Southeast Asian Business Review
https://e-journal.unair.ac.id/sabr
e-ISSN: 3025-5171

Original Research

Volume 3, Issue 1, 2025

Optimizing Container Delivery Services at Nilam Container Terminal: A Lean Services Approach Utilizing VALSAT Framework

***Febriana Wurjaningrum, Rania Divia Nurrahmani**
Department of Management, Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia

Correspondence*:
Address: Airlangga 4-6, Surabaya City, Indonesia, 60286 | e-mail: febriana.w@feb.unair.ac.id

Abstract

The present research explores the optimization of container delivery processes at Terminal Peti Kemas Nilam using a Lean Services approach, addressing increased competition and customer expectations in the logistics supply chain by reducing waste during loading and unloading. Employing qualitative methods, including observations, questionnaires, interviews, and document analyses, the study utilized the VALSAT tool to identify waste and categorize activities into value-added (VA) and non-value-added (NVA). The analysis identified 12 activities, nine VA and three NVA, and key wastes such as waiting, unnecessary inventory, and defects. A fishbone diagram was employed to analyze root causes and guide improvement proposals, providing a framework for enhancing efficiency and service delivery in the logistics sector.

Keywords: Lean Services, VALSAT, Fishbone Diagram, Container Terminal

JEL Classification: L84, L87

DOI: https://doi.org/10.20473/sabr.v3i1.69732
Received: Feb 11, 2025; Accepted: February 27, 2025

1. Introduction

The increasing demand for goods and services necessitates that businesses effectively regulate and control their operations within the business cycle. Enhanced consumption stimulates a cycle of economic activity that can significantly contribute to the national economy's development (Danielis & Gregori, 2013; Park & Seo, 2016; Shan et al., 2014). A key factor in this economic growth is the trade of exports and imports, which can be highly influenced by the efficiency of supply chain management. Companies that fail to manage their operations appropriately may struggle to achieve profitability and maintain a competitive edge. Consequently, strategic planning is essential for companies to optimize their supply chain activities. This optimization aims to reduce operational costs, effectively utilize assets, and, most importantly, enhance customer satisfaction (Fawcett et al., 2008).

Supply Chain Management, as defined by Stein and Voehl (1998), involves a systematic effort to provide integrated oversight of the supply chain, fulfilling customer needs from raw materials through manufacturing to final delivery. This definition resonates with the perspective of Larson and Rogers (1998), who describes Supply Chain Management as the coordination of activities across vertically connected companies that aim to serve end customers profitably. The ability to transport goods efficiently between various stakeholders in the supply chain is fundamental in realizing time and place utility, ensuring that products are available where and when they are needed.

To maintain customer trust and control costs, companies must ensure the timely and strategic movement of goods. Transportation serves as a crucial mechanism to tackle these challenges, guaranteeing that products are moved swiftly and effectively from their origin to their point of consumption. Organizations may choose to operate their transportation fleets or leverage the services of common and contract carriers. Decisions regarding transportation modes must factor in the volume and weight of the goods, as well as route considerations, to ensure economical shipping costs while safeguarding the integrity and safety of the products during transit.

Maritime trade plays a pivotal role in economic development, especially as global population growth intensifies reliance on world trade (Deng et al., 2013; DeSalvo, 1994; Grobar, 2008; Jouili & Allouche, 2016; Song & van Geenhuizen, 2014). Reportedly, maritime transport is responsible for moving approximately 80% of the world's cargo, according to UNCTAD (2022). The escalation of global trade activities through maritime routes has been further spurred by the continued expansion of the global container industry. Nevertheless, the global maritime trade experienced a decline of 3.8% in 2020 due to the ramifications of the COVID-19 pandemic, leading to widespread lockdowns and a weakened economy. By 2021, however, a recovery was observed, with global maritime trade rebounding by 3.2%. Despite this recovery, the maritime sector continues to encounter complexities and uncertainties stemming from the pandemic's impact. UNCTAD's 2022 report predicts a modest growth of 1.4% in maritime trade, with container trade emerging as the fastest-growing segment. Notably, in August 2022, Southeast Asia saw a staggering 36% increase in the average price of containers, illustrating the dynamic nature of this market.

