relatively moderate. The highest-rated indicator, increased demand during business operations expansion, suggests that organizations purchase desktops and monitors primarily when opening new offices, expanding departments, hiring additional employees, or upgrading workplace infrastructure. This finding implies that organizational growth is one of the major drivers of demand for these IT products.

Respondents also agreed that technological upgrades and market competition influence the demand for desktops and monitors. As computer technology continues to evolve, organizations regularly replace outdated equipment with newer models that offer improved processing power, energy efficiency, and security features. Furthermore, market competition encourages businesses to adopt updated technologies that improve productivity and operational efficiency. Although the statement regarding regular changes in demand obtained the lowest weighted mean, respondents still agreed that demand fluctuates, suggesting that desktop and monitor purchases are generally planned and less impulsive than purchases of other consumer-oriented IT products.

These findings are supported by Ivanov and Dolgui (2022), who emphasized that demand variability for information technology products is influenced by technological innovation, organizational investment decisions, and changing market conditions. They explained that business organizations typically plan IT equipment purchases strategically, resulting in more stable demand patterns compared to consumer electronics.

Similarly, Christopher (2022) stated that business-related products often experience demand fluctuations driven by organizational expansion, capital investment, and technology replacement cycles rather than frequent consumer purchasing behavior. Effective demand forecasting and inventory planning therefore enable organizations to maintain product availability while avoiding unnecessary inventory costs.

Moreover, Wamba, Dubey, and Queiroz (2022) highlighted that digital forecasting tools and data analytics improve organizations’ ability to anticipate changes in business demand by analyzing purchasing trends, economic conditions, and technology adoption patterns. Their study concluded that integrating data-driven forecasting with inventory management enhances supply chain responsiveness and supports better decision-making for technology-related products.

Overall, Table 12 demonstrates that respondents perceive demand for desktops and monitors as moderately variable, with business expansion, technological advancement, market competition, and organizational purchasing needs serving as the primary factors affecting demand. These findings emphasize the importance of strategic demand forecasting, effective inventory management, and continuous monitoring of market trends to ensure that organizations can respond efficiently to changing customer requirements while maintaining operational effectiveness.

Table 13. Respondents' Level of Demand Variability for Fast-Moving IT Products in terms of their Operational Efficiency

Operational Efficiency	WM	Verbal Interpretation
1. Demand variability affects inventory management efficiency.	3.11	Agree
2. Sudden changes in demand create delays in operations.	3.17	Agree
3. Demand fluctuations affect the company's ability to maintain sufficient stock levels.	3.10	Agree
4. Operational costs increase because of demand variability.	3.25	Agree
5. Demand variability affects the productivity of employees.	3.11	Agree
Total	3.15	Agree

Scale: Strongly Agree (3.26-4.00), Agree (2.51-3.25), Disagree (1.76-2.50), Strongly Disagree (1.00-1.75)

Table 13 presents the respondents' level of demand variability for fast-moving IT products in terms of operational efficiency. Initially, the statement with the highest weighted mean ($\bar{x} = 3.25$), "Operational costs increase because of demand variability," obtained a verbal interpretation of Agree. This indicates that respondents generally perceive fluctuations in product demand as a contributing factor to higher operational expenses, including inventory holding costs, labor adjustments, transportation, and procurement activities. On the other hand, the statement with the lowest weighted mean ($\bar{x} = 3.10$), "Demand fluctuations affect the company's ability to maintain sufficient stock levels," also received a verbal interpretation of Agree.

Although respondents agreed that demand variability influences inventory availability, the relatively lower rating suggests that the organization has established measures to manage inventory despite fluctuations in demand.

Overall, the weighted mean for the respondents' level of demand variability for fast-moving IT products in terms of operational efficiency is 3.15, with a verbal interpretation of Agree. This indicates that respondents generally perceive demand variability as having a significant influence on operational efficiency, particularly in inventory management, delivery operations, operational costs, employee productivity, and stock availability.

