Empty Container Shortage Anticipation Strategy for Operational Effectiveness at Pt. XYZ

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Abstract

This research explores anticipation strategies for empty container shortages at PT. XYZ, a domestic logistics company facing chronic operational disruptions during peak seasons. These shortages cause delivery delays, high demurrage costs, and reduced customer satisfaction due to trade imbalances across domestic routes. Employing a qualitative approach with triangulation from 9 strategic respondents, field observations at Tanjung Priok container yard, and internal documentation analysis, the study applies PESTEL analysis for external factors, Problem Fit Solution Analysis, and Root Cause Analysis via Fishbone Diagram identifying six primary causes: trade imbalance, customer free time policy, regulatory delays, excessive dwelling time, lack of real-time inter-depot visibility, and forecasting inaccuracies. An Integrated Logistics Control Tower is recommended as the primary solution, integrating AI demand prediction dashboard, IoT real-time CY monitoring, and automated repositioning triggers across 12 depots with phased implementation. Practical contributions include a digital transformation blueprint for PT. XYZ to reduce demurrage costs and improve on-time delivery rates. Policy contributions recommend shared empty container pools with Pelindo. External validity achieved through thick descriptions representative of most Indonesian domestic logistics operators facing similar trade imbalances. The study fills the qualitative research gap in container shortage management based on practitioner insights, providing an actionable anticipation model ready for industry implementation.

Keywords

Container shortage, Operational efficiency, Container repositioning, Logistics management

Introduction

Indonesia as one of biggest archipelago country, faces significant challenges in managing its national logistics system. Among internal factors, identified geographical imbalances and container distribution, which impair operational efficiency. Its source is the dominance of highly expensive land transport, accounting for around 80% of the total volume of national shipments (Notteboom and Rodrigue, 2009). This results in a lack of efficient supply of goods

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across the archipelago. The problem of uneven infrastructure aggravates the underlying high logistics costs, which are unconventionally high for almost all industries, estimated at 14-24% of GDP in 2012-2023, far exceeding ASEAN and world standards. These high logistics costs additionally hinder Indonesia's export competitiveness.

The Logistic industry worldwide, including Indonesia, is currently experiencing major challenges due to growing complexity of the supply chain and also the uncertainty of the international market. One of the most critical impending issues is lack of empty containers, or lack of empty containers to match demand, and the operational efficiency, which affects logistics costs. his is further exacerbated by limited port capacity, geopolitical disruptions, and extreme weather factors that hamper the smooth flow of maritime transportation (UNCTAD, 2022). Empty container shortages can be caused by various factors, ranging from operational patterns to container rotation processes. One indicator that can measure the efficiency of a country's logistics work is the Logistics Performance Index (LPI), released by the World Bank. In its analysis, there are six indicators measured by the LPI in the logistics system, including: Customs, Logistics Infrastructure, International Shipments, Logistics Competence, Tracking & Tracing, and Timeliness. These six indicators can be one of the causes of empty containers or high logistics costs, because LPI is published only periodically, the latest available data are presented in Table 1.

Table 1 LPI Score

Scoring Item	Year	
	2018	2023
Global Rank	46 (From 160)	63
LPI Score	3.15	3
Customs	2.7	2.8
Infrastructure	2.89	2.9
International Shipments	2.98	3
Logistics Competence	3.1	2.9
Tracking & Tracing	3.3	3

Indonesia's average score has decreased, according to the latest data from 2023. The most recent evaluation indicates that Indonesia's average score is currently 3. The average score from 2018 is higher than this. Out of 62 countries worldwide, Indonesia is ranked first in 2023, a decrease from 2018.It is bad news for the Indonesia Logistics Performance Index that Indonesia's ranking has declined. The Logistics Performance Index for Indonesia is currently lower. The Indonesian Logistics Performance Index is having issues with this. In 2023, the Customs dimension was 2.80, which was not very good. At 2.90, the infrastructure was marginally better. The score for international shipments was 3.00, which is less than the 3.23 obtained in 2018. Additionally, the logistics competency dimension dropped from 3.10 to 2.90.

At the time Tracking & Tracing was not as good as it used to be it fell from 3.30 to 3.00. Timeliness is a problem now for Indonesian logistics because it used to be very good, with a score of 3.67 but now it is only 3.00. Indonesian logistics had a lot of trouble with Timeliness. The overall decline, particular in a few areas, signifies that Indonesia still grapples with a number of inefficiencies and delivery reliability and supply chain visibility challenges. This condition could also trigger the issue of empty container shortages and high logistics costs in Indonesia.

