ABSTRACTS

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A systematic literature review of halal transportation in logistics studies

(pages 244-255)

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Keywords: halal transportation, halal supply chain, cross contamination, halal logistics.
Abstract: This article examines how halal transportation supports the integrity of material and information flows in the halal supply chain by systematically reviewing the international scientific literature indexed in the Scopus database. The study addresses the fragmented knowledge of halal logistics transportation, particularly regarding contamination risks, logistical constraints, lead times, and infrastructure quality, which hinder the design of robust halal logistics systems. Using a Systematic Literature Review (SLR) approach guided by the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) framework, 13 relevant articles were selected from an initial set of 28 publications. The findings show that research on halal transportation is still limited and concentrated in a few countries, with Malaysia as the main contributor, and that four critical challenges dominate the discussion: the risk of cross-contamination along logistics flows, the limited availability of halal-certified transport alternatives, delays in delivery time, and inadequate transport infrastructure. In scientific terms, this article offers a structured synthesis of these challenges from a logistics perspective and clarifies how halal transportation influences the performance of supply chain flows. In practical and pedagogical terms, the study provides guidance for logistics managers, policymakers, and educators in designing logistics networks, infrastructure, and learning materials that better support the implementation of halal transportation.

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ESG perception and green logistics adoption: the mediating role of brand image and trust in emerging markets

(pages 256-267)

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Keywords: sustainable supply chain, green logistics, ESG and sustainable consumer behavior, generation Z, green marketing.

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Abstract: Despite the growing adoption of Environmental, Social, and Governance (ESG) criteria in corporate strategy, a significant gap exists in understanding how consumer perceptions of ESG translate into the adoption of tangible green logistics services. This study investigates how ESG factors influence consumer willingness to pay for green logistics such as sustainable transport, optimized material flow and eco-friendly packaging in an emerging market context. Grounded in the Theory of Planned Behavior, the model examines the mediating roles of green brand image, green trust, and green purchase intention in shaping sustainable logistics consumption. A structured online survey was administered to 350 young consumers belong to Generation Z, and data were analyzed using PLS-SEM. Structural model results reveal that green marketing and CSR significantly enhance green purchase intention, while greenwashing undermines trust. All hypothesized relationships were statistically significant. This research provides a novel, validated model linking perceived ESG performance to consumer willingness to pay for green logistics. It offers practical insights for supply chain managers on leveraging transparent ESG practices to build brand trust and drive adoption of sustainable logistics solutions.

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Sustainability of warehouse process by SWP model with orientation on cost reduction and growth performance

(pages 268-280)

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Keywords: costs, improvement, performance, quality, warehouse process.
Abstract: Warehouse management is based on improving productivity while reducing costs, improving quality, lead times, workforce availability, health, safety, and environmental effects. The warehousing costs create key factors for the efficiency of the warehouse process, too, in the food industry. The main goal of the research was to optimize costs in the warehouse process of the food company and improve the efficiency of the warehouse process. We stated the hypotheses oriented towards improving the quality of the warehouse process, which can decrease warehousing costs and increase the warehouse process's efficiency. The results of the research confirmed the hypothesis. Hypothesis H1: Improving the quality of the warehouse process decreases warehousing costs. This hypothesis was confirmed because warehousing costs decreased by 8341€ in the year 2025 and by 1070€ in the year 2024. H2: Improving the quality of the warehouse process influences the efficiency of the process. Ineffective processes - meat, fruit, vegetables, pallet warehouses became effective processes. The corrective measures brought benefits such as financial sources, efficiency, the layout of the warehouse, the JIT system, and cost reduction to the warehouse process in the food company. The suggestion of corrective measures can be used as a SWP model for smart warehouse processes in food companies.

