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THE ROLE OF THE PORT AUTHORITY IN ENHANCING THE RESILIENCE OF THE PORT ORGANIZATIONAL ECOSYSTEM

Elena Valionienė
Faculty of Social Sciences and Humanities, Klaipėda University
5 Salomejos Neries St., 92227 Klaipėda, Lithuania

Erika Župerkienė
Faculty of Social Sciences and Humanities, Klaipėda University
5 Salomejos Neries St., 92227 Klaipėda, Lithuania

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Abstract. This research explores the pivotal role of port authorities (PAs) in enhancing the resilience of the port organizational ecosystem (POE), emphasizing their dual responsibility as operational entities and representatives of public interests. Situated within public administration frameworks, PAs are tasked with advancing societal goals while ensuring efficient governance, innovation, and adaptability in the face of maritime challenges. The study investigates how PAs act as central drivers of resilience by aligning their governance structures, business models, and strategic initiatives with public and private interests. Key objectives include analyzing governance frameworks, assessing management effectiveness, and identifying interventions that promote stakeholder cooperation within entrepreneurial ecosystems. Through qualitative methods, such as stakeholder interviews and focus group discussions, the research highlights the shared responsibilities of PAs and their partners in fostering resilience. Areas of significant PA influence include regulatory oversight, infrastructure development, technological innovation, and environmental sustainability. Effective management and collaboration between PAs and other actors—such as terminal operators, municipalities, and communities—are shown to be critical for building resilient ecosystems. The findings emphasize the strong link between management effectiveness, public accountability, and resilience-building. PAs demonstrate their ability to drive green transitions, support innovation, and balance public and private goals through proactive governance and strategic partnerships. By situating PAs within the entrepreneurial and public administration contexts, the study underscores their capacity to serve public interests while fostering resilient, sustainable port ecosystems.

Keywords: port authority, public administration, resilience, governance, entrepreneurial ecosystems, shared responsibility, managerial effectiveness, sustainability

Raktažodžiai: uosto direkcija, viešasis administravimas, atsparumas, valdymas, antrepreneriškos ekosistemos, paskirstytoji atsakomybė, vadybinis efektyvumas, darni plėtra

Introduction

Ports play a crucial role in global trade, acting as the primary nodes that facilitate the exchange of goods and services across international borders and between land and water transportation systems. The main aspects highlighting and justifying their importance and roles in global trade are trade facilitation, economic impact, supply chain global connectivity, technological and managerial innovation, strategic importance of security and tourism, and leisure services development. Based on these aspects, it is seen that ports not only enable the physical exchange of goods but also play a strategic role in connecting economies, fostering economic development, and driving technological advances (Li et al., 2019). Their effective management is crucial for enhancing competitive advantage in the global marketplace (Silva et al., 2017), especially in the conditions of uncertainties and emergent market fluctuations. In these conditions, ports and their companies become subject to various vulnerabilities due to economic fluctuations, and these vulnerabilities can significantly impact their operations, efficiency, and financial stability (Garrido-Moreno et al., 2024). To enhance port resilience and firm performance, governance must focus on improving operational performance and connectivity. Port governance and management practices directly influence long-term outcomes, with experts seeking effective governance patterns to sustain attractiveness in maritime transportation. In the short term, adaptable practices help maintain stability amid market vulnerabilities (Baafi, 2024). Ports need to regularly update strategies to address market and regulatory changes, ensuring continued operational effectiveness and connectivity. Incorporating knowledge management into these strategies can further improve firm performance (Kusa et al., 2024). The main idea is to investigate managerial interventions rooted in entrepreneurial practices aimed at boosting regional competitiveness and economic benefits through resilient port operations. In this context, optimizing maritime port management strategies through effective short-term managerial interventions is crucial for ensuring the efficiency, sustainability, and competitiveness of ports in the global economy (Valionienė & Župerkienė, 2024). Port authorities must focus on critical areas, including operational efficiency, infrastructure development, environmental sustainability, and stakeholder engagement (Baafi, 2024). By doing so, ports can improve performance and effectively address the challenges of the modern maritime industry.

The object of research is the port organizational ecosystem resilience enhancement through entrepreneurial interventions. And t**he aim** of the research is to investigate the role of entrepreneurship in the field of the port organizational ecosystem's resilience enhancement.