Indonesia's strategic position in maritime trade is underscored by the fact that nearly 50% of the world's maritime shipping passes through its waters. With 90% of global cargo traffic being maritime, Indonesia stands to leverage its geographical advantages. In early 2018, government statements indicated that Indonesia had the potential to emerge as a World Maritime Axis Country by fostering an integrated sea transportation system. According to data from UNCTAD, Indonesia ranks among the top 20 countries in port performance, revealing significant opportunities within the maritime sector to uplift the socio-economic landscape of the nation.

The Indonesian populace is increasingly capitalizing on these opportunities to address their daily needs through natural resource distribution, primarily logistics and goods distribution services. To sustain these activities, effective transportation infrastructure is critical to connecting the country's numerous islands, facilitating the continuous flow of goods and services necessary for economic vitality and resilience.

Ports enhance the value of shipping operations within their respective areas by increasingly integrating into the broader logistics value chain. This trend positions many ports as essential components within their customers' supply chains, effectively operating as integrated nodes that facilitate seamless information flow and management. Such integration is critical for optimizing supply chain efficiency, enhancing responsiveness, and ensuring operational success.

A noteworthy case is the Nilam Container Terminal, which observed a decline in throughput from 396,715 Twenty-foot Equivalent Units (TEUs) in 2021 to 372,022 TEUs in 2022. This reduction indicates fluctuations in maritime trade and overall port performance, underscoring the terminal's high productivity levels despite the observed decrease. Such variability highlights that while the terminal's loading and unloading processes may be efficient, it is not immune to challenges that could impede operational productivity. Addressing these potential issues is crucial for maintaining and enhancing the terminal's operational efficacy and overall contribution to regional maritime trade.

A comprehensive understanding of value and waste is essential for achieving operational excellence and delivering high-quality services in a competitive landscape (Saini et al., 2021). This study will employ value stream analysis tools (VALSAT) as primary analytical techniques to identify and assess waste. VALSAT is a pivotal instrument within lean methodologies, enabling waste identification by pinpointing areas for potential elimination through various analytical factors (Usman, 2020).

Upon waste identification, the root causes will be systematically analyzed using a fishbone diagram, also known as an Ishikawa diagram. This method not only aids in identifying the underlying factors contributing to waste but also facilitates the generation of targeted improvement suggestions. In this context, the fishbone diagram will be instrumental in offering actionable insights for waste reduction at the Nilam Container Terminal, ultimately enhancing operational efficiency and customer satisfaction.

2. Literature Review and Hypothesis Development

Lean Concept

Lean management originated in response to the challenges that Toyota faced, leading to the creation of the Toyota Production System aimed at overcoming financial, technological, and labor relations issues (Dennis, 2017). Central to lean management is the waste concept, which refers to human activities that utilize resources without generating added value for customers. The primary objective of lean management is to minimize the time taken from order placement to product delivery while eliminating wasteful activities (Bittencourt et al., 2021; Ejsmont et al., 2020). To achieve this, five fundamental principles are established: determining the value desired by customers, identifying value streams, ensuring continuous product flow, demonstrating the pull principle, and striving for perfection through continuous improvement, often referred to as kaizen.

Lean Service

While initially applied within the manufacturing sector, the principles of lean management have been effectively extended to the service industry. Lean service pertains to the application of lean thinking in service contexts, with an emphasis on waste elimination. Key characteristics of lean service include minimizing performance sacrifices, employing flow production and just-in-time (JIT) pull methods, maintaining a strong orientation toward customer value, and emphasizing employee training and empowerment (Bowen & Youngdahl, 1998). Thus, lean service operates under the same foundational principles as lean manufacturing, highlighting the universality of the lean philosophy (Ainul Azyan et al., 2017; Asnan et al., 2015; Cavdur et al., 2019; Drotz, 2014; Gupta et al., 2016; Mousavi Isfahani et al., 2019; Tlapa et al., 2022; V et al., 2016).

