

Integrating Sustainability, Digitalization, and Strategic Alliances in B2B Relationship Marketing: A Systematic Literature Review of The Port Sector

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Abstract

The maritime and port industry has undergone rapid transformation driven by sustainability pressures, digital disruption, and increasing global competition, requiring the reconfiguration of traditional Business-to-Business (B2B) relationship marketing practices. This study examined the evolution of B2B relationship marketing within the maritime and port sector through a Systematic Literature Review (SLR) using the PRISMA framework. From an initial pool of 180 Scopus-indexed publications, 46 articles published between 2015 and 2025 met the inclusion criteria and were thematically synthesized. The review identified three interconnected dimensions shaping contemporary port-related B2B marketing: sustainability, digital innovation, and port performance. Sustainability has shifted from a peripheral operational concern to a strategic priority, as reflected in green port initiatives, ecological governance, and decarbonization commitments. Simultaneously, digital technologies, including artificial intelligence, blockchain, and predictive analytics, have transformed operational efficiency while enabling more sustainable and resilient business practices. Port performance, traditionally measured through productivity and cost efficiency, is increasingly evaluated based on technological capabilities, environmental responsibility, and collaborative value creation. The findings further revealed that strategic partnerships play a pivotal role in connecting digital transformation with sustainability objectives, thereby strengthening competitiveness and long-term resilience within the port ecosystem. Conceptually, this review highlighted the growing integration of relationship marketing, digitalization, and sustainability-oriented strategic management in maritime logistics. Nevertheless, several research gaps remain, including limited qualitative investigations, insufficient geographical diversity, and inadequate attention to circular economy practices and digital literacy capabilities. Addressing these limitations requires methodological diversification and broader contextual exploration to better understand how ports can maintain competitive B2B relationships in an increasingly digital and sustainability-driven environment.

INTRODUCTION

Over the last decade, the maritime and port industry has undergone profound structural changes driven by three interrelated forces: increasing sustainability expectations, rapid digital transformation, and the growing need for collaborative governance across complex supply chain networks. Ports are no longer viewed merely as physical nodes that facilitate cargo movement and connectivity; they are now recognized as catalysts for sustainable development

and innovation in global trade (Ng et al., 2018; Tessmann & Elbert, 2022). This transformation requires a more nuanced understanding of how relationship marketing practices can support environmental responsibility and organizational resilience. Earlier studies primarily focused on operational and competitive concerns. For example, research on climate adaptation highlighted the vulnerability of port systems to environmental change, while studies on non-price competition emphasized service quality as a critical source of differentiation. Ng et al. (2018) examined the responses of Canadian ports to climate-related challenges, whereas Esmer et al. (2016) emphasized the importance of service quality as a competitive advantage among Turkish ports. By the late 2010s, academic attention had shifted toward business model innovation and technological integration. Caliskan and Esmer (2019) applied commitment–trust theory to analyze customer relationships in container terminals, while Tessmann and Elbert (2022) examined governance dynamics within Port Community Systems (PCS) and Cargo Community Systems (CCS). Recent studies have suggested that digital transformation and sustainability should not be considered separate trajectories. Instead, these dimensions increasingly reinforce one another by creating opportunities for ports to achieve operational excellence while addressing broader environmental and societal objectives. Ferretti et al. (2022) identified significant alignment between sustainability and digital innovation, including the application of artificial intelligence (AI) for port traffic forecasting and the development of sustainable partnerships through digital adoption in Indonesia (Utama et al., 2024). Collectively, these developments reflect a paradigm aligned with the Sustainable Development Goals (SDGs).

Although numerous review-based studies have provided valuable insights, their scope remains limited. Stein and Acciaro (2020) proposed frameworks for business sustainability; Del Giudice et al. (2022) conducted a bibliometric analysis of digitalization; Yildiz et al. (2024) examined trends in port decarbonization; and Isbaex et al. (2025) investigated the application of Geographic Information Systems (GIS) in maritime logistics. However, many of these studies remain conceptually fragmented, geographically constrained, or limited by methodological approaches, particularly the reliance on qualitative synthesis. Consequently, the complex interactions among sustainability, digitalization, and strategic alliances remain insufficiently understood. This fragmentation is increasingly problematic because contemporary port competitiveness depends not only on operational efficiency but also on the ability of organizations to integrate environmental adaptation, technological capabilities, and collaborative relationships (Alzate et al. 2024; Heilig et al. 2017; Sarinah 2026). Although existing literature has generated valuable insights, it remains fragmented in explaining the integrated relationships among sustainability, digitalization, and strategic alliances within B2B relationship marketing. To address these gaps, this review is guided by the following research questions:

RQ1. How has research on sustainability-oriented B2B relationship marketing evolved in the port sector between 2015 and 2025?

RQ2. What are the dominant themes, theoretical perspectives, and methodological approaches identified in the literature?

RQ3. How are sustainability, digitalization, and strategic alliances conceptually integrated in contemporary B2B relationship marketing research?

RQ4. What research gaps and future research directions emerge from the existing literature?

This study aimed to address these gaps by conducting a Systematic Literature Review (SLR) focusing on sustainability-oriented B2B relationship marketing while explicitly integrating digital transformation and interorganizational collaboration. Unlike previous studies that primarily examined operational efficiency (Merkel & Holmgren, 2017) or environmental management (Puig et al., 2022), this study developed a comprehensive taxonomy illustrating the interconnections among green practices, relational strategies, and technological innovation. This review provided conceptual integration and practical insights for advancing sustainable port development based on an analysis of 46 articles published between 2015 and 2025.

Despite increasing academic attention, existing literature has not yet fully integrated sustainability with relationship marketing and technological frameworks. This study contributed by: (1) demonstrating the essential role of digital adoption in facilitating sustainable port operations; (2) introducing a sustainability-oriented taxonomy incorporating environmental management, operational efficiency, and innovation; and (3) formulating a conceptual framework that integrates sustainability into B2B relationship marketing strategies within the port sector.

The urgency of this research was reinforced by the accelerating pace of digital transformation and sustainability pressures within the global maritime industry. Climate-related regulations, including the International Maritime Organization's (IMO) decarbonization targets, require ports to rapidly adapt their operational practices and collaborative relationships. At the same time, digital technologies are fundamentally transforming how ports interact with stakeholders, creating both opportunities and challenges for B2B relationship marketing. Port authorities and terminal operators must identify key success factors for maintaining competitiveness, particularly as major port users influence strategic priorities and government involvement becomes essential in addressing regulatory gaps and supporting sustainable port development.