The main objectives are as follows:

- To describe the role of entrepreneurial practices in the context of the port organizational ecosystem's resilience enhancement framework
- To prepare the research methodology based on what is required to develop the framework of entrepreneurial interventions
- To analyze the data for the identification of the main effective working entrepreneurial practices
- To discuss research results and identify the entrepreneurial practices driving forces within POEs to enhance POE resilience during international trade volatilities and disturbances

The methodology of research presented in this paper is a preparatory methodology in anticipation of the complex methodology of the wider research. The methodology used in the second stage of the research involved carrying out interviews with experts, and under the rules and methods of deep context analysis, some reasoning principles and visualization techniques were applied.

Theoretical framework

Ports are vital components of global commerce, serving as essential transfer points for goods and services across various transportation modes (Verschuur et al., 2022). Their importance is rooted in roles such as trade facilitation, economic contribution, supply chain integration, global connectivity, geopolitical strategy, and tourism. Consequently, ports function as complex organizational networks involving public and private entities working together to optimize maritime transport (Ilyas et al., 2024). However, ports face inherent vulnerabilities such as economic fluctuations, environmental hazards, and technological disruptions that threaten operational efficiency and resilience (Gurtu & Johny, 2021). The resulting challenges include reduced trade volumes, infrastructure damage, and cybersecurity risks. Given the evolving global supply chain and logistics landscape, a static organizational approach to port management is insufficient (Autio & Thomas, 2022). The competitive environment demands a more dynamic perspective, with competition extending beyond individual port capabilities to encompass entire port organizational ecosystems (Ascenio et al., 2014; Li et al., 2020).

Verhoeven (2010) first defined the port as an ecosystem management object, highlighting the port authority's transformative role in value creation for stakeholders. This perspective acknowledges that ecosystem attributes are not isolated but rather co-evolve with internal and external entities (Li, Urbano, & Guerrero, 2011). This interconnectedness is further amplified by the incorporation of sustainable development goals (United Nations, 2020), leading to the more recent definition of the port organizational ecosystem (Tsvetkova et al., 2017). The port is thus understood to be not merely a single organization but a network of organizations collectively pursuing shared objectives (Ibrahimi,

2017; Golzarjannat et al., 2021; Liu et al., 2024). Scholarly literature (Teece, 2016; Acs et al., 2017; Spigel, 2017; Zdravkovic & Rychkova, 2017; Malecki, 2018; Stam, 2018; Thomas, 2019; Riquelme-Medina et al., 2021; Spaniol & Rowland, 2022; Crnogaj & Rus, 2023) presents several ecosystem typologies:

- Organizational ecosystems, characterized by a central organization's internal and external interactions (Zdravkovic & Rychkova, 2017; Thomas, 2019)
- Business ecosystems, emphasizing value creation through inter-firm collaboration within specific markets (Teece, 2016; Riquelme-Medina et al., 2021; Spaniol & Rowland, 2022)
- Entrepreneurial ecosystems (Acs et al., 2017; Spigel, 2017; Malecki, 2018; Stam, 2018; Crnogaj & Rus, 2023), focusing on the environment fostering innovation and new venture creation (Table 1)

Port ecosystems exhibit characteristics of all three, but the entrepreneurial ecosystem framework offers a particularly valuable lens for understanding dynamic adaptation, innovation, and resilience (Crnogaj & Rus, 2023). The business ecosystem model (Spaniol & Rowland, 2022) focuses on value creation through inter-firm collaboration and the dynamics within a specific market, but the entrepreneurial ecosystem perspective (Crnogaj & Rus, 2023) adds the imperative of supporting new ventures, innovation, and the creation of a robust and dynamic environment for long-term growth and adaptability. Main differences and specific findings based on these findings are presented in Table 1.

Table 1. Feature comparison for organizational, business, and entrepreneurial ecosystems

Feature	**Organizational ecosystem**	**Business ecosystem**	**Entrepreneurial ecosystem**
Central focus	Central organization and collaborative stakeholders	Networks of organizations	Environment for business
Scope	Narrow	Broad	Broad
Emphasis	Internal efficiency	Value creation innovations	Business status creation, value-added creation, and growth

Modern seaports operate as complex, multi-layered business platforms serving diverse stakeholders, such as shippers, agents, energy companies, and port authorities (Bichou, 2007; Golzarjannat et al., 2021). The intricate network requires efficient resource management across multiple institutions (Ratten, 2022) and highlights the need for a robust framework to ensure resilience (Loubet et al., 2024; Valionienė & Župerkienė, 2024). The entrepreneurial ecosystem model offers a comprehensive approach by emphasizing resource availability (funding, talent, and knowledge), supportive institutions, and a culture of risk-taking and innovation, significantly enhancing port resilience (Kehinde et al., 2022; Valionienė & Kalvaitienė, 2023).