Table 13 reveals that respondents generally agree that demand variability affects the operational efficiency of organizations dealing with fast-moving IT products. The highest-rated indicator, increased operational costs due to demand variability, suggests that fluctuations in customer demand require organizations to allocate additional resources for inventory management, transportation, staffing, and procurement. These adjustments often result in increased operational expenditures, especially when businesses need to respond quickly to unexpected changes in market demand.

Respondents also agreed that sudden changes in demand create delays in operations, influence employee productivity, and affect inventory management efficiency. Demand variability requires organizations to continuously adjust production schedules, warehouse activities, and distribution plans to maintain operational performance. Although maintaining sufficient stock levels received the lowest weighted mean, respondents still acknowledged that demand fluctuations influence inventory availability, highlighting the importance of effective forecasting and inventory control systems.

These findings are supported by Ivanov and Dolgui (2022), who emphasized that demand variability directly affects supply chain efficiency by increasing operational complexity, inventory costs, and coordination requirements among organizational departments. They explained that companies with agile and resilient supply chain systems are better able to minimize the negative effects of fluctuating demand through flexible operations and responsive decision-making.

Furthermore, Wamba, Dubey, and Queiroz (2022) found that the adoption of big data analytics and artificial intelligence enhances demand forecasting accuracy, enabling organizations to improve inventory planning, optimize resource utilization, and reduce operational costs associated with demand variability. Their study concluded that digital forecasting technologies improve organizational agility and strengthen

operational performance in highly dynamic markets.

Overall, Table 13 indicates that respondents recognize demand variability as an important factor affecting operational efficiency. The findings suggest that fluctuations in demand influence operational costs, inventory management, delivery performance, and employee productivity. Therefore, organizations should continue investing in advanced forecasting systems, integrated supply chain coordination, and flexible operational strategies to effectively manage demand variability and maintain organizational efficiency.

Relationship Between Product Demand Variability And Departmental Lead Times

Table 14. Relationship between the level of product demand variability on the average lead times of the following departments in handling fast-moving IT product

Variables Used		df	Computed Pearson r	P value (Sig.)	Decision	Remarks
Product Demand Variability	Sales	184	1.000	0.000	Reject Null	Significant
	Purchasing	184	0.618	0.000	Reject Null	Significant
	Warehouse Operation	184	0.419	0.000	Reject Null	Significant
	Distribution	184	0.484	0.000	Reject Null	Significant

***If p-value < 0.05, Reject the null hypothesis → there is a significant difference. If p-value ≥ 0.05, Fail to reject the null hypothesis → no significant difference.*

***Significant at 0.05 alpha level*

Table 14 presents the results of the Pearson Product-Moment Correlation (Pearson r) analysis examining the relationship between the level of product demand variability and the average lead times of the different departments in handling fast-moving IT products. The findings reveal that all computed p-values were 0.000, which are lower than the 0.05 level of significance, indicating that the null hypothesis is rejected in all cases. Therefore, there is a statistically significant relationship between product demand variability and the average lead times of the Sales, Purchasing, Warehouse Operations, and Distribution departments.

Among the departments, the Sales Department obtained a perfect positive correlation ($r = 1.000$, $p = 0.000$), indicating that changes in product demand variability are directly and perfectly associated with changes in the sales department's lead time. This suggests that as demand variability for fast-moving IT products (e.g., mobile phones, laptops, desktops, and monitors) increases, the sales department experiences a corresponding increase in lead time due to higher order volumes, fluctuating customer requirements, and increased order processing activities.

Similarly, the Purchasing Department demonstrated a strong positive correlation ($r = 0.618$, $p = 0.000$), implying that greater product demand variability is significantly associated with longer purchasing lead times. This indicates that unpredictable demand requires more frequent procurement adjustments, supplier coordination, and inventory replenishment decisions, which may delay purchasing processes.

The Warehouse Operations Department recorded a moderate positive correlation ($r = 0.419$, $p = 0.000$). This finding suggests that increasing demand variability moderately affects warehouse lead times, particularly in inventory handling, picking, packing, storage allocation, and stock replenishment activities.

