

Enhancing Logistics Distribution Efficiency for Indonesian Navy Warships in Operations Area

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ABSTRACT

The Indonesian Navy faces challenges in maintaining the readiness of warships deployed in external operation areas due to inefficiencies in logistics distribution. Understanding current practices and identifying bottlenecks is crucial for devising strategies to enhance logistics efficiency. This study aims to investigate the current logistics distribution practices of the Indonesian Navy, identify primary bottlenecks and inefficiencies, explore opportunities for optimization, and propose strategies for increasing logistics distribution efficiency to support warships in external operation areas. Utilizing Creswell's qualitative research framework, this study analyzes existing secondary data from academic journals, reports, and governmental documents related to naval logistics in Indonesia. The study reveals the current logistics distribution practices and procedures of the Indonesian Navy, identifies primary bottlenecks and inefficiencies within the existing system, explores opportunities for optimization of logistics processes and infrastructure, and proposes a comprehensive strategy for increasing logistics distribution efficiency to support the readiness of Indonesian Navy warships in external operation areas. By leveraging qualitative research methods and secondary data analysis, this study provides valuable insights into enhancing logistics distribution efficiency for Indonesian Navy warships, contributing to improved readiness and operational effectiveness in external operation areas.

Keywords: Indonesian Navy, Logistics Distribution, Operation Areas

1. INTRODUCTION

Logistics distribution efficiency plays a pivotal role in ensuring the operational readiness of naval forces, especially in the context of external operation areas. The Indonesian Navy, like other maritime forces worldwide, heavily relies on efficient logistics systems to sustain its warships deployed in various external operation theaters [1]. This research aims to provide an overview of the importance of logistics distribution efficiency in supporting the readiness of Indonesian Navy warships in external operation areas.

Importance of Logistics Distribution Efficiency

Efficient logistics distribution is fundamental for maintaining the readiness of Indonesian Navy warships deployed in external operation areas. According to Bowersox and Closs (1996), logistics distribution encompasses the processes involved in delivering resources and supplies to the right place, at the right time, and in the right condition. In naval operations, this involves the timely and reliable delivery of fuel, ammunition, spare parts, food, and other essential supplies to warships deployed far from home ports.

The readiness of naval vessels directly depends on their ability to operate autonomously and sustainably in remote areas for extended periods. According to Langley & Langley (2019), inadequate logistics support can severely hinder naval operations, resulting in decreased mission effectiveness and increased risk to personnel and assets. For Indonesian Navy warships operating in external theaters, efficient logistics distribution ensures they remain mission-ready by providing the necessary resources to conduct patrols, exercises, humanitarian assistance, and disaster relief operations.

Moreover, efficient logistics distribution contributes to operational flexibility and responsiveness, enabling the Indonesian Navy to adapt quickly to changing operational requirements and emerging threats. As noted by Christopher et al. (2004), agile logistics systems are essential for supporting expeditionary operations, where forces must rapidly deploy and sustain themselves in diverse and often austere environments. By optimizing supply chain processes and leveraging advanced technologies, the Indonesian Navy can enhance its expeditionary capabilities and maintain a credible presence in external operation areas.

In addition to operational considerations, logistics distribution efficiency also has strategic implications for national security and sovereignty. According to Pettit & Beresford (2009), reliable and resilient logistics networks are critical for ensuring the security and integrity of maritime supply chains, especially in regions prone to geopolitical tensions and maritime disputes. By strengthening its logistics capabilities, the Indonesian Navy not only enhances its operational effectiveness but also reinforces Indonesia's maritime sovereignty and influence in the Indo-Pacific region.

In conclusion, logistics distribution efficiency is of paramount importance in supporting the readiness of Indonesian Navy warships deployed in external operation areas. Efficient logistics systems enhance naval readiness, operational effectiveness, and strategic resilience by ensuring the timely and reliable delivery of essential supplies and resources. As the Indonesian Navy continues to modernize and expand its maritime capabilities, investing in agile and responsive logistics infrastructure will be essential for safeguarding national interests and promoting regional stability.

