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THE 15th INTERNATIONAL CONFERENCE ON LOGISTICS AND TRANSPORT 2025

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SUPPLY CHAIN DECOUPLING FROM GLOBAL TO LOCAL

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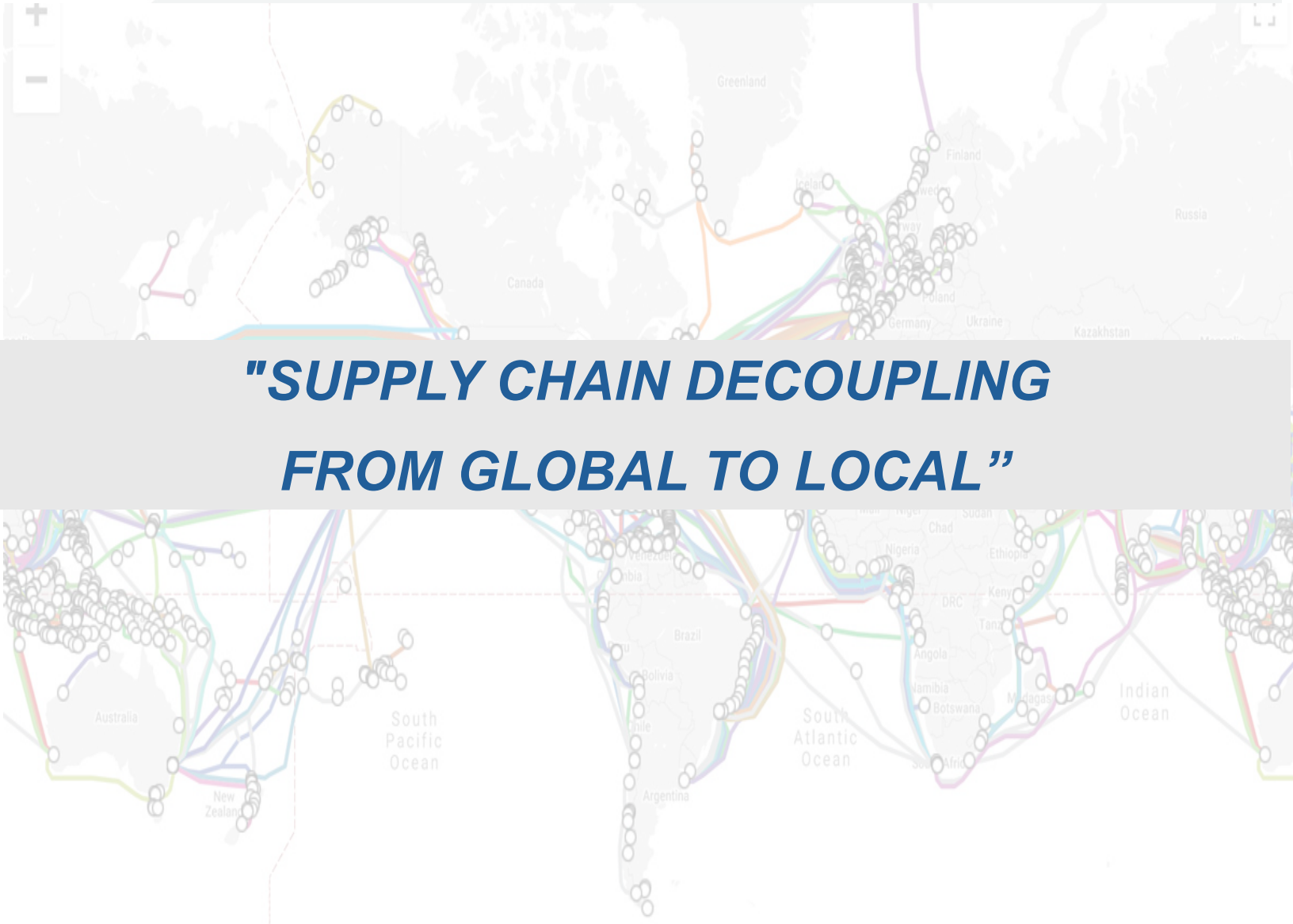

"SUPPLY CHAIN DECOUPLING FROM GLOBAL TO LOCAL"

Proceeding of International Conference on Logistics and Transport 2025

[ABSTRACT]

CONFERENCE LOCATION
TOKYO - JAPAN

CONFERENCE VENUE
TOKYO UNIVERSITY (UTOKYO)
HONGO CAMPUS

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INTRODUCTION

This is the 15th international conference organised by the Centre of Excellence in Connectivity of Thammasat Business School, Thammasat University, Thailand, the Multidisciplinary and Interdisciplinary School of Chiang Mai University, Supply Chain and Engineering Management Research Unit of Chiang Mai University, Thailand, and North-East Asia Logistics and Distribution Research Institute, Chung-Ang University, South Korea, University of Tokyo and Japan Physical Internet Center, Japan. This is a major event for researcher in transport, logistics, supply chain and value chain management especially in the Asia Pacific region.

This year's event in Tokyo University - UTokyo (Japan), is a continuation of past successful conferences held in 2009 in Chiang Mai (Thailand), 2010 in Queenstown (New Zealand), 2011 in Malé (Maldives), 2012 in Chiang Mai (Thailand), 2013 in Kyoto (Japan), 2014 in Kuala Lumpur (Malaysia), 2015 in Lyon (France), 2016 in Singapore, 2017 in Bangkok (Thailand), 2018 in Okinawa (Japan), 2019 in Hanoi (Vietnam), 2022 in Krabi (Thailand), 2023 in Helsinki (Finland) and 2024 in Seoul (South Korea). This year's event will be held in Tokyo, Japan, during November 25th to 29th, 2025, hosted by University of Tokyo (UTokyo) and Japan Physical Internet Center (JPIC), Japan.

Experience the future of supply chain management at this year's conference, themed "Supply Chain Decoupling: From Global to Local." Explore how businesses are adapting to shifting global dynamics by redefining supply chain strategies, enhancing regional resilience, and optimising operational agility. Gain insights from industry leaders and academics, participate in fruitful discussions, and uncover innovative solutions that drive efficiency, sustainability, and competitiveness. The official language of the conference is English.

Be part of this transformative event and join us in shaping the next era of supply chain evolution. We look forward to welcoming you!

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WELCOME ADDRESS FROM THE CONFERENCE CHAIRS

On behalf of the ICLT General Chair, it is our distinct honor to extend a warm welcome to all participants of the **International Conference on Logistics and Transport (ICLT) 2025**, convened this year in the vibrant city of **Tokyo, Japan**.

As the logistics and transport sectors continue to evolve amid global uncertainty and rapid technological change, the conference theme, **"Supply Chain Decoupling – From Global to Local,"** invites us to reflect on how global networks are being reshaped toward greater resilience, localization, and sustainability. This paradigm shift challenges us to rethink long-established models of efficiency and to explore innovative strategies that integrate both global connectivity and local strength.

ICLT 2025 brings together leading academics, industry experts, and policymakers to exchange perspectives, present pioneering research, and foster collaboration across borders. We believe that the discussions held here in Tokyo will generate valuable insights and actionable ideas that contribute to the next era of supply chain transformation.

We extend our heartfelt appreciation to all contributors, keynote speakers, and participants for your dedication and engagement. Your presence and contributions make this conference an inspiring platform for advancing knowledge, innovation, and partnership in logistics and transport.

We wish you a fruitful and memorable experience at ICLT 2025, and hope you enjoy the rich culture, hospitality, and dynamism that Tokyo has to offer.

Warm regards,

Poti Chaopaisarn
ICLT General Chair

WELCOME ADDRESS FROM THE LOCAL CHAIRS

It is with great pride and excitement that we welcome you to the **International Conference on Logistics and Transport (ICLT) 2025**, here in **Tokyo, Japan**.

This year's conference theme, **"Supply Chain Decoupling – From Global to Local,"** reflects one of the most transformative shifts in today's interconnected world. As organizations navigate the evolving global landscape marked by geopolitical tensions, technological disruptions, and sustainability imperatives, the reconfiguration of supply chains from global dependence to local resilience has become more critical than ever.