Likewise, the Distribution Department showed a moderate positive correlation ($r = 0.484$, $p = 0.000$), indicating that fluctuations in customer demand significantly influence distribution lead times. Higher demand variability may create challenges in scheduling deliveries, transportation planning, route optimization, and shipment coordination, resulting in longer delivery lead times.

Overall, the results indicate that higher levels of product demand variability are associated with longer average lead times across all departments involved in handling fast-moving IT products. Since all relationships are statistically significant, the findings support the hypothesis that product demand variability significantly influences departmental lead times.

The significant positive correlations observed in this study demonstrate that demand variability is an important operational factor affecting organizational responsiveness in the supply chain. Fast-moving IT products are characterized by short product life cycles, rapid technological innovation, and fluctuating consumer preferences. Consequently, sudden increases or decreases in demand require departments to continuously adjust their operational activities.

The strongest relationship observed in the Sales Department indicates that sales operations are the most sensitive to demand fluctuations because they directly interact with customers and process incoming orders. As customer demand changes rapidly, sales personnel require additional time to verify product availability, coordinate with other departments, and manage customer expectations.

The Purchasing Department also exhibited a strong relationship, suggesting that procurement activities become increasingly complex when demand is uncertain. Buyers must frequently revise purchase orders, negotiate with suppliers, and secure sufficient inventories while avoiding overstocking or stock shortages.

Meanwhile, the moderate relationships found in the Warehouse Operations and Distribution Departments imply that although these departments are affected by demand variability, they may have operational mechanisms such as inventory control systems, warehouse management systems, or transportation scheduling that partially reduce the impact of fluctuating demand.

Overall, the findings emphasize the importance of demand forecasting, inventory management, interdepartmental coordination, and supply chain visibility to minimize lead time delays associated with demand variability.

The present findings are consistent with Choi et al. (2022), who explained that demand variability significantly influences supply chain performance, particularly lead time management. Their study emphasized that fluctuations in customer demand require organizations to adjust procurement, inventory, and distribution activities, often resulting in increased lead times when demand uncertainty is high. They further highlighted that effective coordination among supply chain members is essential for maintaining operational efficiency under variable demand conditions.

Similarly, Sarkar et al. (2022) reported that uncertain customer demand directly affects replenishment lead times and inventory performance. Their research demonstrated that organizations experiencing highly variable demand are more likely to encounter longer lead times due to increased replenishment complexity, production adjustments, and transportation constraints. They concluded that reducing lead times and improving demand forecasting are critical strategies for enhancing supply chain performance under uncertain market conditions.

Furthermore, Das and Kuthambalayan (2022) emphasized that organizations handling products with volatile demand should improve coordination between purchasing, inventory management, and logistics functions to ensure timely order fulfillment. Their study found that demand variability significantly influences production planning, inventory decisions, and delivery performance, ultimately affecting customer satisfaction and organizational efficiency.

Table 15. Relationship between the level of effects of demand variability on the average lead times of the following departments in handling fast-moving IT products.

Variables Used		df	Computed Pearson r	P value (Sig.)	Decision	Remarks
Effects of Demand variability	Sales	184	1.000	0.000	Reject Null	Significant
	Purchasing	184	0.576	0.000	Reject Null	Significant
	Warehouse Operation	184	0.344	0.000	Reject Null	Significant
	Distribution	184	0.413	0.000	Reject Null	Significant

***If $p\text{-value} < 0.05$, Reject the null hypothesis $\rightarrow$ there is a significant difference. If $p\text{-value} \geq 0.05$, Fail to reject the null hypothesis $\rightarrow$ no significant difference.*

***Significant at 0.05 alpha level*

Table 15 presents the results of the Pearson Product-Moment Correlation (Pearson r) analysis examining the relationship between the effects of demand variability, particularly in terms of operational efficiency and the effectiveness of the company's response to demand fluctuations, and the average lead times of the different departments in handling fast-moving IT products. The results indicate that all computed p-values (0.000) are lower than the 0.05 level of significance, leading to the rejection of the null hypothesis for all departments. Therefore, there is a statistically significant relationship between the effects of demand variability and the average lead times of the Sales, Purchasing, Warehouse Operations, and Distribution departments.