PT. XYZ is one of the main players in Indonesia's logistics industry because it plays an important role in moving goods and containers along domestic routes that connect to main ports like Tanjung Priok and the collector port network. It is very important for a domestic logistics company that relies on containers to be in a good position because Indonesia's logistics costs are still relatively high and very sensitive to port performance and the availability of equipment, including empty containers. In this context, PT. XYZ can be classified as a provider of strategic logistics services that is directly affected by the dynamics of supply and container movement in the domestic market of Indonesia. Even though PT. XYZ is one of the main players, they still feel the shortage of empty containers, especially during peak season when demand for transportation services goes through the roof. A study on the shortage of containers in Indonesia indicates that an imbalance in trade flows, a sudden increase in export volume, and limited repositioning of containers result in a deficit of empty containers at certain ports and domestic routes during peak season. Exporters and freight forwarders have also reported similar situations, saying that during certain times, bookings were already confirmed, but empty containers were not available at the stuffing location (Dwitasari et al., 2021; Trisakti Institute of Transportation & Logistics, 2023).

The lack of empty containers during peak season has a number of effects on the operational and financial performance of logistics companies, including PT. XYZ. Research and industry reports show that the lack of containers and the uneven movement of empty containers raise logistics costs, which can cause freight rates to rise by two to three times, and make it harder to transport goods. Also, delays in shipping because of waiting for empty containers can mess up shipping schedules, causing delays of days or even weeks in delivery, and ultimately making the reliability of the customer's supply chain less reliable (Adhi Darma Cargo, 2021; ERIA, 2023). The chain reaction has caused exporters, importers, and logistics service providers to take on extra risks, such as demurrage/detention costs, late penalties, and losing customers' trust because of lower service levels (20Cube Logistics, 2025; U-Freight, 2025). Because of this shortage, PT. XYZ's profit margins are not only being hurt, but the company is also losing ground in the increasingly competitive domestic logistics market. Exporters and importers are having trouble with their supply chains, which could mean that local goods lose market share. This situation shows how important it is to come up with proactive, forward-looking plans to lower the risk of shortages and keep national logistics operations running smoothly.

The busy activities demonstrate the operational urgency to use every available empty container, where delays can occur if the supply does not meet the daily stuffing demand. This phenomenon reflects the impact of a shortage of empty containers on terminal efficiency, where truck and worker queues waiting for container allocation result in long wait times and increased demurrage costs (Dwitasari et al., 2021). The image also demonstrates the importance of timely empty container repositioning management for domestic logistics operations, especially at busy Indonesian ports like Tanjung Priok. Overall, this visualization demonstrates the need for an anticipatory strategy to lower the risk of shortages and smoother workflow. In facing the challenges described above, logistics companies are required to implement optimal strategies for their operating patterns, with the goal of increasing efficiency and reducing costs. These strategies can include various approaches, such as: container rotation scheduling based on data analysis and home-based forecasting, horizontal collaboration between logistics process stakeholders, utilizing technology updates to facilitate integration between systems and stakeholders.

Siregar et al. (2023) in their study, published in the International Journal of Supply Chain Management, showed that logistics companies implementing an optimal operating

pattern strategy were able to reduce logistics costs by up to 15% while simultaneously increasing the availability of empty containers at their main ports or at their home ports. It has demonstrated to enhance operation efficiency and company competition in the container supply chain environment. Nonetheless, the adoption of an optimal operating pattern is confronted with some issues including lack of technology infrastructure, cultural barriers, coordination and cooperation among partners which may challenge the adoption of an optimal operating pattern strategy. Secondly, not all logistics companies, especially those based in Indonesia, have the people and technology needed to roll out an operational overhaul.

Hence, this qualitative research pays particular attention to understanding how Indonesian logistics companies plan, practice, and review their strategies to optimize operating patterns and reduce potential empty container shortages. This work attempts to contribute to this field by exploring the ways in which logistics cost efficiency is influenced by these strategies and by presenting the challenges and opportunities that emerge from their implementation. With the insight of actual practices in the field, this study will offer theoretical as well as practical contributions for the logistics companies, particularly in the Indonesian context. This research is pertinent not only to PT. XYZ but also to the entire Indonesian domestic logistics industry in addressing the challenges of trade imbalance and the recurring volatility of container demand each year. Consequently, the research findings may serve as a practical contribution to the management of a more resilient and efficient national supply chain.

