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Crisis, Adaptation and Sustainability: Digital System Interoperability in the Cruise Industry

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5.1 Introduction

Cruise tourism in the European Union (EU) is one of the largest growing sectors in the tourism industry. After North America, Europe is the largest cruise market in the world (CLIA, 2019). However, while cruises in Europe were on the rise, the Cypriot cruise industry faced a gradual

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decline. Since 2005, the Cypriot cruise sector lost about 90% of its cruise passengers. The downturn is mainly attributed to slow adaptation to external forces, such as political instability in the Eastern Mediterranean region (Loizou, 2020).

Lately, an attempt is being made to overcome the crisis, as part of a new governmental vision to establish Cyprus as a major cruise hub in Eastern Mediterranean. International agreements have been signed, infrastructure investments have been made, and port components have been privatised (Hadjiannou, 2019). This collaborative effort is taking place within a wider turn to digitisation, which includes the ongoing harmonisation from the National Maritime Single Window (NMSW) to the European Maritime Single Window (EMSW), and the interoperability between various systems. Within this context, the current chapter is part of an Interreg project, titled ‘*NAYS—Utilisation of Maritime Information in the Interoperability of Supply Chains and Cruise Service*’ (<https://naus-project.eu/>). The main aim of ‘NAYS’ is to develop a digital platform to facilitate sustainability in the supply chain (also see Sdoukopoulos et al., 2020). The platform will network ports, local producers and suppliers with cruise companies—who would gain direct access to the market. The platform will also serve as a database for the collection and analysis of cruise-related market needs. In addition, it will aim at reducing the social cost of environmental pollution, energy consumption and traffic congestion with an emphasis on the areas around ports. This is achieved by exploiting available technology, utilising shipping information, and enhancing knowledge transfer in Cypriot ports.

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In this chapter, we seek to contribute to an understanding of crisis, adaptation and sustainability through the following objectives: first, we explore the reasons behind the downturn of the Cypriot Cruise Industry. Then, a second objective is to explore the ongoing digitisation, and its role in enhancing the cruise supply chain sustainably. To address these objectives, we draw on findings collected through workshops and face-to-face interviews with the Shipping Deputy Ministry, Cyprus Port authority, cruise companies, suppliers and other key stakeholders. The current study makes a significant contribution to the literature of system interoperability and utilisation of shipping information. The study's findings concern EU-wide policy and could be generalised, or be useful, to ports in the Mediterranean region and other Member States.

The chapter is organised as follows. First, we review the crisis factors that led to decline, along with the ongoing digitisation through NMSW and EMSW. Then, the research design is discussed, prior to presenting the study's findings. The final section reflects on our findings to discuss how digitisation may support the cruise supply chain sustainably.

5.2 Literature Review: Co-existence of Crisis and Digitisation

Crisis in Context

Since 2010, the Cypriot cruise industry has been declining unceasingly. Its downturn is characterised by a paradox. On the one hand, for almost a decade, Cyprus has seen record-breaking tourism figures and has attracted millions in hotel investment and tourism-related infrastructure, whereas tourism's contribution to the Gross Domestic Product soared by 20% (Loizou, 2020). On the other hand, during the same period, Cyprus has lost about 90% of its recorded cruise passengers. This is evident in the statistics provided by MedCruise on passenger traffic (Table 5.1). From 378,909 passengers in 2010, the number dropped to 43,197 in 2019. Earlier numbers reveal an even sharper decline. For instance, the number of passengers in 2006 was 448,821 (Cyprus Port Authority, CPA). The reduction in numbers of passengers and cruise ships calling to Cyprus is

Table 5.1 Arrivals-departures of passengers and passengers in transit

Year	Total Pax	Total calls
2019	43,197	38
2018	91,089	106
2017	123,397	113
2016	141,358	135
2015	173,309	167
2014	183,507	223
2013	271,673	255
2012	248,356	247
2011	303,086	454
2010	378,909	378

Source: MedCruise

attributed to the wider political turbulence in the Eastern Mediterranean region (Charalambous, 2019).

Lately, an attempt is being made to change the negative picture and promote Cyprus as an attractive port of call for cruise ships. A number of recently signed agreements with neighbouring countries, a new national investment policy and developments in infrastructure aim at reviving stakeholders' interest. As of February 2017, DP World Limassol was awarded a 25-year concession to exclusively operate the multi-purpose and Cruise terminal in Limassol (the biggest port in Cyprus), and a brand new 7000 sqm cruise passenger terminal was inaugurated.

