SURVIVAL STRATEGIES OF MALAYSIAN SHIPPING INDUSTRY DURING COVID-19 PANDEMIC: APPROACH TO DIGITALISATION AND AUTOMATION

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SURVIVAL STRATEGIES OF MALAYSIAN SHIPPING INDUSTRY DURING COVID-19 PANDEMIC: APPROACH TO DIGITALISATION AND AUTOMATION

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Abstract: The COVID-19 pandemic began in Wuhan, China, in December 2019. It has created chaos around the world, including the shipping industry. It struck at a difficult time for the maritime industry as companies are trying to navigate the issues of climate change, political risks, piracy and other problems as highlighted by the International Maritime Organisation in 2020. Thus, this study tries to identify the problems and discover key survival strategies adopted by the Malaysian shipping industry during the pandemic. The results show that Malaysia's shipping industry is suffering from a sharp reduction of business as cargo volumes decline, rising costs and labour issues due to pandemic restrictions. The key survival strategies of companies included the implementation of digitalisation and automation technology. These approaches are found to be maximised by industry players to increase work efficiency, optimise human resources and prevent the spread of COVID-19.

Keywords: Digitalisation, automation technology, pandemic problems, business, survival, strategies.

Introduction

At the end of November 2020, there were 64,485 COVID-19 cases in Malaysia, including 357 deaths and 52,647 recoveries, as reported by the Health Ministry. When the disease was declared a pandemic early that year, countries began closing their borders to international travellers to curb infections. Malaysia was no exception as the government implemented the Movement Control Order to ban all kinds of travelling (sea, land and air), even between districts at the peak of infections. However, even though the movement of humans have been severely curtailed, the movement of cargoes, especially import and export activities at seaports, were allowed to continue as usual. However, despite being recognised as an essential sector to keep the country's economy afloat, the shipping and maritime industry was also affected due to low cargo volume, cost overruns and labour issues.

The epidemic has caused the shipping and maritime industry to face its worst business slump in recent history. Maritime nations like Malaysia, which depends highly on manufacturing production and movement of cargoes at ports, had seen their national revenue being badly affected, causing their economy to fall into a recession. The shipping industry is not only renowned for its vital role in the global supply chain, since it accounts for 80 per cent of the total transportation of global merchandise (UNCTAD, 2019), but its freight rates are also highly volatile (Theodossiou *et al.,* 2020).

According to MATRADE, before COVID-19 was first reported in December 2019, Malaysia recorded its largest trade surplus since 2009 valued at RM137.39 billion — an increase of 11 per cent compared to the previous period. Furthermore, according to Malaysia

Investment Development Authority (MIDA), the United Nations Conference on Trade and Development (UNCTAD) had ranked Malaysia as the world's fifth-best country in terms of shipping connectivity. This shows the importance of Malaysia as an international shipping hub that makes it one of the top trade destinations in the maritime industry.

Problem Statement

The pandemic has affected the shipping and maritime industry, which is already weighed down by the US-China trade war in 2018 and world economic slowdown. The WTO Goods Trade Barometer showed that a sharp contraction of world trade in the second quarter of 2020, which is the lowest value on record.

According to maritime analyst Sea-Intelligence, the first-half of 2020 could see a 25 per cent fall in shipping traffic, with a ten per cent drop for the year overall. Many major ports have recorded a decrease in the number of containers being handled, while according to the world's largest container shipping company, A.P. Moller–Maersk, container volume is expected to remain low at around 25 per cent in the second quarter of 2020. Besides limited production of goods during the pandemic, this slowdown is mainly attributed to labour restrictions at ports as workers are forced to comply with the new norm to prevent the spread of COVID-19.

The low and slow volume of cargo have affected the income of industry players and put their business sustainability at stake. Thus, the objective of this study is to review the key survival strategies adopted by Malaysia's shipping and maritime industry during the COVID-19 pandemic.

Objective of Study

The specific aims of the study are:

I. To identify the problems faced by Malaysia's shipping and maritime industry during the pandemic.

II. To examine the key survival strategies adopted by Malaysia's shipping and maritime industry during the pandemic.

COVID-19

COVID-19 is a disease caused by the novel Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) (Altahir *et al.,* 2020). The first human-to-human transmission was reported in December 2019 in Wuhan, China, and is believed to have originated from bats sold in an exotic meat market. Although its symptoms are similar to the seasonal flu, COVID-19 is more infectious and fatal, which makes it a dangerous disease (Shangguan *et al.,* 2020). According to Jewell (2020), the early symptoms include coughing, runny or stuffy nose, sore throat, fever, headache, fatigue, chills and body aches (Jewell, 2020). Moderate cases will appear with pneumonia, breathing difficulty and low blood oxygen level (hypoxia) as the virus infects the lungs. Severe cases occur when the lungs begin to fail, which requires patients to be placed on ventilators for assisted breathing.