The framework presented in Table 2 builds upon previous evolutionary stages of port ecosystems. Initially, the organizational ecosystem laid the groundwork with a focus on regulatory compliance, collaboration, development, and interaction management. The business ecosystem stage expanded on these functions to include connectivity, integration, cooperation, diversification, and value creation. Evolving into an entrepreneurial ecosystem requires a broader scope, incorporating innovations, diversification strategies, sustainability initiatives, sustainable business models, stakeholder and community engagement, and culturally sensitive interventions (Henríquez et al., 2022). Strategic management actions focusing on engagement, leadership, adaptive capacity, co-evolution, and cultural sensitivity are crucial for realizing this evolution. By implementing these approaches across ecosystem categories—such as innovations, diversification, sustainability, stakeholder engagement, dynamic skills, and cultural aspects—ports can enhance their flexibility and adaptability to meet the diverse challenges of the modern globalized maritime environment.

Table 2. Framework of entrepreneurial practices and interventions, according to the relationship between different types of ecosystems, with the strategic tasks of organization management for POE resilience enhancement

Categories of managerial interventions	**Strategic management tasks: practices and interventions**		
	Organizational ecosystem	**Business ecosystem**	**Entrepreneurial ecosystem**
Innovations	Regulation Compliance Collaboration Development Interactions	Connectivity Integration Cooperation Diversification Added-value	Engagement Leadership Entrepreneurship Adaptiveness Co-evolution Culture
Diversification			
Sustainability initiatives			
Sustainable business modes			
Community/Stakeholder engagement			
Dynamic skills			
Culture			

Based on the findings presented in Table 2, two types of actions can be identified within the context of entrepreneurial ecosystem development and the evolution of the seaport organizational ecosystem: entrepreneurial practices and entrepreneurial interventions. Entrepreneurial practices encompass the methodologies and activities undertaken by entrepreneurs to identify and realize business opportunities, focusing on innovation, risk-taking, and proactive problem-solving to create value and drive growth (Champenois et al., 2019; Wilmsmeier et al., 2024; Valionienė & Kalvaitienė, 2023). This approach includes actions such as product development, business model innovation, market expansion, and strategic networking, allowing entrepreneurs to adapt and sustain competitiveness in dynamic market conditions (Kuakoski et al., 2023; Szymanowska et al., 2023).

In contrast, entrepreneurial interventions involve targeted strategies implemented by various stakeholders to enhance entrepreneurial activity and support business outcomes. These interventions—initiated by government entities, educational institutions, and business incubators—aim to foster an environment conducive to entrepreneurship by removing obstacles and creating supportive ecosystems (Oluchi, 2023). Interventions may include policy reforms, financial support, mentorship programs, and skill-building initiatives, addressing specific challenges such as access to capital and regulatory barriers (Henríquez et al., 2022; Kuakoski et al., 2023).

The integration of both entrepreneurial practices and interventions is vital for the resilience of port organizational ecosystems. By establishing shared roles among stakeholders, ports can drive advancements in innovation, diversification, sustainable business models, skill development, cultural growth, stakeholder engagement, and sustainability initiatives. Port authorities act as catalysts for technological advancements, while private sector companies contribute to sustainability and workforce enhancement. Government agencies provide essential regulatory frameworks and community engagement, and educational institutions facilitate the exchange of knowledge and skills. Community organizations promote responsible practices, ensuring that development aligns with local interests.

This collaborative approach enhances the port ecosystem's ability to address the multifaceted challenges posed by modern maritime environments. It fosters a resilient and adaptive port ecosystem that prioritizes innovation and sustainability, ultimately contributing to a robust, competitive global trade network that can respond effectively to disruptions and changing market dynamics.

Research methodology

This research employed semi-structured interviews, a flexible approach that combines structured questions with open-ended responses. The researcher utilized a list of guiding questions while adapting them based on the conversation flow, enabling a broader exploration of topics alongside systematic coverage of essential areas (Allmark et al., 2009). Semi-structured interviews were chosen for several key reasons (Patton, 2015), but the main one is that they balance consistency and flexibility, allowing for essential topics to be covered while encouraging the emergence of new ideas. Given the complexity of the topics studied, semi-structured interviews enable a deeper understanding through follow-up questions, allowing rich narratives to enhance findings. Adjusting questions based on participant responses fosters relevance to research objectives. Additionally, this format aids in gathering detailed qualitative data that can be compared across interviews, leading to deeper insights. In conclusion, utilizing semi-structured interviews provides an effective balance between comprehensive understanding and organized data collection, making it an ideal method for exploring the complexities of the research topic.