Tokyo, as one of the world's most advanced and dynamic logistics hubs, provides the perfect backdrop for this discussion. It embodies innovation, efficiency, and adaptability—values that resonate deeply with the spirit of this year's theme. We are confident that the insights shared and connections made throughout the conference will inspire new strategies, foster academic and industry collaboration, and drive meaningful progress in logistics and transport.

On behalf of the organizing committee, we extend our warmest welcome to all distinguished speakers, researchers, and participants from around the world. We hope that your time in Tokyo will be both intellectually rewarding and personally enriching.

Welcome to ICLT 2025—where ideas move the world, from global to local.

Warm regards,

Tomoya Kawasaki

Tomoya Kawasaki
The University of Tokyo

Takayuki Mori
Japan Physical Internet Center (JPIC)

CONTENT

A SCOR DIGITAL STANDARD-BASED FREAMEWORK FOR CIRCULAR E-WASTE SUPPLY CHAIN IN THAILAND

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ABSTRACT

Purpose: This study is to develop a practical framework that integrates Circular Supply Chain principles with the SCOR Digital Standard to improve E-waste management in Thailand. It aims to address environmental and operational challenge by promoting sustainable practices, stakeholder collaboration, digital innovation in developing economies.

Design/methodology/approach: This study adopts a conceptual framework approach, integrating Circular Supply chain principles and the designed EDR for E-DS process to align with circular strategies for E-waste management. Data were gathered from primary and secondary sources, including E-waste Consolidation centers reports, academic literature, and government policies relevant to Thailand's E-waste management context.

Findings: The study finds that integrating Circular Supply Chain principles with the SCOR Digital Standard enhances the effectiveness of e-waste management. Each SCOR DS process support circular practices, helping to reduce environmental impact and improve resource recovery. The framework encourages collaboration, digital innovation, and policy alignment for sustainable outcomes in developing economies.

Practical Implication: This study provides a practical roadmap for transforming circular economy principles into actionable logistics practices. The SCOR DS–based framework enables municipalities to establish traceable, community-integrated collection systems, while guiding recyclers and SMEs to enhance refurbishment and material recovery. Policymakers can apply it to operationalize EPR and cross-sector governance, supported by digital traceability tools. Overall, it fosters circular entrepreneurship, local job creation, and sustainable resource retention within domestic markets.

Originality: This study offers a novel integration of Circular Supply chain Concepts with the SCOR Digital Standard, specifically applied to E-waste management in a developing country context. It provides a strategic framework that addresses both environmental and operational challenges, highlighting the role of digital tools and stakeholder collaboration in achieving sustainable resource management.

Keywords: SCOR Digital Standard, Circular Supply Chain, E-waste Management, sustainable strategies, Thailand

ADAPTABILITY EFFECT ON TANZANIA PORTS' COLLABORATION AND CONGESTION

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ABSTRACT

Purpose: This study examined the moderating effect of adaptability on the relationship between team collaboration in port facilities and equipment maintenance, and its impact on truck congestion, based on the experience from Tanzania ports.

Methodology: Structured questionnaires were administered to 325 port stakeholders, with 334 respondents selected from a population of 2,536 agents using simple random sampling from three ports. Hypothesis testing was conducted using Structural Equation Modelling with SmartPLS and SPSS. The study followed a positivist philosophy and deductive approach, utilising an explanatory design and quantitative method. Schein's Theory and Queueing Theory were used to examine the interactions of three constructs, as no existing research model was addressing them.

Findings: The results revealed that team collaboration in port facilities and equipment maintenance has a significant positive impact on truck congestion. In contrast, the moderated link between adaptability and the outcome has a significantly positive effect. Further, the findings of the Importance-Performance Matrix Analysis revealed that team collaboration has the highest levels of both importance and performance in predicting the truck congestion in ports. The study concludes with strong confirmation that team collaboration positively influences truck congestion and expands the ST and QT dimensions.

Practical Implications: The results highlight aspects that the Tanzania Ports Authority and other Stakeholders can improve to eliminate truck congestion and facilitate logistics, thereby enhancing supply chain performance. The study's findings have significant implications for relevant policies and laws, including the National Transport and Trade Policy of 2003, the Ports Act 2004, and Agenda 2063: The Africa We Want.

Originality/value: This research identified dimensions of team collaboration in port facilities and equipment maintenance and examined how adaptability moderates its impact on truck congestion.

Keywords: Collaboration, logistics facilitation, adaptability, truck congestion, and supply chain performance.

ADOPTION OF DIGITAL TECHNOLOGIES FOR SUPPLY CHAIN RISK MANAGEMENT IN THAI LOGISTICS FIRMS

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ABSTRACT

Purpose: This study investigates how the adoption of digital technologies can enhance supply chain risk management (SCRM) capabilities in Thai logistics service providers (LSPs), particularly in the context of geopolitical tensions and economic instability that have disrupted global supply chains.

Design/methodology/approach: A quantitative survey was conducted among logistics service providers in Thailand to assess the relationship between digital transformation initiatives and SCRM practices. The study examines how perceived usefulness of digital technologies influences adoption intensity and organizational performance.

Findings: The results highlight that proactive risk assessment, adaptive strategies, and digital transformation are critical enablers of supply chain resilience. Furthermore, the analysis reveals that perceived usefulness of digital technologies significantly drives their adoption, which in turn enhances organizational performance. Supplier diversification and agile operations are identified as key strategies for mitigating supply chain disruptions.

Research limitations/implications (if applicable): The findings are based on survey data from Thai LSPs, which may limit the generalizability of the results to other contexts or industries. Future studies could expand the scope to include longitudinal data and cross-country comparisons.

Practical implications (if applicable): The study provides practical insights for logistics service providers seeking to strengthen their risk management capabilities through digital technology adoption. It offers guidance on leveraging digital tools to build resilient and agile supply chains in the face of ongoing and future disruptions.

Originality/value: This study contributes to the growing body of knowledge on digital transformation in supply chain management by highlighting the mechanisms through which technology adoption supports resilience. It provides a novel perspective on the role of perceived usefulness in driving adoption intensity and organizational performance in logistics firms.

Keywords: Digital transformation, Supply chain risk management, Logistics service providers, Resilience, Disruption

AN INITIATIVE-BASED MILP APPROACH FOR SUSTAINABILITY PORT PERFORMANCE

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ABSTRACT

Purpose:
This study aims to develop a performance evaluation model tailored for Malaysian ports that addresses the limitations of existing global frameworks. While ports are crucial to trade and economic growth, their operations pose environmental challenges, including emissions, pollution, and habitat loss. Sustainable port initiatives are increasingly adopted to address these concerns, but existing performance measurement models often require extensive data and are not suited for localized application. This study seeks to provide a simplified, initiative-based model to assess sustainability performance efficiently and effectively within the Malaysian context.

Design/methodology/approach:
A Mixed Integer Linear Programming (MILP) model was formulated to assess port sustainability based on actual initiatives documented in annual reports from several major ports in Malaysia for over two years. Thematic analysis was used to categorize the initiatives into sub-factors under four core functions: landlord, regulatory, operator, and community. The MILP model incorporated an iterative optimization process involving four weightage scenarios and 100 iterations each, to determine the optimal configuration that maximized the sustainability score (Z), ensuring statistical robustness and relevance to operational realities.

Findings:
The Operator Function (OF) contributed most significantly to sustainability performance (Z_3 = 1.126), followed by the Landlord Function (Z_1 = 0.487), Regulatory Function (Z_2 = 0.426), and Community Function (Z_4 = 0.292). Despite expert consensus on the importance of infrastructure and long-term environmental planning (LF), ports allocated fewer initiatives to these areas. A clear misalignment was observed between expert-recommended priorities and the actual focus of port operations, with short-term efficiencies prioritized over long-term sustainability goals.

Research limitations/implications (if applicable):
The study focuses on selected ports over a limited timeframe, which may constrain generalizability. Future research should include multiple ports and a broader data range for validation.

Practical implications (if applicable):
The model enables Malaysian ports to evaluate sustainability initiatives using readily available data, providing actionable insights for policy adjustments and strategic planning. It functions as a decision-support tool by quantifying the impact of various initiatives, allowing port authorities to prioritize efforts that yield the greatest sustainability benefits. Additionally, the model can be integrated into regular sustainability reporting and internal performance reviews, ensuring alignment with both national green policies and international environmental standards. Its simplified structure supports routine use without requiring extensive technical expertise or large-scale data systems.