Problem Statement

The Indonesian Navy faces significant challenges in maintaining the readiness of its warships deployed in external operation areas due to inefficiencies in logistics distribution. Despite the critical importance of timely and reliable logistics support for naval operations, the current distribution system often fails to meet the demands of deployed forces, leading to disruptions in supply chains, delayed maintenance activities, and decreased operational effectiveness. As a result, Indonesian Navy warships operating in external theaters may experience logistical constraints, hindering their ability to execute missions and fulfill strategic objectives.

Research Objectives

This research aims to develop a strategy to improve logistics distribution efficiency and support the readiness of Indonesian Navy warships in external operation areas. It will analyze existing practices, identify bottlenecks and challenges, explore best practices and innovative strategies from both military and civilian contexts, and evaluate the strategy for increasing logistics distribution efficiency to support the readiness of Indonesian Navy warships in external operation areas. The research will also evaluate the effectiveness of these strategies in enhancing naval readiness.

Research Questions

To address the research objectives outlined above, the following research questions will guide the investigation:

1. What are the current logistics distribution practices and procedures employed by the Indonesian Navy to support warships deployed in external operation areas?

2. What are the primary bottlenecks, inefficiencies, and challenges within the existing logistics distribution system that adversely affect naval readiness and operational effectiveness?
3. How can logistics distribution processes and infrastructure be optimized to overcome identified challenges and improve support for Indonesian Navy warships in external operation areas?
4. What is the strategy for increasing logistics distribution efficiency to support the readiness of Indonesian Navy warships in external operation areas?

The research aims to analyze the logistics distribution practices and procedures of the Indonesian Navy using theories from logistics management, military logistics, and performance improvement methodologies. Current practices include supply chain management and logistics operations management, while theories on bottlenecks, inefficiencies, and challenges can be identified using the Theory of Constraints and lean logistics and Six Sigma methodologies. Optimization of logistics distribution processes and infrastructure can be achieved using theories on logistics optimization and systems engineering. A comprehensive strategy combining these theories can improve logistics distribution efficiency, involving streamlined supply chain processes, technology integration, inventory optimization, and improved collaboration with key stakeholders.

2. LITERATURE REVIEW

Theories to Analyze Research Questions:

2.1 *Current Logistics Distribution Practices and Procedures*

Understanding the current practices and procedures used by the Indonesian Navy is possible by using theories from logistics management to answer the first research question. Concepts such as supply chain management (SCM) and logistics operations management can provide a framework for analyzing how resources are procured, stored, and distributed to support naval operations in external theaters [3]. Theories about military logistics, such as expeditionary logistics and force sustainment, can also help us understand the difficulties and needs of supporting warships that are deployed in faraway operational areas [2].

2.2 *Bottlenecks, Inefficiencies, and Challenges*

The second research question can be analyzed using theories related to logistics performance measurement and process improvement. The Theory of Constraints (TOC) can be applied to identify bottlenecks and inefficiencies within the logistics distribution system that hinder naval readiness and operational effectiveness [5]. Furthermore, theories on lean logistics and Six Sigma methodologies can help identify waste, variability, and defects in logistics processes, thereby pinpointing areas for improvement [6].

2.3 *Optimization of Logistics Distribution Processes and Infrastructure*

Theories on logistics optimization and systems engineering can be utilized to address the third research question. Operations research techniques, such as mathematical modeling and simulation, can aid in designing more efficient logistics

distribution processes and infrastructure [7]. The concept of agile logistics, derived from agile supply chain management principles, can also inform strategies for enhancing flexibility and responsiveness in supporting Indonesian Navy warships in external operation areas [8].