Altahir *et al.* (2020) stated that the pandemic began in Malaysia with 22 cases in January 2020, which were detected among foreign tourists. Within the next few months, the figure had grown to 651 as the coronavirus began spreading among local communities. According to worldometers. info, up to the end of Jan 31, 2021, there were 214,959 cases recorded in Malaysia with 760 deaths. The world total cases were reported at 103,219,580, with around 2,231,233 deaths. COVID-19 is described

as the worst pandemic after World War 2 (Millefiori *et al.,* 2020). In February 2020, the World Health Organisation (WHO) recommended containment and suppression measures to slow down the spread of the virus (Millefiori *et al.,* 2020).

Literature Review

Concept of Key Survival Strategies

The COVID-19 pandemic has brought major financial and operational impact on the shipping and maritime industry. Therefore, industry players need to come out with ideas to survive. According to Sahler and Carr (2009) and Stroe *et al.* (2018), survival tactics refer to a variety of distinct therapeutic and behavioural efforts that are placed in motion by people or institutions to tolerate, eliminate, monitor and mitigate traumatic experiences, as well as manipulating their way out of trial times. In addition, the survival strategies are not fixed, just like individual personality traits. Howbeit and Sarasvathy (2001) identified survival methods based on problem-solving and emotion-focused approaches. In this case, the problem-solving strategy ensures that the shipping business becomes actively responsible to allay the challenging situations, while emotion-focused survival strategies involve efforts to create success in business.

Areas of Key Survival Strategies – Digitalisation

Digitalisation has been identified as a game-changer and the most significant technological trend in society and business. Digitalisation is defined as the use of technology and data to produce sales, enhance business, replace/transform processes and build a digital climate, whereby information is at the core (Clerck, 2017). In the shipping and maritime industry, the digitalisation and use of data

have significant impact, in which the data is produced, exchanged, processed and analysed in large quantities and high speed. The industrial management literature defines digitalisation as the phenomenon of intelligently connected machines (Lerch & Gotsch, 2015; Parida *et al.,* 2015). Ships may serve as advanced sensor hubs and data generators, often in real-time, from anywhere. At the same time, advancements in satellite communications will enable high amounts of data to be transmitted at ever lower costs.

Digitalisation is a process of disseminating general-purpose technology. The preceding phenomenon was electrification, where humans adapted the use of electronic and electrical technology. Digitalisation of products and services may shorten the distance between people and things. It increases mobility. It makes networking effects decisive. It allows the use of specific data to the extent that it permits the satisfaction of individual customer needs — be it consumers or businesses. It opens up ample opportunities for innovation, investment and the creation of new opportunities. Going forward, it will be one of the main drivers of sustainable growth (Gaspar *et al.,* 2014). With its high networking standards and its wide number of networks, the shipping and maritime industry provides a wide variety of solutions for emerging technology across interfaces.

Digitalisation and Logistics 4.0 thus pose a great future for shipping firms (Binder, 2016). Digitalisation is the growing application of ICT across the economy, encompassing a range of technologies, concepts and trends, such as artificial intelligence, the Internet of Things (IoT) and the Fourth Industrial Revolution (IEA, 2017). Traffic, port logistics and just-in-time shipping will evolve as the big data revolution takes shape, and networking technology continues to grow.
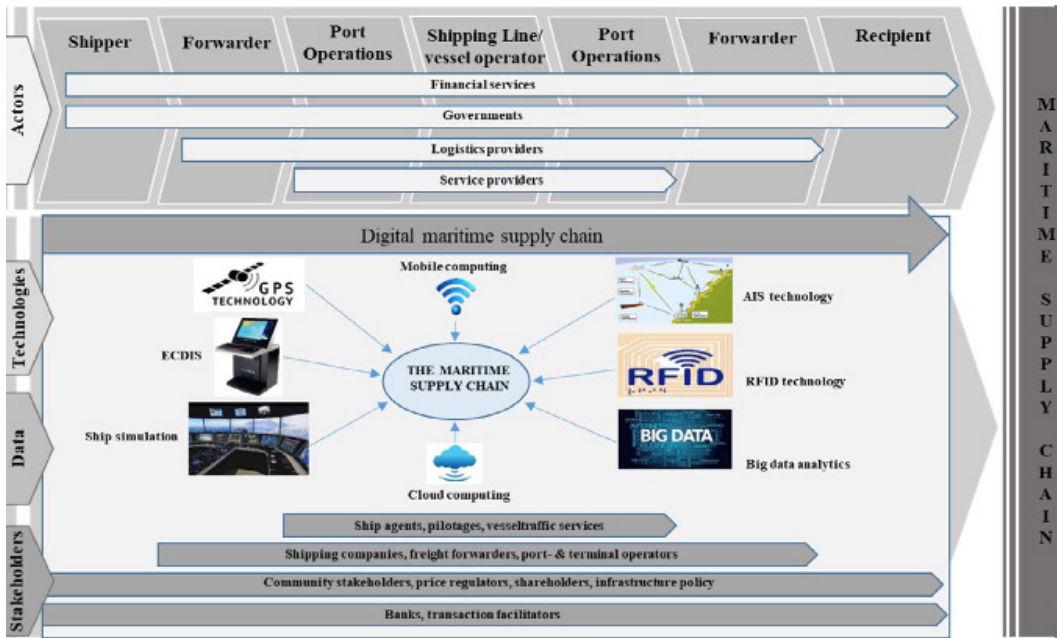
Figure 1: Interplay of actors in the maritime supply chain