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Rebuilding Iraq's road network: challenges and project management solutions

(pages 281-291)

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Keywords: Iraq, road infrastructure, logistics, project management, post-conflict reconstruction.
Abstract: The state of the road infrastructure in Iraq has severely declined due to the long-term conflict, the instability of the institutions, and the lack of investments, thus interrupting the logistical processes and the development of the country. This study examines the main barriers to the rebuilding of the road system in Iraq and proposes a coherent framework that would combine project-management and logistical paradigms in order to reduce these obstacles. Using a comparative approach to determine international best practices in road-infrastructure delivery, the paper evaluates the appropriateness of the PMBOK, PRINCE2, and Agile approaches in the post-conflict context in Iraq. Such frameworks are assessed together with the enabling technologies, such as Geographic Information Systems (GIS) and Artificial Intelligence (AI), and participatory models of stakeholder-engagement. The research suggests a hybrid model of logistics aligned strategy to fill the identified gaps, in which localisation of PMBOK, PRINCE2, and Agile solutions is the key, with material, information, financial, and human flows optimisation provided by GIS/AI decision support. The approach enhances more transparency, efficiency, and sustainability in the governance of infrastructure. The value of the research is twofold: (i) the combining of project-management stage-gates with the transport-logistics flow control in a post-conflict setting, (ii) the flow based blueprint of delivering, and maintaining the Iraqi road assets.

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A slack-based MSME development model: a strategic solution to improve business performance and growth

(pages 292-302)

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Keywords: logistics resources, manufacturing smes, organizational performance, resource slack, sustainable logistics innovation.
Abstract: This study investigates how resource slack supports logistics-dependent business systems and influences organizational performance and growth in manufacturing SMEs operating in supply and distribution environments. It specifically examines the mediating roles of organizational resilience and sustainable logistics innovation, as well as the moderating roles of organizational learning and logistics resources. A quantitative research approach was employed, with data collected from 100 manufacturing SMEs operating in resource-constrained yet logistics-intensive environments. Structural equation modeling (SEM) was used to analyze both the direct and indirect effects of resource slack on organizational performance and growth. The results reveal that resource slack positively affects organizational performance both directly and indirectly through sustainable logistics innovation, while its indirect effect through organizational resilience is rejected. Sustainable logistics innovation is shown to be a key driver of business growth by leveraging slack resources for eco-efficient packaging, transport optimization, and distribution agility. Moreover, organizational learning strengthens the effect of resource slack on organizational resilience, while logistics resources amplify the effect of resource slack on sustainable logistics innovation. These findings suggest that SME managers should strategically manage slack resources such as production buffers, warehouse capacity, and supplier relationships to enhance resilience and foster sustainable logistics innovation. This study uniquely integrates slack theory, logistics resource configuration, and sustainability-oriented innovation to explain how SMEs convert slack into competitive advantage under logistics constraints.

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Sustainability evaluation of material handling machines in intralogistics: a simulation-based approach

(pages 303-313)

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Keywords: intralogistics, material handling, sustainability, simulation.
Abstract: As sustainability becomes a strategic imperative in industrial operations, a comprehensive evaluation of material handling equipment's environmental, economic, and social impacts is essential. This study proposes a novel simulation-based framework to assess and compare the sustainability performance of forklifts and Automated Guided Vehicles (AGVs) in warehouse-to-assembly line operations. Leveraging the Triple Bottom Line (TBL) approach, we integrate technical, environmental (e.g., energy consumption, GHG emissions), economic (operational costs), and social (ergonomics) indicators into a unified evaluation model. Using Siemens Tecnomatix Plant Simulation, we model an automotive intralogistics scenario where components are transported from the warehouse to the assembly stations. Our results reveal that AGVs outperform forklifts in terms of energy efficiency (44% lower consumption) and scalability, but exhibit higher idle times (46.11%). In contrast, forklifts offer greater operational flexibility. The study presents a replicable methodology for dynamic sustainability assessment in intralogistics and provides actionable insights for technology selection, demonstrating how trade-offs between automation and social-centric systems influence sustainable outcomes in manufacturing environments.