However, while the numbers of passengers and cruise ships calling to Cyprus remain low, it is questionable whether the factors behind the decline can be attributed to external factors only. It becomes even more questionable if we consider that the collapse took place in a period where cruises in the EU were recording a steady upward trend; and, Cyprus was recording unprecedented tourism arrivals. Therefore, one of the purposes driving this study is to identify the actual reasons behind the downturn, prior to making suggestions for sustainable development. Also, as explained in the next section, the revival effort takes place within a wider context of digitisation.

The Digital Context

Technology diffusion and digitisation in tourism are manifested in several ways. Scholars have previously examined disruptive technologies in tourism (Buhalis, 2020), smart-tourism interoperability (Buhalis & Amaranggana, 2014; Buhalis & Leung, 2018), hotel analytics (Efthymiou, 2018; Efthymiou et al., 2020), cashless payments (e.g. Batiz-Lazo & Efthymiou, 2016a, 2016b, 2016c; Efthymiou & Michael, 2013, 2016), blockchain and robots in hotels (Efthymiou et al., 2019), digitisation in education (Efthymiou & Zarifis, 2021) and digitalisation in custom-authorities to enhance trade around the world (World Customers Organisation, 2018), among others.

In this chapter, moreover, we examine an institutionalised EU-wide digitisation through system interoperability in the cruise industry. This is carried out through the implementation of a National Maritime Single Window in each EU member state. Then, an equally important step concerns the establishment of a European Maritime Single Window Environment, which is going to be common in all EU ports. These systems aim at enhancing the competitiveness and efficiency of EU ports. At the same time, they aim at minimising instances of crisis by facilitating the use of digital information, and thus, reducing the administrative burden on ships. The following sections offer a review of the conception and implementation of digital technology in the cruise and wider maritime industry.

Conception and Historical Evolution of the National Maritime Single Window (NMSW)

Upon their call into a port, each ship has to submit a set of pre-arrival information via its maritime transport operator. The information needs to be submitted to a range of local agencies, varying from different local authorities, operators and agencies. Multiple reporting results to crisis through disorganisation and excessive administrative burden among stakeholders with negative impacts on the logistics chain. In addition, the information provided by ships is not efficiently shared among concerned

stakeholders (Pape, 2019). To rectify the inefficiency associated with this situation, the ‘*European Parliament and of the Council*’ issued on 20 October 2010, the ‘Directive 2010/65/EU on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC’ (Official Journal of the European Union, 2010). The directive concerned the standardisation of electronic transmission of information and reporting formalities, through a Single Window, which enables all stakeholders involved in the business process to input the information used by other stakeholders. The information provided should be submitted electronically and only once, by using a single point of data entry and storage. The European Parliament set a deadline for implementation by 1 June 2015, offering to Member States five years to establish a National Maritime Single Window (NMSW).

The concept of Single Window (SW) has been in development for decades. Historically, it was conceived by customs for trade facilitation. ‘Single Windows’ were first introduced by United Nations (UN) Centre for Trade Facilitation and Electronic Business (UN/CEFACT), to improve the exchange of information between trade and government (Koliousis & Katsoulakos, 2015). Gradually, the use of SWs became common in transport facilitation until its institutionalisation by ‘Directive 2010/65/EU’, as National Maritime Single Window (NMSW).

More recently, NMSWs is examined in a wide range of contexts and for different purposes. For instance, NMSW has been discussed in relation Blockchain and smart contracts to improve the accuracy and transparency of trade data (Ganne, 2018). In addition, the National Maritime Single Environment (NMSE) has been associated with Economic and Environmental sustainability. According to Tijan et al. (2019), the benefits of implementing an NMSW include economic sustainability (due to paperless clearance, efficient and predictable supply chain management, among others), environmental sustainability (due to disaster management) and social sustainability (due to improved compliance, mutual recognition agreements, robust legal framework). Also, it can integrate the digital platforms of different countries (as with the case of Singapore and Hong Kong), which enhances the supply chain transparency, integrity and security (2019). What is more, NMSW is linked to trade facilitation as simplification and standardisation of information flows enhance trade

and transport chains (Koliousis & Katsoulakos, 2015). At the same time, contradictory studies recommend that the setup and operation costs of NMSWs may be forbidding. Kapidani et al. (2020) have conducted a cost-benefit analysis, which suggests that the cost associated with NMSW, for its implementing and ongoing operation, may exceed its benefit. This is the case especially in developing, small or coastal countries, with limited human resources and infrastructure available.

Moreover, following the implementation of NMSW, an EU-wide harmonisation is attempted. As explained in the next section, for the past several years, the EU has been working on the development of the European Maritime Single Window—EMSW.