Waste in Lean Service

In the framework of lean management, eight categories of waste have been identified: transportation, inventory, waiting, overproduction, over-processing, defects, motion, and waste of talents or skills (Schroeder & Goldstein, 2021). The elimination of these wastes is essential for enhancing quality, boosting efficiency, improving customer satisfaction, and reducing operational costs. To successfully implement lean management, organizations must focus on minimizing or entirely removing activities that do not add value, thereby achieving greater organizational effectiveness and success.

Cross-Functional Flowchart

A cross-functional flowchart serves as a visual tool designed to illustrate the workflow within an organization. This flowchart is instrumental in showcasing the stakeholders involved in various systems and the flow of data throughout processes. By documenting and tracking data movement, a cross-functional flowchart aids in visualizing the workflows or business processes within a system, highlighting the relationships between different functions or departments (Pascoe & Mwangoka, 2016; Shadlou et al., 2011).

The Seven Value Stream Mapping Tools

Value stream mapping necessitates specific tools that facilitate the identification of operational process activities, distinguishing between value-added activities, non-value-added activities, and necessary but non-value-added activities. The seven most prevalent tools utilized for detailed mapping include process activity mapping, supply chain response matrix, production variety funnel, quality filter mapping, demand amplification mapping, decision point analysis, and physical structure (Hines & Rich, 2005). These tools are critical for organizations seeking to optimize their value streams and enhance operational efficiency.

Fishbone Diagram

The fishbone diagram, also known as the cause-and-effect diagram or Ishikawa diagram, serves as a visual tool that aids in the analysis and identification of the root causes of problems or events (Abdulai et al., 2020; Botezatu et al., 2019; Cox & Sandberg, 2018; Liliana, 2016). In the context of complex problem-solving, effective management requires an understanding of robust methodologies such as the fishbone diagram, which assists in pinpointing and resolving issues that stem from multiple interrelated causes. This diagram proves particularly advantageous in situations where specific data may be lacking or when the aim is to uncover causes that justify further data collection.

3. Data and Methodology

The present study employs a descriptive qualitative methodology to investigate the container delivery service process at the Nilam Container Terminal. This approach is intended to facilitate an in-depth understanding of the participant's experiences and the overarching phenomena within the operational framework (Taherdoost, 2022). By leveraging qualitative techniques, the research aims to identify inefficiencies and propose evidence-based improvements to enhance service delivery. This methodology acknowledges the complexity of service processes in logistics and the necessity for a thorough exploration of operational challenges as a precursor to proposing effective solutions (Bougie & Sekaran, 2016).

The research is structured into distinct stages, commencing with an initial research phase that encompasses a preliminary survey of the Nilam Container Terminal. A direct observational visit was executed to assess the current conditions, facilities, and operational processes. These observations informed the formulation of specific research problems, objectives, and expected benefits. Data compilation during this stage involved field studies and literature reviews to gather relevant information (Coy, 2019). Structured instruments, such as interviews and questionnaires, were employed to capture qualitative data on the service process, ensuring a comprehensive understanding of the operational context and participants' perspectives.

After data collection, the study focused on mapping and analyzing waste within the container delivery service process. A cross-functional flowchart was developed to visually represent the operational workflow, facilitating the identification of inefficiencies throughout the process. Waste identification was carried out using the VALSAT tool, prioritizing waste types according to their impact as assessed through questionnaire responses. Identifying wastes using a fishbone diagram to systematically explore the underlying causes of inefficiencies. This analytical framework provided a robust understanding of how various factors contribute to waste generation within the service process.

Targeted interventions were devised based on insights gleaned from the fishbone analysis. These recommendations focused on the application of lean service principles, aimed at streamlining operations and reducing waste. The culmination of this methodological approach involved a comprehensive data collection phase that included preliminary surveys, literature reviews, and extensive field studies involving stakeholder engagement. Key personnel, such as the operations planning manager and shift coordinators, were instrumental in providing qualitative insights into the operational challenges faced and the potential avenues for improvement. The research concludes with a set of actionable suggestions designed to enhance the efficiency of the container delivery service at the Nilam Container Terminal. By addressing identified inefficiencies through the application of systematic, evidence-based interventions, this study aspires to contribute meaningfully to the field of logistics and service operations, fostering an environment of continuous improvement and operational excellence.