Shortage of empty containers is a major problem for global logistics operations, especially in developing markets like Indonesia, where trade imbalances make things worse (Dwitasari et al., 2021). This scarcity disrupts the supply chain, causing delays in delivery, rising operational costs, and a drop in service reliability for domestic shipping companies (Miranda, 2025). This problem is especially bad for PT. XYZ, Indonesia's leading domestic logistics company that handles container handling, warehousing, and shipping with strategic depots at ports like Tanjung Priok and regional feeder ports. The problem is especially bad during peak season when export volumes rise unevenly across routes. A big problem for logistics operations, especially in Indonesia, is not having enough empty containers. This could mean that deliveries take longer and cost more. Even though companies have their own ways of running their businesses, there is still no clear understanding of how operational patterns can solve container shortages and lower overall logistics costs at the same time. This is due to the insufficient exploration of the experiences of logistics practitioners involved in daily operations (Lee & Song, 2020).

There is a lack of in-depth qualitative research on the perspectives of practitioners, particularly managerial and field perspectives from Indonesian domestic companies such as PT. XYZ. Existing studies often focus on quantitative models or international cases, ignoring the subtle realities of local trade imbalances, specific port constraints, and the company's unique depot layout that PT. XYZ faces every day. This gap is particularly glaring in the context of PT. XYZ, where field personnel anecdotally report shortages during periods of high demand, but there has been no in-depth analysis linking these to systemic operational weaknesses (Lee & Song, 2020). This study addresses the identified gap through a rigorous qualitative approach, aiming to optimize operational patterns at PT. XYZ to mitigate the shortage of empty containers and achieve cost-effective total logistics expenditures. By examining the insights of practices and specific company data, this study proposes actionable anticipatory strategies to enhance repositioning efficiency, demand forecasting accuracy, and overall resilience within Indonesia's domestic logistics ecosystem.

Methodology

This study uses a qualitative approach to deeply explore operational efficiency strategies in addressing the shortage of empty containers in logistics companies. Qualitative methods were chosen because they are considered capable of explaining in more detail the complex and contextual dynamics that are difficult to reach with quantitative methods. Specifically, they explore how internal management responds to the issue through work patterns and strategic decisions. Consequently, this study concentrates on investigating the causes of the container shortage problem, highlighting three primary issues identified from prior related research. Additionally, this research aims to enhance comprehension of the decision-making processes and strategies employed by industry participants to optimize container operational efficiency. This research employed a qualitative approach to explore the root causes and potential solutions to address the shortage of empty containers through efficient operational patterns. The inputs to this research model are based on key causal factors, a theoretically grounded exploratory process, and expected outcomes. The following is an explanation of the components of each factor.

The figure 1 below shows a strategic analysis framework for resolving the primary problem of empty container shortages that disrupt operational performance and increase logistics costs at PT. XYZ. This framework begins by identifying a recurring business problem. Next, a PESTEL analysis was conducted for external factors and an internal analysis for internal evaluation. Both led to a root cause analysis using a fishbone diagram specific to PT. XYZ. The analysis results resulted in a proposed solution that was possible, and then an implementation plan based on SWOT was created to implement the plan in stages. This structured approach ensures that the shortage prevention solution not only identifies the problem but also provides PT. XYZ management with an actionable roadmap for implementing it.