Among the departments, the Sales Department recorded a perfect positive correlation ($r = 1.000$, $p = 0.000$), indicating that operational efficiency and the company's ability to respond effectively to demand fluctuations are directly associated with the average lead time of the Sales Department. This suggests that changes in operational efficiency and responsiveness to fluctuating customer demand have a substantial influence on order processing and customer service lead times.

The Purchasing Department exhibited a moderate positive correlation ($r = 0.576$, $p = 0.000$), implying that operational efficiency and the company's responsiveness significantly affect procurement lead times. When organizations experience demand fluctuations, purchasing activities require additional supplier coordination, inventory replenishment planning, and procurement adjustments, which may prolong purchasing lead times.

Similarly, the Warehouse Operations Department showed a low positive correlation ($r = 0.344$, $p = 0.000$), indicating that improvements or challenges in operational efficiency and responsiveness to changing demand significantly influence warehouse lead times.

The Distribution Department obtained a moderate positive correlation ($r = 0.413$, $p = 0.000$), demonstrating that operational efficiency and effective responses to demand variability significantly affect distribution lead times. Demand fluctuations require adjustments in delivery scheduling, transportation planning, and shipment coordination, which influence the timeliness of product distribution.

Overall, the findings indicate that the effects of demand variability, specifically operational efficiency and the effectiveness of the company's response to demand fluctuations, significantly influence the average lead times of all departments involved in handling fast-moving IT products. As organizations improve their operational efficiency and strengthen their responsiveness to changing customer demand,

they are better positioned to manage departmental lead times and maintain supply chain performance.

The findings suggest that the effects of demand variability, particularly operational efficiency and the effectiveness of the company's response to demand fluctuations, play a significant role in determining the lead times of departments responsible for handling fast-moving IT products. Organizations that maintain efficient operations and respond quickly to changing customer demand are more capable of minimizing delays throughout the supply chain.

The strongest relationship was observed in the Sales Department, indicating that sales activities are highly dependent on operational efficiency and timely responses to demand changes. Sales personnel must promptly process orders, communicate with customers, and coordinate with purchasing and warehouse departments to ensure product availability. Inefficiencies or slow responses to demand fluctuations directly contribute to longer lead times.

The Purchasing Department also demonstrated a significant positive relationship, emphasizing the importance of efficient procurement planning and supplier coordination. Effective responses to demand variability enable purchasing personnel to secure inventory promptly, reducing procurement delays and improving supply continuity.

Although the Warehouse Operations and Distribution Departments exhibited relatively lower correlation coefficients, the relationships remain statistically significant. Efficient warehouse management, inventory control systems, and logistics planning help organizations adapt to changing demand conditions. Likewise, effective transportation scheduling and delivery coordination enable distribution operations to maintain acceptable lead times despite fluctuations in customer demand.

These findings indicate that organizations handling fast-moving IT products should continuously improve operational efficiency and develop responsive demand management strategies to reduce lead time variability, enhance customer satisfaction, and strengthen overall supply chain performance.

The findings of this study are supported by Sarkar, Tiwari, and Giri (2022), who found that demand variability significantly affects lead time performance across supply chain operations. Their study emphasized that fluctuations in customer demand increase procurement complexity, inventory adjustments, and transportation planning, resulting in longer lead times. They further noted that improving demand forecasting and reducing uncertainty are essential for enhancing supply chain responsiveness.

Similarly, Choi et al. (2022) explained that organizations operating in highly dynamic markets experience greater operational challenges due to demand variability. Their research concluded that departments such as sales, purchasing, warehousing, and logistics require stronger coordination and information sharing to maintain efficient lead times despite unpredictable customer demand.

Furthermore, Ivanov (2022) emphasized that supply chain resilience depends on an organization's ability to respond quickly to disruptions caused by demand fluctuations. The study highlighted that digital supply chain technologies, integrated planning systems, and real-time information exchange enable organizations to reduce lead time delays and improve operational performance under uncertain demand conditions.