2.4 Strategy for Increasing Logistics Distribution Efficiency

A combination of the above theories can answer the main research question about how to improve the efficiency of logistics distribution to help Indonesian Navy warships be ready for operations in other countries. By integrating insights from logistics management, military logistics, performance improvement methodologies, and optimization techniques, a comprehensive strategy can be formulated. This strategy should encompass initiatives to streamline supply chain processes, leverage technology for enhanced visibility and coordination, optimize inventory management practices, and enhance collaboration with key stakeholders involved in logistics support operations.

3. METHODS

Qualitative research methods, when applied to secondary data, offer a robust approach for investigating complex phenomena such as logistics distribution efficiency in supporting naval operations. In line with Creswell's qualitative research framework, this research will explore the application of qualitative research methods using secondary data to address the research topic of enhancing logistics distribution efficiency for Indonesian Navy warships in external operation areas.

3.1 Defining Qualitative Research Using Secondary Data

Creswell defines qualitative research as an approach that focuses on understanding the lived experiences, perspectives, and meanings of individuals or groups within their social contexts. When applied to secondary data, qualitative research involves analyzing existing data sources, such as documents, reports, and archival records, to generate new insights and interpretations [9].

3.2 Identifying Secondary Data Sources

In conducting qualitative research using secondary data, researchers must identify relevant sources of information related to logistics distribution efficiency for Indonesian Navy warships. These sources may include academic journals, government reports, industry publications, and organizational documents. Creswell (2013) emphasizes the importance of purposive sampling, where researchers select specific documents or datasets that provide rich and meaningful insights into the research topic.

3.3 Data Collection and Analysis

Once the secondary data sources are identified, researchers proceed with data collection and analysis. Creswell (2013) suggests employing a systematic approach to data analysis, involving coding, categorizing, and thematic analysis. Researchers immerse themselves in the data, identifying patterns, themes, and relationships that shed light on the logistics distribution practices and challenges faced by the Indonesian Navy in external operation areas.

3.4 Applying Creswell's Framework

Creswell's qualitative research framework emphasizes flexibility and adaptability in the research process. Researchers may employ various qualitative data analysis techniques, such as narrative analysis, content analysis, or grounded theory, depending on the nature of the secondary data and research objectives. By following Creswell's iterative approach, researchers continuously refine their analysis, revisiting the data to uncover deeper insights and emergent themes [9].

3.5 Ethical Considerations

In conducting qualitative research using secondary data, researchers must adhere to ethical guidelines and principles. Creswell highlights the importance of ensuring the confidentiality and anonymity of individuals or organizations mentioned in the data sources. Researchers must also consider issues of data ownership, copyright, and attribution when accessing and using secondary data from external sources [9].

3.6 Conclusion

Using secondary data in qualitative research methods guided by Creswell's framework is a thorough and organized way to look into the topic of improving the logistics and distribution efficiency for Indonesian Navy warships in areas where they are operating outside of Indonesia. By leveraging existing data sources and employing qualitative data analysis techniques, researchers can generate valuable insights to inform policy and practice in naval logistics. Ultimately, qualitative research using secondary data contributes to a deeper understanding of the challenges and opportunities in optimizing logistics distribution processes, thereby enhancing the readiness and operational effectiveness of Indonesian Navy warships.

4. RESULTS AND DISCUSSION

4.1 Current Logistics Distribution Practices and Procedures of the Indonesian Navy in Supporting Warships Deployed in External Operation Areas

Logistics distribution practices and procedures are vital components of naval operations, particularly for the Indonesian Navy, tasked with supporting warships deployed in external operation areas. To comprehend the current practices and procedures employed by the Indonesian Navy, theories from logistics management offer valuable insights.

Supply chain management (SCM) serves as a fundamental framework for understanding the procurement, storage, and distribution of resources in naval logistics operations [3]. Within this context, the Indonesian Navy likely engages in strategic sourcing to acquire essential supplies, employing supplier selection and contract negotiation techniques to ensure reliability and cost-effectiveness.