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Supply chain management strategies taking into account marketing trends and IT technologies

(pages 314-326)

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Keywords: supply chain, logistics strategy, marketing.
Abstract: Global supply chains are currently undergoing significant transformation under the influence of marketing trends and rapid digitalization. The growing complexity of customer needs, combined with the expansion of e-commerce and the integration of Industry 4.0 technologies, requires new approaches to the design and coordination of supply chain strategies. This article explores the interrelation between supply chain management (SCM), contemporary marketing tendencies, and the implementation of advanced IT solutions. The main objective is to analyze how customer-oriented strategies and digital innovations - such as big data analytics, artificial intelligence, blockchain, and cloud platforms - contribute to the resilience, flexibility, and efficiency of supply chains. The methodological framework includes a literature review, comparative analysis of global companies, and case-based evaluation of IT adoption in logistics operations. Results demonstrate that marketing-driven SCM strategies, supported by digital technologies, improve demand forecasting accuracy, shorten delivery lead times, and enhance customer experience. Moreover, companies that align marketing insights with supply chain planning achieve superior competitive advantages by creating adaptive networks and developing sustainable partnerships. The article contributes to both theory and practice by emphasizing the necessity of integrating market dynamics with technological capabilities in modern SCM. Practical recommendations are provided for managers and policymakers to strengthen competitiveness in volatile markets through the synergy of marketing strategies and IT-enabled logistics.

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Simplex linear programming for route optimization model in urban distribution

(pages 327-336)

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Keywords: planning, freight transportation, logistics, logistics costs.
Abstract: This study proposes a mathematical model for optimizing delivery routes in the urban distribution of Coca-Cola FEMSA to OXXO stores in Texcoco municipality, State of Mexico. Based on a theoretical framework grounded in linear programming using the Simplex method and graph theory, an algorithm was developed and implemented in LINDO software to minimize logistics costs, distance traveled, and fuel consumption. This approach, in turn, ensures a more sustainable route by achieving a reduction in polluting gas emissions. The results show a 12.3% reduction in distance, decreasing from 66.25 km to 58.1 km, and a 12.4% saving in fuel costs, from 686.28 to 600.96 Mexican pesos, for the route. The results demonstrated a significant contribution to the reduction of the carbon footprint, with a decrease of approximately 2.04 kg of CO_2, achieving a more sustainable urban distribution and greater operational efficiency.

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Climate disclosure and carbon tax: accounting insights on earnings volatility in Indonesian transportation firms

(pages 337-352)

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Keywords: carbon tax exposure, climate risk disclosure, earnings volatility, sustainability accounting, transportation logistics.
Abstract: Climate risk disclosure has become a key focus in corporate sustainability reporting, but its financial consequences remain underexplored in high-emission industries. In Indonesia's transportation and logistics sector, where dependence on fossil fuels and regulatory volatility is high and significantly impacts the gross domestic product, the relationship between transparency, taxation, and financial performance warrants further study. This study aims to investigate how climate risk disclosure affects earnings volatility, considering carbon tax exposure as a mediating mechanism and company size as a moderating variable. This study utilizes panel data from publicly listed transportation and logistics companies spanning the period from 2022 to 2024. It applies hierarchical linear regression with mediation and moderation techniques. The analysis shows that increased disclosure leads to higher carbon tax exposure, which fully mediates the effect on earnings volatility. Firm size does not significantly moderate this path, suggesting that larger firms are not necessarily more insulated from fiscal risks associated with climate policy. This finding challenges the assumption that transparency inherently reduces uncertainty. While disclosure can enhance a firm's reputation, it also increases its fiscal visibility and vulnerability. The evidence suggests that the tax consequences of disclosure should not be considered incidental but rather an integral part of corporate financial planning. This study contributes to the advancement of tax accounting discourse by repositioning climate disclosure as a fiscal risk factor. The results have important implications for regulatory design, corporate governance, and sustainable transition strategies in carbon-intensive sectors.