This paper presents theoretical contributions by developing a sustainability-oriented framework that connects environmental objectives, digital innovation, and B2B relationship marketing. It also provides practical implications for policymakers and port managers seeking to develop resilient and environmentally sustainable strategies. The paper is structured as follows: Section 2 reviews the relevant literature; Section 3 describes the methodological framework based on a PRISMA-guided systematic literature review; Section 4 presents the findings and analysis; Section 5 discusses the theoretical and practical contributions; and Section 6 concludes with limitations and recommendations for future research.

Table 1. Theoretical Integration Framework of Sustainability, Digitalization, and Strategic Alliances in B2B Relationship Marketing. Source: author compilation from several references

Theory	Main Focus	Relevance to the Port Sector	Integration with Other Theories	Key References
Social Exchange Theory (SET)	Trust, reciprocity, commitment, and long-term relationships among actors	Explains how ports, terminal operators, shipping lines, and logistics providers develop collaborative relationships and	Complements RBV by explaining relational resources and supports Technology Affordance Theory	Caliskan & Esmer (2019); Utama et al. (2024)

		strategic alliances	by showing how digital platforms strengthen trust and collaboration	
Resource-Based View (RBV)	Competitive advantage through valuable, rare, inimitable, and organizational resources	Sustainability capabilities, digital competencies, and alliance networks become strategic resources for ports	Integrates with SET because trust-based relationships create relational resources; integrates with Technology Affordance Theory because digital technologies enhance organizational capabilities	Del Giudice et al. (2022); Utama et al. (2024)
Technology Affordance Theory (TAT)	How technological features enable new actions, coordination, and value creation	Explains how AI, blockchain, Port Community Systems, and predictive analytics improve collaboration, transparency, and decision-making	Strengthens SET through enhanced transparency and trust; supports RBV by creating digital capabilities as strategic assets	Senyo et al. (2021); Ferretti et al. (2022); Tessmann & Elbert (2022)
Sustainability Transition Theory	Transformation toward environmentally sustainable socio-technical systems	Explains how ports adapt to decarbonization, environmental regulations, and green port initiatives	Supported by RBV because sustainability becomes a strategic capability, and by TAT because digital tools facilitate environmental monitoring and reporting	Bjerkan et al. (2021); Puig et al. (2022); Yildiz et al. (2024)
Circular Economy Theory	Resource efficiency, waste reduction, and value regeneration	Supports sustainable port development through circular business models and resource optimization	Extends Sustainability Transition Theory and requires digital capabilities (TAT) and collaborative partnerships (SET) for implementation	De Langen et al. (2020); Stein & Acciaro (2020)
Business Model Innovation Theory	Organizational adaptation through innovative value creation and delivery mechanisms	Explains how ports redesign business models to respond to sustainability and digitalization pressures	Integrates RBV, TAT, and Sustainability Theory by translating strategic resources and technologies into competitive business models	Garrido Salsas et al. (2022); Del Giudice et al. (2022)

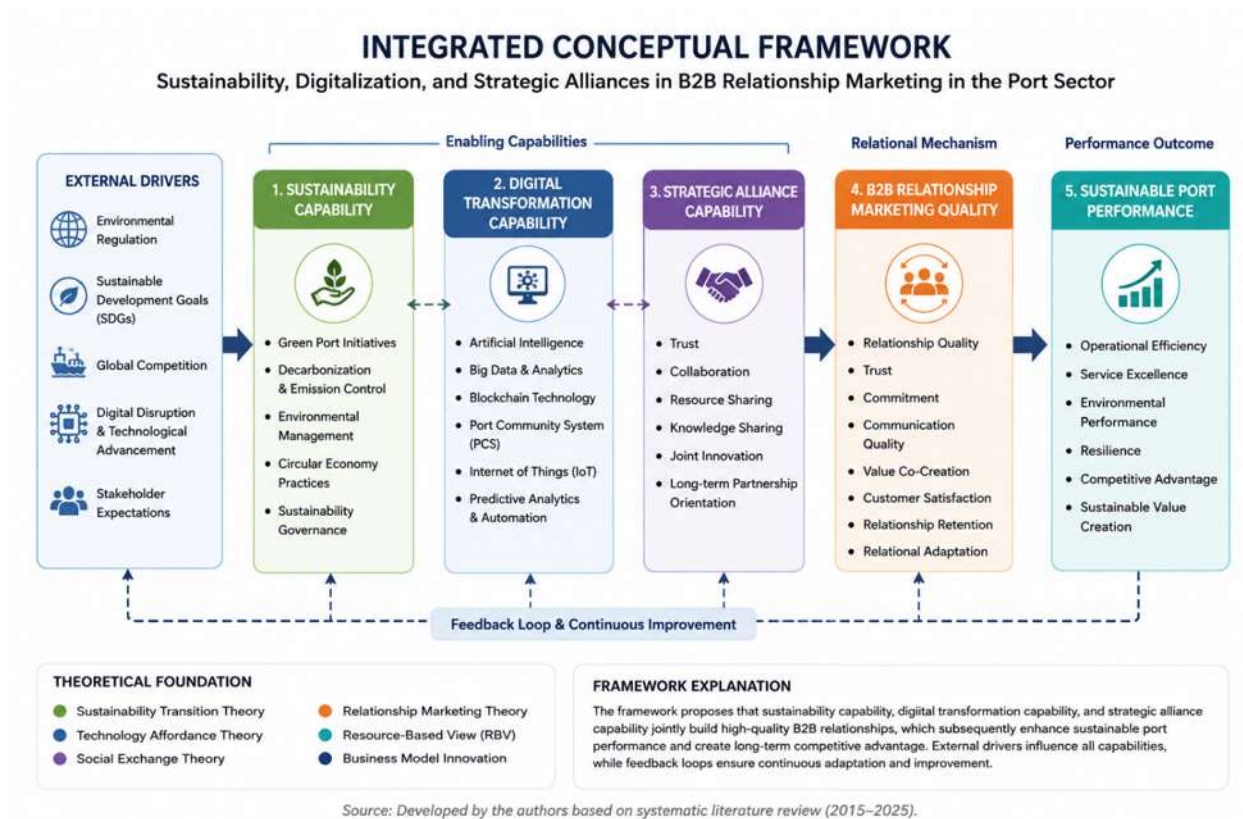


Figure 1. Integrated Conceptual Framework of Sustainability-Oriented B2B Relationship Marketing in the Port Sector.

METHOD

Study Design and Overview

This study adopted a Systematic Literature Review (SLR) methodology based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework and thematic synthesis approach (Moher et al., 2010). PRISMA has been widely adopted across research fields to improve transparency and methodological rigor in systematic reviews (Panic

et al., 2013). Its consistent application demonstrates its reliability in supporting scientifically robust and reproducible review processes (Siddaway et al., 2019; ter Huurne et al., 2017).