4. Results and Discussion

It is essential to identify potential waste factors that can negatively impact productivity to enhance operational efficiency and service quality at the Nilam Container Terminal (Wurjaningrum & Shafak, 2022). The concept of terminalization is closely aligned with lean principles, which emphasize the elimination of waste to optimize processes. As highlighted by Olesen et al. (2015), implementing lean methodologies is particularly pertinent in terminal environments, characterized by their complexity and the necessity to maintain low operational costs while simultaneously increasing container throughput.

The core objective of lean philosophy is to maximize customer value while minimizing waste. This approach entails producing the highest number of services or products at the lowest possible cost. A critical aspect of this process is for terminal operators to distinguish between "value"—the benefit provided to the customer—and "waste," which encompasses any resource utilization that does not contribute to customer satisfaction or operational efficiency. Understanding and implementing this distinction is vital for improving service delivery and achieving sustainable growth in container terminal operations.

This study explores the various forms of waste present in the container delivery process at the Nilam Container Terminal, utilizing the framework of the seven wastes as proposed by lean management theory. This framework offers a structured approach to identifying inefficiencies that do not add value to the service provided. Data was collected through interviews with industry professionals and supplemented with questionnaires to rank the significance of each identified waste. The types of waste analyzed are explained below.

Unnecessary motion encompasses movements or actions performed by service providers that do not contribute to, or enhance, customer value. Within the container loading and unloading services, a pertinent example is the excessive movement within the container yard (CY) during loading and unloading operations. Such redundant movements not only prolong processing times but can also reduce overall operational efficiency.

Transportation waste refers to the unnecessary movement of goods or resources throughout the service provision process. In the context of container delivery, this is illustrated by poor container stacking configurations, which lead to longer transport distances for haulage trucks (TRT). Inefficient placement of containers affects the timeliness and cost-effectiveness of loading and unloading activities.

Inappropriate processing indicates the execution of unnecessary or overly complex tasks that exceed service objectives. An example in this scenario is the occurrence of loading errors on ships, resulting in the need for double handling—unloading and reloading containers incorrectly placed. This not only contributes to waste but also increases the potential for further errors and delays.

Unnecessary inventory is characterized by the accumulation of supplies or stock that exceeds customer demand or requirements. In the container services context, this is exemplified by the filling of stacking yards (CY) due to delays in ship arrivals or because the shipping company has yet to retrieve unloaded containers. Such a backlog leads to reduced operational capacity and increased holding costs.

Defects denote errors, inaccuracies, or failures in service delivery that lead to customer dissatisfaction. Within container loading and unloading services, examples of defects include damage to containers that can occur during the handling and transport processes. Such mistakes not only affect the immediate operational flow but also damage customer relationships and trust.

Overproduction arises when services provided exceed the actual needs of the customer, leading to waste. In the context of container services, this can be observed through excessive queues of trucks in the CY due to delays in Rubber-Tired Gantry (RTG) operations, which may stem from improper planning or scheduling. This backlog exacerbates wait times and reduces overall throughput.

Waiting signifies periods during which customers experience delays beyond necessary limits while awaiting service. In container loading and unloading operations, this is often manifested when container cranes (CC) are idle, awaiting the arrival of container trucks from the CY, either during loading or unloading tasks. Such inefficiencies can have a cascading effect, disrupting scheduled operations and increasing turnaround times.

By delineating the types of waste outlined in this study, stakeholders at the Nilam Container Terminal can adopt targeted strategies to mitigate these inefficiencies, ultimately enhancing their operational effectiveness and customer satisfaction within the container delivery process.

Table 1. Seven waste weighing results at Nilam Container Terminal

Waste	Total	Average	Rank
Unnecessary Motion	13	2.6	3
Transportation	9	1.8	7
Inappropriate Processing	10	2	5
Unnecessary Inventory	15	3	2
Defects	10	2	5
Over Production	12	2.4	4
Waiting	16	3.2	1

A weighting analysis was performed to identify the most prevalent types of waste affecting the service process, employing the seven waste theories. The results, summarized in Table 1, indicated that "waiting" was the category with the highest weight, averaging a score of 3.20, highlighting its significant impact on service efficiency.