EU-Wide Harmonisation Through the European Maritime Single Window Environment (EMSWe)

However fruitful the attempt to establish individual NMSWs in each country is (and it really is), this process does not enable harmonisation across EU ports. Lack of harmonisation often results in crisis (in the short or long term). Therefore, the European Commission has proposed to bring all the reporting linked to a port call together into one digital space, namely, the ‘European Maritime Single Window’. The regulation was published on 25 July 2019 and entered into force on 14 August 2019 as *Regulation (EU) 2019/1239 of the European Parliament and of the Council of 20 June 2019 establishing a European Maritime Single Window environment and repealing Directive 2010/65/EU* (eumonitor.eu, 2019). The main aim of the ‘European Maritime Single Window’ is to harmonise reporting procedures for shipping operators and ensure that data can be shared and reused efficiently. As Norbert Hofer (President of the EU Council) mentioned:

[a] single reporting window for ships will significantly reduce the administrative burden on maritime transport. We are creating conditions for increased application of the once-only principle, so that ships would only need to report once per port call and the same information would be reused for subsequent port calls within the EU.

A good question then is, what happens with the National Maritime Single Window systems. Apparently, the existing National Maritime Single Window in each Member State should be maintained as the basis for a technologically neutral and interoperable European Maritime Single Window environment (EMSWe). However, as mentioned earlier, the directive 2010/65/EU for the National Single Window, in essence, is repealed by regulation (EU) 2019/1239 and becomes redundant.

The European Maritime Single Window offers an environment where all existing National Maritime Single Windows are linked together in a coordinated and harmonised manner. The reform improves interoperability between various systems, making it much easier to share and reuse data (Maritime Cyprus, 2019). The Single Window regulation provides a standardised interface system to provide information to ship operators in the same format across the EU. To that end, the European Maritime Single Window (EMSW) will rely on an established and very specific data set, which covers all reporting obligations set out in the Union as presented in Table 5.2.

Moreover, according to Katsoulakos (2013), EMSW will include the following indirect benefits:

- promote cooperation between customs and business communities.
- traders will trade with a single administrative authority.
- strengthen networking arrangements between customs administrations and consequently support the smooth movement of goods through secure international supply chains.

Within this framework, the chapter's second objective is to examine the progress of the implementation of an EMSW environment. More specifically, we are interested in whether the interoperability of systems (e.g. between EMSW and NMSW) may contribute to a sustainable supply chain, and support the adaptive effort.

Table 5.2 Data set for reporting formalities through EMSW

Directives	Information
Directive 2002/59/EC	Notification for ships arriving in and departing from ports of the Member States
Regulation (EC) No 562/2006	Border checks on persons
Directive 2002/59/EC	Notification of dangerous or polluting goods carried on board
Directive 2000/59/EC	Notification of waste and residues
Regulation (EC) No 725/2004 (EEC) 2913/92 and Regulation (EC) 450/2008	Notification of security information Entry Summary Declaration (Regulation)
FAL forms 1 to 7: Maritime Declaration of Health	General Declaration; Cargo Declaration; Ship's Stores Declaration; Crew's Effects Declaration; Crew List; Passenger List; Dangerous Goods
Directive 2009/16/EC	<ul style="list-style-type: none"> • Pre-arrival notification for ships eligible to expanded inspection • Notifications of actual arrival and departure
Information in accordance with national legislation may also include:	<ul style="list-style-type: none"> • Cargo-related formalities: Declaration of Temporary Storage, Cargo Manifest (tentative) • Waste delivery receipt, • Bunkers remaining on board • Civil Liability Certificate for Oil Pollution Damage • Civil Liability Certificate for Bunker Oil Pollution Damage • Ship defects

Source: Council of the EU, <http://data.consilium.europa.eu/doc/document/ST-14587-2018-REV-1/en/pdf>

5.3 Research Design and Methods

The analysis draws on the findings collected through interviews and two 2-day workshops. The first workshop was held in Nicosia, Cyprus, EU (20–21 July 2019) and was titled 'Nays Information Workshop: Utilisation of Maritime Information in the Interoperability of Supply Chains and Cruise Service'. The second workshop, titled 'Digitisation in the Shipping Sector: Creating a Supply Chain Platform for the Cruise Industry', was held in Limassol, Cyprus (27–28 February 2020). Several important stakeholders participated in the workshop, including:

- the Shipping Deputy Ministry of Cyprus;
- the Cyprus Chamber of Commerce and Industry, CCCCI;

- DP World Limassol (operator of the largest port in Cyprus);
- The Manager of the Limassol Port (the Island's main port);
- International Cruise and Infrastructure Consultants (e.g. Five Senses Consulting & Development);
- International Cruise-ship Management companies (e.g. Celestyal Cruises and Salamis Cruise Lines);
- Information Technology and Communication companies (e.g. DotSoft SA) and
- Small, local producers and suppliers (e.g. Fikardou Winery).