Originality/value:
This study presents a novel, context-specific MILP model that balances simplicity and effectiveness, addressing the data-intensity and generality of conventional sustainability performance models.

Keywords: Sustainable ports, MILP model, Malaysia, performance measurement, port initiatives

BENEFICIARIES' SATISFACTION WITH RELIEF SERVICES: COMPARING DIFFERENT SCALES

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ABSTRACT

Purpose: This study hypothesises that different beneficiary satisfaction scales should yield consistent results when assessing beneficiary satisfaction with relief service quality. It examines whether the scales are highly correlated and, if not, explores possible explanations.

Design/methodology/approach: Three scales were tested: (1) overall satisfaction (two items), (2) disconfirmation-based satisfaction (10 items, Brady *et al.*, 2002), and (3) an alternative (end-state) scale, adapted from the 10-item disconfirmation-based scale by adding the statement "I am satisfied." Surveys were conducted with 350 beneficiaries in Chiang Rai and 325 in Nong Khai. Correlation and contextual analyses were applied.

Findings: All scales were moderately to highly correlated in Chiang Rai but not in Nong Khai. The difference reflected disaster types: Chiang Rai faced a sudden-onset flash flood with immediate responses, leaving little room for expectations. This was a possible reason that why all scales were correlated. In Nong Khai, beneficiaries had time to form expectations because the flood was slow-onset and relief preparations were made. When all ended up flooded, beneficiaries perceived the relief efforts as falling short of expectations, which made the disconfirmation scale only weakly correlated with the other two measures, while those two remained weakly to moderately correlated.

Research limitations/implications: The study did not capture beneficiaries' qualitative reasons for differing ratings. It requires more evidence whether findings hold across other disaster typologies.

Practical implications: The overall satisfaction scale is suitable for a sudden-onset flood, while the disconfirmation-based scale better detects service gaps in a slow- flood.

Originality/value: The study shows that applying satisfaction theory in humanitarian contexts requires attention to disaster type, onset speed, and beneficiary psychological states.

Keywords: Beneficiary satisfaction, Relief service quality, Disconfirmation-based satisfaction scale, Overall satisfaction scale, Flood disaster

BUSINESS MODEL TRANSITION OF MARITIME AUTONOMOUS SURFACE SHIPS: NICHE INNOVATION OSCILLATING BETWEEN INSTITUTIONAL PRESSURE AND RESOURCE DEPENDENCE

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ABSTRACT

Purpose: This study investigates the transformation of business models in the maritime industry through the lens of Maritime Autonomous Surface Ships (MASS). It aims to explore how the interplay of institutional pressures and resource dependence influences firms' innovation orientation and acceptance of autonomous technologies, framing MASS as a niche innovation reshaping the maritime logistics ecosystem.

Design/methodology/approach: Grounded in Institutional Theory and Resource Dependence Theory, this study conceptualizes the transition toward MASS as a function of both institutional and resource-driven dynamics. Data were collected from senior executives in Taiwan's maritime logistics sector. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were employed to empirically validate the proposed theoretical framework.

Findings: The results show that institutional pressures—such as regulatory mandates, safety compliance, and stakeholder expectations—positively influence both firms' resource configurations and their orientation toward innovation. These pressures are also directly associated with more favorable attitudes toward MASS adoption. Conversely, while resource dependence promotes innovation, it also contributes to negative attitudes toward MASS, particularly among small and medium-sized enterprises. Niche innovations, including digitalization, automation, and blockchain, were found to enhance support for autonomous shipping.

Practical implications (if applicable): The findings provide actionable insights for maritime policymakers, technology developers, and shipping firms. Understanding how institutional and resource-related factors jointly shape innovation adoption can guide more effective policy designs and strategic investments that facilitate a just transition toward autonomous shipping, particularly for resource-constrained firms.

Originality/value: This study contributes to the growing literature on business model transformation and maritime innovation by conceptualizing MASS as a niche innovation influenced by institutional-resource tensions. It offers novel empirical evidence on how such tensions shape attitudes toward autonomy, advancing theoretical understanding of adaptive capacity and innovation diffusion in the maritime sector.

Keywords: Institutional pressure, Resource dependence, Niche innovations, Attitudes toward the Maritime Autonomous Surface Ships (MASS)

CARBON AND WATER FOOTPRINTS OF WOODCHIP PRODUCTION SUPPLY CHAINS FROM FAST GROWING TREES IN THAILAND

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ABSTRACT

Purpose: Supply chains of woodchips from fast-growing trees such as *Eucalyptus* and *Acacia* with a plantation area of 860 ha in northern Thailand were examined.

Design/methodology/approach: A standard life cycle assessment tool with ReCiPe 2016 was employed, from seedling to energy generation. The functional unit used in this research was 1.0 GJ of net energy woodchips delivered to the energy plant. Two harvesting methods (BC: brush chipper and IWC: industrial wood chipper) were considered.

Findings: The BC was shown to have over 48% lower global warming impact and 10% lower water consumption than the IWC. Woodchips from *Eucalyptus* appeared to have the lowest global warming impact at 466 and 1,046 gCO_2eq, followed by those from *Acacia* at 703 and 1,356 gCO_2eq for BC and IWC, respectively. From a water consumption perspective, BC uses less water than IWC, with 1.56E-02 m^3 for *Eucalyptus* (BC), 2.32E-02 m^3 for *Acacia* (BC), 1.80E-02 m^3 for *Eucalyptus* (IWC), and 2.59E-02 m^3 for *Acacia* (IWC). Among the supply chain processes, the harvesting stage shows the highest global warming impact, particularly for *Acacia* (IWC) at 1,085 gCO_2eq (80% of total impact) and *Eucalyptus* (IWC) at 943 gCO_2eq (90% of total impact), followed by cultivation, seedling, soil preparation and conditioning, stump removal and soil recovery processes, respectively.

Practical implications: The findings could be used to support policymakers and stakeholders in advancing sustainable bioenergy development.

Originality/value: A comprehensive analysis of woodchip production supply chains is of great interest to bioenergy community.

Keywords: Biomass, Clean energy, Climate action, Life cycle assessment

CARGO HANDLING EQUIPMENT MAINTENANCE AND GREEN PORT PERFORMANCE: EVIDENCE FROM TANZANIA'S SEAPORTS

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Abstract

Purpose

This study investigates the effect of cargo-handling equipment maintenance on green port performance at Tanzania's three major seaports: Dar es Salaam, Tanga, and Mtwara.

Design/methodology/approach

A quantitative, cross-sectional research design was employed. Structured questionnaires were administered to 101 port personnel from operational, engineering, and environmental departments. Descriptive statistics summarized maintenance practices and outcomes. Reliability was tested using Cronbach's Alpha, and Simple Linear Regression (SLR) was used to examine the predictive relationship between preventive maintenance and green port performance.

Findings

The study's findings show that preventive maintenance is commonly practiced and positively affects both environmental and operational performance. Key benefits include reduced fuel consumption, lower emissions, and improved equipment reliability. However, inconsistencies were noted in adherence to maintenance schedules and electricity savings. Regression analysis indicated that inspections and servicing significantly predict green port performance at one percent significance level ($\beta=0.436$, $p=0.001$), accounting for 19% of the observed variance.

Research limitations/implications

The study is limited to three Tanzania's seaports and relies on self-reported data, which may introduce bias. Cross-sectional design also restricts long-term causal interpretations. Equipment heterogeneity across ports could have influenced the results.

Practical implications

The findings provide strong justification for institutionalizing preventive maintenance as a strategic pillar of port's operational management. The Tanzania Ports Authority should strengthen compliance enforcement, invest in energy-efficient equipment, and adopt predictive and eco-conscious servicing frameworks to improve sustainable performance.

Originality/value

The novelty of this paper hinges on empirical evidence on the strategic role of preventive maintenance in promoting green port performance within African contexts. It highlights the value of aligning technical operations with environmental policy, positioning maintenance practices as key drivers of decarbonization and trade competitiveness.

