



NAVIGATING THE WATERS OF THE MARITIME INDUSTRY: CHALLENGES IN MALAYSIA

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ABSTRACT

The maritime industry has always played a significant role in international trade and transportation. The industry has changed significantly in recent years as a result of the introduction of new technology and the expansion of globalization. In this conceptual paper, a review study is undertaken to identify the challenges that the Malaysian maritime industry is facing. In order to get the necessary data regarding the difficulties facing Malaysia's maritime industry, this study looked at two cases from journals. The two publications mentioned in the methodology were utilized to pinpoint the two primary issues the maritime industry in Malaysia is facing. Findings show there are two primary issues faced by maritime industry which are sustainability and cybersecurity. The result of the study is necessary for Malaysia's maritime industry to advance, and it can also be used to guide future research into other areas and industries.

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1.0 INTRODUCTION

Most economists agree that international trading makes the globe a better place to live. Due to the expansion of trade and globalization, the maritime industry has significantly increased during the past few decades which links nations and economies all over the world. Shipping, which satisfies around 90% of commercial demand, is very important to world trade (Zaman et.al, 2017). A sophisticated interconnected set of nodes make up the maritime supply chain;

other shore-based means of transportation connect seaports with the hinterland, and maritime transit between important seaports (Nguyen et.al, 2022).

Accordingly, Southeast Asia was made up of 11 countries, which is typically separated into "island" and "mainland" zones and stretches from eastern India to China. Southeast Asia's island nations and maritime nations include Malaysia, Singapore, Indonesia, the Philippines, Brunei, and the newly independent East Timor (formerly part of Indonesia). Natural resources are abundant in Malaysia, including oil and gas, rubber, palm oil, and tin ore. The Straits of Malacca, which connect the Indian Ocean to the Pacific Ocean and the major Asian economies of India, China, Japan, South Korea, and ASEAN to the rest of the globe, rank among the most significant international waterways since the 7th century.

In addition, Malaysia's seven major seaports—five of which are primarily utilized for containers and two for oil and gas—make a significant contribution to the country's development and economic expansion. Malaysia has become a marine nation as a result of being surrounded by water and being strategically situated along the busiest shipping route in the world (Hanafiah et.al, 2017). According to Malaysia Transport Minister, the Malaysian maritime industry generates roughly 40% of the nation's Gross Domestic Product (Sekaran, 2022). The local economy in Malaysia is significantly boosted by the maritime sector. The oceans off the coast of Malaysia act as host shipping lanes, offering a platform for a prospective economic activities like travel, tourism, shipbuilding, ship maintenance, and port services (Menhat et.al, 2021).

Malaysia's maritime sector experienced a mixed development in 2022, with the shipping industry slowly steaming in rough waters, attempting to recover from the heavy blows of the COVID-19 epidemic, and rebuilding it under a lack of directional stability, although the ports have started to acquire speed (Sinar Daily, 2022). The long-lasting effects of COVID-19 have made shipping in Malaysia challenging. Because there have been so many lockdowns, the supply chain has been thrown off, which has made it harder to get products delivered on schedule and to find them. Because there aren't enough containers to meet demand, shipping costs have increased.

Moreover, due in part to the pandemic's gradual spread, Malaysia is currently recovering well from its consequences, with marine trade's contribution to GDP performing better than anticipated. The maritime sector is expanding slowly nonetheless, even though Malaysia's economy is expanding at various rates (Zaideen, 2023). Malaysia must therefore dramatically increase the efficiency, resiliency, and greenness of its port and shipping industry if it is to be completely equipped for the future. Technology developments, evolving trading patterns, environmental concerns, and regulatory changes have all contributed to the industry's substantial changes in recent years. The future of the sector and the parties engaged are profoundly impacted by these challenges.