Following the identification of waste types, the next phase involved synthesizing them into a structured table of seven value stream mapping tools. This approach aimed to explore the correlation between the tools employed and the identified waste at the Nilam Container Terminal. Each type of waste was quantified by multiplying its weight by a corresponding correlation value derived from the mapping tools. The aggregated scores facilitated the selection of the most pertinent tool. The results, displayed in Table 2, illustrated that "Process Activity Mapping" emerged as the optimal choice with the highest score of 99.8.

Table 2. Value stream mapping tools calculation results

Value Stream Mapping Tools	**Total Weight**	**Rank**
Process Activity Mapping	99.8	1
Supply Chain Response Matrix	65.6	2
Production Variety Funnel	18.2	6
Quality Filter Mapping	22.4	5
Demand Amplification Mapping	43.8	3

In analyzing the activities involved in the container delivery process at the Nilam Container Terminal, a total of 12 identified activities were categorized into value-adding and non-value-adding tasks. Observations over five days revealed that the average duration for the gate-in to gate-out process was 74 minutes. Of this time, operational activities accounted for 42 minutes, while delay activities totalled 44 minutes. Specific operational tasks included stages such as gate-in verification, container movement, and preparation processes, while delays primarily stemmed from trucks waiting for verification and lift services.

Table 3. The title is written above the table

Variables	**Flow**	**Time (minutes)**	**Category**		
			VA	**NVA**	**NNVA**
The truck Goes to the Gate In and Submits the Job Order	O	5	5		
Truck Waits in Queue for Verification	D	15		15	
Gate In Verification	O	1	1		
Prints Job Slip	O	2	2		
Truck Goes to Container Yard (CY)	O	8	8		
Truck Wait in Queue for Lift Service	D	20		20	
The Rubber Tyred Gantry (RTG) Preparation	O	5	5		
Moving Container by RTG	O	10	10		
Truck Goes to Gate Out	O	7	7		
Truck Waits in Queue for Verification	D	9		9	
Gate Out Verification	O	3	3		
Prints Equipment Interchange Receipts (EIR)	O	1	1		
Total		86	42	44	0
Percentage		100%	48,8%	51,2%	0%

The analysis presented in Table 3 outlines a comprehensive assessment of the container delivery service process, identifying 12 distinct activities. These activities are categorized into two primary classifications: operational activities, denoted by "O," and delays, denoted by "D." Operational activities are those that add value (Value-Added activities, VA). Meanwhile, delays represent non-value-added activities (Non-Value-Added activities, NVA).

According to the process activity mapping calculations, 9 operational activities collectively take 42 minutes to complete. This duration encompasses a series of critical tasks, which include the procedural steps necessary for trucks to navigate through the logistics system. Specifically, trucks proceeding to the gate and submitting job orders take approximately 5 minutes, while the gate-in verification process adds 1 minute. The printing of job slips requires 2 minutes, followed by an 8-minute journey for trucks travelling to the stacking yard, termed the Container Yard (CY). Preparation for utilizing the Rubber Tyred Gantry (RTG) accounts for 5 minutes, and the actual movement of containers via the RTG takes substantially longer at 10 minutes. Subsequently, trucks en route to the gate-out complete their journey in 7 minutes, which is succeeded by another 3 minutes dedicated to the gate-out verification process. Finally, the printing of Equipment Interchange Receipts (EIR) involves a brief duration of 1 minute.

In contrast to the operational activities that promote efficiency, the analysis also identifies three significant delay activities that collectively contribute to a staggering total delay of 44 minutes. These delays are critical factors that hinder overall operational performance. The most prolonged delay is attributed to trucks waiting in line to complete the verification process, which takes approximately 15 minutes. This is further compounded by an additional 20 minutes waiting for lift-on service, highlighting a potential bottleneck in the operational workflow. Lastly, trucks also encounter a delay of 9 minutes while waiting in line to undergo gate-out verification. Together, these delays underscore the need for enhanced process optimization to mitigate wait times and improve overall efficiency in logistics operations.