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Specification of employee competencies in creating green innovations as part of the enterprise's technological foresight

(pages 353-363)

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Keywords: green innovations, technological foresight, competencies.
Abstract: This article maps the interconnections between (i) determinants of green innovation implementation, (ii) employee competencies, and (iii) Industry 4.0/5.0 digital technologies. A systematic literature review of the Scopus and Web of Science databases (2019-2025) according to the PRISMA protocol identified 23 relevant studies; 15 of these were analysed using open and axial coding. The output consists of five external determinants (K1-K5), a three-level competency framework (strategic, organizational, individual), and five digital themes (D1-D5). The results show that the synergy of stakeholder pressure and green financing (K1+K4) is the primary driver of innovation. Quick wins (green motivation, internal communication) create a cultural foundation, while data analytics and eco-design are strategic accelerators. The transformation is driven by cyber-physical systems and human-centric I5.0, but requires high capital investment and reverse logistics. We propose a three-stage development framework: (1) modular micro-credential programs for digital and environmental skills, (2) mentoring and job rotation for the transfer of tacit knowledge, and (3) a foresight lab that combines scenario workshops with strategic competency training. The study provides the concept of the "Digital-Sustainability Nexus," which explains how digital technologies simultaneously accelerate and facilitate green innovation and which competencies are key to this process. The results offer managers a practical roadmap of development, research, and policy priorities on the path to a carbon-neutral industry.

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Design and performance analysis of automated vertical parking systems for urban environments

(pages 364-373)

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Keywords: parking, car, chain, cost, city.
Abstract: The article presents the results of work on the design, calculation, and manufacturing of vertical parking systems. Vehicle movement, together with the cradles, is carried out in both vertical and horizontal directions using a chain transmission system. The structure consists of a frame, chain drive, guide rails, and a control unit that manages cradle positioning and ensures their movement to the designated entry and exit point for vehicle parking. Saving land space is a key economic factor. Vertical parking systems allow significantly more cars to be accommodated within the same area compared to traditional surface-level parking lots. In comparison with underground or multi-level reinforced concrete parking structures, automated systems based on metal frameworks can be more cost-effective. Automated parking systems require minimal staff involvement. In closed automated systems, the risk of theft, vandalism, or accidental vehicle damage is virtually eliminated, as access is restricted to vehicle owners only. Parking spaces in areas with a shortage of parking lots are the liquid assets. These spaces be profitably leased, providing passive income, or resold. The payback period for a vertical parking installation project can be approximately three years, although this value strongly depends on specific conditions. The availability of parking in a residential or office complex directly increases the property's value and overall attractiveness.

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Multi-class fault classification in conveyor systems using machine learning: enhancing reliability in production logistics

(pages 374-386)

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Keywords: industrial conveyor systems, multi-fault detection, predictive maintenance, production automation.
Abstract: Industrial conveyor systems are vital to modern manufacturing and logistics operations, where unexpected failures can cause substantial operational disruptions in material flows and economic losses. Traditional maintenance strategies often fall short in addressing the complex and interrelated failure patterns present in contemporary conveyor systems. This study presents a machine learning-based framework for developing multi-class classification models, designed to enable reliable deployment for real-time fault diagnosis in logistics environments. Using real-world operational data with sensor-derived features, multiple machine learning models are trained and evaluated to classify key types of conveyor faults. Experimental results demonstrate that ensemble methods achieved the highest performance, attaining an accuracy of 92.56% and significantly outperforming linear and instance-based approaches. This research aims to advance predictive maintenance by introducing a unified framework for the development of a multi-class classification model, enabling the identification of the most effective model for deployment in logistics settings. The main contribution of this work lies in the integration of machine learning techniques into logistics systems for predictive maintenance, offering an advanced, scalable solution that can be deployed to improve system reliability, reduce downtime, and enhance operational efficiency.