Following the eligibility assessment, all included studies underwent a structured data extraction process. The extracted information included authors, publication year, study location, research objectives, theoretical frameworks, methodologies, key findings, and implications related to sustainability, digitalization, and strategic alliances. The extracted data were organized into a review matrix to enable systematic comparison and thematic synthesis across studies.

During the identification stage, studies were systematically retrieved from the Scopus database due to its rigorous indexing standards and established reputation as a reliable source of high-quality scholarly publications (Lasda Bergman, 2012; Rocha & Nunes, 2020). The search strategy was developed using combinations of keywords, including “B2B Relationship Marketing,” “Port Sector,” “Port Business,” and “Seaport Transportation.” The initial search identified 180 records. Several exclusion criteria were subsequently applied, including three duplicate records, 40 publications outside the specified timeframe (2015–2025), 14 articles published in journals outside the Q1–Q4 quartile range, and five articles without abstracts. After this screening process, 118 records remained for further assessment.

During the screening stage, additional relevance assessments and inclusion criteria were applied. A total of 55 records were excluded because they did not meet the eligibility requirements, leaving 63 articles for full-text retrieval. However, 28 articles could not be accessed. To strengthen the evidence base, 11 additional relevant studies were identified from other reliable sources. Subsequently, 35 articles from the initial database search and 11 additional studies proceeded to the eligibility assessment stage and were considered suitable for inclusion.

The final inclusion stage resulted in a total of 46 studies, consisting of 35 articles retrieved from Scopus and 11 additional studies from other sources. These studies formed the foundation for the subsequent qualitative thematic synthesis.

Data Extraction and Coding Procedure

Following the inclusion stage, all selected articles underwent a structured reading and data extraction process. Each article was reviewed in full text to identify research objectives, theoretical foundations, methodological approaches, and key findings. Particular attention was given to studies addressing sustainability, digitalization, strategic alliances, and B2B relationship marketing within the port sector. The extracted information was organized into a review matrix to support systematic comparison and thematic analysis across studies.

The coding process began with open coding, in which recurring concepts, keywords, and research findings were identified across the selected studies. Initial codes included green port initiatives, decarbonization, environmental management, artificial intelligence, blockchain, digital platforms, operational efficiency, resilience, trust, collaboration, and strategic alliances. This process generated a comprehensive set of codes representing the key issues identified in the literature.

Subsequently, axial coding was conducted to group related codes into broader analytical categories. For example, green port initiatives, carbon reduction, and environmental management were categorized under sustainability transformation, while artificial intelligence, blockchain, and Port Community Systems (PCS) were grouped under digital innovation.

Similarly, trust, cooperation, and partnership-related concepts were classified within relational management categories. This process enabled the identification of conceptual relationships among the extracted codes.

Finally, selective coding was applied to integrate the analytical categories into overarching themes. Through iterative comparison and refinement, four dominant themes emerged from the literature: (1) Sustainability and Environmental Transformation, (2) Digital Innovation and Technological Integration, (3) Efficiency and Resilience, and (4) Strategic Alliances and Relational Management. These themes subsequently formed the foundation of the thematic synthesis presented in the findings section.

To enhance transparency and reproducibility, the overall coding procedure was illustrated in Figure 2. The figure summarized the progression of the selected studies through the stages of open coding, axial coding, and selective coding before being synthesized into the four overarching themes that guided the subsequent analysis.

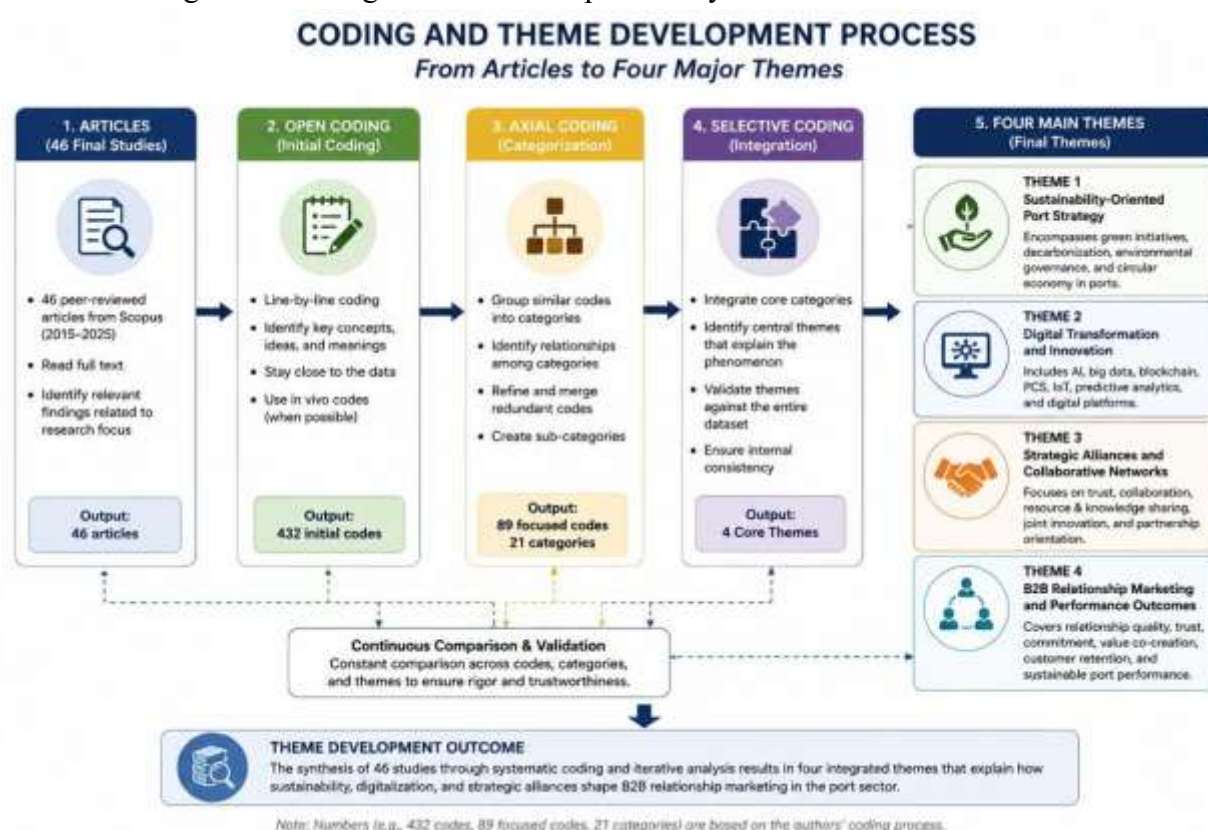


Figure 2. Coding and Theme Development Process

A thematic analysis approach was employed to identify patterns, relationships, and emerging themes within the reviewed literature. The analysis followed the six-step framework proposed by Braun and Clarke (2025), including data familiarization, initial coding, theme development, theme review, theme definition and refinement, and the production of the final analytical narrative. The coding and thematic development processes enabled the identification of recurring patterns and conceptual relationships across the selected studies. The analytical process was supported by the Publish or Perish software system (Wahyudi, 2024), which assisted in organizing and evaluating relevant literature to improve the consistency and depth of thematic categorization.

