MARINE INNOVATION

PAYAM DARYA

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Shipping at the Time of Corona

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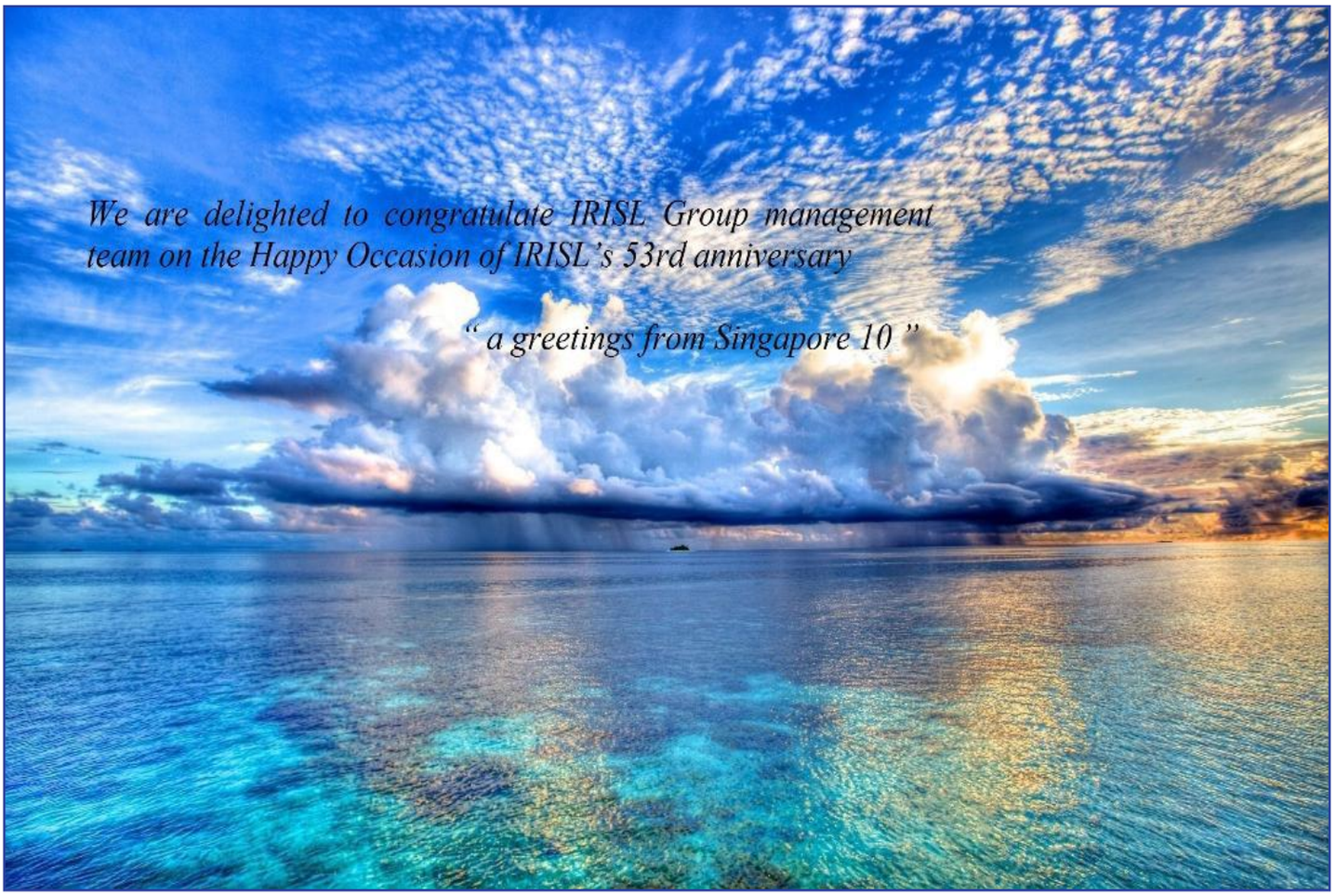
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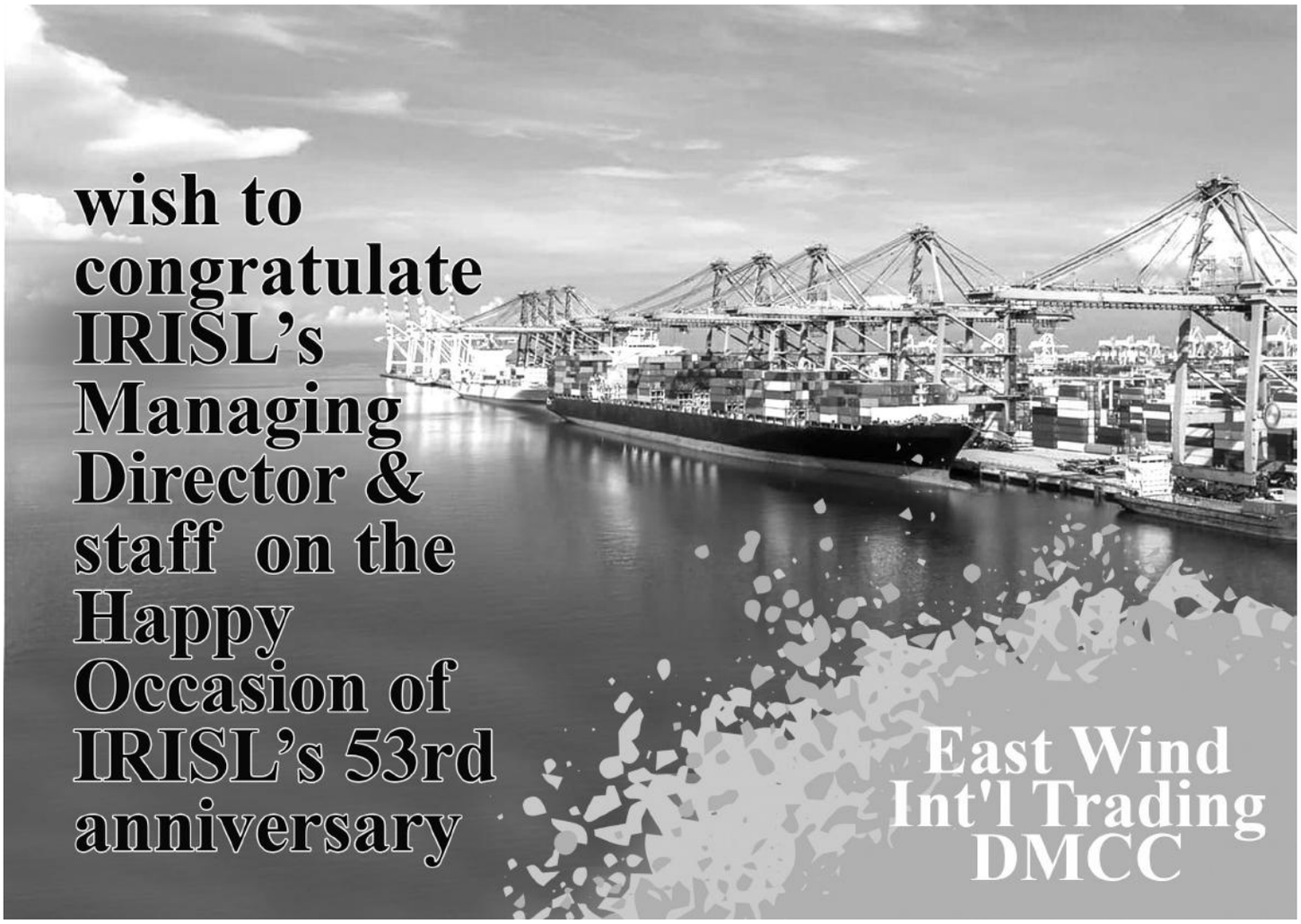

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CONTENTS

Shipping at the Time of Corona

By: Fatemeh Moonesan
Editor-in-Chief

The early days of the year 2020 were happy days for the shipping industry, as this sector staged a fascinating launch into the new decade. Yet, these happy days did not last long. The emergence of Corona Virus, its brisk infiltration to almost every country on our home planet, and the overnight pandemic that it triggered upset everything. Other than claiming the lives of over 1 million individuals, this tiny 65-nanometer virus has so far infected over 33 million people, extending a wide array of pain and suffering to them. Barely even could someone be found today in whom Corona has not instilled fear, panic, agitation and worry. However, things do not just end there. Economy is a major area that has proven vulnerable to these messy pandemic days, and not only that of China, but that of all nations across the globe. Few industries have managed to flee from the demon trap of COVID-19, but sadly, shipping industry has not been one of them. Horror from falling victim to this virus cancelled ships' ventures, sent home fleet staff, delayed orders' shipment, overcrowded ports' storages, elevated the costs, withdrew orders for new ships, downsized the volume of seaborne transportation, and in one word crippled international maritime transportation community in less than three months; and it is continuing to do so despite the partial recovery of maritime industry from the wounds of this predicament.

This too-tiny-to-be-seen-by-naked-eye virus has altered many equations and shifted many paradigms, in such a way that maritime industry after Corona paints a totally different picture compared to its pre-Corona days. According to official reports, from January 20th to February 10th 2020 only, maritime trade witnessed a reduction of between 20 to 40 % in its volume in the light of a decrease in commercial moves in Chinese ports and the venture of fewer ships in Asia. Likewise, Cruise Lines International Association (CLIA), which had reported a growing trend for seaborne transportation of passengers from 2018 onward, states that Corona pandemic has pushed this industry to its limits. CLIA speculates that Corona-caused restrictions worldwide have imposed a loss of 50 billion USD to maritime passenger shipping, laying off 334,000 individuals so far. Tickets are still being cancelled and little sign of recovery is seen for the upcoming fall and winter.
Ever since COVID-19 broke out in China and then to every corner of globe, the economic prospects, both in developing and developed counties, have gone into a coma, and keep swinging between promising and disappointing moves. The conditions have been wrapped with a blanket of vagueness and ambiguity since early 2020, and the uncertainty is still out there. Merely one point can be remarked with certainty and that is: Corona can cripple world economy and industries unless it is harnessed and cured.

Meanwhile, maritime transportation is the most vulnerable sector to this pandemic. Seaborne transportation has shrunk dramatically in its structure, and the parade of COVID-19 worldwide spread could tangibly be felt in all aspects of maritime and port services. Even though coastal countries are putting in their maximum effort to deal with these consequences, there is still a long way to go to beat this minute enemy.
In the light of disruptions in supply chain, reduction in demand, and the pandemic-caused global economy's lying in abeyance, the most optimistic speculation is a 0.5-percent decrease in container transportation in the ports, with the worst case scenario being a reduction of 3%. In addition, demand-supply market is estimated to undergo sharp and frequent fluctuations, transportation fees are prognosticated to drop as far as 6 %, and the operational losses are foreseen to reach approximately 4 billion USD.
Overall, it goes without saying that Corona pandemic is the gravest threat to the global economy and hence to the container shipping industry since 2008 global recession, yet it is too soon to precisely determine how this virus is prone to impact container shipping. Time will shed light on the details surely.

Dr. Mukhisa Kituyi, Secretary-General of UNCTAD:

Corona Virus; An Opportunity Ahead of Green Shipping

Marine Innovation magazine has spoken to Dr. Mukhisa Kituyi, Secretary-General of UNCTAD, regarding global maritime transportation, digital technology and green shipping industry. The transcript of the interview could be accessed in the following:

How do you evaluate the impact of COVID-19 on global maritime transportation?

The impact of the COVID-19 pandemic on international maritime transport is two-fold. First of all, the change in global trade and demand for shipping services has a direct bearing on the port and shipping business. Our recently published data shows, for example, that year-on-year port calls of container ships went down by as much as 8.5 per cent in mid-June. They have since then somewhat recovered, but in early August were still 3 percent below the levels of one year earlier. Apart from container ships – which carry most trade in manufactured goods – the hardest hit segments were passenger ships and RO/RO (roll-on, roll-off) ships, which include ferries and other vessels that also carry passengers.

Further data and charts can be found here: https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2466 *and here:* https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2465

Secondly, shipping lines and ports are affected by the pandemic given the need to keep ships moving and ports open while at the same protecting seafarers, port workers and the population from the virus. One group of workers who have been among the most negatively affected by the crisis are the seafarers. More than 300,000 seafarers are currently working beyond their scheduled time on board, and a similar number of have been unable to get back to work. Early on during the crisis, together with the Secretary-General of the International Maritime Organization, I

called upon governments to consider seafarers key personnel and facilitate crew changes.
On the positive side, in response to the pandemic, ports and carriers have successfully advanced with reforms, especially through digitalization, advancing with the automation and dematerialization of processes.

What changes have been brought about by digital technology?
The pandemic has encouraged further and faster reforms in a wide range of areas where UNCTAD has for many years promoted digitalization. When you look at trade facilitation, for example, digitalization is a key for customs automation, transparency, and transit. The dematerialization of processes helps both, make them faster and more transparent, while at the same time avoiding personal contact and the spread of the virus.
Also, on the shipping side, further technological advances with port call optimization help saving fuel as ships do not go unnecessarily fast, and they spend less time in port.

What is your roadmap for enhancing this technology in maritime transport?
We have put out a 10-point action plan to strengthen international trade and transport facilitation in times of pandemic. Many of the solutions we promote in the action plan depend on modernization and digitalization. I want to particularly highlight that the solutions we promote help achieve both – facilitating trade and transport, and protecting transport workers and the population from the effects of the pandemic.
Concretely, by way of example, in times of a rapidly changing trading environment, it is particularly important for Governments to communicate clearly and ensure information is available and updated. As physical contact between people needs to be minimized, paperless processes become ever more important. Although goods still need to be moved physically, Customs clearance and the exchange of information should make use of electronic data interchange as much as possible, now, more than ever.

In your opinion, why a sustainable blue recovery is needed?
The COVID-19 pandemic is a reminder to all of us that we better take science seriously, and prepare for future shocks. The pandemic and the successful responses of the maritime transport providers can also be considered an opportunity. As volumes have declined and digitalization advanced, the CO2 emissions of the industry have come down more than they would have otherwise.
UNCTAD collaborates closes with the International Maritime Organization (IMO) and its member states towards the decarbonization of shipping. We are also a supporting member of the private sector-led Getting to Zero Coalition.
In order to mitigate climate change, maritime transport needs to reduce the carbon intensity of port and shipping operations in the short term, and switch to alternative fuels in the medium to long term. This fundamental change requires investments not only in new ships, but above all ashore, in renewable energy production, distribution infrastructure, and seaports. Also, the use of alternative fuels may lead to higher transport costs, which may affect Small Island States and Least Developed Countries disproportionally. It will be important that these countries be supported financially and technically to ensure that we can decarbonize shipping without penalizing those same countries who often are also most negatively affected by climate change.