Moreover, leading shipbuilders and operators aim to innovate by using state-of-the-art systems and technology that go beyond conventional designs to produce ships with cutting-edge remote control, communication, and networking capabilities. However, modern ships make great use of automation and IT systems, which gives hackers and other bad actors an additional opportunity to launch various cyberattacks that could result in catastrophic events and inflict significant safety losses (Akpan et al., 2022). Due to an increased reliance on technology and digital systems, the maritime industry in Malaysia, like in many other nations, confronts severe cybersecurity challenges. In terms of the busiest container ports worldwide, Port Klang and Port of Tanjung Pelepas were rated 12th and 18th, respectively, in 2019. (UNCTAD, 2020). Nonetheless, these ports' significance makes them potential targets of cyberattacks (Tan and Mohamad, 2021).

Furthermore, according to Sichun (2022), the most difficult and important problem that the maritime sector will face in the coming years is clearly maritime sustainability. Maritime used to take environmental sustainability for granted while neglecting the damage that the sector is doing to the environment. Furthermore, Yusof (2022) cited that in Malaysia, the maritime industry will have a difficult time reducing emissions because shipowners will continue to place a high priority on the need to preserve a low-cost transportation model. Consequently, Zaideen and Ramli (2022) mentioned that it is essential to raise awareness of the need for net-zero carbon emissions among the nautical community in Malaysia. This paper aims to identify the challenges of maritime industry in Malaysia.

2.0 LITERATURE REVIEW

2.1 SUSTAINABILITY CHALLENGES

Directly and indirectly, the International Maritime Organization (IMO) has significant influence over sustainability issues in the shipping, port, and maritime logistics sectors, as stated in the IMO Convention, which states that the organization's main goal is to conserve and use ocean resources in a "sustainable" manner (Lee et al., 2019). In the existing literature, three notable special issues have tried to deal with sustainability in maritime industry. However, in this study, environmental sustainability is a focus. One of the main forces behind the development of sustainable practices in organisations is environmental regulations and laws. Businesses make investments and work hard to fulfil basic sustainability standards but doing so may limit their capacity to apply creativity and innovation to sustainable business practises (Jović et.al, 2020).

Sustainability is the capacity to deliver services with negligible negative effects on the environment and natural resources (Wu et al., 2020). Concern has been expressed by the International Maritime Organization (IMO) regarding the protection of the world's waters from marine pollution. The unauthorized or unintentional release of solid trash is just one of many contaminations that have been identified as having a negative impact on ocean health (Mobilik and Hassan, 2016). Environmental sustainability must encourage environmental management efforts. In more detail, it encourages actions to lessen emissions, advance environmentally friendly technology and renewable energy sources, and maintain programmes aimed at attaining environmental sustainability (Argyriou et al., 2022).

2.2 CYBERSECURITY CHALLENGES

Over the years, cyberattacks have been rapidly increasing. Due to this, businesses face big financial losses for them to recover. The losses also include collateral damage, such as reputation and trust. This is because the information and communication technology (ICT) sector has advanced significantly over the past 50 years and is now pervasive and deeply ingrained in our contemporary culture. The cost of cybersecurity risks is expected to reach US \$6 trillion annually by 2021, and since COVID-19, the number of attacks has multiplied five times (Williams et al., 2020). Due to that, a combination of technologies and procedures known as cybersecurity are used to safeguard computers, networks, programmes, and data from damage, theft, and illegal access (Sarker et al., 2020). The authors also mentioned that as a result, security policymakers have recently shown tremendous worry about safeguarding ICT systems and applications against cyberattacks.

Cybersecurity is currently a term used to describe the process of defending ICT systems from various cyberthreats or attacks. Consequently, a cyber-attack is characterized as a direct attack initiated from one or more computers against another computer, a group of computers, or the

networks involved (Neo, 2021). He also mentioned that as more operational technology (OT), such as cargo handling systems at ports and engine control systems on board ships, is connected to the internet, cyberattacks have an impact on the real world. Thus, there is a considerable increase in maritime cyber-security events as the threat is becoming more and more obvious. The primary goals of these attacks are to take remote control of ships and other vessels, to steal crucial information that can be used to launch additional attacks, or to interfere with ship operations by tampering with critical components and rendering automated systems inoperable (Farah et al., 2022).