Given the broad implications of the research field and the diverse stakeholders

involved, an international expert group was formed, including individuals from the eastern Baltic Sea region: Estonia, Lithuania, and Latvia. The participant selection process utilized a combination of purposeful and stratified sampling (Patton, 2015; Makwana et al., 2023). Purposeful sampling was employed to select participants based on specific criteria relevant to the research objectives, aiming to include individuals who could provide diverse perspectives within the maritime industry and related scientific fields. Stratified sampling ensured representation across different subgroups within the port organizational ecosystem, encompassing primary port service providers, management companies, and governmental and non-governmental organizations (NGOs) (Patton, 2015). This stratification enhances the diversity and comprehensiveness of the collected data.

According to prior research (Ibrahimi, 2017; Lagoudis et al., 2019; Valionienė, 2020), the stakeholder distribution typically includes primary port service providers (44%), management companies (15%), governmental and non-governmental organizations (15%), hinterland logistics providers (15%), and scientists and researchers (1%). The sample reflected this structure, with most experts from primary port activity sectors. To maximize diversity, stakeholders from various countries (Lithuania, Latvia, and Estonia) were also included, as shown in Table 3.

Table 3. Structure of POE stakeholders invited to be interviewed

Type of stakeholder	**Professional activities of the experts**
Representatives of general cargo operations and services providers in ports (four experts) (R2)	International representatives from the stevedoring companies' association (one expert from Estonia [R5-1] and one expert from the Latvian maritime market [R5-2]), shipowners' association (one expert from the Lithuanian maritime market [R2-1] and one expert from Estonia [R2-2])
Port governance representatives (two experts)	Representatives of the port authority and municipality (one expert from the Klaipėda port authority [R1] and one expert from Klaipėda municipality [R3])
Representatives of other port private and public organizations, including NGOs (two experts)	Representatives of an environmental NGO (Latvia) (R4) and the Estonian maritime industry labor forces (R7)
Representatives of hinterland companies and other maritime-related services providers (one representative)	Representative of land transportation sectors (one expert from the Lithuanian logistics sector [R6])
Representatives of scientific research in the maritime field (one representative in each group, 9%)	Researcher from the University of Latvia (R8)

The structured agenda addresses the best entrepreneurial practices and possible managerial interventions for the implementation of statically described port resilience documents and guidelines. The main questions guiding the agenda are as follows:

1) What entrepreneurial practices contribute most significantly to the resilience of port organizational ecosystems? What are the main expectations of their implementation in practice?
2) Who could be the main driver for accelerating the entrepreneurship practices in the port organizational ecosystem?

The research was conducted in accordance with ethical requirements (Allmark et al., 2009; Nii Laryeafio & Ogbewe, 2023; Maldonado-Castellanos & Barrios, 2023). Participants were informed about the study's purpose, procedures, potential risks, and benefits, and informed consent was obtained prior to interviews to ensure voluntary participation. Confidentiality was maintained by anonymizing transcripts and securely storing data, with identifiable information removed from published materials. Experts were introduced to the research theme and interview objectives, focusing on identifying effective managerial practices that enhance the resilience of the entrepreneurial ecosystem.

Data collection occurred through remote meetings via Zoom, using NVivo software and a semi-structured discussion guide facilitated by a moderator. Discussions were audio-recorded, adhering to ethical requirements, and transcripts were generated along with field notes, though participant non-verbal cues were not analyzed. Thematic analysis was employed to code transcripts according to stakeholder functional types.

To ensure reliability, experts from diverse shipping regions and governance patterns were strategically invited, with emphasis on mid-sized and smaller ports due to their unique challenges. A balanced representation was achieved by focusing on issues relevant to the Baltic Sea region, particularly involving Lithuanian, Latvian, and Estonian maritime sectors. Participants were required to have a minimum of five years of managerial experience in the relevant field. Validity was reinforced by cross-verifying data for inconsistencies within stakeholder groups and comparing responses across various fields. Remote discussions gathered feedback on generalized conclusions, which were incorporated into the study's findings, enhancing the credibility and applicability of the results.