Ports and Terminals: Looking for Future Miracles

Mehdi Rastegary
Ports & Maritime Advisor
Padidavaran Omid Pars Co

Within the past century, the maritime transport systems have fueled a major leap in facilitation of trade and development of economies throughout the world. In a 200 year period, the evolution of the dominant designs of ships (i.e. the sailing ships, the steam ships, and the motor ships) has provided an exponential growth in global trade: According to professor M. Stopford (2020), the tonnage of global maritime trade in 2018 was measured to be 600 times bigger than the relative figure in 1840. This shows that the developments in maritime transport systems and emerging changes in maritime technologies have fostered fundamental changes in human civilization. Accordingly within the end of the past century, Transport (and specifically maritime transport) has been acknowledged as one of the four founding element of global economy and an indispensible principal of the context of human's life on planet earth. he maritime transport system heavily relies on ports and terminals which provide the critical links of this system with other modes of transport. The innovations in the merchant shipping in 1960s and 1970s also led to significant changes in the port systems. Although ports have been evolving through generations, within the recent decades and under the global

ization process forces the merchant shipping has always been ahead of the ports and demanding for haste in their following paces. This has led to development of highly regional competitive markets with greatly volatile, risky, and capital intensive businesses. Yet, as we will discuss the huge waves of change are still on their way to hit this sector. The future of maritime transport systems will be greatly influenced by social and environmental concerns, geo-economics, and technology in the coming decades. These factors will bring fundamental changes to these systems that include merchant shipping and ports and terminals. In this sense the ports and terminals will have to respond to changes that will emerge in shipping, logistics, trade, technology, and society. The harbingers of such changes can be witnessed in reaction to trends like IMO 2020 sulfur cap, COVID-19 pandemics, surge of Ultra-Large Container vessels, Mergers and Acquisitions and Alliances in container shipping, undulations in the oil and energy markets, and many more. Yet, it seems that such groundbreaking changes are only the tip of the iceberg we are heading towards.

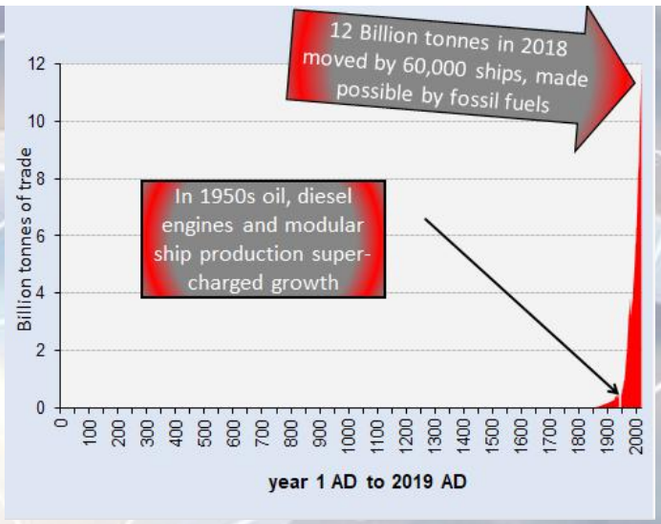

Exhibit 1 - Development of Maritime Transport within the past 20 centuries (Stopford,M.,2020-a)

Let us consider the recent scenarios of professor M.Stopford for the outlook of maritime transport in the 2020-2050 horizon. He considers the COVID-19 and climate change impacts as two topmost phenomena that will configure the demand for maritime trade within the horizon and offers three scenarios in

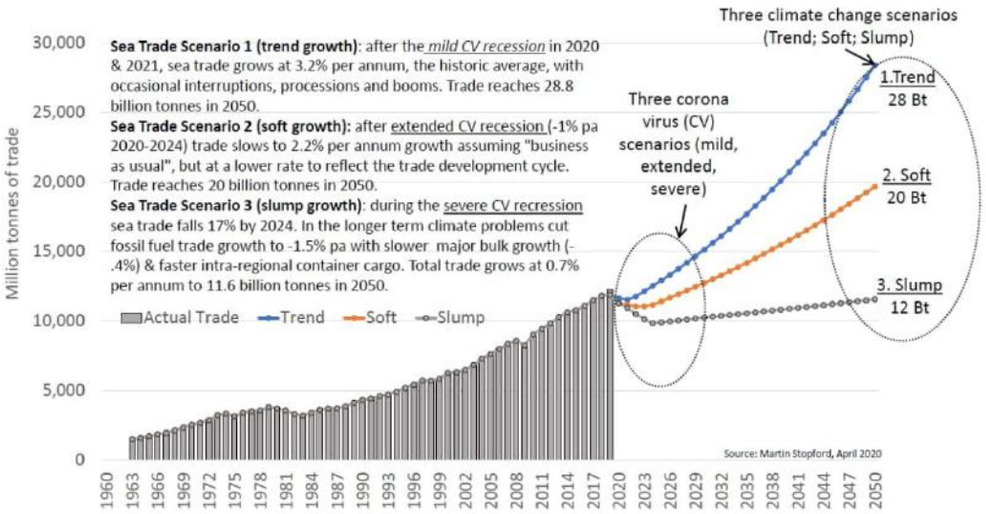

Exhibit 2 - Development of Maritime Trade within the coming three decades (Stopford,M.,2020-b)

this regard. In outcome, the scenarios give diverse figures for global maritime trade that range from 28 billion to 12 billion tonnes in 2050. As the maritime trade can be translated into port traffic and multiplied into port throughput figures, these diverse figures imply the great uncertainty in estimation of future demand for port and terminal capacity in the years ahead.

The ports can also anticipate great changes in terms of cargo mix: as most of world is planning for decarbonization in response to climate change, it can be expected that the wet bulk market and specifically the oil and product tanker segments are gravely affected by the changes in the energy markets: this will have a colossal effect on the maritime transport systems as fossil fuels constitute near 37% of the existing maritime trade. Moreover, by emergence of more customized manufacturing technologies (e.g. 3D-printing) many researchers believe that in future there will be more demand for raw materials and less demand for finished goods. This can have many implications in the future of ports; for instance it may bring a boost to the bulk segments, and diminish the size of the container and general cargo segments. It can also lead to development and enlargement of peripheral industrial clusters around the ports that will transform the ecosystem of port and its businesses.

In tandem to the tendency towards regionalization of economies, the emergence of new manufacturing technologies can also transform the geography of transport in the coming decade. For instance the application of robotics or 3D printing in many developed countries will deteriorate the current competitive advantage of low cost labor force in many maritime forelands. This will lead to reshoring or near-shoring of maritime supply chains and bring

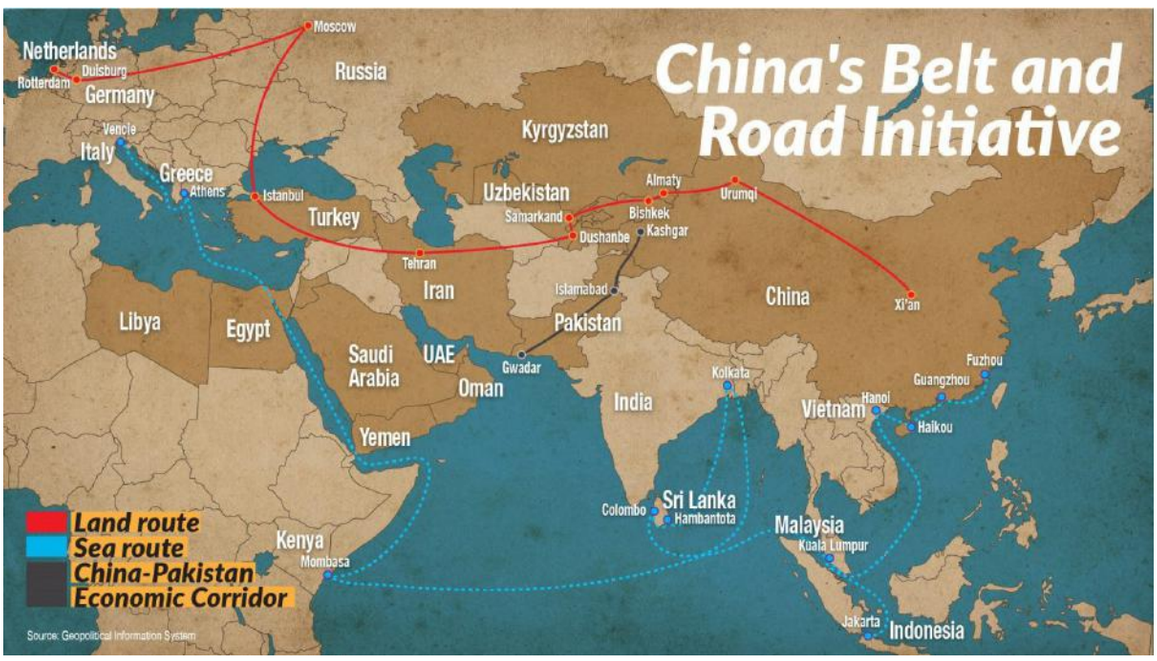

Exhibit 3 - The Belt and Road Initiative Map

a boost to shortsea shipping. These trends will annihilate the businesses of some ports and flourish the business of some others. Moreover in this novel architecture, the merchant shipping fleet will rely more on smaller ships rather than the bigger ones. Subsequently, the Shipping lines will demand more productivity in shorter port operations cycles and this will bring another series of challenges to the ports.

The ports and terminals market will also be deeply affected by political economy. The global economic powers are trying to establish and extend their strategic penetration in different regions of the world by participating and investing in the development and management of transport infrastructures in foreign states. Among the most significant instances of this, we can point to the 'Belt and Road Initiative' that involves in investment of between 1.2-1.3 trillion USD in 70 states in Asia, Europe and Oceania. This initiative that is often compared with US Marshall plan in the Second World War, will have a determining effect on the ports of Asia and Europe. It will certainly increase the economic penetration of China and balance the power and share of her competitors (e.g. US, and Japan) in the markets. This will have a certain effect on the significance of maritime trade routes and the arriving traffic in seaports in the global level. The initiative will certainly disrupt the existing hegemony in the regional port markets in different parts of the world. For instance, according to the investments and concessions of BRI in the Mediterranean ports, within the coming years we may witness a picking growth in their businesses and a slowing growth in the North-west European ports. Moreover, as the entirety of this initiative targets access to inland markets in the national and regional levels; it has special emphasis on intermodality of ports and their access and service to inland transport modes. Therefore, contrary to the current practice in development of mega-ports, the BRI ports are most seen as 'gateways' rather than 'transshipment hubs' and the relevant settings in design and operations will differ in them. The other determining factor that will shape the ports of future is the basic concern for sustainability. The ports shall commit themselves to function and serve the economic, social, and environmental development of human societies optimally. This means that in line with providing a context for facilitation of logistics and mobility, the port systems shall also concern their environmental and social impacts. The developers and operators of a seaport shall concern the pollutions, emissions, ecological protection, use and protection of natural resources (especially the energy resources). The port shall do its best to manage all of its activities to minimize its contamination and its use of natural resources, promote the use of renewables, and protect and recover the natural ecosystems and its resources for the future generations. It is essential to understand that preserving and enhancing the environment is a serious obligation that cannot be overlooked by anyone in this generation.
The ports must also consider the social impacts of their development and operations: within the coming decades, the labor relations will witness great transformations and the labor-intensive industries in the ports need to restructure themselves to avoid injustice in this aspect. They shall also concern for safety and health, security, welfare, and human development not only in the organizational level, but also among the great number of their stakeholders. In spite of the significance of all mentioned factors, we should emphasize that the most important factor in the development of future ports is technology. In 2020, the world has already entered into the fourth industrial revolution era and it is expected that human life on the planet to be radically transformed by development of cyber-physical systems within the coming three decades. It is essential to understand that these speedy and universal transformations have already begun and as many futurists have opted, we are already living in the future. It seems that the time has come for the maritime transport systems to overcome its conservative delay and stagnation, and engage in this enormous transformation process.

It is a fact that maritime transport systems have not changed much for more than half a century: the dominant designs of ships and ports, the

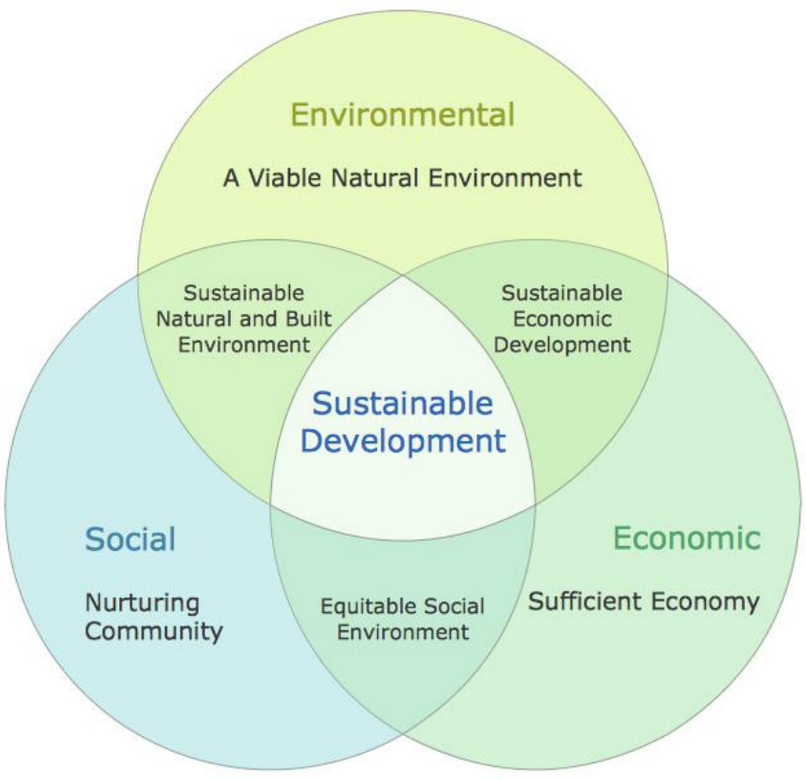

Exhibit 4 – Sustainable Development

structure of markets, and even the process improvements have remained the same, and only enlarged or enhanced to develop savings or economy of scale in the subsystems. The existing architecture of these systems have endured for so many years due to its maturity and proven efficiency. But as a matter of basic paradigm shifts in the maritime transport systems, their current architecture can no more serve the entirety of their aims and purposes. Indeed, the maritime transport system are involved in extreme challenges to make a balanced tradeoff between investment, costs, revenue making, quality of services, environmental objectives, security, social impacts and many more. Although this may seem impractical in the first look, many experts believe that i-4.0 technology can serve as the needed change agent to achieve the impossible. We should be aware that the speedy development of agile and flexible cyber-physical systems acts like a springboard that will heave the maritime transport system into an ocean of changes and transformations. It is obvious that under the paradigm shifts, the emerging requirements, and the revolutionary technological developments, the existing architecture of maritime transport systems will not last more than some years and a new architecture will emerge in short time.

In order to keep pace with the supply chains and the merchant shipping industry, the port and terminals will need to renovate the technology of both their core businesses and the ancillary facilities in them. They shall adapt themselves to facilitate the emerging dominant designs in maritime supply chains (e.g. smart ships, LNG ships, fuel cell ships, autonomous ships, etc.). The results of noncompliance with such demands can be catastrophic for a port, especially in the more competitive segments of the market (e.g. the container segment). Also to keep themselves in the market, ports and terminals shall invest heavily in improving their productivity: the shipping firms and the cargo interests always demand and exert pressure for better service at lower prices. It seems that by evolving new patterns in the maritime supply chains (e.g. more concentration in shipping markets, and increasing demands for faster delivery of orders to cargo interests) , this controversial issue will find more significance. Moreover in terms of sustainable development, the ports will have to commit to principles (e.g. in terms of social and environmental aspects) that will burden huge economic costs to them: They will have to make purely cost-incurring commitments like decarbonization, supply of clean/renewable energy resources, investment in less energy-intensive systems, control of different types of pollution, and managing labor relations in terms of the coming changes in the labor markets. This means need to heavy investments, heightening costs, and diminishing revenues for the ports and terminals. We shall notice that all these are happening in a context where the ports will be encountering more serious constraints in their businesses and a great number of them will have to deal with lessening access to resources (e.g. land, finance, etc.) in spite of their urgent need to expansion and development.