Cover letters and invitations were sent to all stakeholders by the 'Cyprus Chamber of Commerce and Industry (CCCI)', which is one of the project's partners. Both events began with presentations by different stakeholders. Then, participants were divided into teams to discuss, brainstorm and produce suggestions on a particular subject matter. Finally, each team had to present its suggestions and respond to possible questions.

During the same period (July 2019 to March 2020), seven (7) face-to-face and five (5) telephonic interviews were conducted with different stakeholders. Face-to-face interviews were conducted on each participant's premises. Cover letters were sent in advance and interview sessions have been booked telephonically. The benefit of conducting interviews was twofold. First, they provided authors with first-hand information on the cruise supply chain and the implementation of NMSW/EMSW. For example, during a face-to-face interview, the Cyprus Port Authority (CPA) representative kindly offered a virtual tour of NMSW by sharing his computer screen with us. We also had an opportunity to collect valuable documentation. Second, interviews enabled a triangulation—and better understanding—of the findings collected during the workshop(s). The interview sample included government representatives (e.g. the CPA), cruise companies (e.g. Salamis Cruise Lines) and International Ship Management companies (e.g. CSM Columbia). Moreover, to align with established ethical standards on anonymity, all participants' names are kept confidential. As we present below, the combination of

workshops and interviews enabled the collection of important opinions and perceptions of a wide range of stakeholders.

5.4 Findings

The Reasons Contributing to Crisis and Decline

For more than a decade, the Cypriot cruise industry has been recording a decline in passenger arrivals and home-porting. In this section, we draw on our findings to present ten main factors, which led to the downturn, along with lessons that can be learned for other countries in the region. As indicated in the points below, although external forces had a role to play, the decline is also attributed to local factors.

1. The political crisis in the Eastern Mediterranean region. Many of the destinations that are included in the Cypriot cruise packages are located in politically unstable countries. Once popular cruise itineraries, which include Egypt and Syria, ceased to exist. Also, Cyprus is wrongly perceived by the market to be included in the actual politically unstable countries. Geo-political crisis gains a bad name for the entire region and triggers a domino effect in the market. As explained in the following point, clear and systematic communication with target markets may be necessary to alter public perception.
2. Participants highlighted the lack of strategy, promotion and advertising of Cypriot ports as a cruise destination. Representatives of cruise companies highlighted that cruises are no longer part of the Cyprus tourism product. They do not appear in marketing campaigns. As with the previous point, we suggest (in line with participants' observations) that strategic communication has a role to play in the long-term success of the cruise industry.
3. The increasing operational costs (e.g. fuel costs, customer fees and port charges) for cruises that start and end their routes in Cyprus and/or use Cyprus as a destination for approaching the following routes make Cypriot ports less popular. A participant in one of the cruise companies explained that since the new operator took over, all

costs have increased considerably. *'We now need about €10,000 every time our ship enters and leaves the port. Limassol is the most expensive port in the area whereas some costs have increased by 100%'* (Cruise company, Chief Executive Officer). As a result, the decisions of cruise companies on whether to include ports in their destinations are influenced by varied charges; and whether better rates exist for a given type and level of service in a different port in the region.

4. It's hard for small producer and suppliers to cope with increasing costs. A participant explained that *'[t]o enter the port for a delivery, a supplier needs to pay 50 Euro or 1200 Euro per year. This is not financially feasible for small suppliers as their revenue is less than 1200 euro per year [e.g. small producers who deliver flower arrangements to cruise-ships]. Price increase has influenced the entire supply chain'*. Our suggestion here is that a fairer rate of charges could be set on the basis of weight, volume or number and nature of goods.
5. Multiple external charges occurring by other stakeholders. As an interviewee said: *'[t]he number of cruising ships visiting Cyprus is extremely low. Cruising ships prefer alternative ports, such as the one in Malta. About 15 years ago, we had a success story, due to the low costs of 'Tours & Stay & Fly' (e.g. visit Cyprus by plane and visit another two countries by cruise). Today the story is different. Hoteliers and airports add extra costs for the extra nights; airlines offer 50-minute trips to Israel, Airports, Airlines and hoteliers are subsidized—but not the cruises'*. Our suggestion here is that strategic planning requires collective effort and involvement of all stakeholders in decision-making.
6. The significant reduction in the cost of air tickets, especially by budget airlines, is considerably lower than cruise tickets.
7. Failure to find appropriate solutions to deal with possible delays in the process of boarding and disembarking passengers upon arrival at the port due to the procedures to be followed by the immigration department when tourists enter the Republic of Cyprus. As we explain in the next sections, technology here has a role to play, along with a political will.
8. A decade-long neglect and a poor supply chain make it easier for cruise companies to adopt different practices. For instance, TUI imports products from abroad, which are stored in containers within