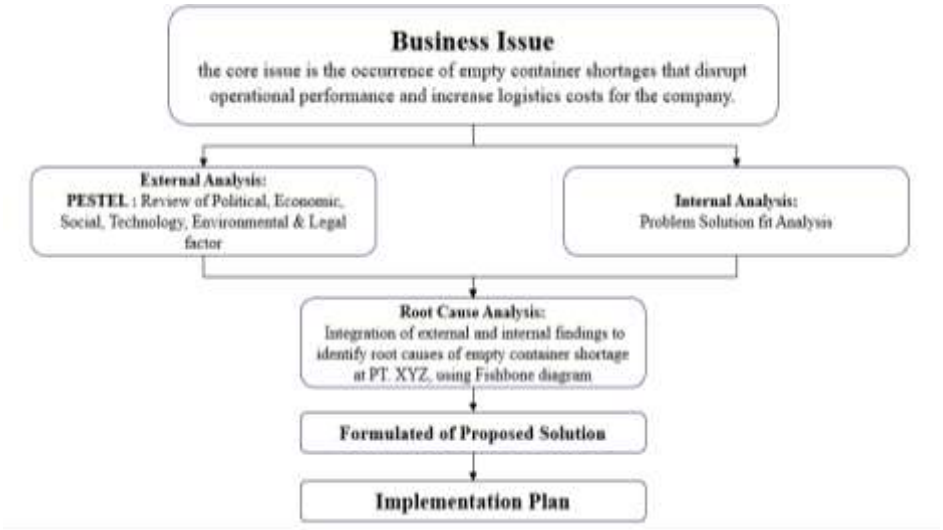


Figure 1. Research Framework

Research Design

This qualitative research is expected to provide researchers with the flexibility to understand the dynamics of insights, behaviors, and strategies implemented in the field through the perspective of an industry player, namely PT XYZ. This shipping company is the object of exploration to understand how container control policies operate, how operations implement

strategies to further mitigate the supply-demand imbalance of empty containers, and how internal control systems are implemented.

Yin (2018) stated in his research that case studies are particularly suitable for use in contexts where researchers want to answer the "how" and "why" of a contemporary phenomenon in a real-life setting, especially when the boundaries between the phenomenon and its context are unclear. Therefore, this research design aims to obtain holistic, in-depth information based on the real-life experiences of container logistics actors.

Participants and Sampling Strategy

In this study, participants were selected from key actors in the full-cycle container logistics supply chain, specifically those who play a role in determining the operational patterns of empty containers. Purposive sampling techniques are employed to choose informants considered capable of delivering pertinent and comprehensive information. Patton (2015) asserts that purposive sampling is especially suitable for qualitative studies as it enables researchers to choose informants based on their expertise and direct engagement with the subject matter under investigation. The saturation point principle is used to figure out how many informants there should be. This is the point at which the data collected stops giving new information (Guest, Bunce, & Johnson, 2006). In qualitative research, the number of participants typically varies from 8 to 20, contingent upon the depth of the data collected. The inclusion criteria for this study were: working in container/logistics operations, direct involvement in decision-making or technical implementation of container repositioning, employment in a logistics company with export-import activities or container depot management, willingness to be interviewed and provide the required data voluntarily. These criteria were created to ensure that participants fully understand the context of the container shortage and the efficiency strategies implemented in their organizations.

Data Collection Method

In a qualitative research approach, researchers use methods that help them get a better understanding of the things they study. In this study, the three main ways to collect data are in-depth interviews, direct observation, and documentation and sampling. All of these methods work together to improve and keep the research results' validity and reliability.

In-Depth Interviews

The primary methodology employed in this study was in-depth interviews. The objective was to comprehend the viewpoints and experiences of key informants involved in empty container management within logistics firms. This method produced detailed accounts of the company's acceleration, retention, and strategies for addressing the escalating container deficit. DiCicco-Bloom and Crabtree (2006) assert that in-depth interviews are exceptionally effective in exploratory studies as they facilitate rich, contextualized, subjective narratives. Alshenqeeti (2014) asserted that this approach facilitates flexibility and depth of data that is not easily accessible through quantitative methods. The interviews were semi-structured, with a list of open-ended questions based on the theoretical framework and results of earlier studies. Interviews lasted between 45 and 60 minutes and were either in person or online, depending on the list of informants. The informants included operational managers, a logistics operator, and field staff. Here are the full Here is the result of the interview with some of the people who answered. This table shows the names of PT XYZ's internal informants. The researcher uses code to hide who the informant is. It also shows the informant's information.

Research Triangulation

Research triangulation was extensively utilized to guarantee the credibility, validity, and reliability of qualitative findings by integrating data from various sources, methods,