Automation Technology

COVID-19 infection may be prevented by reducing human interactions through the use of automated and semi-automatic technology. Automation has been described as the mechanical or electrical output of work which, in many situations, "involve the substitution of automation components for tasks that humans are capable of performing" (Wickens & Hollands, 2000). Usually, the extent of automation is divided between the collection of information, interpretation, selection of decisions and execution of actions (Balfe *et al.,* 2015). Autonomous ships, semi-automatic bridge cranes or visual remote operation systems are simpler to popularise with the advancement of 5G technology. With the advent of computerised systems, operators may increasingly gain control of functions (Meister, 1999) and communicate with their systems (Lee & Moray, 1994). For this purpose, human-computer interaction has become a focus of considerable research in the 1980s (Guastello, 2006).

Automation may be used for a variety of reasons, such as minimising workload and resolving human performance deficiencies, since the operating environment is inadequate for human use and/or decreasing costs (Wickens & Hollands, 2000). Improved capability and efficiency, decreased manual workload and exhaustion, efficient usage of machinery, more precise management of repetitive procedures, and reduced gaps in human abilities are some advantages of automation highlighted by Wiener and Curry (1980) and Balfe *et al.* (2015). During this COVID-19 pandemic, the use of automation technology may be maximised while manual operations may be minimised to increase efficiency, reduce wage cost and most importantly, minimise the spread of COVID-19.

Methodology

Questionnaires were conveniently distributed to 50 respondents of the top management; middle management and the rest were from supervisory and non-managerial level positions shipping companies located in Malaysia to answer and provide data from the question.

The main questions that the study sought to answer for:

I.   To identify the problems faced by Malaysia's shipping and maritime industry during the pandemic.

II. To examine the key survival strategies adopted by Malaysia's shipping and maritime industry during the pandemic. The two questionnaires both had close-ended Likert-type questions and open-ended questions. This made it possible to collect both quantitative and qualitative data. The development of the research instruments, especially the items on Likert-type questions was based on similar studies (Niamie, O., & Germain, O. 2014; Pfohl, H. C., Yahsi, B., Kurnaz, T. 2015; Svahn, F., Mathiassen, L., Lindgren, R., 2017). Data were subjected to quantitative analysis using SPSS version 21.

Results

All 50 respondents had replied to the questionnaires sent to them.

The results of the questionnaire study were used to answer three objectives in the study, namely to identify the problems faced in the shipping and maritime industry during the pandemic, to examine the key survival strategies adopted by industry players (digitalization and automation technology) and develop a model on the strategies. In the questionnaire, the questions were divided into four parts:

Section A: Demographic questions (type of management, department, years of experience, educational background, and gender);

Section B: Problems faced during the pandemic (employees' welfare and business slowdown);

Section C: Key survival strategies (Digitalisation); and,

Section D: Key survival strategies (Automation Technology).