Indeed, the ports and terminals need exclaiming miracles to bring the paradoxical picture that is drawn for their future into reality. Many believe that this miracle can come from i-4.0 cyber-machine technologies that are hyping to find massive use throughout different sectors and industries.This includes implementation of digitalization, industrial automation, Artificial Intelligence, Internet of Things, robotics and many other i-4.0 technologies. While there is a clue of truth in all of this, it is essential to understand that buying technological solutions will not bring forth the needed miracle for the ports and terminals: indeed, the marvelous features of i-4.0 technologies will work only if it leads to development of the needed *capabilities* for inaugurating the groundbreaking transformations in the sector.

Capabilities establish the economic firm's ability to manage and use its resources effectively to serve its mission. They are developed by assemblies of people, processes, and technology within a firm. As D.Leonard (1995) explains, a core capability is established as a system of systems incorporating the physical-technical systems, managerial systems, skills and knowledge systems, and the values and norms of the firm. The core capability allows organizational learning, and knowledge creation and diffusion through a dynamic cycle of problem solving, implementation and integration, experimentation, and Knowledge import. This dynamic cycle develops a capability in the firm that can generate competitive advantages, agility, flexibility and responsiveness to business environment, and focus on customer needs within the firm.

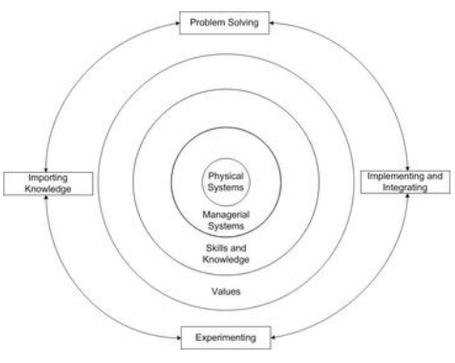

Exhibit 5 – Anatomy of a core capability (Leonard,D.-1995)

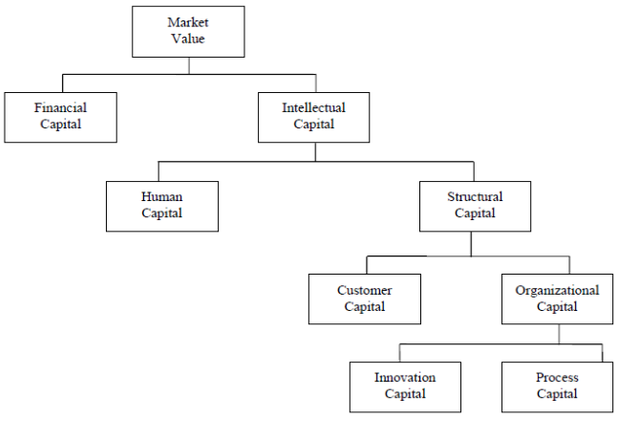

Exhibit 6 – Skandia's value scheme (Bontis, 2001)

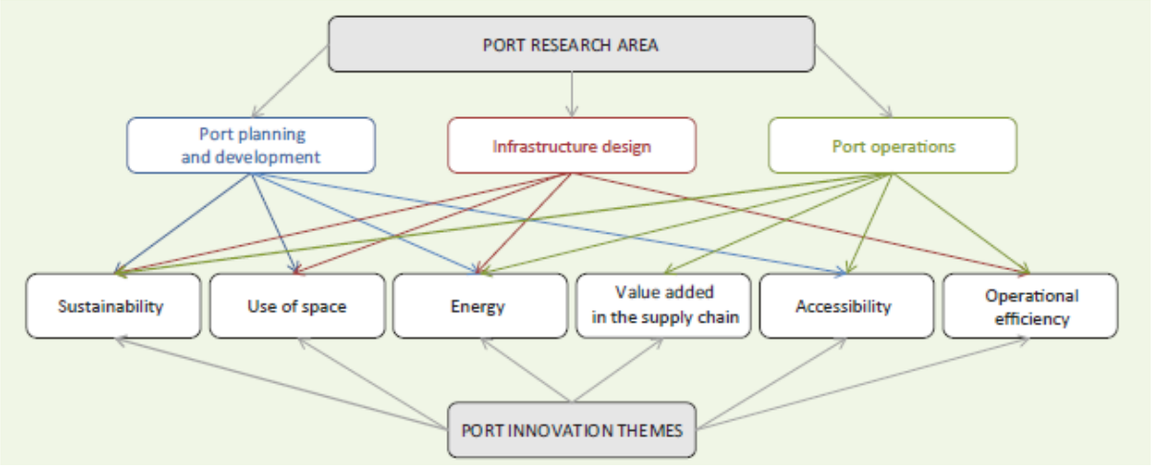

Exhibit 7 – Port research and investment areas (The Netherlands Research School for Transport, Infrastructure and Logistics)

The marvelous nature of i-4.0 technology will allow the firms to expedite the dynamic cycle of capability development in an unprecedented way. This will lead to extreme shortening of organizational learning cycles and ultimate acceleration of improvements and developments in both the processes and the products of the firm. This is a key point in the development and adoption of new technologies for the ports and terminals: the technologies that can enhance the capability development processes are the most important ones for the future of the sector. The rule also applies to managerial concepts, laws and regulatory instruments, financial instruments, etc.

Although capabilities are among the Intellectual Capitals of the economic firm, it is conspicuous that they are developed by the synergetic interplay of its intellectual capitals (i.e. knowledge, experience, relations, technologies, etc). Therefore, in order to enhance or augment capabilities of a port for future, it is critical to enrich and assimilate its intellectual capitals systematically.

The ports and terminal will have to focus on their Human Capital as the main engine for development of all other ICs. Ports should invest in developing creativity, systemic thinking, and soft skills in their human resources and prepare them for an era that every routine job will be done by machines. It can be foreseen that in near future many of blue-collared and white-collared jobs will join to history and the ports will mainly focus on attracting some gold-collared professionals. As mentioned, redefining the labor relations in ports will play a major role in managing the HC in them.

Within the coming decades, most of the ICs of economic firms will be embedded in the Structural Capital Category. The i-4 technologies will provide the firms with the needed Artificial Intelligence to learn, experiment, and enhance the value-creating knowledge and expertise from human resources, organizational procedures, Big Data, and any other resources. Yet in order to lessen the tensions of entry into the new era, the ports need to enrich their SC by working on their organization, culture, governance, management systems, processes, technologies, etc. Ports and terminals shall specifically strengthen their innovation capital in order to overcome the extreme challenges ahead of them. In this regard, ports and terminals should invest and engage in Research and Development, development of maritime clusters, enablement of knowledge based maritime startups, etc.

In terms of the Relational Capitals, the ports will have to use their best efforts to enhance their relations with their customers and stakeholders. The ports shall invest in boosting the level of facilitation and productivity to stay attractive to their customers. They must also invest heavily on sustainability of their activities to satisfy the great number of demanding stakeholders. They should also leverage on their brand value, their extended relations by means of i-4.0 connectivity technologies, and their good relations with customers and stakeholder to keep their businesses running. Obviously, the OC and the HC

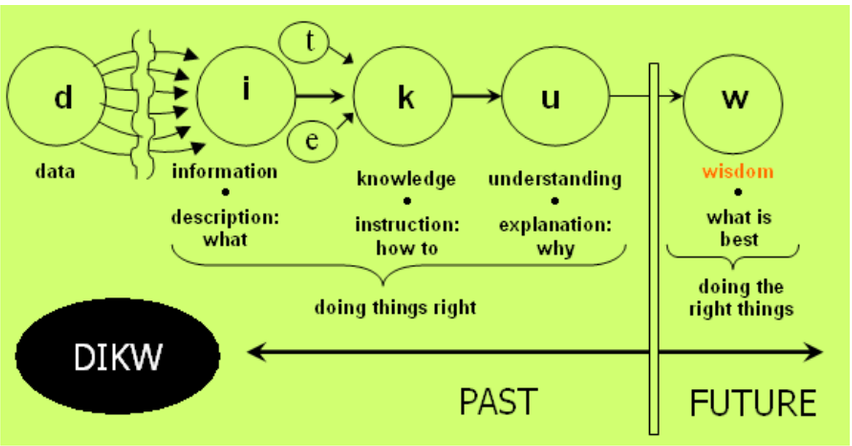

Exhibit 8- DIKW hierarchy (Miler,L.W., Morris,L-2008)

will play a significant role in developing and maintaining the RC in ports and terminals. The sector and its industries should also engage in development of coopetition and complementary co-operation in the marketplace. These approaches will enable them to unite their forces in tackling common issues like environmental management, improving security, standardization of processes, learning, research and innovation, etc.

For the past three decades, Knowledge has been accredited as the core element of modern businesses throughout the world. Interestingly, it seems that within the coming three decades and in terms of the fourth industrial revolution era, the i-4.0 technology will upgrade the common business core element and raise it from the level of knowledge (know-how) to the levels of Understanding (know-why) and Wisdom (what-best).In my opinion, this is the gist of fourth industrial revolution that can even lead to the technological singularity within the economic lifetime of a port and its terminals. Therefore as mentioned, the key to the miraculous survival and agile transformation of the ports and terminals in this tumultuous era relies in enrichment of their Intellectual Capitals and managing their effective interplay to supply the needed organizational capabilities.

In a nutshell, ports and terminal are heading towards a turbulent future that is full of uncertainty, complexity, ambiguity, and volatility. They will encounter myriads of extreme and paradoxical challenges that seem to be unsolvable within the existing architecture of the sector and its industries. Ports and terminals will also suffer from extreme tensions coming from their business environment where they have nearly no control on. In such a fierce context, the ports and terminals hope to perform miracles by adopting the i-4.0 technologies. It is essential for the sector and its industries to understand that i-4.0 technologies can only perform as enablers and accelerators for development of their organizational capabilities. The true origins of the organizational capabilities are the Intellectual Capitals of the firm. Therefore the preliminary condition of performing miracles by i-4.0 technologies is to enrich and enjoy the foundation of Intellectual Capitals. If such a foundation is not established and augmented, the i-4.0 technologies will only burden more complexity to the businesses of a port. In order to enter the new era, the ports and terminals shall invest in enrichment of their Intellectual Capitals and that is while time is the luxury they don't have.

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The Battle of Maritime Transportation Industry Against Corona Virus

Impact of Corona Virus on the shipping industry, ship building, sailing, transporting passengers, the volume of international trade, maritime training and ports cannot be denied. This can be verified by a brisk glance at the early estimations of the financial loss this virus imposed on maritime transportation and ports. Given this, the question is to what extent is executing health instructions and protocols are able to deter the spread of this virus within the maritime transportation industry? In another note, what role can classification institutes play at the time of crises such as Corona pandemic? Have the maritime authorities been capable of playing the role that their special position demands? These are the sorts of questions that are obsessing the minds of people involved in maritime transportation industry. In the middle of all this, admittedly, Corona virus has assisted greatly in the transformation of procedures and activities from traditional to digital. Now, it is ours to see what predicaments are awaiting the maritime transportation in the future and what jeopardies are threatening it.

It should not be left unmentioned that Corona Virus managed to turn the potentials in the field of virtual training to actual; that is to say, some authorities who were unwilling to move toward online classes are now fully convinced that this mode of education is very practical and pragmatic. This positive aspect of this pandemic should not be overlooked.

The other bold matter in regards with this pandemic was the prohibition of crew change of ships by some countries, which made IMO, ITF, WHO, International Chamber of Shipping, and even the United Nations to get involved and take actions. What factors led some countries to decide to ban changes in the staff of ships? And finally, can we claim that the development of digital networks and remote controlling were not the only merits of Corona Virus; and rather, this pandemic brought about further opportunities and accomplishments for international and Iran's transportation?

As you are already aware, maritime transportation industry could not escape from the spread and impacts of Corona Virus, and the pandemic extended serious losses to maritime trade and transportation. Closing down the ports, a diminish in the volume of exports and imports, canceling the orders of new building by the shipping lines, a serious decrease in the capacity of commodity transportation and the like are among the most significant of these losses.

The perspectives of some senior maritime experts could be accessed in the following.

Captain Torabizadeh: As you might already have perceived, the Corona pandemic has introduced itself as a topic that could be viewed and discussed in various legal, humanitarian, commercial, economic, technologic and authority-wise facets. Tragically, many lives were lost. In the international scale, huge concerns were raised. The world faced a phenomenon that had no earlier similar versions. Indeed, this pandemic was unforeseen and the world did not see it coming. In the early days, no one even had any idea how it should be dealt with, and still, there is no cure for it. A large array of restrictions were set on activities and businesses. Governments limited commuting and making trips around town and between cities, closed down many businesses, and imposed any other confinement they saw fit based on their governing systems and their authority. Surely, all these heavily shadowed international trade. International trade, economy, transportation and logistics are all components of a vast network, which are intertwined and impact one another; and in the course of this pandemic, this network was badly hurt. Nevertheless, thanks to the international coordination and the sacrifice of sailors, maritime transportation industry continued its activities, and managed to prevent disruptions in the trade, which could have otherwise happened. Given the

current circumstances, activities, specifically those in the realm of business, could by no means be cancelled and terminated, as this sector is the main ring in the supplier chain of human life.

Mr. Safari: As classification institutes are the deemed as the main legislators of rules and regulations in maritime transportation industry, they were expected to be at the front line of coping with corona pandemic to make sure that Iran's maritime community can operate smoothly without any predicaments. As we witnessed it, the inspectors from classification institutes faced limitations while boarding ships and inspecting ship yards. In other words, the business of these institutes was shadowed by Corona pandemic as well.

In the current circumstances, in order to assist the maritime community, the certificates should be issued with greater collaboration, through remote inspection and with the help of the ships' staff and owners. Under pandemic conditions, the contracts of ship owners as well as industries, especially shipyards, all get lifted, and a change is brought to the fields of building, maintenance and repairs. As they are dealing with suspension and recession, these people expect that classification institutes do not charge them. Thus, in these hard days, classification institutes are facing a decrease in their revenue from issuing certificates. This way, in the light of their legal, scientific and technical position as well as their business activities, classification institutes were heavily impacted by the Corona pandemic and underwent serious consequences. Given all this, just like the other global institutes, the first measure taken by Iranian Classification Society was updating the instructions and codes to make sure that the inspectors board the ships and visit ship yards with higher safety measures.

Necessary hygienic products were supplied for the purpose of protecting staff's health, and efforts were made to execute all the protocols dictated by international authorities and Iranian Health Department. In the course of the pandemic, our staff and inspectors lost their chance of being present in the operational inspection centers and offices, and instead, they shifted to teleworking with a special framework. One of the measures that we took in this regard was the inspection of ships and verifying their qualifications through mobile inspection.

Surveying the offices of the companies was also conducted remotely and provisional verifications were issued for them. Simultaneously, we devised and developed a plan called "The Nuts and Bolts of Iranian Classification Society Services in Corona Pandemic", and publicized it. Meanwhile, the partial closing down of vessel manufacturing and repairs companies suspended our institute's contracts for newly-built ships. I must add that not signing new contracts ever since the Corona pandemic started, does have consequences for us, which will emerge in the future.

The main impact that the Corona pandemic exerted on the international community, and naturally on the classification institutes as the center of standards, classification, knowledge and issuing operation and traffic licensees, was the spirit of digitalization. In this regard, Iranian Classification Society has taken extensive measures such as issuing digital certificates, signing the certificated electronically and inspection through mobile phones.

In another phase, Corona crisis is accelerating the revolution of technology, and hence, classification institutes must be pioneers in this revolution. To do so, the development of new codes and standards are absolutely essential. That is to say, prior to the implementation of new technologies on shops, their standards must be determined and developed in classification institutes. It is therefore necessary to give top priority to the development of a comprehensive maritime industry technology map both for the Corona pandemic and post-pandemic era. Unless the designing of this map is in order, we will fall behind the world. As a companion to this road map, we also need to develop a comprehensive road map for maritime technologies for Corona pandemic and post-pandemic period, which calls for finding investors and resources.