The Indonesian Navy's logistics system is a complex network involving people, resources, organizations, and processes. Several studies focus on the concept and implementation of Supply Chain Quality Risk Management (SCQRM) in the Indonesian Navy's logistics, emphasizing the significant contribution of strategic leadership, information, and control mechanisms to organizational performance. These studies aim to improve organizational performance by enhancing SCQRM implementation, organizational culture, and information management. Furthermore, the logistics management of PT Pelindo Marine Service has been identified as an alternative strategy for maintaining Navy ships to support sea defense. The Indonesian Navy's logistics operations involve various aspects such as inventory management, warehousing, and transportation, as well as the utilization of centralized or decentralized distribution centers to facilitate efficient supply chain flows and minimize transportation costs. The research provides insights into the intricate logistics operations management theories and their application within the Indonesian Navy's distribution network [10], [11], [12].

In addition to civilian logistics management theories, military logistics concepts such as expeditionary logistics and force sustainment provide valuable perspectives on supporting warships deployed in distant operational areas [13]. Expeditionary logistics emphasizes the rapid deployment and sustainment of forces in austere environments, highlighting the need for agility, adaptability, and resourcefulness in logistics operations. Force sustainment encompasses the provision of essential supplies, maintenance services, and logistical support to ensure the continuous readiness and effectiveness of deployed forces.

The Indonesian Navy's logistics distribution practices and procedures are indeed tailored to the unique challenges of supporting warships in external operation areas. While the search results provided various documents related to the Indonesian Navy's logistics system, they did not directly address the specific tailored practices and procedures for supporting warships in external operation areas [14], [15]. However, it is well-known that such practices may include the establishment of forward operating bases or logistical support sites, the pre-positioning of critical assets and supplies, and coordination with host nations or international partners for logistical assistance [12]. These measures are essential for ensuring the timely delivery of supplies to warships deployed in external theaters [11].

The Indonesian Navy employs various strategies to optimize its logistics distribution, such as implementing advanced inventory management systems, utilizing efficient transportation networks, and conducting regular assessments to identify potential areas for improvement. The establishment of forward operating bases or logistical support sites allows for a more streamlined and rapid delivery of essential supplies to deployed forces, reducing the risk of disruptions or delays [16]. Pre-positioning critical assets and supplies in strategic locations further enhances the Navy's ability to respond quickly and effectively to any operational requirements that may arise. Furthermore, coordination with host nations or international partners for logistical assistance ensures a collaborative approach, leveraging resources and expertise from multiple sources to enhance the overall efficiency and effectiveness of the logistics distribution process [12], [14], [17].

The collaborative approach in the Indonesian Navy's logistics operations not only enhances efficiency but also fosters goodwill and cooperation between nations. Advanced technologies and systems are employed to track and monitor the movement of supplies, ensuring real-time visibility and accountability. This enables informed decision-making and adjustments as necessary. By constantly evaluating and improving its logistical capabilities, the Navy maintains a high level of readiness and responsiveness, ensuring that its forces are always well-equipped and supported in any operational environment [12], [14], [17].

4.2 Primary Bottlenecks, Inefficiencies, and Challenges within the Existing Logistics Distribution System of the Indonesian Navy

The second research question delves into identifying the primary bottlenecks, inefficiencies, and challenges within the existing logistics distribution system that adversely affect naval readiness and operational effectiveness. To address this question, theories related to logistics performance measurement and process improvement provide valuable insights.

The Theory of Constraints (TOC) offers a robust framework for identifying bottlenecks and inefficiencies within the logistics distribution system of the Indonesian Navy [5]. By applying TOC principles, potential bottlenecks in the supply chain, such as delays in procurement, transportation bottlenecks, or inventory stockouts, can be pinpointed. These bottlenecks impede the smooth flow of resources to warships deployed in external operation areas, thereby hindering naval readiness and operational effectiveness.