This study minimized potential bias by systematically applying the PRISMA methodology and including only studies that met predefined relevance and quality criteria. To ensure methodological rigor, each article was assessed based on its relevance, methodological transparency, theoretical contribution, and empirical validity. Only studies that satisfied the established quality requirements were retained for the final synthesis. This structured procedure enhanced the reliability of the findings and provided a systematic approach for future interdisciplinary research.

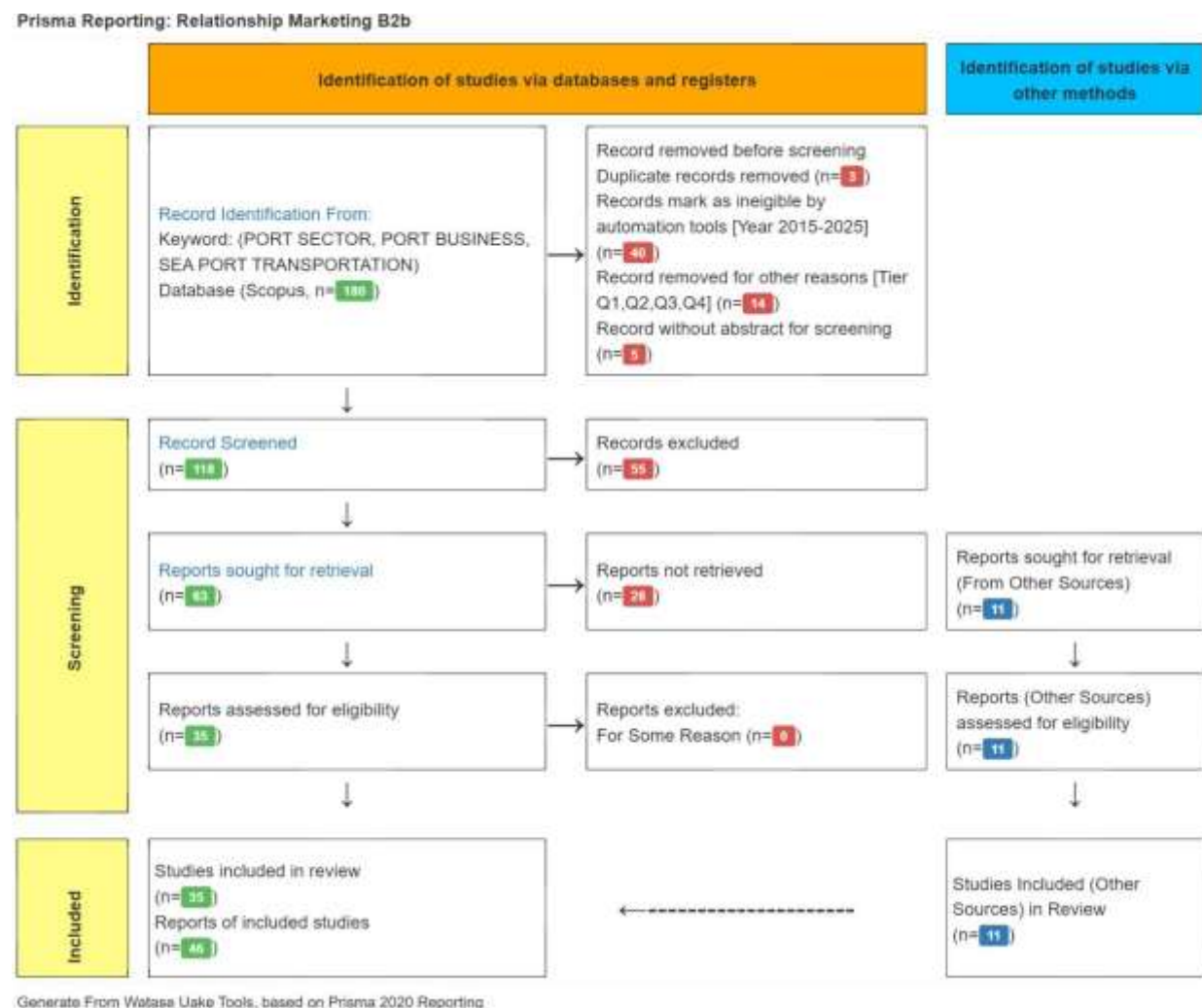


Figure 3. Prisma Reporting : Relationship Marketing B2B

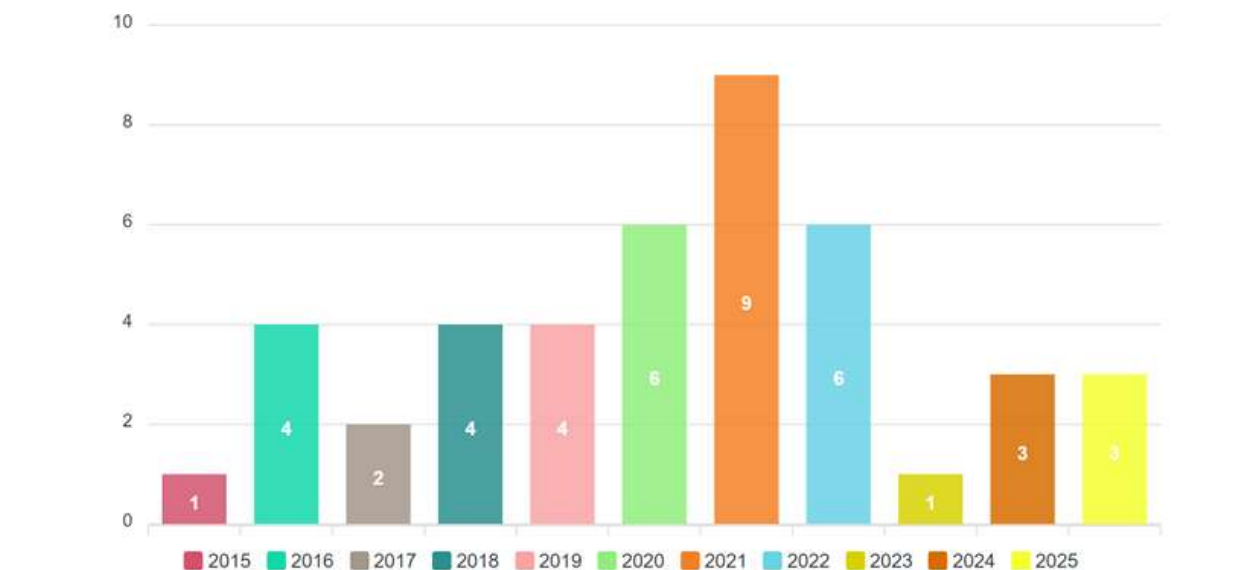


Figure 4. PRISMA Protocol

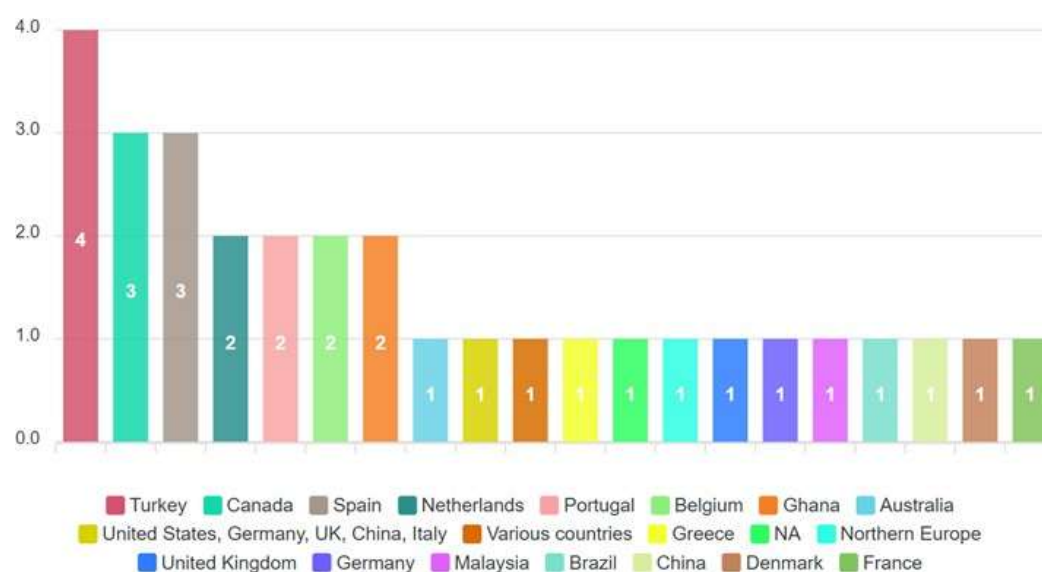


Figure 5. Year Publication

RESULTS AND ANALYSIS

1. Descriptive Overview of the Reviewed Studies

The systematic analysis found 46 articles published from 2015 to 2025 that investigate the dynamics of relationship marketing (RM) in B2B contexts within the port and maritime sector. These studies encompass Q1–Q4 publications, primarily appearing in prestigious sources, hence enhancing both academic discipline and practical significance. The geographical distribution is extensive, with Europe and Asia contributing the majority, but rising nations such as Ghana, Indonesia, and Brazil are increasingly participating in the discussion. This uneven distribution highlights that global trade hubs have been more engaged in promoting the research agenda, whilst other regions are under-represented.

Most studies thematically converge on three elements that characterize the sector: sustainability, digital innovation, and operational efficiency. These focus topics align with urgent global issues, including climate change, digital transformation, and rising global rivalry. The popularity of quantitative designs, especially bibliometric analyses, regression models, and surveys, is clear; nevertheless, there is also a discernible shift towards qualitative case studies and mixed-method techniques, indicating a methodological expansion. This diversity is significant, as it demonstrates scholars' efforts to encompass the nuanced and contextual elements of B2B connections within maritime contexts. The descriptive overview emphasizes a dynamic and progressive research environment that is both theory-driven and responsive to the practical difficulties faced by ports, shipping corporations, and logistics actors

2. Classification According to Analytical Frameworks