Iranian Classification Society has devised and developed a plan for dealing with Corona Virus in shipping lines, both in Persian and English, and anyone interested can visit the Society's website and download this model. Of course, outside Iranian borders, this model is available for sale. Other than the model, plans related to Corona pandemic control and announcements for various ports worldwide, as well as plans proposed by IMO, WHO and other organizations are available on the Society's website in a classified manner. As a case in point, if a shipping line wishes to venture to India, all the Corona-related requirements that Indian government has set in its ports could be accessed and downloaded on our website. This can assist the lines greatly in their pre-venture planning and management. One part of Iranian Classification Society's Corona control plan which has been developed with the collaboration and participation of Iran's Ports and Maritime Organization of Iran has been placed in IMP official website under the title "Iran's Prudence", and that can be downloaded from our website as well. Iran's Ports and Maritime Organization has also sent another plan entitled "Management Model" to IMO, and we do hope that it is likewise placed in IMO website under the title "Iran's Prudence".

Dr. Polmeh: It should be pinpointed that no country worldwide was prepared enough to cope with the Corona pandemic. At least, in the past 100 years, no similar incident at this large extent had happened and hence no country had exercised and prepared for preventing this pandemic within its own borders let alone make plans to manage it in an international scale. Nonetheless, in my mindset, Corona is not a threat; but it prepares grounds for various opportunities as long as it is dealt with wisdom and awareness. It is otherwise that Corona can turn into a threat and extend losses. We all know that the trigger point of this pandemic was in China, the first and largest economy in the world – i.e. the propeller of the world's economy. For many reasons, China was able to manage and

control this virus to a certain degree and within this, it managed to create countless economic opportunities for itself and harvest many benefits. As it is evident in international reports, China is prognosticated to experience an economic growth in 2021 which is much more impressive and larger than its economic growth rates in the pre-Corona era. Hence, it can be argued that to China, Corona was a creator of opportunities.

As you are already aware, the extent of the losses that Corona pandemic brought about is immense. Billions of Dollars have been allocated for compensating these losses in an international scale, even though some of these losses can never be compensated.

Dr. Saraei: Maritime economy shapes up approximately 3.9 % of Iran's GDP and 3.1 % of the job market. The share of the maritime transportation on its own accounts for 1% of Iran's GNP, and while at maritime transportation was at its peak, this figure soared to 1.4 %. We are now under special circumstances. We are dealing with heavy sanctions, oil prices are falling, and Corona pandemic is all over Iran, and each of these factors has its own impacts and consequences. In the Ports and Maritime Organization, measures taken to cope with each of these parameters have been precise and well-calculated. For instance, to deal with the Corona crisis, the operation of the organization has been praised by IMO. Yet, to be fully prepared to tackle the consequences of these crises, we speculated the impacts of these factors individually, and their overall impact put-together. At the moment, Ports and Maritime Organization has formed a panel to determine the economic effect of these factors and seek apt strategies to deal with them. This is a very positive move.

Maritime transportation industry worldwide is wrapped by the blanket of Corona crisis effects. Since the economies are shrinking and consequently the volume of maritime commercial trades is diminishing, sadly, the revival of world's economy in various counties is going to be slow and need a long time. Thus, we need to be prepared for the future. What the future holds is the economic shocks and their upshots, which will be more frequent. This pandemic negatively affected economic activities for a long run, and this was one of the rarest incidents in history, whereby both demand and supply were diminished remarkably. In other words, both poles of economy underwent this recession and sent out a terrible shock to all countries. This matter could be studied in two aspects. First, out economy is not highly consistent with the world's economy. As a case in point, the 2008 crisis, which its impacts were more conspicuously witnessed in East Asia, did not exert any tangible impact on our country's economy. Neither did the recession in American real estate market, which gravely impacted that of Europe. Second, the first and second round of sanctions coupled with the shadows of Corona pandemic are going to create special conditions for Iran's economy. We must expect heavy losses in the fields of maritime transportation

and ports revenue-wise: much heavier than the previous years. Unless proper policies are hammered out, it is highly likely that many individuals working in maritime transportation and ports lose their jobs.

Taking advantage of a precise operational logistics and employing cutting-edge digital capacities, transportation facilitates trade. Once we are practically aware of various aspects of transportation logistics, we can maintain harmony and unity, and thus reduce our costs noticeably. Sadly, logistic visions have not been warmly welcomed in our country and only few transportation companies could be found in Iran that are being managed via a logistic approach. The reason is that logistics is not asked for. In the course of Corona pandemic, many people and many jobs in maritime transportation inevitably moved toward digitalization; yet this extend still cannot cater to the logistic needs. The only move is that some processes and documentations are done online just for the purpose of preventing people from in-person meeting. I am not arguing that this is a bad move, but it can bear more fruit if it is channeled and guided to implement harmony and unity among the components of transportation chain. Admittedly, this matter needs to be institutionalized.

Dr. Biglarkhani: As you are all aware, National Iranian Tanker Company (NITC) is a strategic company. Relying on its frequent analysis and investigations, NITC must diagnose the effective factors in advance and take proper measures to reduce the losses to minimum. Immediatly after the emergence of Corona Virus in China, and even before any official report confirmed Corona has entered Iran, NITC took serious measures and determined very strict protocols and instructions. Once the headquarters approved of the protocols, NITC executed them in all its territories, including its fleet.

Sanctions had already brought about a lot of restrictions for us in terms of ports. I mean the number of ports to which our fleet could venture was limited. Yet, with the Corona pandemic, these ports got even more limitation. However, so far, we have managed to operate prosperously and proudly in the field of transporting oil and petroleum products. We are always ready to deal with emergencies and crises. Devising and executing strict protocols has born productive fruit for NITC while dealing with Corona pandemic, as the preventive measures of NTIC have prevented from many catastrophic incidents. It should be noted that in case Corona Virus enters a ship and infects its staff, it can create a massive human disaster, and it can also cut off the ex-

port of oil to the intended destinations. We commenced dealing with the virus at NITC from the very beginning and did not wait for the international protocols or other organizations, which reached us with delay.

The point that all shipping lines must learn from the Corona pandemic is to always update quick response protocols. The crisis management team must develop scenarios in advance, determine the proper measures to deal with each scenario, and drill them periodically. The analysis of Corona pandemic in NITC determined to what extent this virus can impact each of the variables and paramters. As a case in point, we evaluated the impacts of Corona on the supply chain of spare parts, efficiency of human resources, Information and communication technology, repairs and maintenance, and the delay of ships; and based on the speculations made, we took the necessary measures to deal with them. In addition, we conducted all the internal surveys remotely, and we had excellent and desirable results. WE considered these results an opportunity and incorporated them in our codes and instructions. Besides, we took full advantage of this opportunity, and we expanded our instruments and online systems technology-wise. This is a matter that needs extreme attention nationwide.

The other point to which transportation industry must pay close attention is capturing the market in the post-Corona era. This pandemic and sanctions should not cause us to disregard the future of the market. This Virus spread everywhere quickly and intensively, but it could shrink and travel away from the world at the same fast pace once its vaccine is discovered and launched to the market. Hence, it could place new markets at the disposal of all companies competing in the transportation market. By analyzing the market before, during and after this pandemic, we could capture those new markets. One of the impacts of this pandemic was reducing the global need for energy. Some counties expanded their importing of oil and petroleum products as well as goods with industrial basis, as these had low prices in the pandemic. They did so to save them and employ them to add competitive advantage to their products and services once the pandemic is over. This is the point that is noteworthy regarding post-pandemic era.

Captain Mahmoudpour: Let us take a look at the impacts of Corona pandemic on world trade in a global scale. Maritime trade is an international trade and the impacts that are exerted on Iran's domestic industry are encouraged from outside. Once Corona spread in China, everyone thought that it would stay there as well, but gradually, the visions changed. When we say China is the "the propeller of world economy", we mean 22 % of maritime import belongs to this country. Everyone expected to witness an improvement in maritime trade in 2020, as in 2019, due to conflicts between the USA and china and the incidents in Brazil, this business was at its worst condition since 2009. The speculations had worked out a 4-percent improvement in maritime trade, but so far, this figure is approximately – 0.1 %. It is very interesting that in the middle of all this, China's economy is recovering and healing. World's GDP was also predicted to improve 3.25 % in 2020, but that is also moving toward a negative figure based on new speculations. It has been estimated that by the end of April 2020, maritime industry has born a loss of approximately 1.5 billion USD of potential revenues. Closing down of ports, cancellation of voyages, delay of ships, suspension of activities in various countries and the imposed restrictions are all reasons for this, and all shipping lines have been impacted by this. Meanwhile, IRISL has studied the impacts of Corona pandemic on the international markets and analyzed it. As you stated, the improvement in the container transportation is moving toward negative, and its volume is going to reduce as much as 5 %.

In the safety and environment facet, human resources is the factor that keeps the shipping industry up and running. Various international organizations such as ICS, IMO and classification institutes have raised awareness about this point and have proposed a number of solutions. For instance, IMO has granted Iran's Ports and Maritime Organization the license to renew the certificates and this way, reduce the ventures to minimum. Following this, the ports and Maritime Organization renewed the licenses so that it could manage the cargos on ships in the next few months and control the virus spread by decreasing the number of trips.

In IRISL, once the pandemic started to get serious, we took measures to minimize its impacts. A large number of activities that the staff did on ships were done through teleworking. Other protocols were implemented in the field of hygienic packages. Approximately 15 different solutions were proposed to ships so that they could control this pandemic by collaboration and overlap activities.

As Mr. Biglarkhani stated, through collaboration, this pandemic can be transformed from a threat to an opportunity. For instance, instead of employing foreign staff, we can hire Iranian staff. Or due to the imposed limitations, we

By analyzing the market before, during and after this pandemic, we could capture those new markets

can make use of our own ships whose trade has diminished. This matter calls for a panel in which all the maritime industry stake holders and beneficiaries are present: This panel can detect all the opportunities that this threat has thrown out, and propose how we could seize them.

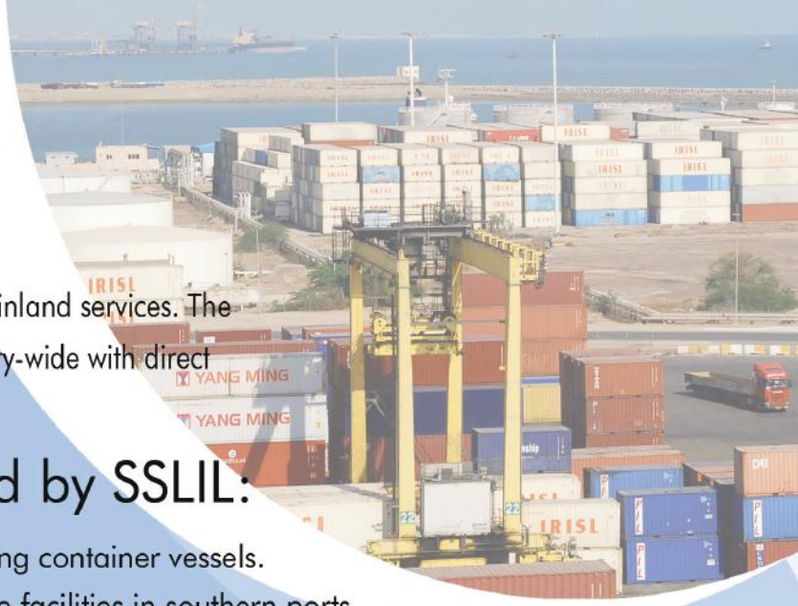
As you know, ships alone or cargos alone are not hurt by the Corona pandemic, but the maritime industry is vulnerable seeing that the human resources (i.e. sailors, port staff and people who are involved in the cycle of this industry) are vulnerable. So let us return to the sensitive sector of human resources.

Captain Ebrahimizadeh: International organizations currently surveying all the positive and negative aspects of COVID-19, such as its impacts on occupations, revenues and incomes, and the like, worldwide. Besides, it has emphasized the execution of social protocols as a solution. Meanwhile, IMO issued a directive, stating that the ports should not be closed to transportation and transit. In addition, Corona pandemic has exerted impacts on goods transportation in all transit modes including maritime, land and air transport.

Through employing WHO protocols, we have achieved impressive results in terms of individual's safety. Taking a professional view, I must say that the majority of ports are closed to their staff and many airlines have grounded their planes. This matter has made problems in the repatriation of employees to their home countries. On the one hand, their homelands are not willing to allow them to return due to Corona pandemic, and on the other hand, these employees do not want to go back on ships for mental and psychological reasons. Hence, we have to accommodate them in hotels and that is a financial burden for us. But luckily, following the instruction as to employing Iranian staff in the IRISL fleet, these problems were diminished to minimum.

Prior to the spread of Corona Virus, we had over 3500 extra crew members, which shaped up 10 % of our staff; but now, we have reduced this number to 2700 to 2800. Studies depict that under the threats of developing Corona infection, crews were disinterested to work on board ships, and lack of sailor staff could be observed in all shipping lines. To complete their cadres, most of the companies that supply human resources have requested crew members from IRISL, and it was decided that contracts for supplying work force are signed while preserving IRISL interests. It was also decided that crew members join the ships only after taking the Corona test and being quarantined for 14 days. Hence, doing the test and accommodating the staff in quarantine has increased the costs in this regard.

Through employing WHO protocols, we have achieved impressive results in terms of individual safety



SSLIL established in 1967 and presently it is one of the companies in IRISL Group. The core activity of the company is terminal operation & logistics, as well as providing cargo support and container inland services. The company manages and operates a terminal network country-wide with direct interest in 4 operating ports and terminal facilities.

Some of the services rendered by SSLIL:

1. Loading and discharging all types of vessels including container vessels.
2. Warehousing of goods by providing suitable storage facilities in southern ports.
3. Providing logistic services according to customers' requirements.
4. Stripping and stuffing of containers.
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Marine Innovation Exclusive Interview With Martin Stopford, the Most Prominent Economic Analyst of Shipping Industry

The Role of 4th Industrial Revolution at Sea

In your perspective, what is the role of 4th Industrial Revolution at Sea?

The shipping industry is under more pressure than ever before from regulators, environmentalists, and customers to improve performance. But these demands have come at a bad time because the performance improvement strategy used by shipping companies over the last fifty years is "running out of steam". Freight rates fell rapidly in real terms between 1945 and 1986 but since then they have started to increase (Figure 1).

For the last 50 years companies have built ever-bigger ships, right across the size range and between 1996 and 2019 the average ship size increased by 75%.. For example, in the early 1980s a handy bulker was 30,000 dwt, but today's "handy" ship is more like 60,000 dwt. At the same time, they squeezed costs with cheap finance, flagging out and very tight office overheads – a typical company in bulk shipping has less than two people in the office for every ship at sea. But as the ships get bigger the economies of scale are diminishing, as are the ways to cut costs.