3.0 METHODOLOGY

This study has been done by reviewing two cases from journals to collect relevant information regarding the challenges of maritime industry in Malaysia. These two journals were used to identify two main challenges faced by Malaysia maritime industry.

“Factors Influencing Malaysian Maritime Industry in Remaining Sustainable in Global Trade” by Hanafiah et.al (2017) has been reviewed and the findings show there were three main issues in Malaysian maritime industry. In the literature, it was mentioned three issues related to sustainability which are operational, environmental and human resources issues.

Furthermore, another journal reviewed is written by Noor (2022) entitled “Addressing cyber security Vulnerabilities and Initiatives in Malaysia maritime industry”. The study provides a detailed discussion of the cybersecurity in maritime industry in Malaysia.

This qualitative case study is an approach to explore the challenges of maritime industry in Malaysia by using a variety of data sources. This method will ensure that the issue discussed in this research is explored through a variety of lenses rather than through one lens. This situation will lead to the multiple facets of the phenomenon being understood.

4.0 FINDINGS AND DISCUSSION

4.1 SUSTAINABILITY CHALLENGE

The world's total deadweight tonnage of container ships reflects the impact that the shipping industry has on global supply chain management. Yet, it is important to identify any potential influencing factors to make sure that Malaysia's maritime industry can sustain to participation in international trade. These factors include operational challenges, environmental issues, and issues related to human resources and the environment. However, this study focuses on environmental issues since ships are employed in the shipping sector to convey goods around the globe. A growing number of people are aware of the contribution that maritime transportation may make to global sustainability imperative. Many nations, including Malaysia, are dealing with environmental problems brought on by the expansion of maritime trade. According to Hanafiah et al., (2020), the primary problem brought on by maritime activities, such as oil spills from tankers and ballast water, which are known to pose risks to aquatic life, is marine pollution. Ritchie (2022) mentioned that Asia's rivers are the primary source of land-based plastic waste in the oceans. greater than 80% of it. However, large and intricate networks make maritime supply chains challenging to track in terms of environmental practises, changes in coastal hydrology, and greenhouse gas footprints (Fernando et al., 2019). Furthermore, the maritime industry's industrial structure is rapidly evolving. The environmental sustainability for this sector has become more difficult because of these changes.

Additionally, it results in an economic loss in terms of the overall amount of liabilities and compensation funds.

Hanafiah et. al (2020) also mentioned that with fossil fuels being its primary energy source, Malaysia is likewise affected by the global carbon dioxide (CO₂) emission problem. A large increase in the release of hazardous gases into the atmosphere is a result of the high energy demand brought on by industrialization and rapid economic growth. This sector also contributes to pollution through its sulphur emissions. Uncontrolled emissions of these toxic gases may cause the greenhouse effect, which is bad for human health, the environment, and the next generation. As a result, this presents a challenge to developing Malaysia to reduce emissions while balancing them with the demands of economic development that depend on the use of these fuels.

4.2 CYBERSECURITY CHALLENGE

Nowadays, most of the maritime sector is moving towards technologically advanced for improved ocean stewardship in order to take advantage of growth prospects. The sector is under constant pressure to satisfy the demands of the commercial marketplace and adhere to the International Maritime Organization's (IMO) carbon emission limits (Malaysian Investment Development Authority, 2021). Furthermore, one of the ways in integrating technology into the marine industry is by having automated ships. As a tool for increased efficiency and cost savings, automation is gaining popularity among shipowners (Berti, 2021). Moreover, maritime informatics' applied discourse has recently begun to focus on the role that digitization plays in marine logistics operations. Even though the maritime logistics business is made up of numerous actors, including shipping firms, rail operators, seaport and inland terminal operators, and freight forwarders, however, each element of maritime logistics needs to focus on its own digital transformation (Raza et al., 2023).