The classification of studies indicates a blend of continuity and evolution in the field's theoretical foundations. Classical frameworks, such as Social Exchange Theory and the Resource-Based View (RBV), continue to exert significant influence, underpinning concepts of trust, the reciprocity principle, and strategic resource allocation. However, there is a noticeable rise in the adoption of contemporary frameworks, including Technology Affordance Theory, Circular Economy Theory, and resilience-based approaches. This shift reflects a dynamic scholarship adaptable to new industry realities, especially regarding the intertwined challenges across environmental, technological, and relational dimensions.

Within this classification, “Port and Maritime Studies” is prominently featured, appearing in 36 of the 37 core publications analyzed. This dominance is expected given the sector's pivotal role in global logistics; nevertheless, it underscores an intellectual reliance on maritime case studies. Of particular note, (Del Giudice et al., 2022) integrated Business Model Innovation Theory with resilience concepts, resulting in one of the highest citation counts (139), which illustrates the effectiveness of such theoretical combinations. Integrate sustainability and digitalization as fundamental imperatives rather than optional considerations.

3. Visualization and Bibliometric Trends

The bibliometric visualization in Figure 2 provides a valuable overview of the temporal and thematic shifts in the research landscape. Notably, publication activity experienced a significant uptick post-2018, aligning with heightened discussions surrounding decarbonization and the swift advancement of digital initiatives in port management. The pronounced peaks observed in 2020 and 2022 are particularly significant, likely attributable to disruptions to global supply chains caused by the pandemic and to the academic imperative to explore resilience in port operations.

Keyword analysis supports these findings, with prominent terms such as “green ports,” “AI in logistics,” “port efficiency,” and “strategic alliances” emerging as key themes, thereby affirming the previously identified thematic clusters. Geographic mapping underscores the robust involvement of research institutions in Europe, particularly in the Netherlands, Spain, and Norway, as well as active centers in Asia, with notable contributions from China, Singapore, and Indonesia. In contrast, engagement from Africa and South America remains comparatively limited, though research from Ghana and Brazil offers important contextual insights. Citation networks additionally emphasize the strong interconnection between sustainability and digital innovation as pivotal nodes in this domain. The evidence suggests that these themes transcend disciplinary boundaries. Collectively, the bibliometric trends not

only reflect the dynamism of research in this field but also its growing relevance to broader discussions of global transformation.