the Limassol Port, to supply its cruise ships while in Cyprus. 'Fragmented information result to extra costs and make supply chain services time-consuming' (Ship Management Company, Control Room Manager).

9. The supply chain in Cyprus relies solely on agents. As a result, selection of suppliers relies heavily on each agent's preferences, with little direct access of incoming ships to the local supply market (Ship Management Company, Control Room Manager). The proposed NAYS platform is likely to overcome this kind of barriers.
10. Level of services and places of interest around Cypriot ports. It's positive that the new Passenger Terminal has been completed, as well as the infrastructure around the port. However, passengers of short-stay ships will disembark only if they have something interesting to see in the surrounding area. If not, they will stay in the ship and, therefore, there will be limited benefit for the local businesses (restaurants, shops, etc.). This is a lesson to be learned, as well as an opportunity for smaller ports in the region. For instance, smaller ports, with poorer infrastructure, may be selected if the surrounding areas have something interesting to offer in terms of tourist attractions.

The downturn in the cruise industry is attributed to several aspects, including government, industry and wider geo-political factors. There are lessons that can be learned out of these findings: for a cruise industry to thrive, we need strategic vision, long-term planning, continuous competitive analysis, political will to confront regional challenges, the participation of several stakeholders in policy formulation, as well as incentives for stakeholders. These factors become increasingly important in the new, digitised environment. The next section examines the implementation of a National Single Window, and its possible benefits to the cruise supply chain.

Implementation of NMSW and Links to the Cruise Supply Chain

The data reported to Port Authorities regarding the arrival and departure of a ship should be submitted electronically through the National Maritime Single Window. This is a national portal administered by local authorities (CPA representative). Our findings suggest that the National Maritime Single Window was established fully in most EU countries, including Cyprus, in line with Directive 2010/65/EU. However, some exemptions exist, such as the case of Greece, where the system is only partly implemented. These findings resonate with previous studies, which underline the difficulties of implementing the NMSW. For example, through a cost-benefit analysis, Kapidani et al. (2020) reveal that the cost of implementing and operating an NMSW may exceed its benefit. This is the case in developing, small or coastal countries, with limited availability of human resources and infrastructure.

Prior to the full implementation of NMSW in 2015, several collaborations took place between EU member states, which served as forerunners for system interoperability. For instance, The Cyprus Port Authority was part of a collaboration with respective organisations in Italy, Spain, Germany and Portugal, namely, the MIELE project (Mediterranean Interoperability E-services for Logistics and Environment sustainability). The project aimed at developing a supply chain model (multimodal logistic chain), linking all modes of transport related to shipping. The supply chain model was called 'Motorways of the Sea' (MOS). At the same time, MIELE aimed at implementing a unified and interoperable IT system, allowing interconnection of different supply chain systems among the specific EU member states. According to CPA representatives, MIELE can be considered the forerunner of NMSW and EMSW, as it contributed to an understanding of how a common information platform (single-window concept) exists and operates.

Moreover, prior to entering a port, all ships must provide information using the Ship Security Pre-Arrival Form, through the electronic single-window system—Port Community System (PCS) of the Cyprus Ports Authority (CPA). The information is submitted through the NMSW by

private shipping agents, representing the ships and their companies. Our findings suggest that the private agents are trained on how to use and interact with the NMSW system directly by the CPA. The CPA officials seemed to be quite satisfied with institutionalised response to the Directive 2010/65/EU. As they explained, their organisation has done a great work implementing the NMSW while other EU countries are yet to implement it.

However, although it facilitates the submission of information before and during the departure of ships, NMSW does not seem to be helpful in linking cruise ships with the local supply chains—in contrast to our literature review—mainly due to contextual factors. Our findings suggest that local cruise shipping companies in Cyprus choose to supply their ships in other countries. Also, on some occasions, multinational cruise companies import the goods intended for their cruise ships (e.g. those approaching Cypriot ports) from abroad (CEO, Major local cruise company). Although NMSW accepts modifications, which can be used to enhance information transfer relating to supply chain, the current condition of the Cypriot Cruise industry discourages trade of goods, whereas, there is a difficulty of local suppliers to penetrate the cruise supply chains competitively.