A new strategy is needed and I4 digital technology is by far the best option available today. It will make it possible to improve efficiency in dealing with costs, emissions and through transport efficiency. I4 has been used effectively in transport sectors on land, ranging from cabs to parcel delivery and even formula 1 racing – you cannot win a race without it! So, we know it works. The challenge is to make it work in shipping

The I4 revolution is possible by the availability of small, cheap microcontrollers. These are tiny but powerful computers which can be embedded in all sorts of equipment on the ship. They can do three things. *Firstly* provides information about what the equipment doing; *secondly* allows precise control of equipment by messaging across a network; and *thirdly* can run algorithms to avoid errors and improve performance. To give just one example, before the I4 revolution, balancing the

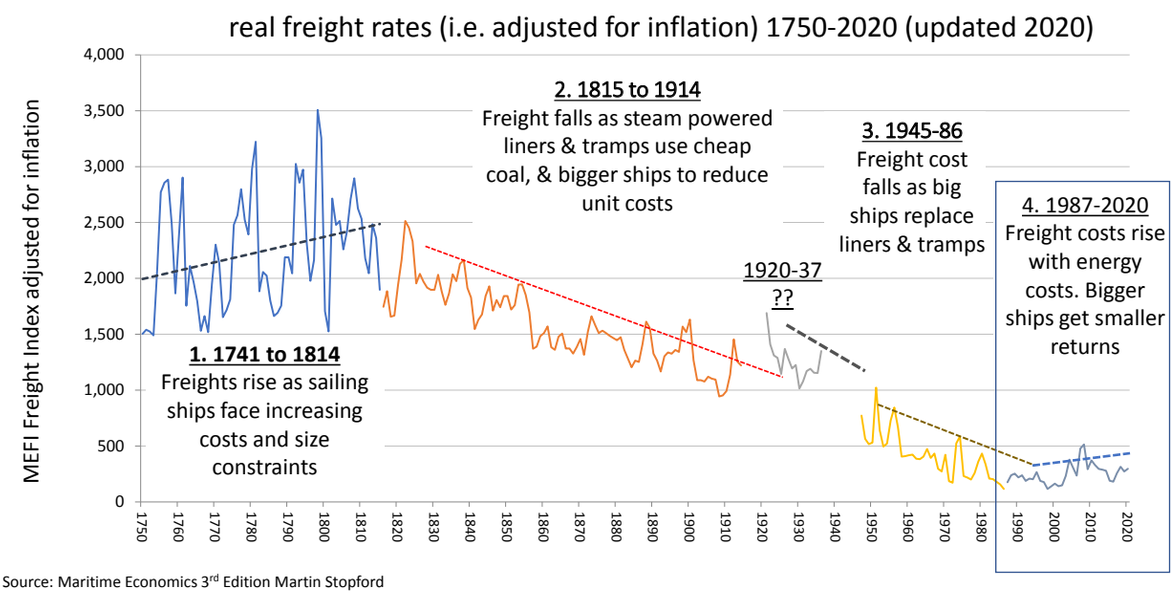
A new strategy is needed and I4 digital technology is by far the best option available today

cylinders on a diesel engine was a major mechanical operation. The camshafts operating the exhaust valves and fuel injection had to be adjusted – not an easy job. The electronic engines operate the exhaust valves and fuel injection hydraulically, with electronic controls. This makes it technically possible to balance the engine while it is running. This is not new territory – formula 1 racing cars balance their engines on every revolution at 16,000 rpm.

A rapidly expanding range of new electronically controlled equipment is now becoming available, designed to improve the performance of merchant ships. The biggest problem is putting it all to work. Financial benefits are hard to quantify and there is concern that "the charterers will not pay for it". In addition, shipping companies have slim management teams, with few executives who understand the digital technology well enough to commission it on a ship and make it productive. Even more importantly, once the "electronic" ship is in service, it will need new management systems to use it effectively. My experience working with companies on this over the last few years, it is challenging. Strong leadership is needed.

What is the role of the 5G network?

Communications play an essential part in making the I4 revo-



Source: Maritime Economics 3rd Edition Martin Stopford

Figure 1 Real freight rates fell until the1980s, but are now increasing

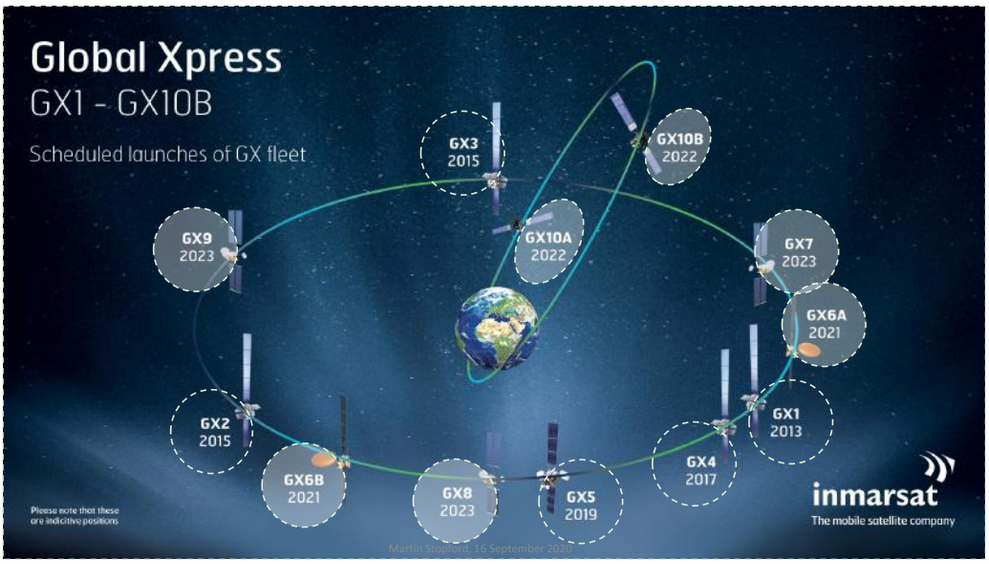


Figure 2 Rapidly growing satellite network will create the framework for smarter sea transport. Current satellites GX1-5 and planned GX6-

lution possible at sea. Ships still operate as independent business units, and until very recently communication between ship and shore were quite limited. But things are moving very fast, opening a new world of global communication for shipping. But 5G is not a major part of this revolution. The new 5G networks will deliver data 10 to 100 times faster than current 4G networks, with latency (i.e. lags), as low as 1 millisecond. This will be useful for shipping company offices on shore, but not for ships. Except when in port, ships rely on satellite networks, linking the ship to access stations on land. These access stations link to the internet; the cable network; cellular networks and the cloud, allowing companies to set up large globally accessible data systems without investing in their own computer systems.

The expanding satellite network

The key development for shipping is the rapidly expanding satellite network. This will make it possible for shipping companies to integrate digital systems and databases between offices and across their fleet of ships. This is a terrific opportunity to develop the organizations needed to make I4 technology effective.

In the last five years Inmarsat has commissioned five geostationary satellites (see Figure 2 -GX1-GX5) – the latest, GX5 was commissioned this month. These K band satellites already have global coverage of the world merchant shipping routes, with steerable beams to focus bandwidth where it is needed. The Inmarsat Global Express system is already on 10,000 ships.

A much bigger step up in satellite capacity lies ahead. Inmarsat has 7 more satellites scheduled over the next two years (see Figure 2 GX6 to GX10B). Each of which will be more powerful than the last (GX9 will be more powerful than GX 1-6 combined!). The management of satellite traffic is also greatly improved so that busy areas such as the seas around the straits of Malacca will have plenty of band width. The strategic significance for shipping companies is that for the first time in history a fleet of ships can operate as a networked business with integrated systems, allowing teamwork of a sort we have been learning about during the Covid Pandemic. As I4 technology is built into the ships, information and tasks can be shared between land and sea. For example, the new Sperry Marine VisionMaster navigation system allows offices on shore to share the information available to the helmsman on the ship. This opens new ways of workload integration and planning- for example masters can delegate laborious paperwork!

What is the importance of autonomous ships for shipping industry?

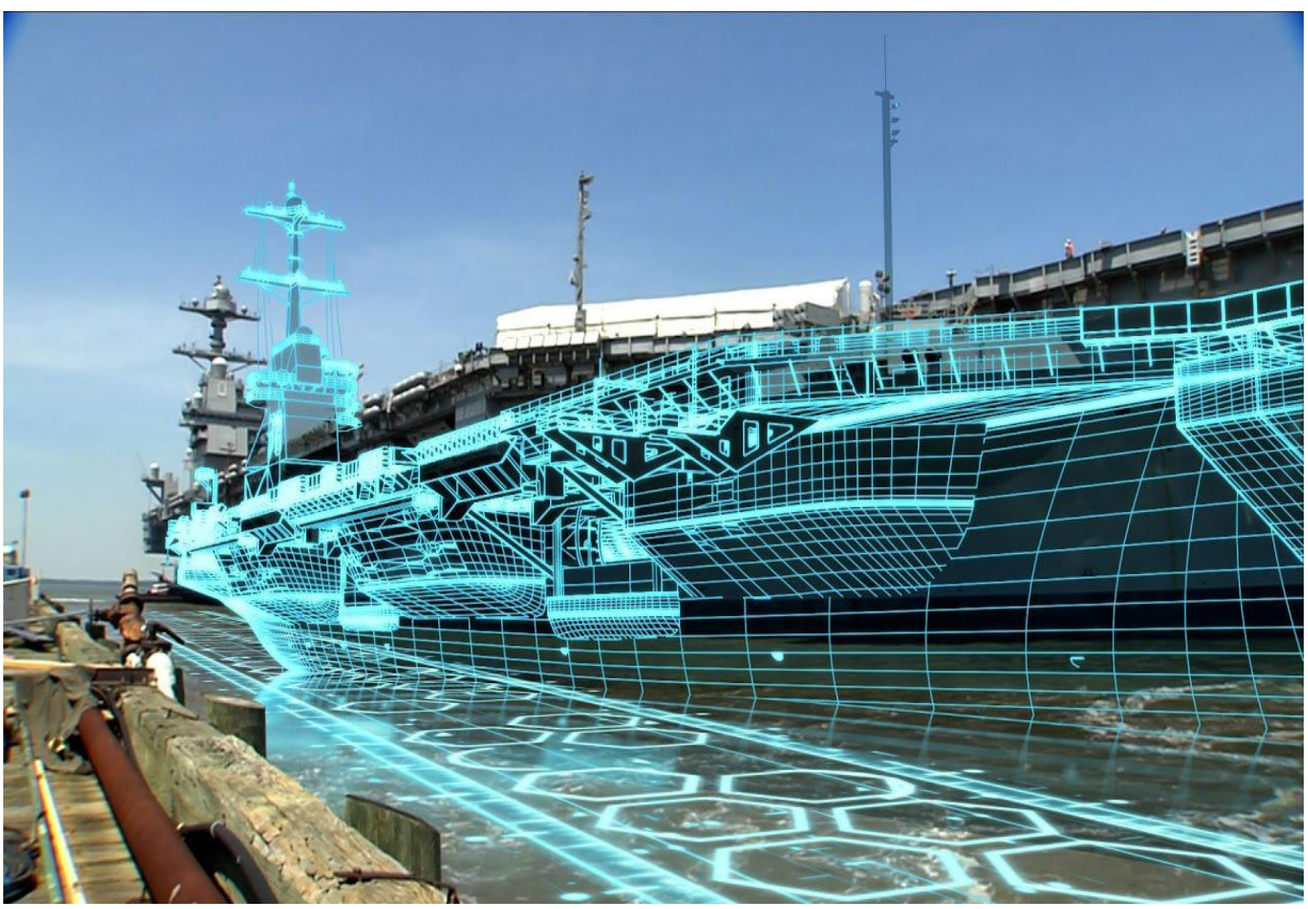
Autonomous ships will play a specialised part in all this but are not a pressing issue for most commercial shipping businesses. With today's technology it is perfectly possible to build an autonomous ship. Indeed, Yara is building a 100 TEU containership to operate between its chemical plant and a nearby container terminal. The 100 TEU electric powered ship will save 40,000 short lorry journeys a year and have an excellent impact on the environment. But it will be expensive and does not need to be autonomous to get the environmental benefits.

My sense is that a more important benefit of I4 and communications will be to change the personnel system, making life on board ship much more interesting and opening new career opportunities as the crew become part of the shipping company's global management team. Digital technology will make ships more efficient, more reliable, and cheaper to run. But I suspect the step to autonomy will only be worthwhile in local short sea services and other specialist applications which can justify the high cost and manage the risk. In today's world sending a 20,000 TEU containership to sea with no one on board would be risky. For the immediate future a better strategy would be to use the new technology to make the crew more productive.

The smart valve is plugged into network. It receives a digital message to open the valve and actuates the motor. You can program it to do lots of other clever things too! Same sort of thing for pumps. As a result, pipe systems will become smarter, safer, and much easier to operate

Figure 3 Electronic control systems with micro controllers, sending messages over networks, will revolutionise ship-board systems

How will ship design and construction develop in future?
In terms of the ships themselves, the surge of electronic equipment coming onto the market will make it possible to streamline on-board ship systems. It is exactly the strategy followed by the car industry twenty years ago when they replaced wiring with messaging, by developing CANbus control area networks.
The principle is simple. Instead of switching a pump on or off by sending an electric signal from a switch down a wire to the pump, you control the pump electronically. This is done by fitting an electronic actuator, plugged into a network. A digital message is sent to the pump through the network, telling it



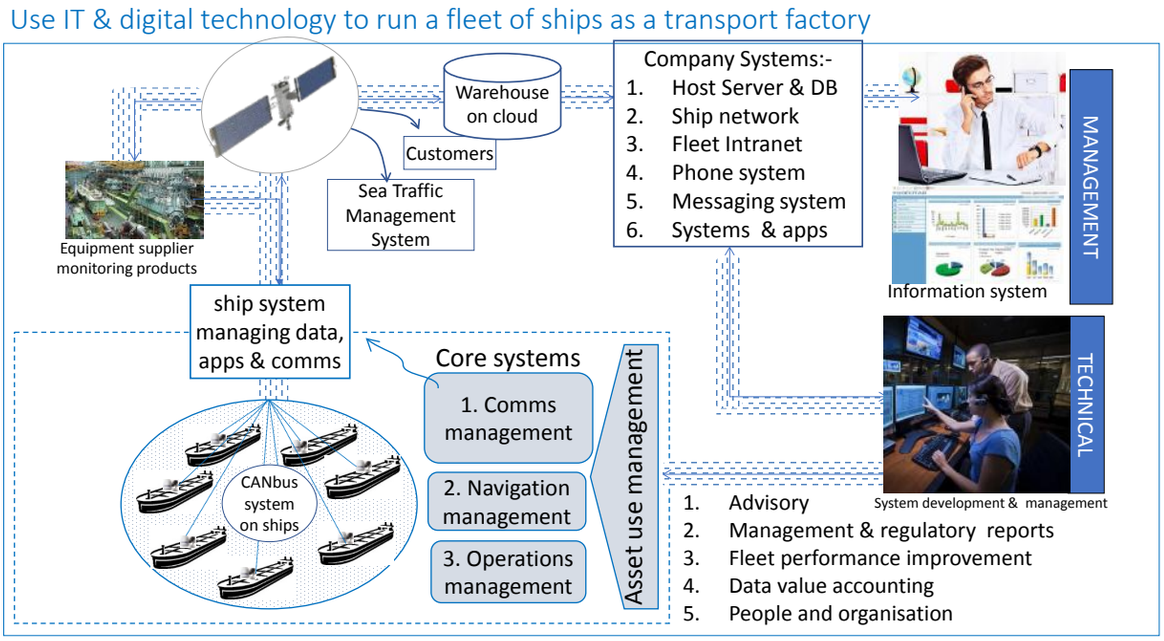


Figure 4 Satellite communications and digital technology will make it possible to run shipping companies in a very different way, providing better service and asset usel

what to do (see Figure 3). In addition to starting and stopping the pump, this opens new possibilities. The actuator can send back messages reporting pump status; it can optimise speed in response to flow rates; log usage; and report vibration or power spikes that might indicate a problem.