4. In-depth Thematic Analysis

A comprehensive thematic analysis reveals four interconnected aspects: (1) sustainability and environmental transformation, (2) digital innovation and technological integration, (3) efficiency and resilience, and (4) strategic alliances and relational management. Every theme illustrates the changing dynamics of maritime B2B relationships and highlights the growing interplay between academic discourse and practical necessities.

1. Sustainability and Environmental Transformation

Sustainability is the central focus, highlighting the sector's direct susceptibility to ecological regulations and community expectations. Initiatives such as carbon accounting (Azarkamand et al., 2020) and environmental management systems (Seguí et al., 2016) are currently viewed not just as compliance tasks but as relational assets that enhance trust between B2B partners. (Bjerkkan et al., 2021) demonstrate that environmental intermediation encourages incremental transformations at Norwegian ports, while (Puig et al., 2022) highlight the importance of integrating policies. Nevertheless, it is equally important that the social dimensions of sustainability, workplace standards, community involvement, and inclusivity remain insufficiently explored. This gap suggests that further research might successfully broaden the definition of sustainability in B2B relationship management to include social and human dimensions

2. Digital innovation and Technological Integration

The second topic highlights the transformative impacts of digital technology. Digital technologies such as AI, blockchain, and predictive analytics are enhancing productivity while also changing the dynamics of B2B relationships. (Senyo et al., 2021) show that in Ghana, digital platforms foster interdependence and transparency, while (Ferretti et al., 2022) highlight the forecasting accuracy of deep learning for container traffic. Importantly, these improvements go beyond functional use, creating new opportunities for collaboration and trust-building. However, as (Kapalidis et al., 2022) caution, digitalization reveals new vulnerabilities, particularly in cybersecurity, complicating the otherwise rosy story of technological progress. As a result, digital innovation simultaneously enhances and challenges B2B relationship management, highlighting the need for flexible governance structures.

3. Efficiency and Resilience

Although efficiency remains a crucial focus, its meaning has evolved. Efficiency is increasingly understood not just in terms of throughput and cost savings, but also in terms of resilience. (Caliskan & Esmer, 2019) argue that operational productivity is currently associated with environmental goals, suggesting a merging of economic and ecological justifications. (Del Giudice et al., 2022) Support this claim by demonstrating how adaptive business models allow ports to withstand systemic shocks, such as pandemics and trade interruptions. (Stein & Acciaro, 2020) Note that efficiency aimed at sustainability is not necessarily a compromise, but often produces synergistic benefits. The pandemic highlighted resilience as an essential relational trait, encouraging B2B partners to prioritize collaborative risk-sharing strategies over limited transactional benefits.

4. Strategic Alliances and Relational Management

Ultimately, alliances and governance structures offer the essential connections of B2B marketing in the port sector. (Utama et al., 2024) illustrate how strategic partnerships affect the connection between digital adoption, service quality, and sustainability outcomes in Indonesian ports. This finding closely aligns with Social Exchange Theory, emphasizing the importance of trust and reciprocity. Alliances often serve as a means for joint investments in digital systems or sustainable infrastructure, thereby minimizing risk among collaborators. At the same time, (Macneil et al., 2021) underscore that linking these partnerships to the SDGs provides both credibility and strategic alignment. Nevertheless, forming alliances is not without conflict: disparities in power, differing regulatory systems, and an emphasis on immediate results could compromise stability. These tensions suggest a valuable chance for further examination of the relationship between shared aspirations and organizational independence.

Development of Thematic Understandings

An examination of themes shows that the port and maritime B2B industry is undergoing a significant shift. Sustainability initiatives encourage innovation, digital solutions improve transparency and trust, efficiency evolves into resilience, and partnerships serve as facilitators that incorporate these advancements. The literature suggests that upcoming studies should embrace methodological diversity and improve regional representation, while professionals should understand that relationship marketing in this sector extends beyond mere transactional interactions. Rather, it is incorporated into ecological, technical, and social systems that require adaptive and holistic approaches.

1. Integrating Key Themes: Sustainability, Digital Innovation, and Port Efficiency

This review's findings highlight that sustainability, digital innovation, and port efficiency are the three primary, interconnected characteristics that influence contemporary research on relationship marketing in B2B maritime and port environments. The significance of sustainability, frequently expressed through concepts such as green ports and environmental management, validates previous findings by (Bjerkan et al., 2021) and (Seguí et al., 2016), who highlighted the increasing global demand for ports to implement environmentally responsible practices. This research illustrates that sustainability is now perceived not only as an environmental necessity but also as increasingly linked to economic resilience and enduring stakeholder trust in B2B engagements.

According to (Stein & Acciaro, 2020), evidence indicates that environmental management is most effective when it aligns with efficiency objectives. Multiple studies indicate that ports that invest in sustainable technologies often achieve simultaneous improvements in productivity and cost efficiency, underscoring the benefits of sustainability measures. This review distinguishes itself from prior research by demonstrating that sustainability in B2B marine contexts is not isolated; rather, it operates synergistically with digital innovation as a key driver.

The results further underscore the significance of port efficiency as an important component of competitiveness, as emphasized by (Caliskan & Esmer, 2019). However, in contrast to previous depictions of efficiency as just an economic struggle, current research demonstrates that efficiency is being redefined as a multi-faceted construct integrating profitability, environmental sustainability, and resilience to disturbances. This conceptual shift

indicates that port efficiency should be seen not as an ultimate goal but as a means to achieving broader sustainability and stakeholder engagement objectives.

Finally, digital innovation manifests as a distinct theme and serves as a catalyst that enhances the other two. The review underscores the disruptive impact of artificial intelligence, blockchain, and automation on enhancing port operations and B2B logistics, as stated by (Ferretti et al., 2022) and (Senyo et al., 2021). This review expands on these findings by demonstrating that digital technologies not only enhance operational efficiency but also fundamentally alter the dynamics of interorganizational trust, collaboration, and value co-creation. This is a significant contribution: digitalization is not simply about technology adoption but also a relational mechanism that affects the quality and endurance of B2B collaborations.

2. Comparison with Existing Literature

The insights from this analysis are distinct from those of other systematic reviews in maritime studies. Previous bibliometric reviews (e.g., Del Giudice et al. 2022) predominantly charted publishing trends in port digitalization and efficiency. Although the investigations identified prevailing themes, they frequently failed to predict the interrelations among them. This research defines the relational aspect and illustrates how sustainability, efficiency, and digital innovation collectively transform B2B relationship marketing in the port sector.