Keywords: Preventive maintenance; cargo-handling equipment; energy efficiency; emission reduction; green port performance.

COMPARATIVE ANALYSIS OF LOGISTICS MANAGEMENT EFFICIENCY AT BORDER CUSTOMS: EVIDENCE FROM MUKDAHAN AND CHONG MEK CHECKPOINTS IN THAILAND

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ABSTRACT

Purpose: This study examines the impact of inventory management, transportation, and information management on logistics efficiency at two Thai border customs checkpoints, Mukdahan and Chong Mek, with the aim of comparing both determinants and overall performance.

Design/methodology/approach: A quantitative survey was conducted with 125 respondents including exporters, importers, freight forwarders, and transport providers. Data were collected through structured questionnaires and analyzed using descriptive statistics, Pearson correlation, multiple regression, and independent samples t-test, following recent approaches in cross-border logistics studies (Sumbal et al., 2024).

Findings: Overall, all three logistics factors significantly influenced efficiency, with information management showing the strongest effect. At Mukdahan, located on the East–West Economic Corridor (EWEC), IT systems such as e-Customs and the National Single Window were key drivers of efficiency, consistent with evidence that digital adoption reduces bottlenecks (Zdolsek Draksler et al., 2023; Nguyen et al., 2024). At Chong Mek, however, the model was statistically insignificant, suggesting that informal practices and local trade dynamics were more decisive, echoing earlier findings on the role of non-formal mechanisms in border trade (Lesser & Moisé-Leeman, 2009). Unexpectedly, Chong Mek was rated more efficient than Mukdahan, contradicting the hypothesis and highlighting context-specific dynamics.

Research limitations/implications: The study's quantitative design may overlook non-formal determinants; qualitative methods are recommended for future research.
Practical implications: Policymakers should continue IT investment at Mukdahan while focusing on facilitation and basic infrastructure at Chong Mek. Practitioners can use Mukdahan for high-value goods requiring transparency, and Chong Mek for local consumer trade benefiting from flexibility.

Originality/value: The study advances understanding of how formal IT-driven systems and informal practices jointly shape cross-border logistics performance in ASEAN.

Keywords: cross-border logistics, customs efficiency, inventory management, transportation, information management, Thailand

COMPETITIVE LOCATION OF COLLECTION DELIVERY POINTS IN LAST-MILE LOGISTICS

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ABSTRACT

Purpose: This paper focuses on the last-mile service market within an e-commerce context, involving two existing firms that operate self-collection and delivery services—pickup shops and automated parcel lockers. The analysis is conducted within a competitive location framework, where a follower firm is aware of a leader's existing facility locations and strategies. The follower's objective is to maximize profit by opening new service points. The proposed model aims to identify the optimal locations for the follower's new facilities and determine the most appropriate facility type—either a pickup shop or an automated parcel locker.

Design/methodology/approach: To model customer choice behaviour, Huff's gravity-based model is employed to estimate the probability that customers will patronise a given collection and delivery point. The problem is formulated as an integer nonlinear programming model, which is solved for a representative instance using a branch-and-bound algorithm. This approach facilitates the determination of optimal placement strategies for the follower in a dynamic urban logistics environment.

Findings: The results indicate that the follower's profit and market share can be increased significantly through strategic expansion, leading to a corresponding decline in the leader's performance. Numerical results demonstrate that the follower's profit increases by approximately 53.8%, while the leader's profit decreases by 56.2%. The follower gains a 28% share of the market, with its total share rising from 24% to 52%. From a profit-maximization perspective, the model suggests the establishment of four new pickup shops, with three located in residential areas to compete directly with the incumbent and one situated in ;a touristic area.

Originality/value: This study offers a quantitative model for market followers to optimize facility locations, capture market share, and increase profits in the burgeoning last-mile delivery sector. The research provides valuable methodological and strategic insights into competitive last-mile logistics, addressing a notable gap in the literature concerning dynamic, competitive facility location problems for modern e-commerce services.

Keywords: Competitive location, Last-mile delivery, Collection-delivery point, Huff’s rule.

DECOUPLING THROUGH CIRCULARITY: A CROSS-COUNTRY ANALYSIS OF LOCALIZATION OPPORTUNITIES FOR REFURBISHED MOBILE PHONES IN SOUTHEAST ASIA

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Abstract

Purpose: This paper explores the consumer perception of remanufactured products in three different Southeast Asian countries to investigate the potential of such circular strategies for localization to decouple the local markets from global supply chain strategies.

Design/methodology/approach: This paper uses survey research as the key method. A large amount of survey data has been collected in the relevant markets and has been analyzed using a multinomial logistic regression model.

Findings: Results are showing similarities between the data from the analyzed countries, such as a high level of price sensitivity and concerns about the battery life. Prior knowledge of remanufacturing strategies has a positive impact on the willingness to opt for such products. Besides the similarities, differences have also been identified, such as a strong behavioral tendency to keep used products in Cambodia, a high level of demand for sufficient information in Thailand, and a high eco-consciousness in Vietnam.

Research limitations/implications: This research has local limitations on the three defined markets, as well as product-related limitations on mobile phones. Future research should extend this research to additional ASEAN countries and other product groups.

Practical implications: Based on these findings, recommendations on governmental strategies, communication actions, and tailored activities for each market are provided, leading to the potential of localizing remanufacturing businesses in these three countries and thereby reducing the negative impact from global supply chain disruptions.

Originality/value: This research is among the first academic approaches to provide large-scale data on these Southeast Asian countries to analyze the potential of circular strategies to decrease on the one hand, the negative impact from production and consumption of electronic products, and on the other hand, reduce the dependencies on global supply chains.

Keywords:

Decoupling, supply chain risks, circularity, refurbishing, closed-loop supply chain, Southeast Asia

DEVELOPMENT OF RAW MATERIAL INVENTORY MANAGEMENT SYSTEM FOR CARTON BOX MANUFACTURING FACTORY

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ABSTRACT

Purpose: This research focuses on improving the raw material process to enhance the inventory management system of a carton box manufacturing factory located in Wang Noi Subdistrict, Wang Noi District, Ayutthaya Province. The study analyzed 109 Stock Keeping Units (SKUs) from 2011 to 2022, aiming to prevent both material shortages and excess stock, which were primarily caused by inefficient order management and consequently increased overall costs.

Design/methodology/approach: Inventory management principles were applied to analyze ordering and holding costs. The raw materials were classified using ABC analysis and further evaluated with the Peterson-Silver rule by examining the coefficient of variation (VC) for each SKU. Raw materials with stable demand were managed using the Economic Order Quantity (EOQ) model, while those with fluctuating demand were handled using the Silver-Meal and Lot-for-Lot (LFL) methods. Additionally, safety stock levels and reorder points were determined for critical A and B category items. Microsoft Excel's VBA (Visual Basic for Applications) was also employed to develop a system that manages procurement schedules and records raw material inflows and outflows, thereby improving both data accuracy and efficiency.

Findings: The results showed a significant reduction in total inventory management costs. In 2021, total costs decreased from 210,093.63 Thai Baht to 96,419.75 Thai Baht, a reduction of 54.11%. In 2022, costs were reduced from 217,371.01 Thai Baht to 77,025.72 Thai Baht, reflecting a 64.56% decrease.

Keywords: Inventory Management, Economic Order Quantity, Silver-Meal, Least Unit Cost, Lot-for-Lot, Visual Basic

DYNAMIC WORKFORCE MANAGEMENT FOR TRANSIT-BASED LAST-MILE DELIVERY

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ABSTRACT

Purpose: Last-mile parcel delivery in urban areas faces persistent challenges, including rising operational costs, limited workforce availability, and growing environmental concerns.

Design/methodology/approach: This study addresses these issues by introducing a cost-optimization approach that leverages existing public transportation systems through a rolling horizon framework. We develop a dynamic decision-making model that allocates delivery tasks between crowd-sourced commuters and flexible part-time workers, adapting to dynamic train conditions. The model accounts for constraints such as train capacity and the discomfort experienced by passengers.

Findings: Our results highlight inefficiencies in the use of part-timers, particularly near the start and end of employment cycles—where idle time can lead to inefficiencies of up to 21% in 10-hour shifts. The insights underscore the importance of optimizing workforce deployment to enhance cost-efficiency in last-mile logistics.