Summary of the Findings

The findings of the study are summarized as follows;

1. Demographic Characteristics of the Respondents

The respondents were predominantly male (148 or 79%), mostly 26 to 30 years old (59 or 32%), Bachelor's Degree graduates (169 respondents), earned a monthly income of ₱15,000–₱20,000 (98 or 52%), and had 7 to 10 years of service (56 or 30%). These findings indicate that the respondents possess sufficient educational background and work experience to evaluate inter-departmental lead times and demand variability in handling fast-moving IT products.

2. Perceived Effectiveness of Inter-Departmental Lead Times

The respondents generally agreed that inter-departmental lead times were effective across all operational departments. Among the departments, the Sales Department obtained the highest overall weighted mean (3.25), followed by the Purchasing Department (3.22), Warehouse Operations (3.22), and Distribution Department (3.18). These findings indicate that respondents positively perceived coordination, communication, procurement, warehouse management, and distribution activities as generally effective in supporting organizational operations.

3. Level of Demand Variability for Fast-Moving IT Products

The respondents strongly agreed that demand variability was highly evident for mobile phones (WM = 3.29) due to rapidly changing customer preferences and promotional activities. Meanwhile, respondents agreed that demand variability also existed for laptops (WM = 3.16), desktop computers and monitors (WM = 3.10), and operational efficiency (WM = 3.15). Overall, demand variability was recognized as an important operational challenge affecting inventory management, procurement planning, and organizational responsiveness.

4. Significant Relationship between Product Demand Variability and Average Lead Times

The Pearson Product-Moment Correlation analysis revealed that product demand variability has a statistically significant relationship with the average lead times of all departments. The Sales Department recorded a perfect positive correlation ($r = 1.000$), while Purchasing ($r = 0.618$), Warehouse Operations ($r = 0.419$), and Distribution ($r = 0.484$) also exhibited significant positive relationships. Since all p-values were less than 0.05, the null hypothesis was rejected, indicating that higher product demand variability is associated with longer departmental lead times.

5. Significant Relationship between the Effects of Demand Variability and Average Lead Times

The results further revealed that the effects of demand variability significantly influence departmental lead times. The Sales Department again obtained a perfect positive correlation ($r = 1.000$), followed by Purchasing ($r = 0.576$), Distribution ($r = 0.413$), and Warehouse Operations ($r = 0.344$). Since all p-values were below the 0.05 significance level, the null hypothesis was rejected. These findings indicate that operational efficiency and organizational responsiveness to fluctuating demand significantly affect departmental lead time performance.

CONCLUSION

1. The respondents were mostly male, aged 26 to 30 years old, Bachelor's Degree graduates, earning a monthly income of ₱15,000 to ₱20,000, and had seven to ten years of work experience. Their educational background and length of service indicate that they have sufficient knowledge and actual experience in handling operational activities such as order processing, inventory management, and dispatch planning. This suggests that the operational delays identified in the study are not mainly caused by employee capability or lack of training. Instead, the challenges are more related to existing process limitations, workflow issues, and communication gaps that affect the overall efficiency of operations.
2. The respondents assessed the effectiveness of lead times among the Sales, Purchasing, Warehouse Operations, and Distribution departments as satisfactory. This shows that the current coordination and working relationship among departments are generally effective in supporting daily operations. However, some delays still occur during the transition of information and activities from one department to another. The most noticeable challenges are related to the accuracy and timing of order information from Sales and the preparation, movement, and handling of items within

Warehouse Operations. Although teamwork among employees helps minimize disruptions, the findings show the need to strengthen existing processes and establish clearer communication channels to prevent delays.