Data Analysis

Table 1: Analysis questions related to problems faced by Malaysia's shipping and maritime industry
(Crew welfare and business slowdown)

Question No.	Problem Statement	Percentage					Mean	
		SD	D	NDA	A	SA	Score	Level
1	Increase in human error	0	6	32	38	24	3.80	High
2	Inability to change crew shifts	0	4	26	34	36	4.02	High
3	Extended working periods may lead to crew fatigue	0	4	14	50	32	4.10	High
4	Economic slowdown	0	8	22	36	34	3.96	High
5	Delay in cargo deliveries	2	2	26	42	28	3.92	High
6	Decline of imports and exports	2	14	18	44	22	3.70	High
	Average Mean						**3.92**	**High**

Table 1 shows the mean of problems faced by Malaysia's shipping and maritime industry during the COVID-19 pandemic in terms of crew welfare and business slowdown. Six items were presented and 50 percent of respondents agreed that extended working periods would lead to crew fatigue (item No. 3), while 44 percent agreed that the decline of imports and exports was a problem (item No. 6). A total of two percent of respondents disagreed that the pandemic could cause delays in cargo deliveries. The mean Likert score for problems faced by the industry in terms of crew welfare and business loss was 3.92, which could be considered severe.

Table 2: Analysis question related to key survival strategies (digitalisation)

Question No.	Statement	Percentage					Mean	
		SD	D	NDA	A	SA	Score	Level
1	The key survival strategies	2	0	14	52	32	4.12	High
2	A game-changer and significant technological trend	0	0	22	42	36	4.14	High
3	Making significant impact on the data produced, exchanged and analysed in large quantities	0	0	22	38	40	4.18	High
4	Increasing speed in the way data is produced, exchanged and analysed	0	2	20	48	30	4.06	High
5	Growing application of ICT	0	2	16	42	40	4.20	High
6	Ample opportunities for innovation and investment	0	0	16	48	36	4.20	High
7	Creation of new business and job opportunities	0	2	36	38	24	3.84	
	Average Mean						**4.11**	**High**

Table 2 shows the mean of the key survival strategies in terms of digitalization. There are seven items, with item No. 1 gaining agreement from 52 percent of the total respondents. Meanwhile, 48 per cent of the total respondents agreed that digitalisation technology could increase the speed in producing, exchanging and analysing data (item No. 4). Both the scores in item No. 5 and 6 showed that digitalisation technology was growing with the application of ICT, and it provided ample opportunities for innovation and investment. The mean score for the whole key survival strategies in terms of digitalisation was 4.11, which indicated a high level of adaptation.

Table 3: Analysis question related to the key survival strategies (automation technology)

Question No.	Problem Statement	Percentage					Mean	
		SD	D	NDA	A	SA	Score	Level
1	The key survival strategies	0	2	10	54	34	4.20	High
2	A game-changer and significant technological trend	0	2	16	52	30	4.10	High
3	More effective method to prevent the spread of COVID-19	0	2	18	50	30	4.08	High
4	Can increase work efficiency	0	0	20	50	30	4.10	High
5	Can reduce the cost of labour	2	4	36	36	22	3.72	High
6	Creation of new business and job opportunities	2	0	34	36	28	3.88	High
	Average Mean						**4.01**	**High**

Table 3 shows the mean score of key survival strategies in terms of automation technology. There are six items and item No. 1 was agreed to by 54 per cent of the respondents. Meanwhile, 52 per cent of respondents agreed that automation technology was a game-changer an significant technological trend. Item No. 5 showed that automation technology could reduce labour cost with the lowest mean score of 3.72. The average score was 4.01, which indicated a high level of adoption.

Reliability Analysis

Table 4: Reliability of test results

No	Construct Name	No. of Items	Cronbach's Alpha
1	Problems faced by Malaysia's shipping and maritime industry during the COVID-19 pandemic (Crew welfare and business slowdown).	6	0.667
2	The key survival strategies for Malaysia's shipping industry during the COVID-19 pandemic (Digitalisation)	7	0.814
3	The key survival strategies for Malaysia's shipping industry during the COVID-19 pandemic (Automation Technology)	6	0.736

Table 4 shows the value of Cronbach's Alpha, which was above the benchmark. Problems faced by the industry had a Cronbach value of 0.667, which indicated a fair level of reliability. The key survival strategies in digitalisation had a value of 0.814, which was a very good level of reliability. Lastly, the key survival strategies in automation technology had a value of 0.736, which was a good level of reliability.

Discussion

Pandemic Problems

Many respondents s agreed that the pandemic had caused employees to experience extended working periods because of labour restrictions, particularly in the rotation of shipping crew. This causes the crew members to be separated from their families for a long time, leading to fatigue. When crew fatigue happens, there would be potential for human error to occur, leading to accidents and losses to the companies.