Scientific discussion of results: identifying the sources of initiatives for the implementation of entrepreneurial interventions for POE resilience enhancement

By combining the content of Table 1 and Table 2, some entrepreneurial practices for POE resilience enhancement could be identified by horizontal analysis for the explanation of the entrepreneurship influence on POE resilience and long-lasting monitoring and managerial practices:

– Development and integration of **innovations** for:
  - Port infrastructure as well as hinterland infrastructure, which will lead to the enhancement of resilience in the port disruption field through the operational performance and high adaptability of operations

  - Port superstructure and all equipment, reducing the time of ship operations and increasing throughput
  - Marine and port innovation management study programs, strengthening simulated and virtual training technologies for students, seafarers, and port labor to increase the level of versatile understanding of port operations and disruptions
- **Diversification** of port activities, which will enhance the business continuity opportunities during unexpected events in the global markets:
  - Developing new business areas in marine tourism, and also developing the technological services for vessels and trucks
  - Developing customer-oriented business models consisting of solutions for the deeply individualized advanced customer services creation
  - Diversifying the field of business activities through the development of value-added services, such as those designed to decrease the environmental footprint of customers, which links this priority with the environmental category
  - Diversifying port activities to increase community engagement opportunities for the establishment and alignment of port operations with the needs and values of communities, increasing the minimization of potential external risks that can lead to slower decision-making processes and influence the decrease in adaptability and flexibility of the whole POE
- Implementation of **sustainability** initiatives, which increase the PE compliance with international and national environmental regulations and also increase the importance of cooperative legislation formation on the different levels of port environments: micro-macro-mezzo-maxi-giga. These sustainability initiatives help maritime business companies bolster their reputation, comply with regulations, and—for public or public-private managing bodies—develop strong, eco-friendly port conceptions dedicated to urbanized areas and strengthening interaction between port authorities and municipalities.
- Development of innovative integrative **business models** for port business companies, which include sustainability-centric functions, value-added services promotions, and eco-friendly process orientation by including high-level services and the customization of algorithms for an increase in operational efficiency and flexibility, maximization of revenue, and optimization of operational decision-making under the pressure of disruptions and uncertainties.
- Ensuring up-to-date professional **competence** is an important entrepreneurial practice and could be implemented through safety and training programs, specialized lifelong learning and continuous training programs, cross disciplinary education models, and learning models on maritime innovation management and entrepreneurship, which influence the enhancement of resilience through important outcomes, such as up-to-date professional competence, adaptable and skilled workforce, health, security, cohesion, sustainability, and resilience, resulting in satisfied and loyal employees in the main POE labor force.

Summarizing the results of this study, it can be said that, by prioritizing the anti-principal practices according to the source of identification in the sample of experts, it is possible to highlight the importance of cooperation between private and public capital operators in enhancing the resilience of the whole port organizational ecosystem, but it is also possible to see more significant expressions of leadership in the initiation and support of certain different entrepreneurial practices, which could be possible or probable sources of initiation of a particular entrepreneurial managerial intervention:

- The private sector as an initiator is visible in the initiation, implementation, and maintenance of entrepreneurial practices such as the promotion and development of innovations, development of sustainable business models, and provision of dynamic competence of the labor force, both in terms of reskilling and upskilling, and in terms of the provision of up-to-date competence.
- The private sector as an initiator is visible in practices—and in their initiation and maintenance—for example, the development of diversification of activities, both at the regional and international level, sustainability initiatives, the involvement of communities, and the creation of a sustainable consumption culture conditioned by sustainable behaviors.

The results of the study also point to a number of areas where a gap between public and private actors in the organizational ecosystem has been highlighted, such as community engagement and culture-building practices (Table). The results of the study showed that, when it comes to community engagement, the experts largely referred only to the external community of the seaport but failed to identify the internal community of the seaport ecosystem. Partly based on theoretical assumptions, the experts placed more emphasis on communities as a component of stakeholders, and therefore, the private equity segment did not give importance to community engagement. This is also the case for the cultural practices of behavioral and consumption culture formation, which were given a strong focus by the public sector, where the general culture of consumption can also be shaped through the components of the organizational culture, which is particularly important for the development of an internal culture of sustainability in the organizational ecosystem.

Table 4.