investigators, and theories, in accordance with the principles of qualitative rigor methodology (Denzin, 2017; Patton, 2015). The multi-method triangulation in this study comprised in-depth interviews, field observations, internal document analysis, and expert validation, collectively establishing a substantial evidence foundation for the Integrated Control Tower's recommendations. This strategy made sure that the results were not only academically sound but also useful for PT. XYZ management when it came to putting shortage anticipation solutions into action. Extensive member checking was conducted with nine key respondents from various levels at PT. XYZ to verify the accuracy of data interpretation. At this stage, complete interview transcripts, initial thematic analysis, and draft Root Cause Analysis findings (including the Fishbone Diagram in Figure), during which respondents could add, correct, or clarify the researcher's interpretations. This technique significantly minimized researcher bias and ensured that the voice of practitioners was accurately represented in the strategic analysis. Source triangulation was accomplished via a systematically structured multi-layered verification protocol and respondent heterogeneity. Before the interviews, a panel of experts, including a supervisor, a senior logistics practitioner, and a qualitative methodologist, checked and approved the research instrument (an interview guide with 15 semi-open-ended structured questions). Additionally, respondents were intentionally chosen from various backgrounds: (1) 3 strategic decision-makers (12 years of experience), (2) 4 central and branch operational supervisors (5-7 years), and (3) 2 frontline operators (1-3 years), guaranteeing a thorough viewpoint from C-level executives to field implementers. Further data from CY observations (Figure 1.1), the internal shortage report Q4 2025, and the repositioning SOP confirmed consistency across sources. External validity explores the generalizability of study findings to various contexts, people and time frames. In qualitative studies, the external validity is captured in the audience relevance of the findings, insights, and conclusions beyond the immediate study environment. The following describes ways to improve external validity in qualitative studies.

Results and Discussion

According to the Central Statistics Agency (BPS), Indonesia's national container traffic grew a lot from 15.2 million TEU in 2019 to 18.5 million TEU in 2022. In 2023, it reached its highest point at 20.1 million TEU, but then it dropped to 19.8 million TEU in 2024 because of changes in the world economy. Pelindo said that container traffic as a whole grew 14% from the previous year to 12.4 million TEU in the third quarter of 2021 and 17.7 million TEU in 2023. This shows that there is still a lot of demand in the US, even though the pandemic has caused problems. The World Bank's data shows a similar trend, with Indonesia being one of the top 10 countries that import containers in 2022. This growth was not evenly balanced between directions. External demand, notably from the United States, stayed strong despite pandemic disruptions and pulled export-bound cargo through Indonesian ports, while inbound loaded flows at the same ports and routes did not always match that outbound volume.

UNCTAD Policy Brief No. 84 (2021) said that the COVID-19 pandemic caused a global container crisis that led to freight rates rising by 400–500% and a severe shortage of empty stocks. This crisis is still having effects across Southeast Asia, including Indonesia. CNBC Indonesia (2021) said that there was a "container apocalypse" in the country that caused prices to go up and exporters to complain. Jokowi also talked about the "horrific" effects on the national supply chain (CNBC Indonesia, 2022). Tenggara Strategics (2024) said that Indonesia's logistics costs are still high at 23–24% of GDP, which is twice ahigh as other ASEAN countries. Container shortages are a big part of the problem. Pratama and Nur (2023)

looked closely at Tanjung Priok and found that there were shortages because of things like supply-demand imbalances, delays in stripping, and a minimum of depot infrastructure. According to the Indonesia Shipping Gazette (2021), the domestic shortage was caused by an imbalance between exports and imports and a slow process for empty ships to return.

The table 2 below displays the daily container stock monitoring dashboard of PT. XYZ Surabaya branch during the acute shortage period (week 48 to 49, November 25 December 7, 2025), which explicitly illustrates the company's inability to meet daily booking needs due to a consistent and severe recap deficit. The data shows a critical pattern: Monday (November 25, Week 48) required 460 units but only 346 were recapped (a deficit of 114 units), Tuesday (November 26) 479 vs 377 (a deficit of 102), Wednesday (November 27) jumped to 669 vs 435 (a deficit of 234), and reached a peak on Thursday (November 28) of 577 vs 254 (an extreme deficit of 323 units, marked in red). Although the weekends of Week 48 and Week 49 showed a "safe" status with the recap fulfilled (1,110 vs. 1,104 units), initial FG stocks remained low (207–554 units) and FG stocks were progressively depleted, reflecting ongoing supply pressures that forced emergency allocations and mass booking rejections.