This information highlights the significant impact of delays on the overall process. While operational activities total 42 minutes, the delays add 44 minutes, indicating that the time spent on non-value-added activities is substantial. This discrepancy suggests a need for further investigation into the sources of delays and potential strategies for improving efficiency within the container delivery service process. By addressing these delays, there may be opportunities to enhance overall throughput and operational effectiveness.

A fishbone diagram analysis revealed three key factors contributing to delays at gate-in/out verifications and lift services: People, Method, and Machine. Under the "People" category, issues such as the lack of gate inspection officers and certain driver behaviours were noted. The "Method" category highlighted unpredictable load shifting and congestion. Lastly, the "Machine" category pointed to malfunctioning Rubber Tyred Gantry (RTG) equipment and application issues. Similarly, factors contributing to a crowded stacking yard included excessive container inventories (People), poor planning (Method), and limitations in the current application for planning and control (Machine).

Based on insights from the fishbone diagram, several improvements were suggested to alleviate the identified issues. These include enhancing the gate inspection system, evaluating equipment maintenance schedules, increasing personnel dedicated to gate inspections, and improving communication of policies to service users. Additionally, adjustments to yard allocation and refinement of bill of lading procedures in alignment with established standards were recommended. Lastly, a thorough evaluation of planning needs and a comprehensive analysis of service user requests were advised to enhance overall operational efficiency.

5. Conclusion

The analysis of the seven waste theories revealed the presence of waste within the container delivery service process at the Nilam Container Terminal, specifically in the categories of transportation, inventory, motion, waiting, over-processing, over-production, and defects. Based on the questionnaire results, the most significant waste identified was waiting, scoring an average of 3.20. It was followed by unnecessary inventory, with an average score of 3.00. Utilizing value stream mapping tools indicated that process activity mapping was the most effective for detailing the value stream, achieving a weight of 99.8. An analysis using process activity mapping revealed that the container delivery service comprises 12 activities, categorized into nine value-added activities totalling 42 minutes and three non-value-added activities totalling 44 minutes. Value-added activities accounted for 48.8% of the total time, while non-value-added activities comprised 51.2%.

From the fishbone diagram analysis, the root causes of waiting and unnecessary inventory were identified as follows. Waiting was attributed to machine-related issues, such as system or application failures and damaged Rubber Tyred Gantry (RTG) equipment; human factors, including the absence of gate inspection officers and driver behaviors leading to untimely breaks; and method-related factors, including traffic congestion resulting in a crowded stacking yard and unpredictable load shifting. Unnecessary inventory was attributed to machine-related factors, specifically the limitations of current applications in performing standard planning and control functions, coupled with human factors such as excessive container inventory at the terminal exceeding actual demand. Further investigations could focus on value stream analysis, specifically targeting delivery activities, along with the validation of the fishbone diagram post-implementation of corrective measures.

References

Abdulai, M. N., Prah, J. K., Walker, E., & Afrifa, A. D. (2020). A Fishbone Analysis of the Use of Electronic Health Records (EHR) in a Primary Healthcare Setting: The Case of University of Cape Coast Hospital. *International Journal of Applied Information Systems*, *12*(33), 27–31. https://doi.org/10.5120/ijais2020451882

Ainul Azyan, Z. H., Pulakanam, V., & Pons, D. (2017). Success factors and barriers to implementing lean in the printing industry. *Journal of Manufacturing Technology Management*, *28*(4), 458–484. https://doi.org/10.1108/JMTM-05-2016-0067

Asnan, R., Nordin, N., & Othman, S. N. (2015). Managing Change on Lean Implementation in Service Sector. *Procedia - Social and Behavioral Sciences*, *211*, 313–319. https://doi.org/10.1016/j.sbspro.2015.11.040

Bittencourt, V. L., Alves, A. C., & Leão, C. P. (2021). Industry 4.0 triggered by Lean Thinking: insights from a systematic literature review. *International Journal of Production Research*, *59*(5), 1496–1510. https://doi.org/10.1080/00207543.2020.1832274

Botezatu, C., Condrea, I., Oroian, B., Hriţuc, A., Eţcu, M., & Slătineanu, L. (2019). Use of the Ishikawa diagram in the investigation of some industrial processes. *IOP Conference Series: Materials Science and Engineering*, *682*(1), 012012. https://doi.org/10.1088/1757-899X/682/1/012012

Bougie, R., & Sekaran, U. (2016). *Research Methods For Business: A Skill Building Approach* (7th ed.). WILEY.