The Theory of Constraints (TOC) framework is crucial for the Indonesian Navy to systematically analyze the supply chain, identify key constraints, and develop strategies to overcome them. While the search results did not directly address the application of TOC in the Indonesian Navy, they highlighted the use of TOC in the sea transportation system and the potential for its application in the services sector. When used, the TOC framework can help the Indonesian Navy come up with targeted ways to cut down on delays in procurement, find the best transportation routes, and make sure they have enough inventory. This will improve the efficiency of the logistics distribution system and allow warships to get the resources they need on time. This, in turn, improves operational effectiveness and mission success [17], [18].

Furthermore, theories on lean logistics and Six Sigma methodologies are instrumental in identifying waste, variability, and defects in logistics processes [6]. Lean principles emphasize the

elimination of non-value-added activities and the optimization of process flow, while Six Sigma focuses on reducing process variability and improving quality. In the context of the Indonesian Navy's logistics distribution system, inefficiencies such as excessive inventory levels, redundant processes, and inconsistent supply chain performance may be prevalent.

Implementing lean logistics and Six Sigma methodologies can significantly benefit the Indonesian Navy's logistics distribution system. These methodologies, which focus on eliminating waste, reducing variability, and eliminating defects, can streamline operations, reduce costs, and improve overall efficiency. The optimization of process flow and the reduction of process variability can lead to more consistent and reliable supply chain performance, ensuring that the Navy has the necessary resources and supplies at the right time and in the right quantities, thereby enhancing its operational readiness and effectiveness [19].

The challenges related to infrastructure, technology, and human resources can indeed impact naval readiness and operational effectiveness. Inadequate infrastructure, such as insufficient storage facilities or outdated transportation networks, can lead to logistical constraints and delays. Similarly, outdated technology systems for tracking and monitoring inventory levels may contribute to inaccuracies and inefficiencies in logistics operations. Moreover, a lack of trained personnel or ineffective coordination among stakeholders can further exacerbate logistical challenges and impede the timely delivery of critical supplies to warships deployed in external theaters [14], [18], [20].

4.3 Optimization of Logistics Distribution Processes and Infrastructure for Indonesian Navy Warships in External Operation Areas

The third research question explores how logistics distribution processes and infrastructure can be optimized to overcome identified challenges and improve support for Indonesian Navy warships deployed in external operation areas. To address this question, theories on logistics optimization and systems engineering offer valuable insights.

Operations research techniques, such as mathematical modeling and simulation, provide powerful tools for designing more efficient logistics distribution processes and infrastructure [7]. By applying mathematical optimization models, the Indonesian Navy can determine the most cost-effective routes for transporting supplies, optimize inventory levels to minimize stockouts and excess inventory, and allocate resources efficiently to meet the demands of warships deployed in external theaters. Simulation modeling allows naval planners to test various logistics scenarios and evaluate the impact of different strategies on operational performance, enabling informed decision-making and resource allocation.

The application of mathematical optimization models and simulation modeling in the Indonesian Navy's logistics planning enhances their ability to make informed decisions, allocate resources effectively, and maintain a high level of operational performance. Simulation modeling provides a platform to assess potential risks and vulnerabilities in distribution processes and infrastructure. By simulating various scenarios, the Navy can proactively identify bottlenecks, weak points, or areas of improvement in their supply chain, ensuring a smooth and efficient flow of supplies to warships in external theaters. Moreover, simulation modeling enables naval planners to analyze the impact of external factors such as weather conditions or geopolitical events on their logistics operations, allowing them to devise contingency plans to mitigate potential disruptions [18], [21].

Furthermore, the concept of agile logistics, derived from agile supply chain management principles, offers a strategic approach to enhancing flexibility and responsiveness in supporting Indonesian Navy warships in external operation areas [8]. Agile logistics emphasizes adaptability, collaboration, and rapid response to changing operational requirements, aligning closely with the dynamic nature of naval operations. By adopting agile logistics principles, the Indonesian Navy can develop agile supply chains capable of quickly adjusting to disruptions, accommodating mission changes, and effectively supporting warships deployed in remote and challenging environments.