What such findings tell us is that digitisation on its own is not enough. There is a wider range of factors that need to be implemented to attract cruise companies, cruise ships and passengers—as discussed in the previous section. Moreover, as we explain below, this study also explores possible links between NMSW, the EMSW and how they may contribute to a sustainable Cruise Supply chain.

Implementation of EMSW and Links to the Cruise Supply Chain

While these lines are written, the authorities of each EU member state (e.g. Ministries of Shipping) work in a coordinated way to implement the European Maritime Single Window (EMSW), which needs to be applied by 15 August 2025, a CPA representative explained. The existing National Single Window systems in each Member State will remain as the basis for

a technologically neutral and interoperable European Maritime Single Window. Officials in the Cyprus Port Authority and the Shipping Deputy Ministry of Cyprus expressed great optimism regarding the implementation of the European Maritime Single Window: *'most of the hard work has already been done while implementing the National Single Window'*. The processes that have been established, as well as the expertise accumulated during that process, are now a great contributor to the upcoming implementation of the EMSW: *'although its full implementation is going to take some years, it will definitely happen'*.

However, an interesting claim, which relates to the cruise supply chain, was expressed by the head of the IT Department in CPA. More specifically, he mentioned:

We work relentlessly on the establishment of EMSW. This week, we had a meeting with the other 26 member states to decide what exactly we want the EMSW to include. As soon as we decide, the final system will be standardized for all ports across the EU. No additional components or forms will be added or changed by member states (e.g. the crew list will include the same entries—such as the passport number—across the entire system, in all EU ports). All European ports will be using the same structured system.

Such findings tell us that the EMSW will differ from NMSW in the way it is treated and used. The NMSW could be modified. Additional forms and functions could be added. Several stakeholders, such as the immigration office, police, agents and more, could add entries on the existing system. The customs, for example, could add a requirement for a certificate by private suppliers, listing extra information for containers (e.g. oversized, extra length, temperature and other business-related information). However, *'EMSW will have no place for this kind of additions, alterations and extra information. All EMSW standards will be generic and unaltered. If we would add what each country wants, a unified EMSW environment will never become materialized'* (CPS, Head of IT Department). When we asked about the possible contribution of EMSW to the supply chain, the immediate response was: *'No. EMSW will neither be related to nor enhance the cruise supply chain. The system will be so standardized that leaves no space for modifications relating to the supply chain.'*

Due to its standardised structure, the EMSW will have no direct impact on the cruise supply chain. Our findings, moreover, contradict previous scholars, who believed that harmonisation through European Single Windows would facilitate trade, either by directly supporting trade interfaces or by serving as ‘global single window trade portals’ (e.g. Nowak, 2007).

There are, nevertheless, some indirect benefits that could have a meaningful impact—provided that a collective effort is made by key stakeholders. This prospect is best expressed by one of our responders:

The establishment of EMSWe, which aims to harmonize and improve the interoperability of the various systems through the interconnection of National Shipping Units (NMSWs), is expected to minimize the complexity of inter-stakeholder relationships. A platform working in parallel to EMSW, could enhance the cruise ship supply. (Ship Management Company, Control Room Manager)

These findings corroborate Katsoulakos’s work (2013), which has been presented in the literature review. Also, the findings highlight the importance of interoperability of systems. EMSW can work in parallel with existing systems, such as the NMSW and SafeSeaNet, to enhance utilisation of information in the cruise supply chain. In other words, although NMSW will play a complementary role, it may help in stitching up trade ecosystem, empowered by both EMSW and other interoperable technologies. Besides, although the NMSW directive (2010/65/EU) is repealed by the EMSW regulation (EU 2019/1239), NMSW will not cease to exist. It will be able to host additional information, forms and entries—for example, for agents, traders and suppliers.

By the same token, the proposed ‘NAYS’ platform will be interoperable and dependable with the rest of the system. ‘Today, a single trade can involve over 25 parties, generating 30–40 documents, and about 60–70% of the information is manually re-entered at least once’ (World Customs Organization, 2018). It is up to stakeholders, such as port authorities, suppliers, cruise companies, agents and others (including other trade communities and platforms), to network with the platform and take

advantage of information transfer and enhanced communication along with the entire trade ecosystem.