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Global research trends in logistics performance and trade facilitation: a bibliometric analysis of logistics flows and trade

(pages 387-398)

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Keywords: logistics performance, logistics flows, trade facilitation, supply chain management, bibliometric analysis.
Abstract: Logistics performance plays a critical role in enabling efficient material, information, and financial flows across international trade networks. Despite extensive empirical research examining the relationship between logistics performance and trade outcomes, the literature remains fragmented, with no comprehensive bibliometric synthesis mapping its intellectual structure and thematic evolution. This study addresses this gap by conducting a bibliometric analysis of 265 peer-reviewed journal articles indexed in the Scopus database between 2008 and 2025. Using Biblioshiny and VOSviewer, the study analyzes annual scientific production, influential authors and journals, institutional and country-level collaboration patterns, citation structures, and thematic clusters. The findings reveal a steady growth in logistics–trade research following the introduction of the World Bank's Logistics Performance Index, with dominant themes centered on logistics efficiency, trade facilitation, transport infrastructure, and supply chain management.

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Emerging research directions emphasize sustainability, green logistics, digitalization, and supply chain resilience. By systematically mapping logistics-related knowledge flows, this study provides a consolidated overview of the field and identifies research gaps that are relevant for logistics scholars, policymakers, and practitioners. The study contributes to logistics science by clarifying how logistics performance is conceptualized within international trade research and by offering future research directions aligned with contemporary logistics challenges.

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Digital transformation and economic growth: managing material and information flows in Central Asia's evolving digital economy

(pages 399-410)

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Keywords: public administration, e-commerce, investment, financial services, global market.
Abstract: The study addresses uneven digital integration in Kazakhstan, Uzbekistan, Kyrgyzstan, and Tajikistan, with particular attention to how digital technologies affect economic development, logistics performance, e-commerce, and fintech. The aim is to examine the relationship between digital readiness and economic growth by analyzing the management of information, material, and financial flows across key sectors. The methodology was based on statistical, correlation, and comparative analyses, which made it possible to assess differences in digital infrastructure, investment levels, and sectoral implementation of digital tools. The results show that digitalization has improved business productivity, expanded e-commerce and financial technologies, optimized public administration, and strengthened logistics processes through route optimization, faster information exchange, and reduced operational costs. Kazakhstan and Uzbekistan demonstrated more advanced digital integration, while Kyrgyzstan and Tajikistan remained constrained by weaker infrastructure, limited investment, and insufficient ICT skills. Correlation analysis confirmed a strong link between digital readiness, investment in the digital economy, and economic growth, indicating the strategic importance of digital transformation for regional competitiveness. The findings emphasize the need for stronger governmental support, expanded digital logistics platforms, improved regulatory conditions, and targeted investment in infrastructure and human capital. The practical significance of the study lies in developing recommendations for reducing barriers to digitalization and improving the efficiency of economic and logistics systems in Central Asia.

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Risk assessment of ESG-based logistics systems using a TOPSIS-based approach

(pages 411-419)

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Keywords: ESG, recycling, risk management, TOPSIS.
Abstract: The operation of ESG-based systems is a complex task, as a multitude of environmental, social, and governance factors must be simultaneously addressed within logistics and recycling processes. ESG, as a legal and risk management framework, permeates all economic activities, making it indispensable in logistics, the largest globally interpretable service (supply) activity. The research aims to optimize the application of ESG obligations and opportunities in the field of recycling logistics. The research examined possible solutions through a systematic literature review and the creation of a holistic model. For the model, it was necessary to define the main logistics processes, their components, the scope and types of data required for data-based operation, and the relationships between the elements of the system. Achieving sustainability objectives necessitates the identification, evaluation, and management of risks through approaches capable of integrating diverse considerations. The Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) provides a suitable tool for ranking decision alternatives by quantifying and comparing various criteria. Integrating the ESG perspective with multi-criteria decision support enables more sustainable and efficient management of logistics operations. An additional advantage of this methodological framework lies in its adaptability to different industry environments and organizational structures. The study's findings lay the groundwork for the development of further model applications and practical implementation strategies.