Cybersecurity dangers have therefore been increasing in the maritime industry. Becoming the target of cyberattacks on ships may seem strange. However, the growing usage of satellite communications and industrial control systems (ICS) has given hackers a new arena to play in (Tan and Mohamad, 2021). Furthermore, the literature also mentioned that while addressing cyberthreats, it's critical to keep in mind how unique maritime operational technology (OT) systems are because these components control the actual environment. A cyberattack aims to modify, remove, or steal data from a system as well as to disrupt, demolish, or control computer networks and systems. Maritime logistics could be negatively impacted by a very high risk of cyberattack (Noor, 2022). For instance, in May 2020, hackers gained access to the computers at the Iranian Shahid Rajaei Port, causing them to malfunction. As a result, the port's approach was severely congested on both land and waterways. To Israeli hackers, the cyberattack was attributed (Ismail and Main, 2021).

There are many challenges to consider, such as the fact that operational technology systems are responsible for real-time performance, incident response is time-critical to ensure the high reliability and availability of the systems, and access to OT systems should be strictly controlled without obstructing the necessary human-machine interaction. However, due to OT systems are designed to assist operational processes, they may not have the memory or processing power to handle the addition of security capabilities. The safety of the crew and the cargo on board, as well as the environment's health and the ship's ability to operate, may all be seriously compromised by OT system malfunctions (Arampatzis, 2020).

5.0 CONCLUSIONS

In contrast to the rising demand the sector saw during the pandemic, global shipping executives are struggling with declining exports, dropping freight rates, and growing anxiety about whether the industry is headed for a pricing war (Paris, 2023). The author also mentioned that early in the epidemic, there were lines of more than 100 ships off the coast of Southern California due to the surge in global demand for products. Since then, growing inflation has reduced demand for a variety of items as Americans have switched more of their expenditure to food, fuel, and services, leaving stores with an abundance of goods. In Malaysia, the shipping tonnage and number of shipping businesses are declining due to a lack of achievement due to the Covid-19 outbreak which made the maritime industry halted recently (Mohamed, 2022).

However, in this study there are two main challenges were highlighted regarding to maritime industry in Malaysia which are sustainability and cybersecurity issues. To address the sustainability challenge, regulations have been implemented, such as the Sulphur 2020 and GHG reduction targets of the International Maritime Organization (IMO). To lessen the industry's environmental impact, more innovation and funding must still be put into cutting-edge technologies. According to the chairman of the Malaysian Shipowners' Association (MASA), Mohamed Safwan Othman, adopting green shipping techniques is a key priority for maritime industry in order to solve environmental challenges (Bakar, 2022). However, lack of cost allocation is the key issue. To assist them in making the switch to environmentally friendly shipping, ship owners need financing. This is due to the high cost associated with high-tech green ships.

The port operations, ship navigation systems, and shore-based information technology systems of shipping businesses are the most frequently vulnerable areas in the maritime realm. Malaysia must therefore strengthen its maritime cybersecurity posture. Even in traditional industries, interest in digitization and corporate transformation utilizing technology has surged. However, malicious cyberattacks against ports across the world have been widely reported (Tan and Mohamad, 2021). According to Noor (2022), the maritime sector should develop a plan to lessen the effects of cyberattacks. Becoming cyber-resilient means doing this. Cybersecurity needs to be continually improved. The requirement is to comprehend, evaluate, and implement the essential safeguards. But there is no such thing as being too secure. An organization can still be attacked and compromised, regardless of how established or safe it is. As a result, a company can always respond to an attack and lessen its effects if they know what to do. Furthermore, the rising use of digital technologies has made modern, autonomous ships attractive targets for high-profile hacks. In order to strengthen resistance against threats to internal and foreign security, a variety of countermeasures and comprehensive defense plans should be implemented (Akpan et al., 2022).

Governments, port authorities, shipping firms, and labour unions all have a crucial role to play in determining the direction of the sector. It is crucial to strike a balance between the industry's obligation to safeguard the environment, guarantee safety and security, and advance social and economic development, and the need for innovation and growth. The findings of this study show there are two main challenges that are faced by the maritime industry. These findings are required to advance the maritime sector in Malaysia and can be used to direct future investigations into other regions and industries. A more in-depth study can be done in the future to further discuss this topic. A study can be done by doing interviews with maritime organizations. It also may include another element such as trends in maritime industry and comparison can be done with other Asia countries.

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