Here is where technology, and more specifically the implementation of EMSW, becomes vital: orders need to be processed in a timely manner, so that products are delivered on time and without any deviations in terms of number or volume. Interoperability of the platform with other systems, such as the NMSW, enables orders of passengers to be delivered in very short time after the arrival of the cruise vessel at the port. System interoperability here is like the two sides of the coin. On the one hand, it offers reduced administrative burden, more efficient interaction with authorities and a fast turnaround for the ship. On the other hand, local suppliers will have to make sure that the delivery process is efficiently planned and executed within the short period of time (Cruise Consultant, Workshop Participant).

Sustainable Supply Chain Through an e-Marketplace Platform

The idea of an e-marketplace platform, which takes advantage of system interoperability, was welcomed by research participants positively. Traders expressed willingness to use the platform provided that it offers some of the following benefits: process simplification, supply time-reduction, automation, ease of use, secured transactions and a wide range of products/services/prices.

Furthermore, representatives of cruise companies, suppliers, port operators and cruise consultants considered the platform as an extra benefit for their customers. For instance, while a cruise ship approaches a port, its passengers/tourists may have the ability to order good/gifts from a list of local products while on the ship (prior to their arrival) and collect them at each cruise destination. Among others, they suggested that:

1. a traditional dish or meal can be included on the cruise-ship menu, which is unique to each or selected destinations. The ingredients could be sourced entirely by small, local, organic producers;

2. cruise-ship passengers may have the ability to order 'platform-only' goods that are available in special packages; quality goods of certified origin.
3. the platform may be able to provide customers with additional information about the products on offer (e.g. enabling them to trace the origins of ingredients, the tradition and history of the place of production).

Another suggestion/possibility includes the development of Apps, which are connected to the wider trade ecosystem through the NAYS platform. Apps may be used by each stakeholder for different purposes. For instance, cruise companies may have access to consumption metrics; customers may have access to gifts and consumables, business partners can have access to government services, ship personnel can gain access to energy savings, ship positioning and weather information—through the interoperability of systems. This suggestion is consonant with a wide body of literature, which discusses the interconnectivity of the maritime sector, through digitisation (Sanchez-Gonzalez et al., 2019), real-time information (Bauk et al., 2017), electronic reporting, 'maritime Big Data', remote monitoring and maritime clouds (Ullah et al., 2019), among others.

Taken altogether, such findings point to the sustainable nature of the platform. The economic, societal and environmental benefits stemming from the 'NAYS' platform align with, and expand, the widely accepted triple-bottom-line of sustainability (coined by Elkington in 1998). In addition, the platform can serve as a reflexive mechanism that is easier to adapt to the changing environment and market needs (Vrontis et al., 2012; Thrassou et al., 2014). Moreover, several participants highlighted the importance of competitive edge. To increase their transactions, local producers and sellers must be as competitive as those in other countries. Cruise companies are especially concerned about shorter delivery times and cost-effectiveness. Today, it is cheaper for a Cypriot cruise-ship company to supply its ship in a port outside Cyprus instead of using Cypriot logistics companies (Interviewee: Cruise Ship Owner and CEO).

Finally, a new important aspect that has affected the whole community worldwide is the COVID-19 crisis, where almost all cruise traffic has been at a standstill for the past nine months. This unprecedented crisis has resulted in a -90% of cruise traffic worldwide for 2020 and an unclear 2021. The new era of cruise travel will happen with much stricter rules and health protocols that we have never witnessed before. As cruise will gradually restart, the industry will be much different. The cruise product will exist in a pre- and post-vaccine reality. Strict excursions may result in a new cruise product, where passengers have to taste the local flavours within the ship—rather than disembarking. This will give the opportunity to local vendors to provide products unique to the destination to each ship. Additionally, as purchasing in the destination might be limited, it is an excellent opportunity for local producers to promote their products in an organised way for e-purchases and then delivered to their cabins. As presented in Fig. 5.1, the platform can be adapted to play such a role, adding further to its sustainable nature.

The interoperability of systems and the proposed NAYS platform is presented in Fig. 5.1. Our graphic representation illustrates how the digitisation of systems and processes, along with the interoperability that comes through harmonisation, can facilitate an inclusive platform-based supply chain. The role of stakeholders, nevertheless, remains important,