Table 2. PT XYZ Condition in empty shortage moment

Data												
Week	Day	Date	Recap		Status initial Stock				Initial Stock			
			20"	40"	20" PG	20" FG	20" GG & MK	40 HC	20" PG	20" FG	20" GG & MK	40 HC
48	Monday	24-Nov	940	384	Safe	Safe	Safe	Safe	227	409	304	384
	Tuesday	25-Nov	791	350	Safe	Safe	Defisit	Safe	248	333	210	350
	Wednesday	26-Nov	579	375	Defisit	Defisit	Defisit	Safe	199	238	142	375
	Thursday	27-Nov	605	504	Safe	Defisit	Defisit	Safe	290	181	134	504
	Friday	28-Nov	485	474	Safe	Defisit	Defisit	Safe	239	154	91	474
	Saturday	29-Nov	669	410	Safe	Safe	Defisit	Safe	279	296	94	410
	Sunday	30-Nov	977	413	Safe	Safe	Safe	Safe	364	413	200	413
49	Monday	1-Dec	777	301	Defisit	Safe	Safe	Safe	104	429	244	301
	Tuesday	2-Dec	377	240	Defisit	Defisit	Defisit	Safe	121	163	93	240
	Wednesday	3-Dec	96	248	Defisit	Defisit	Defisit	Defisit	75	(9)	30	248
	Thursday	4-Dec	373	253	Defisit	Defisit	Defisit	Defisit	147	118	108	253
	Friday	5-Dec	1,258	358	Safe	Safe	Safe	Safe	472	541	245	358
	Saturday	6-Dec	1,110	290	Safe	Safe	Safe	Safe	414	483	214	290
	Sunday	7-Dec	1,294	459	Safe	Safe	Safe	Safe	500	566	228	459

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1. Identify how PT.XYZ knows that it is experiencing a container shortage problem

PT. XYZ implements a sophisticated empty container shortage detection system with a layered approach, combining real-time quantitative metrics at the branch level with strategic projections from the central planning team. At the branch level, a key trigger is activated when empty container stocks fall below a critical threshold, typically 1.3–1.5 times the average daily discharge, or approximately 40% of projected daily demand, triggering an immediate operational alert and discussions about vessel supply schedules, accelerated stripping, or temporarily curtailing bookings to preserve remaining stock. Centralized monitoring enhances this approach through an Excel-based dashboard that synthesizes customer forecasts, current inventory positions, and confirmed vessel schedules to generate 2–4-week shortage simulations, enabling preventative resource allocation across the network. These tools not only uncover immediate shortages but also trajectory risks, such as declining stock trends despite stable or increasing bookings, which signal deeper systemic imbalances before they manifest operationally.

> *"MR (Container Inventory Control SPV, 5 years of experience), with extensive experience monitoring inventory across the network, explains the precision of these projections: "When projections show that actual stock and future supply are below safety stock, and the inventory trend continues to decline, this immediately signals a shortage that requires corrective action." Similarly, MLA (Equipment & Logistics Manager, 12*

years), who oversees strategic equipment planning, emphasizes the preventive power of integrated metrics: "The company identifies a potential shortage when container stock at a branch is lower than 1.5 times daily discharge and the combination of forecast projections, daily supply, and stock indicates a concerning gap." KK (Data Analyst, operational experience) adds granularity about the ongoing trend: "Indications of a shortage are seen when the ratio of stock to average daily discharge falls below 1.3–1.5 times and this trend persist for several consecutive days."

This dual structure of branch reactivity and central foresight not only finds problems but also sorts them by severity, separating local depot constraints from broad network imbalances that need cross-regional repositioning. Everyone who answered said that the system has improved, and they pointed out that the company's recent dashboard improvements have changed the way it manages capacity from reactive firefighting to proactive management. However. This dual structure of branch reactivity and central foresight not only finds problems but also sorts them by severity, separating local depot constraints from broad network imbalances that need cross-regional repositioning (Forma et al., 2015). Everyone who answered said that the system has improved, and they pointed out that the company's recent dashboard improvements have changed the way it manages capacity from reactive firefighting to proactive management.

2. Identify the causes of container logistics companies experiencing container shortage problems

The container shortage at PT. XYZ stems from a complex interplay of external market dynamics and internal operational friction, consistently described by all levels of respondents. Externally, a surge in peak season demand characterized by simultaneous increases in lifting from home base and outports overwhelms the supply chain, compounded by vessel schedule delays due to global congestion, port congestion, and weather disruptions that delay empty container shipments. Indonesia trade imbalance exacerbates this, with Java is central of economic generating a surplus while eastern outports face a chronic deficit, creating persistent regional flow distortions that cannot be addressed by a single operator without collaborative industry solutions.

"MLA (Equipment & Logistics Manager, 12 years) captured the peak season amplification: "The main contributing factor is the significant and almost simultaneous increase in lifting from the home base and outport, especially during the peak season, which is exacerbated by irregular vessel schedules due to congestion and other disruptions." MS (Operations Supervisor Semarang, 7 years) highlighted the structural geography: "The main contributing factors identified are the imbalance in container movements between regions and limited container availability in high-demand locations." MR (Container Inventory Control SPV, 5 years) pointed out the process bottlenecks: "The main causes of shortages are the lengthy stripping process, limited overall container availability, and the mismatch between forecast and actual demand."