Research limitations/implications (if applicable): In our model, the compensation provided to crowd-shippers was based on a theoretical discomfort cost function calibrated through nonlinear least squares estimation. We converted abstract discomfort units into monetary values to establish a reasonable approximation based on established transportation literature and Singapore's fare structure. However, this approach may not capture commuters' actual willingness to participate in crowd-shipping under varying crowding conditions.

Originality/value: We integrate train occupancy-based discomfort costs directly into the compensation structure for crowd-shippers, replacing the fixed remuneration rates used in previous studies with a more realistic model that accounts for varying crowding conditions throughout the day.

Keywords: Crowd-shipping, Multi-period optimization, Rolling horizon framework, Mass Transit Discomfort cost, Part-time employment, Workforce optimization

EFFICIENT ROUTE PLANNING FOR CONSERVATION TOURISM IN THE MEKONG: A HEURISTIC OPTIMIZATION APPROACH

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ABSTRACT

Purpose: This study develops an efficient route planning model for conservation tourism across 80 destinations in the Mekong region between Thailand and the Lao People's Democratic Republic (PDR). The research aims to minimize travel distance and cost while promoting sustainable tourism practices.

Design/methodology/approach: The study employs the Nearest Neighbor Heuristic (NNH) and Local Search Optimization techniques to identify the shortest routes, comparing their performance with the traditional Traveling Salesman Problem (TSP) approach. Location coordinates were collected within the study area, and the optimized routes were further enhanced through the integration of dynamic pricing and AI-driven forecasting strategies.

Findings: The findings demonstrate that the proposed method significantly reduces travel distances compared to the TSP approach. Incorporating dynamic pricing and AI forecasting enables effective cost management and supports balanced distribution of tourist flows throughout the year, contributing to sustainable tourism in the Mekong region.

Research limitations/implications (if applicable): This study focuses on a specific geographic area, which may limit the generalizability of the proposed model. Future research could expand the framework to larger regions and incorporate multi-modal transport considerations.

Practical implications (if applicable): The proposed route planning model provides a practical tool for tourism planners and policymakers to enhance conservation tourism efficiency, reduce operational costs, and promote environmentally responsible travel practices.

Originality/value: This research introduces an innovative integration of heuristic optimization techniques with dynamic pricing and AI forecasting to support efficient and sustainable tourism route planning. It offers a replicable model for other conservation-focused tourism initiatives.

Keywords: Dynamic Pricing, Nearest Neighbor Heuristic (NNH), Local Search Optimization, Sustainable Travel, Traveling Salesman Problem (TSP)

EEG-BASED DEEP LEARNING FRAMEWORK FOR MONITORING TRAIN DRIVER ATTENTION UNDER SMARTPHONE DISTRACTION

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ABSTRACT

Purpose: This study explores the impact of smartphone usage on train driver performance, a critical factor influencing railroad safety. Phone distractions significantly impair situational awareness and contribute to accidents, necessitating innovative monitoring solutions.

Design/methodology/approach: Using a full-type train simulator, experiments were conducted with 25 licensed drivers under phone-use and non-use conditions. Electroencephalogram (EEG) data were collected and analyzed through deep learning algorithms (LSTM) to classify attention states with high precision and recall.

Findings: Results show that phone usage leads to a 1.4 times increase in reaction time and approximately 3.7 times more operational errors compared to non-usage. The LSTM model achieved an average classification accuracy of 85.6%, demonstrating its effectiveness in real-time attention monitoring.

Research limitations/implications The study sample was limited to 25 participants with specific licensing backgrounds. Broader validation across diverse driver populations and real-world conditions is recommended.

Practical implications The findings provide quantitative evidence of smartphone risks and support the development of EEG-based monitoring systems integrated with train safety protocols. This can serve as a foundation for enhancing operational safety and training programs.

Originality/value: This research uniquely integrates EEG biosignal analysis with deep learning for assessing driver attentiveness in railroad operations, offering a novel framework for real-time safety monitoring and human reliability analysis.

Keywords: Railroad, Safety, Human performance, Train driver, Biosignals, Deep learning

FACTORS INFLUENCING LOGISTICS IN THAILAND–LAO PDR CROSS-BORDER TRADE: CHONGMEK & MUKDAHAN

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Abstract

Purpose: This study investigates the key factors influencing the effectiveness of logistics management in Thailand–Lao PDR cross-border trade, with a specific focus on Chongmek and Mukdahan Customs Houses as primary trade gateways in the region.

Design/methodology/approach: A logistic regression approach utilizing machine learning techniques was employed to analyze data collected from 185 logistics service users. This methodological framework allowed for the identification and prioritization of critical factors affecting trade efficiency.

Findings: The analysis reveals four critical factors that significantly enhance cross-border trade efficiency and competitiveness, which consists distribution management, inventory control, transportation reliability, and the implementation of modern information systems.

Research limitations/implications: The study is limited to two major customs houses, which may affect the generalizability of the findings to other cross-border trade contexts. Future research could expand the geographic scope and incorporate longitudinal analyses to validate and extend the proposed model.

Practical implications: This study introduces a logistics performance assessment index for cross-border gateways, providing a practical tool for monitoring and improving logistics practices. The findings offer actionable insights for policymakers and logistics managers seeking to enhance trade efficiency between Thailand and Lao PDR.

Originality/value: This study contributes to the understanding of cross-border logistics management by integrating machine learning techniques to identify key performance drivers. It provides a novel assessment framework for evaluating and improving logistics efficiency at critical trade gateways in Southeast Asia

Keywords: Cross-border trade, Logistics management, Thailand–Lao PDR, Customs houses, Trade competitiveness

FOUNDATIONS AND FRONTIERS IN LINER SHIPPING RESILIENCE

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ABSTRACT

Purpose: Liner shipping serves as the backbone for international trade and global supply chains, facilitating the efficient movement of goods across global markets. However, the industry's resilience is increasingly challenged by unforeseen disruptions caused by a diverse range of events including cyber-attacks, geopolitical conflicts, regulatory changes, and global crises such as pandemics. This study explores the current state of liner shipping resilience literature by synthesizing the research methods used, analysing emerging trends and themes, and providing directions for future research on liner shipping resilience.

Design/methodology/approach: To achieve the purpose of the study, a systematic literature review was conducted on peer-reviewed articles exploring diverse topics related to liner shipping resilience. A defined inclusion/exclusion criteria was applied to an initial pool of 710 articles retrieved from Scopus and Web of Science, covering publications from 2010 to 2023. Following this screening process, 42 articles were included in the bibliometric analysis. Furthermore, an in-depth review of the articles was conducted to contextualise the identified themes shaping current and future research on liner shipping resilience.

Findings: The findings revealed a surge in the number of studies on liner shipping resilience between 2019 and 2022, with COVID-19 and risk assessment as main themes of interest. The findings revealed that liner shipping resilience research was mainly conducted using mathematical and optimisation models, and empirical research methods. The thematic structure of the literature centres on operations, modelling for optimisation, with technological solutions acting as cross-cutting enablers. Moreover, emerging themes point towards a shift from isolated solutions to system-oriented actionable measures.

Research limitations: The study was limited to publications available in Web of Science and Scopus databases based on a predefined inclusion/exclusion criteria that might omit non-indexed relevant literature.

Practical implications: This study underscores key foundations and emerging frontiers in liner shipping resilience, paving way for future research and supporting strategic decision-making within the industry.

Originality/value: This study provides a systematic and bibliometric review of research on liner shipping resilience between 2010 and 2023, highlighting the trends and actionable insights to support effective decision making for key stakeholders.

Keywords: Liner Shipping, Resilience, Unforeseen Disruptions, Systematic Review, Bibliometric Analysis

FROM GROUND TO CLOUD: THE IMPACT OF THE PHYSICAL INTERNET ON AIR CARGO OPERATION

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Abstract

Purpose: This paper aims to explore how the emerging concept of the Physical Internet can transform traditional air cargo operations by enabling standardized, modular, and interconnected logistics networks. It seeks to provide an accessible overview of the Physical Internet's core principles and assess its potential to enhance operational efficiency, streamline workflows, and improve data visibility in air cargo logistics.