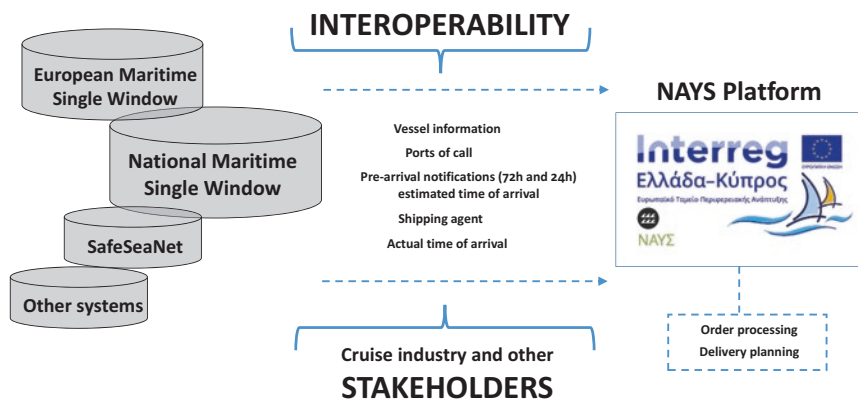


Fig. 5.1 Interoperability facilitating the NAYS platform

especially in terms of vision, strategy and promotion of the cruise industry. Besides, the NAYS platform is an innovation that has been conceived and designed for the particular context. This deliberate effort is consonant with previous studies, suggesting that each innovation has a context, which is shaped by consumer behaviour and all the macro- and micro-environmental factors affecting it (Chebbi et al., 2013; Thrassou, 2007; Vrontis & Thrassou, 2007; Thrassou & Vrontis, 2009).

5.5 Discussion and Conclusion

This chapter makes a threefold contribution to the literature of system interoperability and utilisation of shipping information in the cruise supply chain. First, we have demonstrated the actual reasons that led to the industry's decline. Poor planning, absence of vision, high costs in relation to competing countries/ports, lack of infrastructure and geo-political instability are all ingredients for prolonged decline. By identifying the nature of the crisis, we inform the industry's revival effort, and offer lessons to other countries in the region.

Second, our chapter adds to the literature on digitisation through NMSWs and EMSWs. For many years, there was no clear understanding in regard to the purpose, use and capabilities of NMSWs and EMSWs. Scholars often treated Single Windows and National Single Windows as synonymous, whereas, others believed that EMSWs would directly facilitate trade interfaces or serve as 'global single window trade portals' (e.g. Nowak, 2007). In this chapter, we clearly explain what each system is, what is capable of and how it could facilitate or hinder the cruise supply chain. Also, by drawing on workshops and interviews with key stakeholders, we explain what the interoperability of systems can offer to the trading ecosystem, as presented in Fig. 5.1.

Moreover, following the successful implementation of NMSW in most EU member states, countries work persistently to establish the EMSW (Regulation EU2019/1239). As our findings reveal, EMSW is going to be standardised across all EU ports. In fact, EMSW will be so standardised and bound up by its generic and narrow function that no space is left for a direct support to cruise supply chains. As one of our responders claimed,

on the one hand, the EU had to choose between standardising the EMSW platform and putting its materialisation at risk—standardisation was the only way towards materialisation. On the other hand, the national window (NMSW) will continue to work in parallel to EMSW. At the same time, it can sustain its previous modifications (or accept further changes), to support the cruise industry and its supply chain. Towards this end, we invite key stakeholders, such as the CPA, to re-engineer the NMSW towards becoming a fully interoperable system, which prioritises trade facilitation, transport security, safety and environmental protection.

This suggestion is a third contribution, which concerns the literature of system interoperability in the cruise supply chain. The interoperability of NMSW and EMSW can have a meaningful contribution on the local supply chain, entrepreneurship and further economic development. It will contribute to the wider digitisation, which supports the NAYS Interreg project, as well as the development of an e-marketplace platform for the Cypriot Cruise Industry. The proposed platform will provide a digital common point for all those involved in the supply chain, including entrepreneurs, local producers, traders, distributors and cruise-ship companies. Purchasing turnover will be faster. Good's auctions will facilitate trading inclusion, as local producers and traders will gain direct access to the supply chain, whereas, stakeholders will have access to market data and trends' analysis. Also, cruise-ship passengers will have direct access to local 'platform-only' products. The overall economy is likely to be strengthened along with the development of a sustainable supply chain. However, for this to happen, a collective effort and stakeholder collaboration are required, as illustrated in Fig. 5.1.

Disclaimer/Funding/Acknowledgement Research for this paper/chapter has been carried out within the framework of the project 'NAYS—Exploitation of maritime information for the interoperability of cruise supply chains and services'. The NAYS project is part of the Interreg V-A Greece-Cyprus cooperation programme 2014–2020 and is being co-funded by the European Union and other national resources of Greece and Cyprus. The content of this paper/chapter is under the responsibility of its owner and under no circumstances does it represent the opinions of the European Union, the participating countries and the managing authority.

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