Ships are crammed with systems that could be transformed by electronic operation and electronic products are increasingly available. The biggest challenge for shipbuilders is to integrate these systems, so that you do not end up with a hodgepodge of different networks, making life difficult for future operators, maintenance engineers and systems engineers rolling out the inevitable upgrades. Ideally the industry would develop standard shipboard network protocols for big ships. In due course this would open the way for process control systems, of the sort which are currently used on chemical refineries.

All this is a massive challenge. Building a fleet of smart ships and running them as a transport factory (see Figure 4) will require a great deal financial investment; training; and a change in the way activities are organised in this ancient business. Under the current system, there is a strict hierarchy, with the ship under the total control of the master, and an often uneasy relationship between ship and shore. Decisive control is essential for safety, but effective teamwork is important too. My vision is that in future shipping companies might shar information and management systems across the fleet. It is another step along the road which started with the autopilot in the 1960s and the unmanned engine room at night in the 1980s. Businesses built around teams will be more adaptable and quicker to respond to changing circumstances. And, of course we will all need to become much more familiar with making digital technology work!

How do you evaluate the outlook for demand in freight rates in the container, bulk, and tanker sectors?

One thing that will not change because of the I4 revolution is the market cycle. It has been around for at least 300 years (see Figure 1)! I expect the shipping industry will continue to have unexpected cycles in both directions, earning modest returns and very occasionally making lots of money. The value added by the I4 technology revolution is, unfortunately, likely be passed onto the charterers[1], which raises the issue I want to finish on.

In the spot market, shipowners and charterers are on different sides of the negotiating table. But if the industry is to move forward with digital technology, it would be beneficial if cargo owners became involved in developing the new ships and transport systems. Digital ships will be expensive, and this sort of investment is difficult to justify in financial terms when ordering a ship.

Getting cargo involved ensures the new digital technology is put to good use, especially in voyage optimization and through transport logistics. This applies to all the stakeholders including customers, ports, shipbuilders, equipment suppliers, bunker suppliers, crewing agencies – the list is endless. More stakeholders mean better information and organisation to manage the ship voyage more effectively. But we need to take one step at a time. This first step is for each company to understand I4 technology and decide what to do about it.

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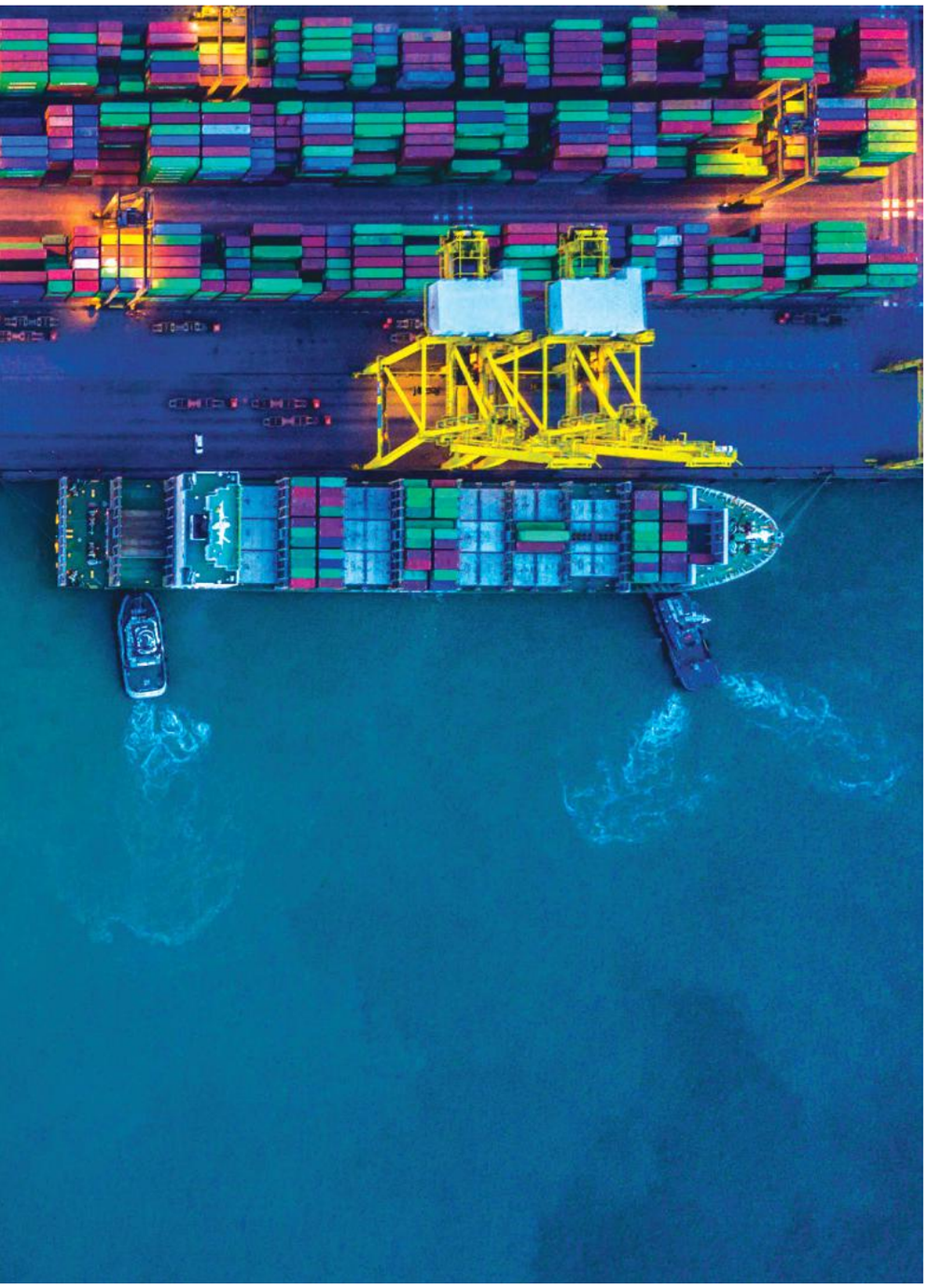
Smart Transportation Calls For Smart Ports

By: Bahareh Ghahremani

Smart transportation has been a concept with which maritime community activists have been wrestling for a long time. Every day, we are witnessing news stories regarding the construction of ships that enjoy the state-of-the-art digital technologies. Despite the spread of Corona Virus, building such ships is in progress at full throttle all across the world. Self-driving ships are also being launched one after another. However, we must stop for a second and see whether or not the capacities and infrastructures of world's ports are ready for the docking of these sorts of ships: Tremendous container ships with digital box and no human resources.



Maritime analysts have sparked a storm of criticism toward the shipyards that build self-driving ships, as they believe these yards merely wish not to fall behind in the competition of building self-driving vessels and they have thus totally turned a blind eye to the side issues and other problems that may emerge. Experts firmly believe that smart transportation and smart ports are tightly tied together, in such a way that unless ships and ports are not in full harmony, we can never feel optimistic about the future of smart transportation and self-driving ships.

The first warning to the maritime community was given a while ago by Richard Ballantyne, the Chief Executive of the British Ports Association. He warned that sheer concentration on building smart ships without taking into account the capacities of the ports would not only fail to solve any problems, but it will bring about a whole basket of problems on its own. In another note, John Bright Ramson, a maritime analyst, believes that even though the future prospects of smart large-scale ships are bright, no organized plan has been put into place in their use. It seems that, he adds, some international ship yards are not thinking clearly and comprehensively. They are only struggling and endeavoring to provide us with smart huge vessels, not pondering that ships are useful only when they can venture to all ports across the globe. Few countries are taking measures to build ports that could cater to the needs of a huge 22,000-TEU-container ship.

According to Ramson, building smart ships in only one side of the coin. Just think of a self-driving ship, which is venturing the open seas with a huge amount of cargo but with no or minimum human resources, relying merely on its remote control technology. What would happen to this ship in the absence of an organized itinerary for docking, embarking and disembarking in the source and destination ports, safety, preparation to cope with cyber-attacks, and creative specialist staff at the ports? In another pessimistic prediction, he adds, there will be pirates in the middle of all this, for which no acceptable and solid solution has not been offered.

Marry Klan Peterson, who has been conducting extensive research in this regard, states that experts and analysts keep making inquiries concerning the future of smart maritime transportation. When we speak of building smart ships, have we contemplated enough over the standards, instructions and planning of these ships' trips? Fortunately or unfortunately, all NGOs, including the International Maritime Organization, consider building and launching self-driving digital smart ships significant and essential, but no comprehensive plan seems to have been offered in this regard, and even if it has been, the maritime community is not aware of that.

According to Peterson, given the new conditions brought about by the Corona Virus, it is unclear whether or not there will be an increase in the number of smart ports with huge investment, as a large number of Asian, African, or even European ports do not have the necessary hull for the docking of the current ships. Yet, the one port that Peterson pointed out, which could welcome the docking of mega-scale self-driving ships is the Port of Rotterdam in the Netherlands. This port ranks first in the list of top smart ports worldwide. But the question is "Can all other ports compete with Rotterdam?" Of course, Port of Antwerp and Port of Hamburg could not be disregarded.

Dr. Panos Theodoropoulos, a senior

maritime analyst, harbors a unique mindset toward employing digital technologies in building ships. According to Theodoropoulos, smart transportation is not a future outlook, but it is a fact that we will face in the upcoming years, as employing digital technologies is not just a solution, but also a source of new problems. In this facet, macro data management, the Internet of things, data collection, and block chain are the pioneer areas; yet, we have to wait and see whether or not port operators are aware of how to implement smart transportation. Are world ports prepared enough to welcome smart technologies in transportation, collect data and maintain block chain?

Theodoropoulos adds that we should refrain from taking a simplistic and superficial outlook to this matter, seeing that smart transportation, in which innovative technologies and self-driving ships shadow the management of transportation, encompasses each and every facet of transportation. Indeed, smart technologies would revolutionize the culture of transportation and will direct the world toward new conditions. Nevertheless, at the moment, no one is sure how the entrance and exit of self-driving ships to ports is going to be supervised and how high the quality of their performance is going to be. Under current circumstances, it is said that pessimistic individuals like us always bring about challenges; yet, no one truly knows the fact: What is going to happen? What will happen to human resources? Will they all be thrown off the game? Will they be laid off? Or will they still be employed? These human-resources-related concerns are debatable. These are all the questions that have obsessed maritime analysts' minds.

John Wright Villant, another maritime analyst, believes it is too soon to prognosticate whether employing self-driving ships will be a challenge or an opportunity; but what we do know is that great opportunities are awaiting the world thanks to self-driving ships and smart transportation, on condition that we realize how to utilize them in the most efficient way. It might be advised that ships and ports must be all handed to smart technologies, macro date, the Internet of things, block chain and the like; nevertheless, it should not be mistakenly thought that smart ports and self-driving ships merely move forward with technology. It is the creative, knowledgeable and skilled human resources that are needed. Thus, meticulous plans must be hammered out to train and nurture highly-skilled and adroit human resources, and this can confer solid grounds to smart ports and self-driving ships to walk on. According to Wright, no one rejects the innovative solutions and every one tends to move toward a bright future, because they believe digital maturity will lead to the transportation maturity of smart transportation; but at what cost?

The leading maritime analyst Joyce Black holds a contrary view. He asserts that the ports and shipyards have been moving toward digitalization and inclusion of smart technologies at an incredible pace for years, but the maritime community must also give one question some serious thought: Is it really necessary to make huge investments for constructing wharfs where gigantic smart ships and self-driving vessels can dock? Maritime community must also consider how much preparation and arrangement has been made for the welcoming of smart ships so that the idea is believable for the maritime community?

Another prominent maritime analyst, Reslia Cardoom, refers to a report released by the Organization for Economic Co-operation and Development (OECD), which states container transportation worldwide will four fold up to the year 2030, and by the year 2050, the world ports will witness the march of containers at a volume which is 5 to 6 times more than their current number. Reassuringly, no technique or strategy can come handy to handle cargoes to that tremendous amount except for smart maritime transportation. That is why we must start today and plan for the upcoming 10 to 20 years. We do need to acknowledge that current ports cannot do miracles.

Stewart Reitin, almost shares the same view. He emphasizes that nothing will stay static, and change will surely happen in all areas, one main one of which is the area of maritime transportation, which is altering day after day. With no tinge of doubt, he continues that self-driving ships are going to partner with maritime transportation worldwide, even if traditional transportation moves alongside it at its slow pace. We do need to accept the fact that smart transportation calls for smart ports. According to Reitin, the docking of a self-driving ship at a smart European port is not a new phenomenon. What we need to is to prepare the grounds for such ships to be able to dock at the ports of India, Sri Lanka, Pakistan, South African, and other nations. Self-driving ships are not built for a certain geographical area, such as from Germany to the Netherlands and back. This is an international industry and it needs to be looked at with an international vision.

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Shipping Industry in the Post-Pandemic World

As the world continues to grapple with the COVID-19, global shipping industry continues to face disruptions. The condition of shipping industry in the post-pandemic world is remains to be seen. In order to delve into this issue, Marine innovation magazine has conducted an exclusive interview with Mr. Peter Sand, Chief Shipping Analyst at BIMCO.

What is the impact of coronavirus on global shipping demand?

The outbreak is negatively impacting shipping demand everywhere. But due to various other external shocks, the impact on shipping in 2020 has been very diverse.

You see that clearly now, with demand for oil tankers being low, but only after an oil production/oil price war was raging in the early start of the year. In short, as real consumption of fuels dropped like a rock, redistribution of oil from wells to storage was as busy as never before. Pushing forward future demands to present times. These events have lowered future demand for the coming 1-3 years, from the level it would otherwise be at, was it not for the temporary breakdown of OPEC+ alliance and the following events.

Global container shipping have seen demand falling by -6.8%, while reported earnings have gone up. How can that be? Mainly because of significantly lower bunker fuel prices, which have cut voyage costs at large. Those external cost cut, came on top of internal cost cuts as sailing were blanked across the board. Obvious the idle fleet went sky-high. This bring me to the second point, someone is obviously paying the price here. But also non-operating owners – that only charter out their container ships to the operating lines. As demand evaporated, charter-rates dropped like a rock – for some ship sizes by as much as 50%. Fast forward, we have seen an extraordinary fast recovery for some ship sizes, like a traditional 3,500 TEU gearless for instance. Showing a real V-shaped recovery for rates, even exceeding where they were in early March.

For all dry bulk ship sizes, January and

February were dreadful. But then China went on a massive buying spree for iron ore, coal and soya beans – pushing freight rates back up again. For South American agricultural exports, the comeback in Q2 really supported Supramax and Panamax markets. For the full year, dry bulk demand will fall, but for individual commodities demand will go up, for grains surely.

How do you evaluate the shipping industry in the post-pandemic world?

A part of what we see today in terms of shipping demand is boosted by economic stimuli provided by most nations across the globe, an effort to limit the inevitable damage done by the containment measures and the loss of economic activity. On the other side of stimuli packages provided, after the scaling down and ending of them all, a vacuum will show up. Dry bulk imports seem to be the most likely sector to be hit by this 'vacuum'. Tankers are on a long road to recovery, but find themselves at rock-bottom now with plenty of ground to cover before a level of demand last seen in 2019 will establish itself.

For container shipping, it is somewhere in between. What we have seen in recent months is a gradual improvement in volumes being shipped. But when we are looking forward and see an ongoing contraction of "new export orders" from the global manufacturing sector or the Chinese manufacturing sector – it's obviously a worrying sign. Time will tell if operating lines can continue to balance the services being offered on any trade to the actual demand which is there, by blanking the sailings needed in order to sustain high freight rates. That's going to be interesting to see.