Design/ methodology/ approach: The study adopts a conceptual and case study-based approach, reviewing current literature and practical examples from the industry. It examines the transition from conventional, siloed systems ("ground") to integrated, cloud-based networks that facilitate real-time data exchange and collaborative decision-making. The analysis focuses on identifying the challenges and opportunities associated with adopting the Physical Internet in air cargo operations.

Findings: Preliminary findings suggest that integrating Physical Internet concepts into air cargo operations can significantly reduce operational inefficiencies, improve capacity management, and enhance sustainability. The approach enables more effective data sharing and coordination across stakeholders, thereby driving smarter decision-making and increased operational resilience.

Originality/value: This work offers a novel perspective by linking the transformative potential of the Physical Internet directly to air cargo operations. It contributes to the field by providing actionable insights for industry professionals, academics, and policymakers on leveraging digital transformation to create a more connected and efficient air cargo network. The research underscores the value of digitalization in overcoming longstanding operational challenges in the logistics sector.

Keywords: Air Cargo, Physical Internet, Digital Transformation, Logistics, Operational Efficiency, Sustainability

INTEGRATING DIGITAL TWIN AND BARCODE TECHNOLOGIES FOR PREDICTIVE AND COMPARE INVENTORY OPTIMIZATION IN PUBLIC UTILITY WAREHOUSES

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Abstract

Purpose: This study aims to address the operational limitations of centralized Enterprise Resource Planning (ERP) systems in public utility warehouses by examining the effectiveness of a localized Warehouse Management System (WMS) integrated with Digital Twin (DT), QR Code tracking, and Machine Learning (ML) forecasting.

Design/Methodology/Approach: A quasi-experimental pretest–posttest design was employed across eight regional warehouses operated by Thailand's Provincial Electricity Authority (PEA). Six months of historical SAP ERP data were compared with two months of post-implementation WMS data. The prototype system integrated QR-based asset tracking, DT simulation for operational optimization, and ML models (Random Forest and LSTM) for workload forecasting. Statistical analysis included t-tests, effect size measurement, and evaluation of predictive models against baseline forecasting methods.

Findings: The localized WMS demonstrated significant improvements, with an average processing time decrease of 28.9%, an increase in inventory accuracy from 96.5% to 98.8%, and a 47.3% reduction in error rates. Inventory turnover improved by 15.6%. In predictive analytics, ML models outperformed baseline moving averages, with the LSTM achieving a 20.8% reduction in MAE and a 17.8% reduction in RMSE, enhancing resource allocation and demand planning.

Originality / Value: This study provides one of the first empirical evaluations of integrating DT, QR, and ML technologies in a full-scale ERP-to-WMS migration within a public utility context. It extends the literature on supply chain decoupling by demonstrating how localized digital solutions can deliver superior agility and accuracy compared to centralized systems, offering a replicable framework for digital transformation in asset-intensive sectors.

Keywords: Digital Twin, Warehouse Management System, QR Code, Machine Learning, Supply Chain Decoupling, Public Utility Logistics

OPTIMIZING CROSS-BORDER SUSTAINABLE TOURISM ROUTES FOR ELECTRIC VEHICLES

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ABSTRACT

Purpose: Introduce a novel hybrid optimization model, combining Genetic Algorithms and Simulated Annealing, for designing efficient and sustainable cross-border electric vehicle tourism routes.

Design/methodology/approach: Develop an optimization model, integrates a hybrid approach that combines Genetic Algorithms (GA) and Simulated Annealing (SA) to find the best tourism routes for electric vehicles, using a case study in Ubon Ratchathani province in Thailand and Champasak province in Laos. The chosen routes begin and end at Ubon Ratchathani Airport, pass through the Chong Mek – Vang Tao border checkpoint. Data were collected from official tourism websites, online travel platforms, and Google Maps. The performance of this hybrid method was subsequently evaluated against key metrics, demonstrating superior results in terms of travel time, energy consumption and tourist satisfaction.

Findings: The study shows that the hybrid GA-SA method can effectively optimize cross-border tourism routes for electric vehicles that reduced travel time and distance while connecting important cultural and natural attractions. Compared to other planning methods, the hybrid approach offered better performance in terms of route efficiency and tourist satisfaction.

Research limitations/implications: This study is limited to one case area and assumes constant travel conditions. It does not include real-time factors or user preferences.

Practical implications: The model supports low-carbon route planning, EV infrastructure development, and sustainable tourism in cross-border regions.

Originality/value: It supports sustainable tourism, enhances route efficiency, and expands the application of metaheuristic techniques in transportation and tourism planning, particularly in environmentally sensitive and regional development contexts.

Keywords: Cross-Border Tourism, Genetic Algorithms, Simulated Annealing, Electric Vehicles, Sustainable Tourism

OPTIMIZING FOGGING AREAS IN DENGUE VECTOR CONTROL STRATEGIES USING GENETIC ALGORITHMS

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ABSTRACT

Purpose:
This study aims to address the persistent challenge of dengue fever in Malaysia, particularly in the context of rapid urbanization and its impact on the rise of vector-borne diseases. It evaluates the effectiveness of different resource allocation strategies in dengue vector control by applying genetic algorithm-based fitness functions to optimize decision-making. This study contributes to the field of public health logistics by demonstrating how algorithmic optimization can improve the strategic deployment of limited resources in urban vector control operations.

Design/methodology/approach:
A comparative analysis of four fitness functions was conducted using a genetic algorithm framework to simulate resource distribution for dengue control. Fitness Function 1 applies uniform allocation, Fitness Function 2 incorporates severity-based weighting, Fitness Function 3 ranks areas by case counts, and Fitness Function 4 integrates both rank and variability. The performance and impact of each approach were assessed based on allocation efficiency and ability to target high-risk zones.

Findings:
Results indicate a clear progression in allocation effectiveness from the basic Fitness Function 1 to the more complex Fitness Function 4. While Fitness Functions 2 and 3 show improvements by focusing on severity and case count, respectively, Fitness Function 4 provides the most balanced and strategic allocation. It enhances resource efficiency by accounting for both severity and variability in dengue incidence, leading to improved targeting and reduced disease burden.

Research limitations/implications (if applicable):
The study is based on simulated models and secondary data, which may not fully capture real-world complexities such as human behavior, environmental variability, and cross-agency coordination. Future research should incorporate real-time field data and stakeholder feedback to validate model outcomes.

Practical implications (if applicable):
The findings support the integration of advanced optimization techniques in public health planning. By adopting Fitness Function 4, health authorities can allocate resources more effectively, prioritize high-risk areas, and enhance the overall impact of dengue control strategies, especially in rapidly urbanizing regions.

Originality/value:
This research introduces a novel application of genetic algorithm-based fitness functions for optimizing vector control efforts. By comparing multiple prioritization strategies, it provides valuable insights into data-driven dengue management and highlights the importance of adaptive and targeted intervention planning.

Keywords: Resource allocation, Dengue vector control, Genetic algorithm, Optimization techniques

PREDICTING LOGISTICS DELAYS FOR RESILIENT SUPPLY CHAINS USING DEEP LEARNING

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ABSTRACT

Purpose: Building resilience in logistics systems is essential to navigating disruptions, reducing risk, and ensuring operational continuity. Despite growing disruptions, existing delay prediction models often lack interpretability and adaptability. This study addresses that gap by developing and explaining a deep learning-based model to predict delivery delays, thereby supporting proactive logistics decision-making and enhancing supply chain resilience.
Design/methodology/approach: We use a real-world logistics dataset containing over 32,000 hourly records from a Southern California network collected between 2021 and 2024. Data features span traffic congestion, ETA variation, port activity, vehicle behavior, and IoT sensor data. After preprocessing and feature selection, we trained 10 Multi-Layer Perceptron (MLP) models with varying depths and dropout rates. Binary classification was performed using the delay_probability variable, with class imbalance handled through class weighting in the loss function. Model performance was evaluated via accuracy, precision, recall, and AUC. The best-performing model was further explained using Captum's Integrated Gradients method to identify key contributing features.
Findings: The optimal MLP model achieved 72.8% accuracy and high recall, effectively identifying delayed deliveries. Using Captum's Integrated Gradients, input features were ranked by their contribution to model predictions. The top features included ETA variation, port congestion level, weather severity, and driver fatigue score. These insights enhanced model transparency and supported operational trust and interpretability.
Research limitations/implications (if applicable): This study is based on a historical static dataset; future research may incorporate live data feeds and spatiotemporal event modeling for real-time prediction capabilities. Extension to multi-class delay severity or integration with route optimization engines is also suggested.
Practical implications (if applicable):
The proposed model serves as an early-warning tool for logistics planners, enabling timely identification of potential delivery delays. By providing interpretable predictions, the tool supports proactive decision-making such as rerouting shipments, reallocating warehouse resources, and adjusting driver assignments. These capabilities directly contribute to maintaining business continuity, minimizing service disruptions, and implementing adaptive logistics strategies in the face of uncertainty—whether caused by traffic congestion, port delays, or extreme weather events. The approach helps organizations transition from reactive to predictive logistics management, strengthening resilience across the supply chain.
Originality/value:
This research presents a practical and explainable application of deep learning in supply chain risk prediction, contributing to the literature on resilient logistics systems and the role of AI-driven decision support tools.