Bowen, D. E., & Youngdahl, W. E. (1998). "Lean" service: in defence of a production-line approach. *International Journal of Service Industry Management*, *9*(3), 207–225. https://doi.org/10.1108/09564239810223510

Cavdur, F., Yagmahan, B., Oguzcan, E., Arslan, N., & Sahan, N. (2019). Lean service system design: a simulation-based VSM case study. *Business Process Management Journal*, *25*(7), 1802–1821. https://doi.org/10.1108/BPMJ-02-2018-0057

Cox, M., & Sandberg, K. (2018). Modelling Causal Relationships in Quality Improvement. *Current Problems in Pediatric and Adolescent Health Care*, *48*(7), 182–185. https://doi.org/10.1016/j.cppeds.2018.08.011

Coy, M. J. (2019). Research Methodologies: Increasing Understanding of the World. *International*

Journal of Scientific and Research Publications (IJSRP), *9*(1), p8511. https://doi.org/10.29322/IJSRP.9.01.2019.p8511

Danielis, R., & Gregori, T. (2013). An input-output-based methodology to estimate the economic role of a port: The case of the port system of the Friuli Venezia Giulia Region, Italy. *Maritime Economics & Logistics*, *15*(2), 222–255. https://doi.org/10.1057/mel.2013.1

Deng, P., Lu, S., & Xiao, H. (2013). Evaluation of the relevance measure between ports and regional economy using structural equation modelling. *Transport Policy*, *27*, 123–133. https://doi.org/10.1016/j.tranpol.2013.01.008

Dennis, P. (2017). *Lean Production Simplified*. Productivity Press. https://doi.org/10.1201/b18961

DeSALVO, J. S. (1994). Measuring the Direct Impacts of a Port. *Transportation Journal*, *33*(4), 33–42. http://www.jstor.org/stable/20713212

Drotz, E. (2014). *Lean in the Public Sector : Possibilities and Limitations*. Linköping University Electronic Press. https://doi.org/10.3384/lic.diva-110660

Ejsmont, K., Gladysz, B., Corti, D., Castaño, F., Mohammed, W. M., & Martinez Lastra, J. L. (2020). Towards 'Lean Industry 4.0' – Current trends and future perspectives. *Cogent Business & Management*, *7*(1), 1781995. https://doi.org/10.1080/23311975.2020.1781995

Fawcett, S. E., Magnan, G. M., & McCarter, M. W. (2008). Benefits, barriers, and bridges to effective supply chain management. *Supply Chain Management: An International Journal*, *13*(1), 35–48. https://doi.org/10.1108/13598540810850300

Grobar, L. M. (2008). The Economic Status of Areas Surrounding Major U.S. Container Ports: Evidence and Policy Issues. *Growth and Change*, *39*(3), 497–516. https://doi.org/10.1111/j.1468-2257.2008.00435.x

Gupta, S., Sharma, M., & Sunder M., V. (2016). Lean services: a systematic review. *International Journal of Productivity and Performance Management*, *65*(8), 1025–1056. https://doi.org/10.1108/IJPPM-02-2015-0032

Hines, P., & Rich, N. (2005). The Seven Tools for Value Stream Mapping. *Applied Mechanics and Materials*, *17*(1), 553–564.

Jouili, T. A., & Allouche, M. A. (2016). Impacts of Seaport Investment on the Economic Growth. *PROMET - Traffic&Transportation*, *28*(4), 365–370. https://doi.org/10.7307/ptt.v28i4.1933

Larson, P. D., & Rogers, D. S. (1998). Supply Chain Management: Definition, Growth and Approaches. *Journal of Marketing Theory and Practice*, *6*(4), 1–5. https://doi.org/10.1080/10696679.1998.11501805

Liliana, L. (2016). A new model of the Ishikawa diagram for quality assessment. *IOP Conference Series: Materials Science and Engineering*, *161*, 012099. https://doi.org/10.1088/1757-899X/161/1/012099