These causes don't usually work alone. Respondents said that delayed vessels create a vicious cycle in which stripping backlogs grow, depot occupancy rises, and booking rejections happen, which hurts customer confidence (Song, 2021). Senior staff members like MLA stressed that even though outside factors get a lot of attention, strict internal processes are the best way to deal with problems. This shows how important it is to change the way data is handled and hold people accountable across departments. This pattern is most clear during busy times of the year, when both outside and inside factors put the most stress on the system. This causal pattern shows that we need a systemic approach that combines long-term planning with short-term responses.

3. *Impact of container shortage problems on PT. XYZ and Customer operations*

The container shortage hurt PT. XYZ in many ways, including making operations more rigid, costing money, and damaging relationships with customers. The branch lost all of its flexibility and had to turn down all bookings, rush to re-position through more expensive ad-hoc slots, and load ships in a way that hurt throughput efficiency by replacing revenue cargo space with empty containers. Financially, the lost revenue from rejected volumes was made worse by higher costs for repositioning, storage fees at depots, spot market unit rental premiums, and overtime pay for workers who had to deal with angry customers. This made margins tighter during peak revenue periods. Customers need to deal with multiple problems at once moment: delayed shipments led to production stoppages, missed vessel closing deadlines, and inventory shortages at destinations.

"MR (Container Inventory Control SPV, 5 years) measures the revenue disaster: "Shortages cause significant revenue declines because the company cannot accommodate all shipping requests, while reducing the satisfaction of customers who feel their needs are not being met." MLA (Equipment & Logistics Manager, 12 years) emphasizes the competitive danger: "The impact of shortages is not only operational disruption, but also loss of customer trust and decreased revenue, especially if competitors are not experiencing shortages." MS (Operations Supervisor Semarang, 7 years) details the supply chain ripples: "The impact of shortages is very serious because it can disrupt the supply chain, trigger increased shipping costs, and cause delays in the delivery of goods, resulting in shortages in the market."

The cumulative effects extend beyond the immediate quarter; repeated incidents normalize customer hedging strategies, fragment market share, and require costly re-acquisition campaigns. Longer-tenured respondents emphasized that while financial blows dominate boardroom discussions, the more subtle erosion of operational muscle memory—where teams default to crisis mode—poses the greatest long-term threat to agility. This impact is felt more acutely on customer operations that rely on tight schedules (Steenken et al., 2004). Overall, container shortages are not just a capacity issue but an existential threat to business models, demanding agile responses to protect fragile operational and relational ecosystems (Song, 2021).

4. PT. XYZ's response & strategy in facing container shortages

PT. XYZ deployed a comprehensive, multi-pronged strategy to address the shortfall, encompassing predictive planning, tactical operational optimization, and commercial oversight. Planning led with Container Projection Reports and the Evaline system, plus a 3 4 weekly dashboard that integrated vessel arrivals, customer forecasts, and inventory flows for network-wide simulations that triggered preventative action. Peak season protocols enforced outport load limits, while daily huddles analyzed forecast deviations to improve accuracy. Operationally, acceleration targeted pipeline stripping/repair through priority workflows and depot overtime, complemented by aggressive slot-join negotiations for empty repositioning on partner vessels. Commercial levers included revenue-based allocations favoring high-margin routes and accounts, selective one-way free use schemes to address bilateral imbalances, and enhanced free time DnD with customer reminders to minimize stays. Proactive communication mapped booking patterns per voyage, tempering expectations and uncovering hidden surpluses through collaborative planning.

"*MLA (Manager Equipment & Logistics, 12 years) outlined a holistic blueprint: "Study lifting trends well in advance (from the budgeting stage) with commercial and trade; on-hire early if container shortages are projected; tighten DnD free time and prioritize highest-revenue services or regions; implement one-way free use to reduce*

repositioning costs." MS (Operations Supervisor Semarang, 7 years) detailed the execution: "Optimize empty container repositioning, including procuring new containers if necessary, and use data and analytics technology to determine the most efficient repositioning patterns." MR (Container Inventory Control SPV, 5 years) highlighted the tools: "Strategies implemented include the use of Container Projection Reports and monitoring systems such as Evaline. They are also developing a dashboard that can provide projections 3–4 weeks in advance by combining vessel schedules, forecasts, and other data."