Keywords: Resilient Logistics, Delay Prediction, Deep Learning, Explainable AI, Supply Chain Analytics

REDUCING RE-DELIVERY FAILURES IN E-COMMERCE: AN EMPIRICAL STUDY ON SMART LOCKER ADOPTION

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Abstract

Research purpose: The rapid expansion of e-commerce has transformed consumer purchasing behaviors and introduced substantial challenges for last-mile logistics, particularly concerning failed delivery attempts due to recipient unavailability. These unsuccessful deliveries often result in costly and inefficient re-delivery processes. In response, distribution service providers have implemented smart locker systems to streamline parcel collection and improve delivery efficiency. Thus, this study aims to investigate the key determinants influencing the adoption of smart lockers and examine the interrelationships among these factors, grounded in an established research framework and a comprehensive literature review.

Design/Methodology/Approach: This study employes a combination of purposive and snowball sampling methods to select research participants, focusing on consumers with prior experience using smart lockers to examine their usage intentions. Further, building upon the insights garnered from the literature review, the research framework of this study has been meticulously structured. The foundational theoretical underpinning for this research architecture is rooted in the Decomposed Theory of Planned Behavior (DTPB) to examine the determinants of consumers' intentions to adopt smart lockers.

Findings: Based on survey data from 316 respondents, the analysis identifies perceived usefulness, ease of use, and compatibility as significant predictors of positive attitudes toward smart lockers. Social influences, including peer and supervisor opinions, shape subjective norms, while self-efficacy and facilitating conditions contribute to perceived behavioral control. In turn, these three dimensions, attitude, subjective norm, and perceived behavioral control, significantly affect behavioral intention.

Originality/Value: The study contributes to the broader literature on technology adoption by highlighting the critical role of decomposed belief structures and social-cognitive variables in shaping consumer behavior. Managerial implications and actionable recommendations are offered for logistics providers and e-commerce platforms to enhance smart locker adoption and mitigate the inefficiencies associated with re-delivery.

Keywords: smart locker, re-delivery, decomposed theory of planned behavior

Safety Logistics: A Case Study in the Risk of Work-Related Musculoskeletal Disorders in Manual Logistics Task in Thailand

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ABSTRACT

Purpose: This research addresses the critical yet often overlooked aspect of occupational safety within the logistics industry, specifically focusing on safety logistics. While logistics management typically prioritizes cost reduction and operational efficiency, the significant financial and human costs associated with work-related injuries and illnesses are substantial. This study aims to identify and assess ergonomic risks among gas cylinder delivery workers in Thailand to ultimately enhance worker safety and well-being.

Design/methodology/approach: This study employed an observational design to investigate the work behaviors of gas cylinder delivery workers in Thailand. The research focused on tasks involving the manual handling of 15 kg, 30 kg, and 45 kg gas cylinders during loading onto vehicles, offloading, and delivery to customer homes. To evaluate the risk of work-related musculoskeletal disorders (WMSDs), the Rapid Upper Limb Assessment (RULA) tool was systematically applied to observe and analyze the working postures of these employees.

Findings: The RULA assessment effectively identified various postures presenting risks for WMSDs among the gas cylinder delivery workers. The findings indicate specific high-risk movements and body positions frequently adopted during the manual handling tasks. These identified risks highlight the potential for injuries if no intervention measures are taken.

Research limitations/implications: This study's findings are specific to gas cylinder delivery workers in Thailand, utilizing a single ergonomic assessment tool. Future research could benefit from a larger sample size, longitudinal studies to track injury rates, and the incorporation of additional ergonomic assessment tools or physiological measurements to provide a more comprehensive understanding of the risks.

Practical implications: The identified ergonomic risks provide valuable insights for developing targeted intervention strategies. These strategies may include implementing ergonomic training programs for workers, providing appropriate material handling equipment, redesigning work processes, or introducing regular rotation of tasks to reduce repetitive strain. Addressing these risks can significantly reduce WMSDs, leading to fewer injuries, lower healthcare costs, improved worker morale, and increased productivity for logistics companies.

Originality/value: This research contributes to the growing body of knowledge on safety logistics by specifically addressing ergonomic risks in manual handling tasks within the Thai gas delivery sector. By utilizing the RULA tool, it offers a practical and immediate method for identifying specific high-risk postures. The findings provide a strong foundation for developing evidence-based interventions to improve occupational health and safety standards in this physically demanding industry.

Keywords: Safety Logistics, Ergonomics, Manual Handling, RULA, Work Related Musculoskeletal Disorders

SMART TRANSPORTATION MANAGEMENT IN NIMMAN AREA: A STRATEGIC FRAMEWORK FOR URBAN MOBILITY ENHANCEMENT

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Abstract

Purpose: This study analyzes transportation challenges in Chiang Mai's Nimman-Hemin area to develop a strategic framework for intelligent transportation management that enhances safety and stimulates economic growth within Thailand's smart city development initiative.

Design/methodology/approach: A mixed-method research design was employed, combining quantitative surveys (n=401) across four stakeholder groups (residents, tourists, commuters, business operators) and qualitative focus groups with 20 policy makers and practitioners. Data collection utilized validated questionnaires with Likert scales and in-depth interviews to assess traffic problems, root causes, and development priorities.

Findings: Traffic congestion (3.35/4.0) and insufficient parking (3.25/4.0) emerged as primary problems. Root cause analysis identified vehicle volume exceeding road capacity (3.12/4.0) and inadequate parking facilities (2.98/4.0) as principal factors. Strong stakeholder support exists for technology-based solutions including traffic information platforms and intelligent traffic management systems.

Research limitations/implications: The study focuses on a single urban district, limiting generalizability. However, findings provide foundation for smart city template development applicable to other Thai commercial areas. Future longitudinal studies should track implementation outcomes.

Practical implications: Results inform phased implementation strategies including short-term infrastructure improvements, medium-term system integration, and long-term regional coordination. Policy recommendations address budget constraints, stakeholder coordination, and technological readiness gaps identified through stakeholder consultation.

Originality/value: This research provides the first comprehensive stakeholder analysis of transportation challenges in Thailand's designated smart city pilot area, contributing empirical evidence for national smart city policy development and offering replicable methodological approaches for similar urban contexts.

Keywords: Smart City, Transportation Management, Urban Mobility, Traffic Congestion, Smart Parking

STRENGTHENING SAFETY LEADERSHIP IN INDONESIA'S MARITIME SECTOR

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ABSTRACT

Purpose: This study aims to explore and analyze the structural relationships among the key determinants influencing safety leadership behaviors in the Indonesian maritime industry. Amid increasing safety concerns and complex maritime conditions in Indonesia, this research seeks to provide a comprehensive understanding of how various individual, behavioral, and environmental factors interact to shape leaders' safety behaviors.

Design/methodology/approach: An exploratory research design is employed, utilizing the Fuzzy-DEMATEL method to investigate the causal relationships among safety leadership factors. Data is collected through an online survey targeting maritime industry managers and officers with safety-related decision-making experience. The survey applies a pairwise comparison format to assess the influence levels among determinants such as safety attitude, safety knowledge, safety motivation, AI knowledge, and safety culture.