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Optimizing fulfillment center flows to improve delivery speed and service level

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Keywords: logistics flow, fulfillment center, location optimization, inventory management, delivery time and e-commerce.
Abstract: This article aims to develop a methodology for choosing the optimal configuration within the logistics network through placing regional fulfillment centers, thereby facilitating swifter delivery of goods. The study examines the influence of both the quantity and geographical positioning of fulfillment centers on critical delivery efficiency indicators, as well as inventory planning to attain the desired service level. The methodological framework is built upon a synthesis

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of discrete optimization techniques, inventory management theory, and stochastic simulation. A model for the placement of fulfillment centers, grounded in the p-median problem and constrained by delivery time, alongside a model for managing the safety stock, are employed to realize the target objective of timely and complete delivery. The empirical foundation is established using data derived from the global postal and parcel service market, along with logistics indices from the United States, Germany, and China. Sensitivity analysis indicated that the system is particularly susceptible to fluctuations in the proportion of international orders. The practical implications of this study lie in the applicability of the proposed approach for decision-making in the strategic planning of logistics flow expansion, contingent upon the specific stage of the business life cycle. Future research prospects include the integration of alternative transportation modalities, the modeling of dynamic stock redistribution among fulfillment centers, as well as evaluating the economic viability of warehouse operations automation. The paper introduces a flow management approach for regional fulfillment centers that jointly optimizes material and information flows to accelerate delivery with controlled cost trade-offs.

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Machine learning for exchange rate forecasting: a case study on SAR/PKR, SAR/IDR, and USD/IDR

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Keywords: machine learning, support vector regression, currency rates, foreign exchange comparative analysis.
Abstract: Exchange rate prediction is essential in industries such as travel, finance, and religious tourism, particularly to Indonesia and Pakistan as the sources of Umrah and Hajj pilgrims to Saudi Arabia. This paper compares machine learning models, namely, Long Short-Term Memory (LSTM), Support Vector Regression (SVR), and Multi-layer Perceptron (MLP), in predicting SAR/PKR, SAR/IDR, and USD/IDR rates based on historical data. While prior research noted LSTM's utility during periods like the COVID-19 pandemic, its precision remained limited. This work evaluates models using key metrics: Mean Squared Error (MSE), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and R-squared.Results identify LSTM as the most effective for the SAR/PKR pair, achieving an MSE of 26.814, RMSE of 5.178, MAE of 3.370, and R-squared of 0.8685. However, for the SAR/IDR and USD/IDR pairs, the SVR model demonstrated superior performance with lower errors. For SAR/IDR, it recorded an MSE of 768.295, RMSE of 27.718, MAE of 20.788, and R-squared of 0.9768. For USD/IDR, metrics were an MSE of 17752.818, RMSE of 133.239, MAE of 108.761, and R-squared of 0.9631.The findings validate SVR's reliability for forecasting these specific currency pairs. This analysis provides valuable insights for travelers, investors, and pilgrimage stakeholders, enabling better currency risk management in religious tourism and related financial activities.

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Logistics service quality, consumer trust, and product judgments in cross-border e-commerce

(pages 444-460)