Mousavi Isfahani, H., Tourani, S., & Seyedin, H. (2019). Lean management approach in hospitals: a systematic review. *International Journal of Lean Six Sigma*, *10*(1), 161–188. https://doi.org/10.1108/IJLSS-05-2017-0051

Olesen, P., Powell, D., Hvolby, H.-H., & Fraser, K. (2015). Using lean principles to drive operational improvements in intermodal container facilities. *Journal of Facilities Management*, *13*(3), 266–281. https://doi.org/10.1108/JFM-09-2014-0030

Park, J. S., & Seo, Y.-J. (2016). The impact of seaports on the regional economies in South Korea: Panel evidence from the augmented Solow model. *Transportation Research Part E: Logistics and Transportation Review*, *85*, 107–119. https://doi.org/10.1016/j.tre.2015.11.009

Pascoe, L., & Mwangoka, J. W. (2016). A smartphone-based reporting application for routine health data: system requirements, analysis and design. *International Journal of Telemedicine and Clinical Practices*, *1*(4), 323. https://doi.org/10.1504/IJTMCP.2016.078429

Saini, M., Efimova, A., & Chromjaková, F. (2021). VALUE STREAM MAPPING OF OCEAN IMPORT CONTAINERS: A PROCESS CYCLE EFFICIENCY PERSPECTIVE. *Acta Logistica*, *8*(4), 393–405. https://doi.org/10.22306/al.v8i4.245

Schroeder, R. G., & Goldstein, S. M. (2021). *OPERATIONS MANAGEMENT IN THE SUPPLY CHAIN: DECISIONS & CASES (8th edition).* (8th ed.). McGraw-Hill Education.

Shadlou, S., Pong, C. K., & Sukumaran, S. (2011). Proposal Submission System - A Content Management System Approach for Proposal Submission. *International Journal of Web & Semantic Technology*, *2*(2), 1–10. https://doi.org/10.5121/ijwest.2011.2201

Shan, J., Yu, M., & Lee, C.-Y. (2014). An empirical investigation of the seaport's economic impact: Evidence from major ports in China. *Transportation Research Part E: Logistics and Transportation Review*, *69*, 41–53. https://doi.org/10.1016/j.tre.2014.05.010

Song, L., & van Geenhuizen, M. (2014). Port infrastructure investment and regional economic growth in China: Panel evidence in port regions and provinces. *Transport Policy*, *36*, 173–183. https://doi.org/10.1016/j.tranpol.2014.08.003

Stein, M., & Voehl, F. (1998). *Macrologistics management*. St.

Taherdoost, H. (2022). What are Different Research Approaches? Comprehensive Review of Qualitative, Quantitative, and Mixed Method Research, Their Applications, Types, and Limitations. *Journal of Management Science & Engineering Research*, *5*(1), 53–63. https://doi.org/10.30564/jmser.v5i1.4538

Tlapa, D., Tortorella, G., Fogliatto, F., Kumar, M., Mac Cawley, A., Vassolo, R., Enberg, L., & Baez-Lopez, Y. (2022). Effects of Lean Interventions Supported by Digital Technologies on Healthcare Services: A Systematic Review. *International Journal of Environmental Research and Public Health*, *19*(15), 9018. https://doi.org/10.3390/ijerph19159018

UNCTAD. (2022). *UNCTAD Annuaş Report*. 1–84.

Usman, I. (2020). Lean hospital management implementation in health care service: A multicase study. *Systematic Reviews in Pharmacy*, *11*(3), 361–367. https://doi.org/10.5530/srp.2020.3.45

V, V., Suresh, M., & Aramvalarthan, S. (2016). Lean in service industries: A literature review. *IOP Conference Series: Materials Science and Engineering*, *149*, 012008. https://doi.org/10.1088/1757-899X/149/1/012008

Wurjaningrum, F., & Shafak, C. A. A. (2022). How Does the Value Stream Mapping Method Identify Waste and Improve the Coffee Bean Production Process of a Café? *Jurnal Manajemen Teori Dan Terapan | Journal of Theory and Applied Management*, *15*(3), 361–375. https://doi.org/10.20473/jmtt.v15i3.40440