Findings: The findings revealed the critical pathways and hierarchical influence structures among the determinants of safety leadership behaviors. The study provides empirical evidence on how advanced technologies, particularly AI applications, and organizational safety culture collectively enhance or hinder safety leadership. The results offer valuable insights into which factors should be prioritized to strengthen safety leadership practices in the Indonesian maritime sector effectively.

Practical implications: The study's outcomes are expected to support the development of practical strategies and policies aimed at improving safety leadership in maritime operations. By identifying the most influential factors, maritime organizations can implement targeted interventions to enhance safety performance and prevent accidents.

Originality/value: This research contributes to the literature by applying a systems-thinking approach through Fuzzy-DEMATEL to safety leadership, a methodology that has been scarcely used in the maritime context. It also introduces the integration of AI-related factors into safety leadership analysis, offering novel perspectives for both academia and industry. The methodology and analytical framework can be adapted for broader applications in similar high-risk sectors.

Keywords: Safety leadership; Maritime safety; f-DEMATEL; Reciprocal determinism; Safety compliance; Communication; AI knowledge; Safety policy; Indonesia; Maritime governance

THE EVALUATION FOR SMEs OF COLD CHAIN AGRICULTURAL FOOD INDUSTRY 4.0 PERFORMANCE IN THAILAND

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Abstract

Purpose: This study investigates the structural relationships between digital transformation adaptation, smart management systems, Supply Chain 4.0 capabilities, and food loss and waste minimization amongst Thai agricultural food SMEs.

Design/methodology/approach: The Structural Equation Model (SEM) to test six hypotheses, utilizing confirmatory factor analysis to ensure construct validity and reliability.

Findings: The findings provide actionable insights for SME managers and policymakers, emphasizing the critical role of digital technologies in enhancing cold chain logistics performance that using survey data from 452 SMEs in Thailand's agricultural food industry.

Research limitations/implications (if applicable): The study focuses on SME of Agriculture food industry in Thailand limiting generalizability to other emerging economies or developed markets that strengthen the understanding of how relationships evolve over time.

Practical implications (if applicable): The implications extend beyond individual firm performance to broader societal benefits, including social reduced food waste, improved food security, and enhanced sustainability. As such, continued research and support for Cold Chain Logistics 4.0 implementation in emerging economies represents both an economic opportunity and a social imperative.

Originality/value: This study provides empirical evidence for the critical role of digital transformation and smart management systems in enhancing Cold Chain Logistics 4.0 performance among Thai agricultural food SMEs. The findings demonstrate that investments in digital technologies and management system innovations significantly enhance Supply Chain 4.0 capabilities and organizational capabilities, which in turn contribute to substantial reductions in food loss and waste.

Keywords: Cold Chain Logistics, Industry 4.0, Digital Transformation , Smart Management, Supply Chain

THE IMPACT OF THE INTEGRATION OF IOT AND BUSINESS INTELLIGENCE IN SMART CITY LOGISTICS: A CONCEPTUAL FRAMEWORK

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Abstract

Purpose: This research examines the impact of Digital Transformation in the field of Smart City Logistics. For several years now, there has been a significant intensification of urbanization, with the concentration of a large population in urban centres. This trend is escalating private vehicle ownership, traffic congestion and parking saturation, followed by consumer pressures for on time delivery of goods, highlighting the need for a sustainable solution. The aim of this paper is to contribute to the research on the effective interaction between new technologies and urban supply chain management. Specifically, the paper seeks to explore how IoT and business intelligence systems can empower City Logistics and enhance the sustainability and social value of supply chains.

Design/methodology/approach: The research methodology followed, initially relies on an extensive literature review. The aim of the literature review is to cover a wide range of information and data to ensure the objectivity and validity of the research under study. Furthermore, to better explain the subjects of study, the paper examines relevant theories such as “legitimacy”, “stakeholders” and “socio-technical” theory. Based on these theories and on the results of the literature, it develops a theoretical framework.

Findings: Smart city logistics represents a proactive and progressive approach to optimize urban freight transport in the face of increasing urbanization and evolving consumer demands. By harnessing the power of technology, sustainability and collaboration, cities can create more resilient, efficient, environmentally and socially sustainable logistics systems that meet the needs of both businesses and residents, while ensuring the long-term sustainability of urban ecosystems. Therefore, the conceptual framework will work as a roadmap (for both practitioners and academics) for using these technologies in city logistics planning and operations.

Originality/value: The aim of the proposed framework is to promote an understanding of the complex interplay between IoT, BI systems and social implications of City Logistics, taking into consideration the challenges and technological difficulties that may arise. Digital Transformation through new technologies brings revolutionary changes in the logistics sector, which acquires different operational characteristics and is transformed into Logistics 4.0, increasing business value and leading to more sustainable smart cities.

Keywords

Internet of Things, Business Intelligence Systems, Sustainability, Smart City Logistics

THE IMPORTANCE OF SUPPLY CHAIN DATA ANALYTICS IN SMES

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ABSTRACT

Purpose: While large corporations leverage data analytics for supply chain optimization, Thai SMEs lag significantly behind despite representing 99% of local businesses. This study investigates how supply chain data analytics (SCDAs) can transform operational performance in resource-constrained SME environments and examines their impact on supply chain decision-making and efficiency.

Design/methodology/approach: The authors has conducted a cross-sectional survey of Thai SME managers across multiple industries using the Technology-Organization-Environment (TOE) framework. Statistical analysis and regression modeling established links between analytics adoption and key performance indicators including inventory turnover, demand forecasting accuracy, and supply chain responsiveness.

Findings: SMEs implementing basic SCDAs achieved improvements in inventory management and demand forecasting accuracy compared to non-adopters. However, only few SMEs currently use supply chain analytics due to perceived complexity and resource constraints. Critical success factors include management commitment, employee training, and phased implementation.

Originality: This study addresses a critical gap by focusing on SME analytics applications in emerging economies. Unlike previous research on large-scale enterprise solutions, the authors demonstrate how simplified approaches deliver substantial value in small-scale operations, providing the first comprehensive analysis of SCDA adoption barriers and success factors specific to Thai SMEs.

Keywords: Supply Chain Data Analytics, Small and Medium-sized Enterprises, Data Analytics, Operational Performance, Data-driven decision-making

UNDER HUMANITARIAN LOGISTICS, THE RELATIONSHIP BETWEEN DISASTERS AND LOGISTIC PERFORMANCE

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ABSTRACT

Purpose: The impact of COVID-19 pandemic goes beyond its direct impact on health and far-reaching effects on the economy, society, and mental health globally, while the likelihood of other serious infectious disease like the COVID-19 pandemic occurring has increased. The World Development Index emphasizing that the ultimate goal of development should be to enhance human well-being. Therefore, this study quantitatively analyzes the relationship between humanitarian logistics (HL) performance and disaster response in the context of the COVID-19 pandemic, aiming to explore three key relationships: 1) the relationship between logistics performance and the control and spread of the epidemic; 2) the relationship between the World Development Index and the self-construction of logistics performance; and 3) the relationship between the World Development Index and the control and spread of the epidemic.

Design/methodology/approach: Correlation analysis and regression analysis were used to conduct correlation analysis on the logistics performance index, the world development index, and the number of epidemic infections and deaths.

Findings: This study is based on the theoretical guidance of Sustainable Development Goal 3: Good Health and Well-being. Conducting a combined empirical and applied study of basic epidemic and logistics data. The results shown that developed countries with better logistics had faster vaccine adoption but still have higher infection rates, with correlation with strong Foreign Direct Investment (FDI). While Geographic locations and Urban population (UP) play significant roles to determine the rate of COVID-19 deaths. Encouraging knowledge cooperation and independent development, putting forward four logistics-centered epidemic prevention and control suggestions.

Originality/value: This study outlines the potential global index associations of logistics performance under the COVID-19 pandemic and how these changes affect the number of infections and deaths from the pandemic. It also provides insights into the participation of different countries in the global supply chain and points out future research directions.

Keywords: Humanitarian logistics (HL); COVID-19 pandemic; Vaccine; Supply chain management; World development indicators.