Integration is still important A cross-functional war room during an alert makes sure that operational, commercial, and trade priorities are all in line (Song, 2021). A continuous feedback loop helps improve tactics after an event. Veteran responders say that network defense is slowly getting better, but scaling up needs systems that work together better. This coordination is very important for dealing with the dynamics of archipelagos (Steenken et al., 2004). This method shows how to go from responding to problems as they come up to managing capacity strategically. However, it will only work if there is a long-term commitment to technological innovation and a culture of working together.

5. Impact of strategies and operational patterns implemented by PT. XYZ on reducing logistics costs

The implemented strategies for PT XYZ significant logistics cost reductions by compressing container cycles, limiting unproductive movements, and maximizing the value of limited capacity. Tighter stock thresholds and forward projections enabled preventative repositioning through economical vessel slots, avoiding premium ad-hoc freight that bloated contingency budgets. Accelerated stripping/repair throughput reduced depot dwell time, trimmed storage accruals, and freed up slots for high-speed processing, while disciplined free time enforcement cultivated customer return habits that sustained these benefits. Capacity optimization shined through prioritized revenue allocation, ensuring empty spaces flowed to high-profit channels first, along with one-way free use that monetized straggler units without full-cycle lease commitments.

"MLA (Equipment & Logistics Manager, 12 years) connects tactics with metrics: "A one-way free use approach can reduce empty repositioning costs, while tightening DnD free time shortens dwelling time, thereby reducing the need for excess containers." MS (Operations Supervisor Semarang, 7 years) confirms the scale: "Optimize empty container repositioning, including procuring new containers if needed, and using data and analytics technology to determine the most efficient repositioning patterns." MR (Container Inventory Control SPV, 5 years) notes early wins: "Strategies implemented include the use of Container Projection Reports and monitoring systems such as Evaline."

There is clear progress, as shown by lower rejection rates and stable service levels even when there is a lot of demand (Song, 2021). However, a full network will only be possible if everyone uses it and the systems are unified to take advantage of the hidden synergies across Indonesia's fragmented archipelago. Over time, these effects add up, giving you a long-term competitive cost advantage.

Conclusion

Logistics companies identify empty container shortages through a layered approach that combines quantitative indicators and field signals. Early warnings are triggered when stocks fall below safe thresholds such as a ratio of 1.3–1.5 times daily discharge, 40% of daily requirements, or a persistently declining safety stock trend, coupled with operational signals such as depot slot shortages and a high number of unfulfilled bookings. Preventive simulations and an understanding of customer booking patterns facilitate early repositioning of empty containers from surplus to deficit areas, while prioritizing repairs and maximizing joint slots maintain smooth operations despite vessel delays or schedule disruptions. PT. XYZ optimized operating patterns through container projection reports, real-time monitoring via dashboards, and peak-season-specific protocols that integrate forecast data with actual stock positions. Empty repositioning was efficiently directed by eliminating unnecessary movements, promoting reuse and interchange between ports, and developing alternative scenarios for vessel schedule disruptions. Close communication with major customers ensured accurate planning, while strengthened tracking systems and human resource training supported more precise execution. Key implementation challenges included ship schedule delays, slow stripping processes at some depots, inaccurate customer forecasts, and regional flow imbalances that created gaps between system data and physical inventory. Poor visibility of surplus inventory between branches, limited depot capacity, and information silos between departments hampered rapid response, risking business continuity if resource shortages persisted. Supporting factors included top management's commitment to dashboard technology and real-time monitoring, a cross-functional war room for priority alignment, and a wealth of veteran experience navigating seasonal crises. This reliance on veteran experience is valuable, but it also a weakness, because much of the know-how is held by individuals and has not yet been written into standard procedures, which makes the system vulnerable to staff turnover.

To reduce the dependence on individual experience, the rules that veteran staff apply today, such as alert thresholds, booking-curtailment decisions, and repositioning priorities, should be documented as standard operating procedures and used to train newer staff. Pairing junior staff with experienced supervisors during peak season would also help pass this knowledge on before turnover causes it to be lost. That said, this strategy still depends on two factors that PT. XYZ cannot fully control, which are the accuracy of customer forecasts and the speed of stripping at depots. These risks can be reduced but not removed. Monitoring both indicators in the Control Tower would allow deviations to be detected early, and further research could test how far these measures improve forecast reliability and stripping performance.

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