The findings predominantly align with the Resource-Based View (RBV), which emphasizes that strategic alliances, along with capabilities, foster sustainable competitive advantage (Utama et al., 2024). This analysis indicates that intangible resources such as digital trust, collaborative norms, and stakeholder legitimacy are as critical as physical assets in determining port competitiveness. The study is significantly at odds with previous uses of the Resource-Based View that recommended economic resources. It demonstrates that environmental legitimacy and technology adaptability are essential strategic resources in B2B maritime situations.

This review further elaborates on the findings of (Senyo et al., 2021), who examined digital transformation at Ghanaian ports. This review demonstrates how the technical affordances of digital platforms, as examined by Senyo et al., translate into marketing results, including enhanced inter-firm cooperation and increased consumer retention. The findings align with those of (Ferretti et al., 2022), who use deep learning to estimate container movements, although they extend beyond mere forecasting to examine how predictive abilities influence bargaining power, risk-sharing, and contractual agreements in B2B transactions.

This review ultimately challenges previous research that saw sustainability, efficiency, and digitalization as isolated issues. The integration of these elements demonstrates that their interrelation signifies an overlooked aspect of relationship marketing in ports. Sustainable efforts are improbable to thrive without digital technologies that guarantee transparency, and efficiency enhancements are unlikely to persist without a focus on sustainability. This comprehensive perspective presents a more compact structure than previously available in the literature.

3. Original Contributions of This Review

This research presents an original perspective by specifically positioning B2B relationship marketing at the integration of sustainability, efficiency, and digital transformation within the maritime and port industry. In contrast to previous research, which mostly analyzed

these topics in isolation, the current synthesis illustrates their interdependence and relational consequences. The findings highlight a forgotten dimension of port research: the dual influence of global sustainability demands and technical advancements on B2B relationship marketing.

A significant contribution is the redefinition of port competitiveness, encompassing not only operational performance but also the ability to foster sustainable, technology-enabled inter-firm partnerships. This reframing enhances theoretical debate by situating ports as interconnected ecosystems where economic, environmental, and technological forces intersect. This review distinguishes itself from previous systematic literature reviews (e.g., Puig et al., 2022; Yildiz et al., 2024) by specifically examining the marketing and relationship components, rather than focusing solely on operational or environmental results.

4. Theoretical and Practical Implications

The findings theoretically confirm and expand upon three principal frameworks: Social Exchange Theory, Resource-Based View (RBV), and Technology Affordance Theory. According to (Caliskan & Esmer, 2019), the research substantiates the claim that trust and reciprocity are fundamental to Social Exchange Theory. This research extends its focus by demonstrating that social exchange in port B2B relationships now includes environmental mutuality. Businesses enhance legitimacy and confidence by participating in joint sustainability objectives.

The review further develops the Resource-Based View by illustrating that organizational competencies in digital adaptation and sustainability integration are becoming non-conventional strategic resources. This reformulation enhances RBV applications by highlighting relational and institutional resources alongside real assets.

The findings ultimately strengthen Technology Affordance Theory, as articulated by (Ferretti et al., 2022), while also expanding it by demonstrating how affordances transform relationship dynamics and operational processes. For instance, blockchain provides transparency that directly impacts contractual trust, whereas AI forecasting enables predictive coordination that transforms bargaining dynamics.

As a whole, these contributions indicate that future theoretical advancements in B2B relationship marketing must consider the multidimensional roles of sustainability and digitalization, rather than treating them as mere contextual elements.

The practical implications of these results are similarly significant. The prevalence of sustainability in the literature indicates to practitioners that ecologically responsible solutions are essential for maintaining B2B competitiveness, rather than optional. Ports and their collaborators must engage in renewable energy, carbon reduction, and trash management not solely for compliance, but also to bolster relationship credibility and attract enduring corporate partnerships.

Secondly, digital innovation becomes an imperative. Consistent with (Senyo et al., 2021), the review indicates that AI, blockchain, and automation can improve efficiency. This analysis further substantiates the assertion that digitalization enhances openness and accountability, hence bolstering confidence in B2B transactions. Managers should perceive digital systems not only as instruments of efficiency but as relational frameworks that support collaborative relationships.

The findings highlight the strategic significance of alliances. According to (Utama et al., 2024), collaboration among ports, operators, and governments can create synergies

unattainable by any individual entity. This analysis shows that coalitions are most effective when they align with digital and sustainability agendas, indicating that multi-party partnerships must prioritize green innovation projects and digital integration initiatives.

Finally, the review emphasizes the significance of service quality in maintaining B2B partnerships. In line with (Caliskan & Esmer, 2019), the research indicates that exceptional service quality fosters enduring loyalty and resilience amid competitive disruptions.

CONCLUSION

This comprehensive literature review mapped the intellectual landscape of B2B relationship marketing within the port and maritime sector based on 46 carefully selected studies. Three interconnected themes emerged as particularly significant: sustainability, port efficiency, and digital innovation. Collectively, these themes reflected a substantial shift in academic attention from a narrow focus on operational performance toward a broader perspective incorporating environmental responsibility, technological advancement, and collaborative resilience. The review demonstrated that digital technologies had evolved from supporting tools into strategic enablers that improved operational efficiency and supported sustainability objectives, while strategic alliances played a critical role in managing uncertainties within global trade networks.

This study contributed theoretically by integrating classical perspectives, such as Social Exchange Theory and the Resource-Based View, with contemporary frameworks, including Technology Affordance Theory and Circular Economy Theory. This integration not only reinforced existing knowledge but also expanded ongoing discussions regarding how ports and maritime enterprises achieved competitive advantage while addressing sustainability challenges. The findings indicated that B2B relationship marketing was no longer characterized solely by transactional efficiency; instead, it had become increasingly embedded within broader social, environmental, and technological transformations that reshaped the foundations of interorganizational collaboration.

Although several research areas remained underexplored, they provided substantial opportunities for future investigation. Existing empirical research has predominantly focused on Europe and selected regions of Asia, leaving regions such as Sub-Saharan Africa and Latin America relatively overlooked. Expanding research into these contexts could provide valuable comparative insights into how cultural and institutional differences influence B2B relationship dynamics. Furthermore, the dominance of quantitative survey approaches has generated important generalizations; however, qualitative and mixed-method approaches may provide deeper insights into the processes of trust development, adaptation, and strategic alignment that often underpin empirical relationships. Theoretical integration also remained an important area for advancement. Future studies could further incorporate emerging perspectives, such as Digital Affordance Theory and Circular Economy Theory, to better explain the complex interactions between technological innovation and sustainability within B2B networks. Longitudinal and cross-sectoral studies are also needed to examine how ports and maritime companies adapt their relationship strategies in response to the dual challenges of climate change and digital disruption.