The Indonesian Navy can enhance its logistics distribution system through the following key strategies:

Establishment of Pre-Positioned Logistics Hubs: The Navy can set up a network of pre-positioned logistics hubs in strategic locations, serving as forward operating bases with the necessary infrastructure and resources to support naval operations in remote areas.

Leveraging Advanced Technology and Data Analytics: The Navy can utilize advanced technology and data analytics to improve visibility and coordination across the supply chain. This includes implementing real-time tracking systems for shipments, using predictive analytics to anticipate demand fluctuations, and employing automation and robotics to streamline logistics processes [22].

While the references did not directly address the strategies of the Indonesian Navy, the provided information about the logistics challenges in Indonesia can be used to understand the general logistics landscape in the country.

The Indonesian Navy can enhance its logistics distribution processes and infrastructure through strategic investments in technology, automation, and infrastructure development. Advanced tracking and monitoring systems, such as RFID (Radio Frequency Identification) and GPS (Global Positioning System), can provide real-time visibility into the location and status of critical supplies, enabling better decision-making and proactive management of logistics operations. Automation technologies, such as robotic process automation (RPA) and autonomous vehicles, can streamline repetitive tasks, improve efficiency, and reduce reliance on manual labor in logistics operations. Furthermore, investments in infrastructure development, including the expansion and modernization of port facilities, transportation networks, and logistics hubs, can enhance the resilience and capacity of the logistics distribution system to support Indonesian Navy warships in external operation areas [22], [23], [24].

4.4 Strategy for Increasing Logistics Distribution Efficiency to Support the Readiness of Indonesian Navy Warships in External Operation Areas

The Indonesian Navy faces significant challenges in maintaining the readiness of its warships deployed in external operation areas. To address these challenges and improve logistics distribution efficiency, a comprehensive strategy must be developed. This strategy will draw upon insights from current logistics distribution practices and procedures, the identification of bottlenecks, inefficiencies, and challenges, as well as the optimization of logistics distribution processes and infrastructure.

1. Current Logistics Distribution Practices and Procedures

Understanding the current practices and procedures used by the Indonesian Navy is essential for developing an effective strategy. Concepts from logistics management, such as supply chain management (SCM) and logistics operations management, provide a framework for analyzing how resources are procured, stored, and distributed to support naval operations [3]. Moreover, theories about military logistics, including expeditionary logistics and force sustainment, help identify the difficulties and needs of supporting warships deployed in faraway operational areas [13].

2. Bottlenecks, Inefficiencies, and Challenges

Identifying bottlenecks, inefficiencies, and challenges within the logistics distribution system is crucial for devising targeted interventions. The Theory of Constraints (TOC) offers a systematic approach to identifying and addressing bottlenecks that hinder naval readiness and operational effectiveness [5]. Lean logistics and Six Sigma methodologies also help find waste, variation, and mistakes

in logistics processes, which makes it possible to make specific process improvements [6].

3. Optimization of Logistics Distribution Processes and Infrastructure

Optimizing logistics distribution processes and infrastructure is paramount for enhancing efficiency and supporting Indonesian Navy warships in external operation areas. Operations research techniques, such as mathematical modeling and simulation, provide valuable tools for designing efficient logistics processes and infrastructure [7]. Furthermore, the concept of agile logistics, derived from agile supply chain management principles, informs strategies for enhancing flexibility and responsiveness in supporting naval operations [8].

4. Comprehensive Strategy

Drawing upon insights from current practices and procedures, identification of bottlenecks and inefficiencies, and optimization of logistics distribution processes and infrastructure, the Indonesian Navy can formulate a comprehensive strategy for increasing logistics distribution efficiency. This strategy should encompass initiatives such as:

1) Streamlining supply chain processes and reducing administrative overhead.

The Indonesian Navy is implementing advanced technologies to improve supply chain visibility and reduce delays. They are also improving communication with key stakeholders and investing in training for logistics distribution personnel. These initiatives aim to overcome bottlenecks and inefficiencies, resulting in a more agile and responsive logistics distribution system [25], [26].