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Keywords: cross-border e-commerce, consumer trust, product judgments, logistics service quality, cross-border logistics.
Abstract: In emerging markets, cross-border e-commerce (CBEC) depends on consumer trust and product judgments under conditions of logistics complexity, information asymmetry, and cross-border flow uncertainty. This research investigates the collective impact of platform attributes (information, system, and e-service/logistics service quality), value perceptions (price competitiveness, product uniqueness), and national psychological factors (affinity, ethnocentrism, animosity) on trust, product assessments, and cross-border purchasing flows involving U.S. and Chinese products purchased by Vietnamese consumers. Two online surveys were administered to CBEC users assessing U.S. (N = 1,041) and Chinese (N = 1,013) products. Using PLS-SEM and artificial neural networks, the results show that platform quality affects purchasing behavior mainly through trust and product evaluations rather than direct transactional mechanisms. For Chinese products, information quality and logistics-related e-service quality play a more prominent role, reflecting differences in logistics service execution. Price competitiveness and product uniqueness emerge as key value-driven determinants of product evaluations. Affinity strengthens trust and product evaluations, whereas ethnocentrism weakens them; animosity is largely insignificant in routine CBEC logistics flows. Trust is more influential for U.S. goods, while perceived value is more critical for Chinese goods. The study frames CBEC platforms as digital logistics systems coordinating information and service flows, and provides implications for cross-border logistics and platform design in emerging economies.

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Simulation-based optimization of buffer sizing in demand-driven distribution requirements planning

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Keywords: demand-driven DRP, buffer sizing, bullwhip effect, working capital, on-time service.

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ABSTRACTS

Abstract: Demand-Driven Distribution Requirements Planning (DDDRP) has emerged as an effective alternative to traditional forecast-driven planning systems by relying on strategically positioned buffers to protect logistics flows against demand and lead-time variability. However, buffer sizing in DDDRP is still largely based on fixed parameters, which may limit its effectiveness in complex multi-echelon distribution networks. This paper proposes a simulation–optimization framework for the tactical calibration of buffer sizes in a demand-driven distribution context. The approach integrates discrete-event simulation, developed using Arena software, with a metaheuristic optimization engine (OptQuest) to dynamically adjust buffer sizing parameters under realistic material and information flow conditions. The model is applied to a multi-echelon distribution network characterized by heterogeneous demand and lead-time profiles. The results demonstrate that the proposed framework significantly improves the trade-off between working capital and service level, which are two primordial indicators for an optimal distribution, while enhancing the stability of downstream and upstream logistics flows. By bridging the gap between theoretical DDDRP sizing rules and their practical implementation, this study contributes to the literature on demand-driven logistics planning and provides decision support for distribution managers. Future research perspectives include the integration of capacity constraints, multi-product flows, and stochastic supply delays.

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Mechanisms of digital logistics: how e-commerce SMEs improve logistics service quality and competitiveness

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Keywords: competitiveness, digital logistics management, digital maturity, e-commerce, service quality.
Abstract: This study examines how logistics digitalization in small and medium-sized enterprises (SMEs) engaged in e-commerce shapes customer satisfaction and business competitiveness through specific operational mechanisms. Using a structured narrative review, the research integrates conceptual findings into an analytical framework. The methodology consists of a bibliographic search (2020-2025), followed by a thematic synthesis of 69 abstracts selected after applying exclusion criteria. The analysis shows that digital logistics practices create value when they activate four mechanisms: visibility, synchronization, accuracy, and efficiency/automation. These mechanisms enhance customer satisfaction by improving transparency, reliability, personalization, and service speed, while strengthening competitiveness through cost reduction, scalability, and market differentiation. The findings also reveal that the effectiveness of these mechanisms depends on digital maturity, cultural adaptability, and absorptive capacity, as well as on broader institutional conditions. Limited investment, skill shortages, regulatory gaps, and infrastructural inequalities constrain SMEs' ability to fully scale digital tools, underscoring that technological adoption alone is insufficient without organizational readiness and institutional support. By articulating a framework of mechanism-based pathways linking digital practices to customer satisfaction and competitiveness, the study advances theoretical understanding beyond descriptive taxonomies and toward explanatory models of digital logistics. The study concludes by proposing a staged digital maturity model as a supporting tool to identify the current level of logistics capabilities of SMEs and to project scaling pathways toward higher levels of integration, automation, and analytical sophistication.

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