This result was supported by Feng *et al.* (2020), which stated that practically all port authorities had forbidden seafarers from disembarking their ships for rest and recreation. Furthermore, to comply with applicable international maritime rules, more than 100,000 seafarers must be rotated from their ships every month. However, owing to travel prohibitions, it is believed that some seafarers were unable to join their ships. Another research by UNCTAD (2020) also supported this statement that in certain nations, changing of crew members had not been permitted. In certain ports, the marine sanitary authority had yet to adopt a crew change policy. This had caused existing crew members onboard ships to extend their service on board ships as they could not be substituted because of COVID-19 restrictions.

Item No. 4 had the third-highest mean score of 3.96, in which respondents strongly agreed that there was an economic slowdown. This showed that the COVID-19 pandemic has caused the global economy to suffer a recession. This result concurred with Feng *et al.* (2020), which stated that COVID-19 posed an immense economic problem. As a result of global isolation policies, the economy and trade were expected to decline as seen in falling stock markets, which might lead to major line adjustments and capacity suspension in shipping. Another research that supported this statement was conducted by the World Bank in 2020, which found that a major pandemic could reduce the global gross domestic product by up to one per cent. Another statement by the United Nations (2020) said that 90 per cent of the global economy had been impacted by various lockdowns in the second quarter of 2020.

Digitalisation

The analysis showed that digitalisation was a key strategy adopted by Malaysian shipping and maritime industry. Digitalisation was growing fast in the industry because the companies wanted to minimise the number of employees to reduce labour cost and comply with pandemic restrictions. As digitalisation continued to grow, its would bring ample opportunities for innovations in technology.

This result concurred with those obtained in a study by the International Energy Agency (IEA) in 2017, which found that digitalisation was growing in the world economy, encompassing a range of digital technologies, concepts and trends, such as artificial intelligence, the Internet of Things (IoT) and the Fourth Industrial Revolution. In the maritime world, there was the "Internet of Ships and Sea Services", which comprised sensors, actuators and processors incorporated in the technical systems of ships, such as engines, communications and data fusion systems,

propellers and cargo systems (Levander, 2017). Embedded software platforms could control ship operations remotely, network the shipping business and link marine logistics service systems (Lycett, 2013; Shmueli *et al.,* 2011; Thomas *et al.*, 2014).

Svahn *et al.* (2017) stated that digital solutions could be complemented with novel business concepts, models and practices. With the advancement of digitalisation in the shipping industry, a variety of orthogonal or interlaced technologies, such as artificial intelligence algorithms and block chain platforms, might be combined to provide a variety of solutions, such as digital assistants for transportation experts and safe, decentralised cargo-tracking systems. Traffic, port logistics and just-in-time shipping would evolve as the big data revolution takes shape, and networking technologies continued to grow. Shipping technologies and solutions would be synergised with their supply chain counterparts (Pfohl *et al.,* 2015).

Automation Technology

Respondents strongly agreed that automation technology could be widely implemented in shipping activities. This technology could increase process efficiency by reducing manpower and substitute it with robots.

This observation was supported by Wickens and Hollands (2000), which stated that automation might be used for a variety of reasons, such as minimising workloads and improving human deficiencies, since the operating environment was inadequate for human use and/or decreasing costs. Improved capability and efficiency, decreased manual workload and exhaustion, efficient usage of machinery, precise management of repetitive procedures, and reduced gaps in human abilities were advantages of automation highlighted by Wiener and Curry (1980) and Balfe e*t al.* (2015). According to McKinsey &

Co Malaysia senior partner Nimal Manuel, automation was already being adopted by the shipping and maritime industry prior to the emergence of COVID-19. Indeed, the management consultancy company estimated that by 2030, automation might take up to 25 per cent of Malaysian labour hours. As a result, the long-running effects of the pandemic were expected to accelerate the adverse effects of automation: contraction of labour share, differential impact on workforce (primarily favouring high-skill workers), and increased income inequality.

However, there was a bright aspect to future possibilities. Because of the pandemic, we may see acceleration in the automation technology of our economy and lives. Investing in higher-quality automation technology infrastructure could assist in building a more equitable ecosystem of opportunities. Building human capital with an emphasis on automation technology competencies might open new opportunities.

Conclusion

The study on key survival strategies for Malaysia's shipping industry during the COVID-19 pandemic was clearly influence by the two variables which were digitalisation and automation technology. Digitalisation was growing faster because companies had to deploy fewer employees to comply with pandemic restrictions and reduce labour cost. As digitalisation continued to grow, ample opportunities might arise for technological innovations. The pandemic had also helped companies to understand the power of digital communication, which had major implications in doing business efficiently beyond boundaries. Meanwhile for automation technology, respondents strongly agreed that automation technology was an important tool to capitalise on to increase work efficiency and prevent the spread of COVID-19.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Notes on Contributors

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