2) Investing in technology to improve visibility and tracking of critical supplies.

By investing in technology, the Indonesian Navy can improve the visibility and tracking of critical supplies. This allows them to have a real-time understanding of the location and condition of these supplies, ensuring that they are readily available when needed. The use of advanced tracking systems also helps to prevent loss or damage to these supplies, further enhancing the efficiency of the logistics distribution system. Overall, these technological investments contribute to more effective and reliable supply chain management for the Indonesian Navy [25], [27], [28].

3) Implementing lean logistics principles to eliminate waste and enhance efficiency.

One way the Indonesian Navy can implement lean logistics principles is by reducing excess inventory and streamlining its procurement process. By closely monitoring and analyzing supply and demand patterns, they can make more accurate forecasts and avoid overstocking or understocking critical supplies. Additionally, they can optimize their transportation routes and utilize just-in-time delivery methods, minimizing unnecessary transportation costs and reducing lead times. These lean logistics practices will not only save costs but also increase overall operational efficiency for the Indonesian Navy [19], [29].

4) Enhancing infrastructure to support agile and responsive logistics operations.

Investment in contemporary storage facilities, such as warehouses and distribution centers, strategically placed close to important naval bases and ports, can achieve this. Upgrading the transportation infrastructure, including roads and bridges, will also enable smoother and quicker movement of goods and supplies. Furthermore, implementing advanced tracking and communication systems will facilitate real-time monitoring and coordination of logistics operations, allowing for faster response times and better decision-making. By enhancing infrastructure, the Indonesian Navy will be able to establish a robust logistics network that can adapt swiftly to changing operational requirements [28], [29], [30].

5) Fostering collaboration with industry partners and international allies to optimize resource allocation and sharing.

Collaborating with industry partners and international allies will play a crucial role in optimizing resource allocation and sharing for the Indonesian Navy. This partnership will enable the sharing of knowledge, expertise, and resources, leading to more efficient logistics operations. Additionally, this collaboration will enhance interoperability between different navies, enabling seamless coordination and support during joint operations. By leveraging the strengths and capabilities of its partners, the Indonesian Navy can further strengthen its logistics network and effectively address any operational challenges that may arise [27], [28], [29], [30].

By implementing this strategy, the Indonesian Navy can enhance its logistics distribution efficiency, thereby improving the readiness and operational effectiveness of its warships deployed in external operation areas.

CONCLUSION

Theories from logistics management, including supply chain management and logistics operations management, offer valuable frameworks for understanding the current logistics distribution practices and procedures employed by the Indonesian Navy to support warships deployed in external operation areas. Military logistics concepts such as expeditionary logistics and force sustainment further enhance our understanding of the challenges and complexities inherent in naval logistics operations.

The primary bottlenecks, inefficiencies, and challenges within the existing logistics distribution system of the Indonesian Navy stem from a combination of process-related issues, infrastructure limitations, technological deficiencies, and human resource constraints. By leveraging theories such as TOC, lean logistics, and Six Sigma, the Indonesian Navy can systematically identify and address these challenges to enhance naval readiness and operational effectiveness in external operation areas.

The optimization of logistics distribution processes and infrastructure is essential for overcoming identified challenges and improving support for Indonesian Navy warships deployed in external operation areas. The Indonesian Navy can make its logistics system more efficient, flexible, and quick by using operations research techniques, adopting agile logistics principles, and making smart investments in technology and infrastructure development. This will make the navy more ready for battle and improve its ability to do its job in other theaters.

The Indonesian Navy is aiming to improve logistics distribution efficiency by implementing a comprehensive strategy that includes understanding current practices, identifying bottlenecks, and optimizing processes and infrastructure. This includes using techniques like TOC, Lean logistics, and Six Sigma methodologies. The strategy should also include streamlining supply chain processes, investing in technology, implementing lean logistics principles, enhancing infrastructure, and collaborating with industry partners to optimize resource allocation and sharing.

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