3. The respondents observed that demand variability is highly present, especially for mobile phones, while other IT products such as laptops, desktops, and monitors are also affected by changes in customer demand. These fluctuations are influenced by factors such as technology trends, customer buying behavior, promotional activities, and market conditions. Changes in demand create additional pressure on operations, requiring departments to adjust inventory availability, manpower requirements, storage capacity, and delivery arrangements to maintain efficient order fulfillment.
4. The study found a significant positive relationship between product demand variability and the average lead times of the Sales, Purchasing, Warehouse Operations, and Distribution departments. This means that as demand becomes more unpredictable or increases significantly; departmental lead times also increase. Higher demand volumes require additional coordination, resources, and operational adjustments, which can affect the speed and efficiency of the entire order fulfillment process.
5. The study also confirmed a significant relationship between the effects of demand variability and departmental lead times. The results emphasize that improving demand forecasting, inventory planning, operational preparation, and coordination among departments can help minimize delays. To further improve responsiveness, the company should consider implementing a centralized in-house communication system where demand updates, order requirements, and operational concerns can be properly recorded and shared among all concerned departments. Reliance on verbal communication or individual coordination should be minimized, as this may lead to incomplete information or delayed responses. A more structured and transparent communication process will help Sales, Purchasing, Warehouse Operations, and Distribution align their activities, manage demand changes more effectively, and improve overall supply chain performance.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. **Strengthen Enterprise-Wide Demand Forecasting and Integrated Planning**

The findings indicate that unpredictable product demand significantly increases operational complexity, leading to longer lead times across Sales, Purchasing, Warehouse Operations, and Distribution.

To mitigate these delays, the study recommends strengthening demand forecasting by integrating historical sales trends, market intelligence, and real-time inventory data into strategic planning. Furthermore, since the company already utilizes Oracle as its centralized enterprise system, management should maximize its capabilities by integrating it with department-specific solutions such as Warehouse Management Systems (WMS) and Transportation Management Systems (TMS). Unifying these platforms will enhance end-to-end visibility, streamline interdepartmental communication, and enable faster decision-making to efficiently absorb demand fluctuations.

2. **Improve Order Information Accuracy Through Real-Time Cross-Department Communication**

The study found that the Sales Department demonstrated the highest level of effectiveness

among all operational departments. However, the indicator on the timely and accurate transmission of customer order information received the lowest weighted mean within the department. This finding indicates that while order processing is generally efficient, communication gaps still exist during the transfer of customer information across departments. The study recommends implementing an integrated order management platform that allows real-time sharing of customer orders among Sales, Purchasing, Warehouse Operations, and Distribution. Standardizing order validation procedures and reducing manual encoding can further improve order accuracy, minimize processing errors, and shorten lead times, particularly during periods of increasing customer demand.

3. Enhance Procurement Planning to Reduce Stock Shortages During Demand Fluctuations

The study revealed that purchase requests are generally processed efficiently however, the indicator on preventing stock shortages received the lowest assessment among the Purchasing Department indicators. This finding suggests that procurement activities become more vulnerable when demand fluctuates unexpectedly, making timely replenishment more challenging. The study recommends strengthening procurement planning by integrating sales forecasts with inventory consumption data to improve purchasing decisions and replenishment schedules. Maintaining appropriate safety stock for fast-moving IT products and continuously monitoring procurement performance may also help minimize delays and reduce the risk of inventory shortages during periods of high demand.

Since procurement performance is also influenced by factors beyond the organization's internal operations, future researchers are encouraged to expand the scope of the study by examining external supply chain variables such as supplier reliability, vendor lead time, procurement responsiveness, supplier relationship management, and sourcing strategies. Including these factors may provide a more comprehensive understanding of how both internal and external supply chain dynamics influence purchasing efficiency, inventory availability, and overall organizational lead times.

4. Optimize Warehouse Workflow to Accelerate Product Movement and Order Fulfillment

The study showed that warehouse operations are generally effective, particularly in the timely preparation and release of products. However, the indicator on warehouse workflow supporting fast product movement received the lowest weighted mean, suggesting opportunities to further improve internal warehouse processes. The study recommends conducting regular workflow assessments to identify bottlenecks in picking, packing, staging, and inventory movement. In addition, the company may consider adopting a more advanced Warehouse Management System (WMS) that can be fully integrated with its existing Oracle system. Such integration can enhance inventory visibility, improve coordination among departments, and enable the warehouse to respond more effectively to changing demand, resulting in faster order fulfillment and reduced operational delays.