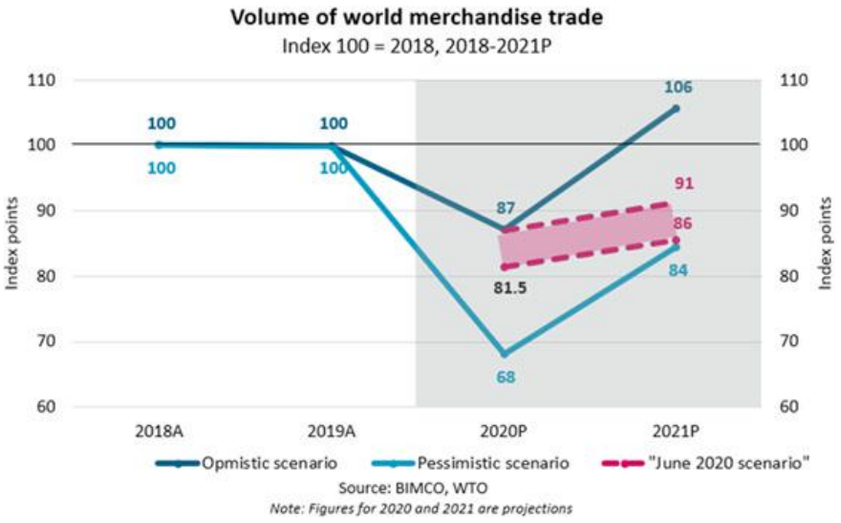
Will demand for container shipping industry bounce back in the next year?

Demand will go up in 2021 from the level of demand in 2020. But it's likely to remain below that of 2019. As you can also see in the chart below –the growth will be in trade, but from a low point. Overall, globalization is under "attack" from geopolitical movements anywhere. In many places the focus is much more on domestic matters than taking advantage of the benefits constantly offered by globalization. This is

hurting not only those countries shying away, but also international shipping.

In your opinion, what is the main incentive for scrubber investments in container sector?

I trust you have read this: https://www.bimco.org/news/market_analysis/2020/20200813containerships_overtake_crudeoil_tankers_scrubber Container ships burn the most fuel of any ship type, and if you have the money to invest in a scrubber available, you basically make sure that you can always optimise your bunker fuel costs. In the very unlikely case that any low sulphur fuel type becomes cheaper than HSFO, you can always switch off the scrubber. But as an economist, this scrubber investment decision seems fairly straightforward. As a normalised fuel market will see a price spread between HSFO and LSFO open up to be larger than it is today. I may not climb all the way back at $200 per mt, but even at $50 per mt – the savings more than outweigh the costs of running a scrubber. Having said that, it's by far not trouble free to run your engine on low sulphur fuel oil as compared to the HSFO that you know so well. This is well documented here: https://www.bimco.org/news/priority-news/20200819-industry-survey



Corona Virus: Challenges & Implications

By: Arash Shoghnia

The novel coronavirus outbreak, which emerged in Wuhan, in late December 2020 registered only a dozen active cases in Wuhan. At the first, No one could imagine that it would spread quickly to all corners of the world. The economic pain became severe as people were asked to stay at home, and the severity was felt in various sectors of the economy with travel bans affecting the aviation industry, sporting event cancellations affecting the sports industry, the prohibition of mass gatherings affecting the events and entertainment industries.

The coronavirus outbreak has now tightened its grip on the entire world, with Europe as its current epicenter. The first country to be hit by Covid-19 is the only one with a recovering economy and re-emerging population. For the rest of the world, uncertainly is the only certainly.

The rapid of coronavirus has had a major impact on global shipping markets, with the slump in demand for goods from China having a ripple effect on everything from container ships to oil tankers.

We need to keep globalization alive
Ever since Europe became the epicenter of the Covid –19 spread, a sentiment widely shared across all Western markets and beyond is that there is a firm need to the economy going , something that is not only paramount to individual countries but also the globalization dependent shipping sector. One of the biggest long–term impacts of this outbreak will be that now countries /companies will be wary of putting all their eggs in one basket, People will surly look into diversifying their supply chains.

One of the biggest long–term impacts of this outbreak will be that now countries /companies will be wary of putting all their eggs in one basket

Long – term impact of coronavirus on shipping: investment in freight technologies
Just may say "Covid-19 had just slapped everybody in the face so get ready because what's coming is going to be even greater disruption in different forms."
Believe the first impact will be increasing investment in freight technologies as well as companies providing data analysis, artificial intelligence software and overall end-to-end supply chain management. This will be key to reduce the shock, increases the resilience, providing more data/information, greater ability to manage inventories to track the rates and timing of the shipping that is done.
Investment into freight tech companies will help the existing industry to connect all the different players, shippers, brokers and carries in the maritime basis to optimize current operations.

Commercial View
The outbreak came at a time when shipping companies are used to lower demand due to the Chinese New Year (CNY) and had already planned for this, the shipping industry experienced major disruption in first quarter of 2020 due to both the Coronavirus and the crude oil price crash. As major parts of the global economy shut down, not all vessel types have experienced the same disruption.
By using vessel tracker system, analysis shows that among all vessels' type; cruise ships activity has collapsed in the wake of reduced tourism due to Coronavirus Pandemic to about 10% at the beginning comparing with same period in 2019 with overall drop of 35% in total year.
Other types of vessels remain at lower level at about 10-15 % depend to the type & purpose of vessels.
As BIMCO's Peter Sand puts it: " Coronavirus caused demand to fall lower , and remain at lower levels for much longer than in a usual year ; for many in the industry it became about prolonging their measuring for dealing with CNY which were already in place, with little other options to deal with the blow."
According to figures from Chinese think – tank the Shanghai International Shipping Institute , this led to reduced capacity utilization which fell between 20% and 50% at the biggest Chinese ports and a sharp increase in the use of port storage facilities.
It is too early to gauge the full economic and trade effects of the Coronavirus outbreak. However, shipping data, based on real – time observations of vessel positions (AIS) and information about the cargoes aboard those ships, already shows a change in the operational behavior of container vessels and in the amount of oil product on the water.

Container vessel /Industry
Containership visits to Chinese ports, measured both in number of vessels scheduled to call and their cumulative capacity in TEU plunged in late January and early February 2020. At the same time , the ratio of missed port calls (i.e. scheduled vessel calls that do not occur) has risen sharply to levels usually seen in late February and March.
Typically, vessel operating companies reduce capacity in the weeks following the two- week Lunar New Year vacation in China. The number of missed port calls – shipping companies bypasses a port because of a lack of volume and go straight to the next port in their scheduled rotation- rise during that period. Ahead of the holiday, shippers usually pre-order goods ahead of the drop in Chinese output, which helps minimize the number of missed port calls.
More significantly, the slowdown in port calls is occurring worldwide, not just in China. Shipping companies have been reducing scheduled capacity since about August of 2018 on most trade lanes as trade wars slow global demand for cargo capacity. In the second half of January and early February, this drop accelerated significantly. The certainly of China to the movement of goods around the world explains this: if Chinese ports are not loading or discharging containers, there is no reason to stop at the port where the shipment is supposed to go to or come from. The move towards bigger containerships is another important factor at play; a missed port call now has a more profound impact on available capacity.
China also plays a crucial role in terms of global oil products trade, as an important source of demand for crude oil and of supply of refined products. Crude oil is moved under long- term arrangements, via either annual contracts or bought months in advance. As expected, the flow of this commodity currently seems unaffected. However, sings of stress are starting to appear in

the downstream sector of the oil value chain.

Since the beginning of the year, jet fuel in transit has declined by about five percent from the same period in 2019. Measured since January 10, 2020, when the extent of the epidemic started to become more widely known. This drop must be seen against the backdrop of steady rises in fuel demand over the last five years, representing the fastest growing segment of the petroleum product market, with considering of air travel demand as well.

Another indicator is the amount of a commodity onboard ships that are idle. This so-called "floating storage" can build up due to operational factors such as port congestion or weather delays, or it occurs because demand dropped while the ship was sailing from the loading to the discharge port. Using this indicator, it is observed that although the volume of diesel in transit is steady during the same period, the amount of the fuel in floating storage aboard ships that are idle and not moving has soared.

Potential impact on trade of oil products

Data on the amount of crude oil imports and crude oil in storage onshore in China reveal a significant slowdown in refining activity, especially in the north of the country where the independent refiners are concentrated. At the same, net outflow of transport fuels- jet fuel, gasoline and gasoline has increased.

Refinery runs, particularly in the north of China, are being cut, leading to a pile-up of crude oil vessels waiting offshore to discharge and an increase in onshore storage. Refinery runs are calculated based on the change of onshore storage levels(remotely measured by satellite- mounted radar sensors, and the sum of supply made up of observed waterborne deliveries and statistical modelling of domestic production and deliveries by pipeline).

CONCLUSION

The outlook for economic and trade activity and refined oil product demand is one of the weakness which definitely has influencing decisions by manufacturers, importers and exporters.

The epidemic has yet to run its course, but even after the spread subsides and china starts to return to normal business activity, it will take a long time to unwind the stresses inflicted on the world's trading system. A return to medium / long term trends in shipping and trade is unlikely before the second half or even fourth quarter of 2020. Immediate actions so far show an uncoordinated and pointillist approach.

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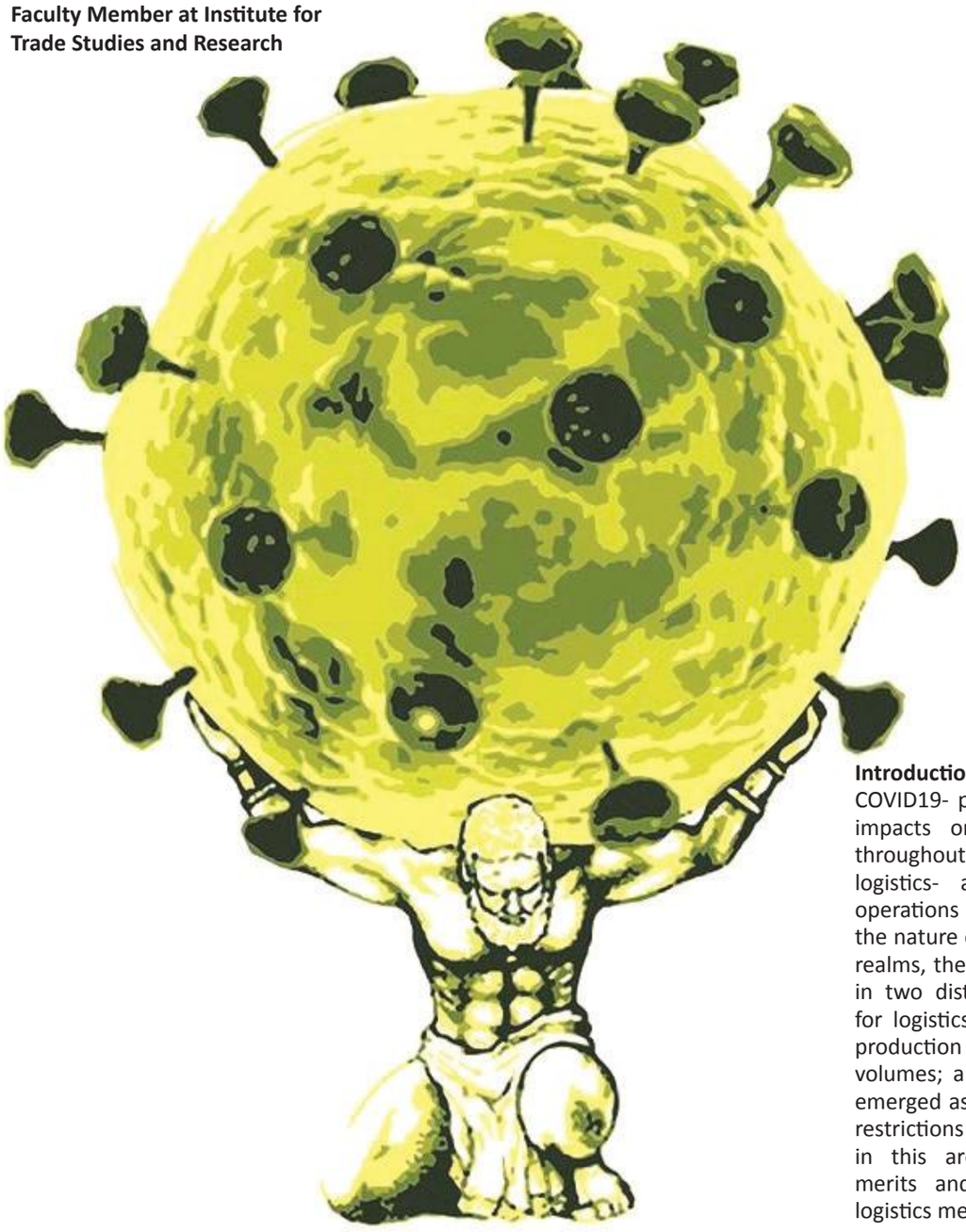
The Impact of COVID-19 Pandemic on Transportation and Logistics Activities Worldwide

By: Elnaz Miandoabchi
Faculty Member at Institute for Trade Studies and Research



Introduction

COVID19- pandemic exerted profound impacts on economic activities all throughout the globe, and accordingly, logistics- and transportation-related operations were no exception. Given the nature of the services in these two realms, the pandemic shadowed them in two distinct facets: First, demand for logistics upon the changes in the production rates and world trade volumes; and second, the issues that emerged as a result of imposing social restrictions and health protocols in this area. Additionally, different merits and confinements in global logistics means and methods made the

impacts of this pandemic even more complicated. That is to say, despite the serious damage and losses that Corona pandemic extended to logistics and transportation operations, it gave rise to new opportunities in several sectors. As an attempt at closely probing various dimensions of Corona pandemic on maritime and other global means of logistics, this article also discusses the challenges and opportunities ahead of companies offering logistics services. Besides, this article investigates the impacts of global economic recession on demand for logistics services, particularly maritime logistics.

1. The Impacts of Corona Pandemic on Global Maritime Logistics Activities

With the spread of Corona Virus in China, container transportation in Chinese ports experienced a reduction of roughly 10.1 percent. In the main ports of this country, transportation of container reached a halt due to the quarantine of ports' staff and lack of truck drivers to move the containers. Accordingly, international shipping lines cancelled or restricted their transportation plans. Seeing that exports of goods from China is the main axis of maritime transportation, a large number of automobile manufacturing plants, producers of electronic devices, pharmaceutical companies, manufacturers of medical materials and devices, and producers of high-demand consumer goods such as food and hygienic products ran into disruptions in their routines at a global scale. In other countries, as well, imposition of quarantines and health protocols reduced logistics capacities. As a case in point, quarantine regulation in India decreased the number of truck drives, which caused over 50,000 containers to lie uncleared and uncollected in the Chennai, Kamarajar and Kattupalli ports. Restrictions imposed on maritime logistics worldwide brought about problems for key importers and exporters such as Brazil, India, China, Mexico and the European Union.

In close collaboration, International Association of Ports and Harbors (IAPH) and World Port Sustainability Program (WPSP) conducted biweekly surveys from world ports regarding the impact of Corona pandemic on their port operations from April to July 2020. The criteria that were set for these surveys were reductions in the number of entering ships, delays in the hinterland transportation, occupation of storage capacities due to accumulation of goods, and lack of workforce at port. Ports were asked to compare their normal conditions in the past with the new Corona-stricken conditions in terms of these criteria on any given week, and report the comparison results. Based on the results of the last survey, conducted in mid July 2020, the number of container ships entering ports was smaller than normal conditions in 40 % of the ports. The same figure for non-container cargo ships was smaller than normal days in 37 % of ports, as well. This highlights that despite quarantine rules' getting less strict globally and the reduction in shipping lines' cancellation, maritime transportation is still growing at a very slow pace.