This research highlighted the fundamental role of relationship marketing in addressing the intersection of sustainability, efficiency, and digital transformation within the maritime

industry. By integrating theoretical perspectives, identifying geographical research gaps, and highlighting methodological limitations, this study provided a foundation for researchers and practitioners. Future research that adopts diverse methodologies, expands geographical coverage, and advances theoretical development will be essential for strengthening knowledge and practices in sustainable B2B relationship marketing within the port sector.

REFERENCES

- Alzate, Paola et al. 2024. "Operational Efficiency and Sustainability in Smart Ports: A Comprehensive Review." *Marine Systems & Ocean Technology* 19(1): 120–31.
- Alzate, P., et al. (2024). Operational efficiency and sustainability in smart ports: A comprehensive review. *Marine Systems & Ocean Technology*, 19(1), 120–131.
- Azarkamand, S., Balbaa, A., Wooldridge, C., & Darbra, R. M. (2020). Climate change challenges and response options for the port sector. *Sustainability*, 12(17), Article 6941. <https://doi.org/10.3390/su12176941>
- Bjerkkan, K. Y., Hansen, L., & Steen, M. (2021). Towards sustainability in the port sector: The role of intermediation in transition work. *Environmental Innovation and Societal Transitions*, 40, 296–314. <https://doi.org/10.1016/j.eist.2021.08.004>
- Braun, V., & Clarke, V. (2025). Reporting guidelines for qualitative research: A values-based approach. *Qualitative Research in Psychology*, 22(2), 399–438. <https://doi.org/10.1080/14780887.2024.2382244>
- Caliskan, A., & Esmer, S. (2019). Does it really worth investing in relationship marketing for a port business? *Case Studies on Transport Policy*, 7(2), 375–383. <https://doi.org/10.1016/j.cstp.2019.02.003>
- Del Giudice, M., Di Vaio, A., Hassan, R., & Palladino, R. (2022). Digitalization and new technologies for sustainable business models at the ship–port interface: A bibliometric analysis. *Maritime Policy & Management*, 49(3), 410–446. <https://doi.org/10.1080/03088839.2021.1903600>
- Esmer, S., Nguyen, H.-O., Bandara, Y. M., & Yeni, K. (2016). Non-price competition in the port sector: A case study of ports in Turkey. *The Asian Journal of Shipping and Logistics*, 32(1), 3–11. <https://doi.org/10.1016/j.ajsl.2016.03.001>
- Ferretti, M., Fiore, U., Perla, F., Risitano, M., & Scognamiglio, S. (2022). Deep learning forecasting for supporting terminal operators in port business development. *Future Internet*, 14(8), Article 221. <https://doi.org/10.3390/fi14080221>
- Heilig, L., Lalla-Ruiz, E., & Voß, S. (2017). Digital transformation in maritime ports: Analysis and a game theoretic framework. *Netnomics*, 18(2), 227–254.
- Isbaex, C., Costa, F. D. R. F., & Batista, T. (2025). Application of GIS in the maritime port sector: A systematic review. *Sustainability*, 17(8), Article 3386. <https://doi.org/10.3390/su17083386>
- Kapalidis, C., Karamperidis, S., Watson, T., & Koligiannis, G. (2022). A vulnerability centric system of systems analysis on the maritime transportation sector most valuable assets: Recommendations for port facilities and ships. *Journal of Marine Science and Engineering*, 10(10), Article 1486. <https://doi.org/10.3390/jmse10101486>
- MacNeil, J. L., Adams, M., & Walker, T. R. (2021a). Development of framework for improved sustainability in the Canadian port sector. *Sustainability*, 13(21), Article 11980. <https://doi.org/10.3390/su132111980>
- MacNeil, J. L., Adams, M., & Walker, T. R. (2021b). Evaluating the efficacy of sustainability initiatives in the Canadian port sector. *Sustainability*, 14(1), Article 373. <https://doi.org/10.3390/su14010373>
- Merkel, A., & Holmgren, J. (2017). Dredging the depths of knowledge: Efficiency analysis in

- the maritime port sector. *Transport Policy*, 60, 63–74. <https://doi.org/10.1016/j.tranpol.2017.08.010>
- Merkel, A., & Sløk-Madsen, S. K. (2019). Lessons from port sector regulatory reforms in Denmark: An analysis of port governance and institutional structure outcomes. *Transport Policy*, 78, 31–41. <https://doi.org/10.1016/j.tranpol.2019.03.010>
- Sarinah. (2026). Digital innovation in port service governance: Implementation of Indonesia Shipping Agencies Association policy in Southeast Sulawesi. *Jurnal Ilmu Administrasi: Media Pengembangan Ilmu dan Praktek Administrasi*, 23(1), 29–46.
- Seguí, X., Puig, M., Quintieri, E., Wooldridge, C., & Darbra, R. M. (2016). New environmental performance baseline for inland ports: A benchmark for the European inland port sector. *Environmental Science & Policy*, 58, 29–40. <https://doi.org/10.1016/j.envsci.2015.12.014>
- Senyo, P. K., Effah, J., & Osabutey, E. L. C. (2021). Digital platformisation as public sector transformation strategy: A case of Ghana's paperless port. *Technological Forecasting and Social Change*, 162, Article 120387. <https://doi.org/10.1016/j.techfore.2020.120387>
- Stein, M., & Acciaro, M. (2020). Value creation through corporate sustainability in the port sector: A structured literature analysis. *Sustainability*, 12(14), Article 5504. <https://doi.org/10.3390/su12145504>
- Tessmann, R., & Elbert, R. (2022). Multi-sided platforms in competitive B2B networks with varying governmental influence: A taxonomy of port and cargo community system business models. *Electronic Markets*, 32(2), 829–872. <https://doi.org/10.1007/s12525-022-00529-z>
- Utama, D. R., Hamsal, M., Rahim, R. K., & Furinto, A. (2024). The effect of digital adoption and service quality on business sustainability through strategic alliances at port terminals in Indonesia. *The Asian Journal of Shipping and Logistics*, 40(1), 11–21. <https://doi.org/10.1016/j.ajsl.2023.12.001>
- Wahyudi. (2024). *Watase Uake: Research collaboration tools*. https://watase.web.id/1_tentangwataseppm_html
- Yildiz, R. O., Koc, E., Der, O., & Aymelek, M. (2024). Unveiling the contemporary research direction and current business management strategies for port decarbonization through a systematic review. *Sustainability*, 16(24), Article 10959. <https://doi.org/10.3390/su162410959>