Entrepreneurial interventions	**Possible driving forces within POEs**		
	Public sector	**Public and private sector partnership**	**Private sector**
Innovation			Initiators: port operators Support: port authority
Diversification	Initiators: municipality and hinterland logistics Support: port authority		

Sustainability initiatives	Initiator: port authority Support: municipality and education			
Sustainable business models			Initiator: port operators Support: education and research	
Community engagement	Initiators: port authority Support: municipality	X		
Dynamic competence			Initiator: port authority Support: port operators and education	
Culture	Initiator: education Support: port authority	X		

Thus, an examination of the impact of entrepreneurial interventions on POE resilience shows that public–private partnerships are an important factor, with exceptional initiatives distributed in this way: the business operators of the port operations should initiate and ensure the implementation of supra-generic initiatives such as innovation, sustainable business models and, in perspective, further research should be carried out, the initiation of the implementation of sustainability initiatives in the field of the port authority's competence, in the field of competitions, the involvement of communities, and the development of dynamic competence in the formation of a sustainable port workforce, leaving the initiatives for diversification processes to the segment of municipalities in cooperation with land-based logistics companies, and the initiatives for the formation of sustainable behavior and a sustainable consumer culture in cooperation with the port authority to be implemented through higher education and vocational training institutions providing qualification, retraining, and study and research services.

According to the research results, one of the most effective ways of implementing the identified anti-retrospective interventions, such as community involvement, is to activate private sector organizations, expand the concept of communities as stakeholders in the port's organizational ecosystem, and seek innovative methods of involvement in decision-making in the field of resilience and sustainable development. In the context of cultural anti-consumption interventions, the interaction of consumption behavior and consumption ultras with the culture of organizations in the port organizational ecosystem should be developed, and these latter interventions should be developed in parallel, since they have both horizontal and vertical interactions as a key component of building organizational resilience.

Conclusions

The theoretical analysis of the role of entrepreneurship in enhancing the resilience of port organizational ecosystems reveals that entrepreneurial practices serve as a bridge between various governance patterns. These practices are embodied through leadership, engagement, adaptability, and organizational culture, and they contribute to the benefits of networking and the cooperative and entrepreneurial governance practices in parallel with the conservative, cooperative, and entrepreneurial governance patterns described in the previous studies. The analysis also identified key criteria for resilience, which were later validated through empirical research. These criteria, according to the theoretical model, include the following: innovation and creativity, coordination and collaboration, inclusivity and participation, adaptability and flexibility, value creation, transparency and accountability, risk management and business continuity, long-term sustainability, and cultural development. The transformed system of criteria for the empirical research was applied, and due to limited information accessibility of some information, the empirical list of criteria was applied as follows: innovations and creativity, diversification, sustainability initiatives and business models transformations, community engagement, dynamic competence, and cultural developments.

The research methodology employed semi-structured interviews, utilizing both stratified and purposive sampling to ensure scientific validity and reliability of the research results. The sampling framework was based on a typical stakeholder structure, as outlined in previous studies on the attractiveness of the maritime transport sector and governance effectiveness.

Expert findings highlighted several entrepreneurial practices that enhance the resilience of port organizational ecosystems. According to the research, the driving forces behind these practices can be categorized as follows: innovation management requires partnerships between public and private entities within the port organizational ecosystem, including port authorities, educators, port labor, stevedoring companies, shipowners, and logistics firms. The development of dynamic competence is closely tied to innovation, with an emphasis on managing operational efficiency, adaptability, and the generation of versatile knowledge. Sustainability initiatives, on the other hand, are largely driven by municipalities, port authorities, maritime education and training institutions (MET), and labor forces, whereas business model adaptation in the context of resilience and sustainability is more commonly pursued by private organizations within the POE. Similarly, the development of competence and culture is spearheaded by port companies and educational institutions through efforts focused on skilling, upskilling, and reskilling. However, cultural initiatives aimed at fostering sustainability and resilience are more commonly associated with public entities, such as municipalities, port authorities, NGOs, and educational institutions.

It is important to note that across these various interdependencies, educational institutions play a crucial role. These institutions can act as connectors by offering specialized

courses, programs, and research initiatives aimed at ensuring greater resilience and promoting coastal sustainability.

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Elena Valionienė, Associate Professor, Management Department, Faculty of Social Sciences and Humanities, Klaipėda University, e-mail: elena.valioniene@ku.lt

Erika Župerkienė, Professor, Management Department, Faculty of Social Sciences and Humanities, Klaipėda University, e-mail: erika.zuperkiene@ku.lt