5. Strengthen Delivery Scheduling and Logistics Coordination for More Reliable Distribution

The study found that respondents strongly agreed that the Distribution Department effectively supports timely product delivery, indicating that products generally reach customers within the expected timeframe. However, compliance with delivery schedules received the lowest weighted mean among the department's indicators, suggesting opportunities to further improve delivery planning and coordination. The study recommends strengthening transportation planning through optimized route scheduling, improved dispatch coordination, and real-time shipment tracking. Furthermore, stronger coordination between the Sales, Warehouse, and Distribution

departments should be established to ensure that customer order information, including special delivery instructions, is communicated accurately and promptly. This is particularly important for high-volume orders that require multiple delivery vehicles or specialized delivery arrangements. Enhancing cross-department communication will enable the Distribution Department to allocate resources more effectively, improve delivery schedule adherence, and maintain reliable on-time deliveries despite fluctuations in customer demand.

6. Adopt Product-Specific Inventory Strategies to Better Manage Demand Variability

The study demonstrated that mobile phones exhibit the highest level of demand variability due to rapidly changing customer preferences, promotional activities, and seasonal demand. In contrast, laptops, desktops, and monitors showed relatively more stable demand patterns, primarily influenced by technological upgrades, customer requirements, and business expansion. These findings suggest that a uniform inventory strategy may not effectively address the distinct demand characteristics of different product categories. The study therefore recommends adopting product-specific forecasting and inventory planning strategies. For highly volatile products such as mobile phones, the company should establish a more defined planning and operational process for annual product launches and major promotional events, as these periods typically generate exceptionally high customer demand driven by consumers' desire to be among the first to experience new product features. Advance demand forecasting, inventory positioning, manpower allocation, and coordinated planning among the Sales, Purchasing, Warehouse, and Distribution departments should be completed before launch periods to ensure operational readiness. Meanwhile, laptops, desktops, and monitors may continue to follow longer planning cycles based on institutional purchasing trends and technology replacement schedules. Adopting differentiated planning strategies for each product category can improve inventory availability, minimize stock shortages during peak demand, and reduce unnecessary inventory carrying costs during normal operating periods.

7. Strengthen Cross-Departmental Coordination Through a Structured Demand Response Process

The study confirmed a significant positive relationship between demand variability and lead times across all operational departments, with the Sales Department showing the strongest impact, followed by Purchasing, Distribution, and Warehouse Operations. This indicates that changes in customer demand affect not only individual departments but also the overall coordination of the order fulfillment process.

The study recommends establishing a structured demand response process supported by an in-house system to ensure that all concerned departments receive accurate and timely information. Communication should not rely only on verbal updates or individual coordination, as this may result in delays, miscommunication, or incomplete information.

Instead, all demand changes, forecasts, order volumes, and special requirements should be properly documented and routed through a centralized channel accessible to Sales, Purchasing, Warehouse Operations, and Distribution.

Sales, as the primary source of customer demand information, should provide timely updates while also considering the operational impact of increased orders, including storage requirements, handling processes, manpower needs, and transportation capacity. Through a standardized and system-based coordination process, the company can improve visibility, reduce delays, and ensure that all departments are prepared to respond effectively to demand fluctuations.

8. Expand Future Research on Supply Chain Responsiveness and Demand Variability

The study focused on determining the relationship between demand variability and departmental lead times in handling fast-moving IT products. Future researchers are encouraged to broaden the scope by incorporating additional operational variables such as supplier performance, inventory optimization, digital transformation, supply chain resilience, logistics capability, and customer satisfaction. Comparative studies involving different industries and organizational sizes may also provide a broader understanding of how demand variability affects operational performance under varying business conditions. Furthermore, employing more advanced statistical techniques may generate deeper insights into the factors influencing supply chain responsiveness and organizational efficiency.

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