

Editorial: The time factor in maritime and port logistics

The theme of this special issue of *Maritime Business Review* is “The Time Factor in Maritime and Port Logistics.” It is an assortment of selected papers from the Maritime and Port Logistics (MPL) session of the MHCL 2022 (the 24th International Conference on Material Handling, Constructions and Logistics) – Belgrade and Bar Conferences held on September 21–23, 2022 at Belgrade, Serbia, and on December 14–16, 2022 in Bar, Montenegro.

The time factor in maritime and port logistics has gained importance due to its influence in completing a trip in liner shipping (a fixed route and schedule) and tramp (does not have a fixed schedule or route) shipping service and handling processes in ports, the time it takes to receiving or delivery goods or unit loads and the time it takes for the total cycle time of the maritime supply chain. How to reduce these times and through which methods are very common questions. The competition of shipping, port and logistics companies and operators has shifted from costs to how can time be a strategic advantage – who can respond to users in a shorter time and meet their needs of users. Managing the time factor is an important issue in maritime and port logistics, with a twofold impact. The first one is port congestion that impedes shipping lines from delivering impeccable liner services, while the second puts pressure on applying and using new emerging technologies in maritime and port logistics such as SMART technologies, among others.

A common inquiry in current MPL practice is how to relate the time factor to international seaborne trade, which reached a volume of 12.027bn tons in 2022, a decrease of 0.4% compared to 2021 (12.072bn tons). More details can be found in UNCTAD’s “Review of Maritime Transport” for 2023. Oil cargo distances reached long-term highs at the beginning of 2023. Grain transport covered longer distances in 2023 than any other year on record. Dry bulk cargo (excluding grain) also traveled longer distances during the same period, while containerized trade covered shorter distances since 2020 but increased slightly in 2023. Container freight rates are returning to pre-pandemic levels. Port cargo handling performance has improved after declining during the pandemic and port calls and traffic are recovering. Liner shipping connectivity is on the rise, as measured by the Liner Shipping Connectivity Index, with China at the top, followed by the Republic of Korea, Singapore and Malaysia (UNCTAD, 2023). Other improvements include bulk shipping performance, reduced time in port and congestion and the introduction of ultra large containerships with capacities exceeding 24,000 TEUs. A shorter time in port is a positive indicator of a port’s efficiency and trade competitiveness. Digital transformation and automation have also contributed to improved port performance.

To address these developments, this special issue explores the optimization of modeling container port operations and liner shipping connectivity data analytics, while the enhanced role of canals and route choice due to disruptions in maritime operations considered in the paper entitled “The Enhanced Role of Canals and Route Choice Due to Disruptions in Maritime Operations” by Zis will be published as a part of a regular issue in this journal during 2024 (due to the late acceptance of this paper, which made it impossible to be part of this special issue).



The open call for papers for MPL at the MHCL 2022 Conferences received dozens of submissions, and 33 papers were selected for publication in the 2 MHCL 2022 Proceedings. Selected submissions from these proceedings were further considered for this special issue. After rigorous review procedures in line with journal standards, the brief outlines of the accepted papers are presented below.

Various models are used to integrate decision-making and find optimal or near-optimal solutions to problems within a container terminal. In “Queueing Networks for Supporting Container Storage and Retrieval” by Legato and Mazza, an integrated model is developed to address container storage and retrieval operations in the yard. This network supports decisions regarding the organization of container yards, including operational policies and timing on the quay of a transshipment hub. Despite the frequent use of heuristic and metaheuristic methods, this paper studies analytical results and related approximations that consider nonexponential service times. A combination of simulation and analytical solutions is used to integrate handling processes on the quay and yard areas with transfer operations between them. Simulation results are used to estimate times, which feed into a simplified analytical model for container storage and retrieval operations. The queuing network is solved using algorithms based on mean value analysis (MVA) for product-form networks. This analytical approach allows for performance evaluation related to organizational policies and operations management in the yard area. This method provides reliable estimations of expected values for both user- and system-oriented performance metrics. The practical contribution of this paper lies in applying queuing networks for time-effective decision-making by combining analytical MVA and simulation to assess system throughput, time duration of round trips, queue lengths and waiting times at internal congestion points in container terminals.

As liner shipping connectivity is a central subject of interest in maritime shipping research, this paper, “Framework for Liner Shipping Connectivity Data Analytics and Research” by Yap, presents a framework for conceptualizing a large amount of related data and applying data analytics to gain deeper insights into the state of such linkages and potential areas for practical applications. The paper comprehensively discusses different perspectives on assessing shipping connectivity and the various levels of data contained within container shipping services. It highlights the potential application of data analytics for analyzing profitability, performance, competitiveness, risk and environmental impact. This approach provides a unique way to explore the data dimensions and levels within container shipping services that constitute liner shipping connectivity. The paper recommends the use of data analytics by shipping lines, port managers and operators and policymakers to enhance profitability through sustainable strategies. Shipping lines can optimize the deployment of ship capacity, improve economic efficiencies, expand market share, use cleaner fuels and assess the impact of changes in ship deployment using data analytics. Port managers and operators can achieve better integration of port and terminal assets with those of shipping lines, negotiate ship calls more effectively, enhance port safety and security and develop e-commerce platforms. Data analytics also offer policymakers the potential to integrate broader economic and societal data.

Keeping in mind that this special issue is based on relevant literature and current trends in maritime and port logistics, we hope that these insights will stimulate new research and discussions in the years to come. As an additional resource for our readers, this issue provides a concise yet important summary to address the ever-increasing demand for maritime and port logistics.

Last but not least, we express our sincere gratitude to the authors of the papers and all the reviewers who supported us in preparing this special issue.

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Branislav Dragović
Faculty of Maritime Studies, University of Montenegro, Kotor, Montenegro

Gang Chen
World Maritime University, Malmö, Sweden, and

Stratos Papadimitriou
Department of Maritime Studies, University of Piraeus, Piraeus, Greece

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