Nevertheless, other port problems have noticeably diminished compared to previous months. Only 9 to 11 % of the ports reported delays in road, railway and canal transportation in July, while this figure was between 28 to 43 % in April. In terms of accumulation of goods, only 10 % of the ports reported this problem for food, medical, dry bulk, and consumer products; and 16 % reported the issue for bulk liquid products. Likewise, only 4 % of the ports reported lack of human resources and 7 % complained about not having enough truck drivers.

2. The Impacts of Corona Pandemic on Global Air and Land Logistics Activities

The volume of airborne cargo in March 2020 underwent a -19percent decrease due to a sharp drop in commercial flights and a descent in the production of countries like China. In another front, the tendency of governments and cargo owners for airborne transportation of essential good triggered an increase in air transport fares and also caused delays due to heavy traffic of cargo flights in some airports. In early April, however, in the light of a reduction in Corona-related restrictions, airborne cargo transport increased globally. Even so, reduction in global airborne transport capacity was further than the reduction of transport demand, and this matter kept airborne transport fares still high. As restrictions on commercial flights continued, some airlines had to launch charter flights for moving cargos and convert passenger

airliners to cargo aircrafts.

Unlike air and maritime transportation sectors, over-land transportation was facing fewer limitations, and the majority of countries left their borders open for the transport of goods. Governments were making their best efforts not to halt the transport of essential goods among countries. Even so, given the difference in the nature of road and rail logistics, road transport was affected more intensely than railway transportation. An increase in demand for transporting essential food and hygienic products as well as quarantine-caused lack of drivers on roads disrupted logistics activities in other sectors and led to a sharp rise in road transport fares. Nevertheless, the total demand for road transportation dropped due to a decrease or termination in production of goods. In the railway sector, Corona pandemic gave rise to new opportunities to employ the capacities and potentials of trains to their

fullest in international transportation. Indeed, high airborne transport fares, cancellation of shipping lines' services, coupled with the high cost and slow pace of road transportation led a large portion of transportation demands toward railways. In the view of a -60percent reduction in airborne transportation of cargo between China and Europe, it is prognosticated that railway transport between these two regions expands dramatically. In recent months, the use of long freight trains has soared noticeably in China-Russia-Latvia-Kaliningrad international railway corridor.

3. The Impacts of Corona Pandemic on Logistics Services Companies

In order to protect the health of their workforce, companies that offer logistics services executed certain health protocols such as equipping their staff with protective props, disinfecting work spaces, maintaining social distancing in storages and similar establishments (i.e. reducing the number of working staff) and granting long-term leaves to their staff. Other than restricting the capacities of offering logistics services, these health protocols imposed additional financial burdens to these companies. In addition, in order to control Corona in their borders, many countries commenced practicing various health protocols in their border checkpoints. Not only did these health measures slowed down the pace of cargo transport from borders (airborne, over-land, and maritime), but they also caused long delays as well as an increase in logistics services.

In recent years, the application of innovative technologies such as the Internet of Things, cloud computing, automation, and advanced data analysis increased remarkably in logistics services. Yet, the restrictions posed as a result of Corona pandemic, accelerated this process. Indeed, the challenges ahead of the world posed by the pandemic could be deemed as a golden opportunity for the activists in the field of logistics and supply chain to integrate technology in their services and offer new services. In the long run, other fields such as robotics, unmanned drones, and self-driving vehicles will also be placed in the spotlight of attention, seeing that employing them would reduce the need for human resources and would enable logistic services to be done with minimum human contact.

4. The Impacts of Global Economic Recession on Demand for Logistics Services

The actual impacts of Corona pandemic on global supply chains are not truly known to anyone. International monetary fund has predicted that global economy will shrink by 3 % in 2020, which depicts the emergence of recession in many countries. With the resuming of economic activities in the post-Corona era, many countries will have increasing demands for logistics services because they will be trying to make up for all the pre-quarantined delayed and undone orders. Nevertheless, chances are high that production and trade activities undergo a decreasing trend due to economic recession. This matter is highly likely to give the second shock of demands to logistics sector.

Stakes are high that the pandemic consequences on global trade are far deeper and more long-lasting that previous crises. The extent of disruptions would vary depending on the type of goods, trade roots and transportation moods. As a case in point, studies conducted by McKinsey Institute highlight that demand for maritime container transportation will decrease between 6 to 20 % in 2020 – compared to 2019 – even if pandemic control policies and governments' interventions are successful. Based on these speculations, the smallest reduction will be 6 % belonging to South American container exports to Europe (mostly agricultural products), while the largest reduction will be 20 %, belonging to East Asian and South East Asian container exports to Europe and American (mostly machineries and equipment). Overall, the amount of reduction of demands in east-west routes will be more than that of north-west route.

The European Green Deal: Key to a Climate-Neutral Continent

Marine innovation magazine has conducted an exclusive interview with Mrs. Maja Bakran Marcich, the European Commission's Deputy Director-General for Mobility and Transport. In the following, you will find the transcript of the interview.

The European Green Deal seeks a 90% reduction in these emissions by 2050, could you please explain about it?

The Green Deal defines a new growth strategy that will transform the Union into a modern, resource-efficient and competitive economy, where there are no net emissions of greenhouse gases by 2050, where economic growth is decoupled from resource use and where no person and no place is left behind. With its 2030 Climate Target Plan and the ambition to reduce EU greenhouse gas emissions by at least 55% by 2030, (compared to 1990 levels), we are supporting our vision with very concrete, measurable targets. As part of the commitment to turn Europe into the first climate-neutral continent by 2050, the

European Green Deal notes the need to reduce transport emissions by 90% in 2050. This will require a real acceleration in the shift to sustainable and smart mobility. We need to make all transport modes cleaner, incentivise low- and zero-emission practices and improve efficiency across the whole transport system. The Commission is now working on the publication of a comprehensive strategy for sustainable and smart mobility by the end of 2020. It will outline essential policy initiatives to support this transition.

What efforts should be made to accelerate the transition to a carbon neutral waterborne transport?

Shipping must use less energy and it must use cleaner energy. While energy efficiency improvements have occurred over the past decade, the uptake of sustainable alternative fuels or means of propulsion has been negligible. The process for deploying new sustainable alternative fuels is a complex one and several key barriers need to be addressed. Such barriers include the presence of split incentives in the maritime sector, high risk of investment in vessel technology and port infrastructure, high price differential between conventional and alternative fuels as well as the lack of communication between actors and transparency on the fuel life-cycle climate performance. Collective and coordinated approach is needed between the regulators and operators, as well as between the actors across the entire logistic supply chain. Customers have already started to demand greener, sustainable transport services and it is up to the operators to respond with own commitments, new business models and innovative solutions. The role of the regulator is to ensure a level playing field, transparency and a clear pathway and conditions for decarbonising the current fuel mix. This requires putting in place a basket of regulatory as well as non-regulatory measures that make the polluter pay, boost the demand and supply of sustainable alternative fuels and accelerate research and innovation in the technologies of the future. The Commission will be proposing a number of initiatives in this respect, including the extension of the EU Emission Trading Scheme to maritime and mandating the uptake of sustainable alternative fuels by ships calling EU ports (the so-called FuelEU maritime initiative). Coordination with regulatory framework and incentives at global as well as national level is equally important and the EU advocates for similar progress at International Maritime Organization on all the aspects mentioned above. In the times of major crisis and the challenges posed by the spread of COVID-19, the persistence on green transition becomes more imperative than ever.

The digital transformation of the transport and logistics sector is an important driver for the integration of modes in truly multimodal transport chains.

According to EU, the digitalization will also pave the way to Mobility as a Service and the seamless combination of transport modes for a single journey, what measures have you taken to promote digitalization in the shipping transport?

The digital transformation of the transport and logistics sector is an important driver for the integration of modes in truly multimodal transport chains. It will facilitate the better use of assets and infrastructures, and the compliance with regulatory duties, and by that enhance the efficiency and safety of logistics chains and reduce their environmental footprint.

The Communication on a European strategy for data released earlier this year highlights that transport and mobility are, among others, at the forefront of the debate on data sharing and promotes the idea of European sectoral data spaces in strategic areas such as transport and mobility.

Accessible and interoperable data combined with the adequate digital infrastructures and artificial intelligence solutions will substantially facilitate this process.

Before the end of the year, the European Commission will publish a new strategy on transport, in which digitalisation will feature prominently.

We have already several initiatives in place serving that purpose and we will identify further actions in the upcoming transport strategy, including measures, which affect and promote the digitalisation of the shipping sector.

The Regulation establishing the European Maritime Single Window environment (EMSWe) adopted by the EU in 2019 is one of the main legislative instruments to promote the digtalisation of the shipping sector. It aims at harmonised ship reporting throughout the EU, with more efficient information flows thanks to a truly harmonised data set and enhanced digital reporting systems.

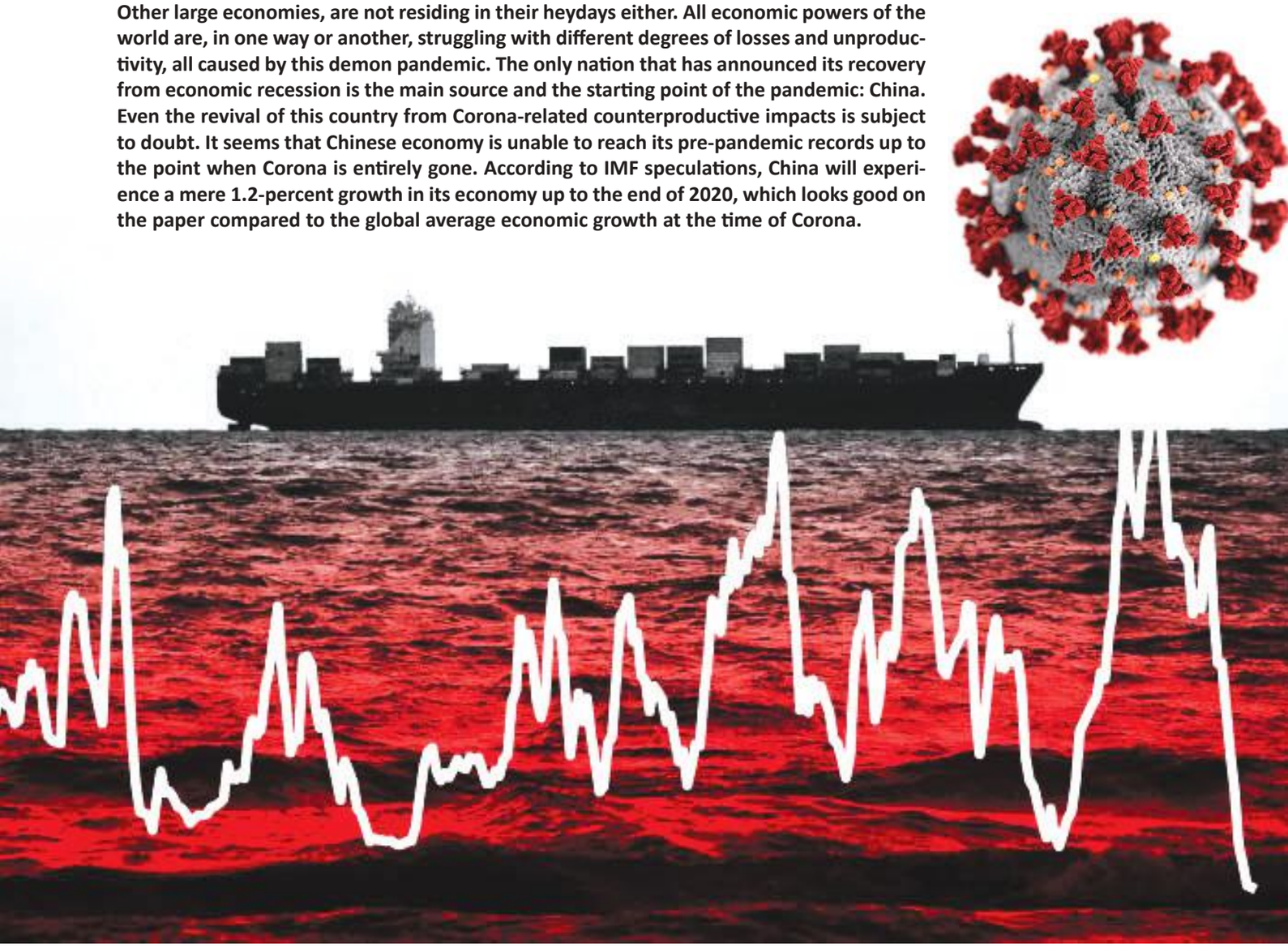
The adoption of a common data set and common formats, along with the provision of data sharing in support of multimodal transport services will allow a more efficient flow of information between authorities, port service providers and logistic operators, increasing the overall competitiveness of the maritime transport.

In addition, a new EU Regulation on electronic freight transport information (eFTI) entered into force in August this year. The eFTI Regulation complements the maritime single environment, as it allows freight transport data to be shared electronically with the authorities also before or after the goods reached the port, and thus enabling end-to-end real-time visibility of the movement of goods along the logistics chain. This will allow operators to more efficiently organise the logistics operations leading to, among others, reduced traffic congestion at the ports gates at peak-hours, faster service times within ports and increased terminal capacity.

Hard Days of Global Economy under the Shadow of Corona Pandemic

By: Vahid Basereh

Corona pandemic has given rise to unprecedented disruptions in global economy. Earlier, International Monetary Fund (IMF) had speculated a pandemic-caused loss of 12 trillion USD for the global economy. It is also estimated that Germany, as the largest European economy, has lost 5 percent of its production power ever since the pandemic commenced. Other large economies, are not residing in their heydays either. All economic powers of the world are, in one way or another, struggling with different degrees of losses and unproductivity, all caused by this demon pandemic. The only nation that has announced its recovery from economic recession is the main source and the starting point of the pandemic: China. Even the revival of this country from Corona-related counterproductive impacts is subject to doubt. It seems that Chinese economy is unable to reach its pre-pandemic records up to the point when Corona is entirely gone. According to IMF speculations, China will experience a mere 1.2-percent growth in its economy up to the end of 2020, which looks good on the paper compared to the global average economic growth at the time of Corona.



The US economy could not escape from Corona predation either, as the pandemic brought its economic growth to a halt. This world's largest economy had just been recovering from its 2009 economic crisis for one or two years, and it had just set a good record in creating job opportunities when the unwelcomed virus marched in, and it has even infected the US president as well. The immediate reaction of financial markets to Trump's Corona infection was highly negative, with New York's stock exchange indices all turning red. Estimations indicate that US economy is prone to fall as much as 8 %, which is a very considerable figure. The European Union's economy is also lurking under critical conditions, as a 10-percent negative economic growth has been prognosticated for it. This is a painful blow to this Union's economy, and that is happening in the middle of the costly and controversial Brexit.

This 12-nanometer virus seems to be far mightier and much more destructive than what experts pondered at the early days of its arrival in Wuhan, China. Now, we do know that Corona is going to cause a 3-percent shrink in the global economy in 2020 while the 2009 economic recession only did so at the scale of 1 % negative growth. Nevertheless, the ruinous impacts of the pandemic have not been similar on all sort of economic areas: Some have lost more and some less.

The pandemic practically crippled tourism industry worldwide, pushing it to very critical limits. A while ago, the giant bulk carrier Japanese ship, MV Wakashio, which was headed to Brazil, ran aground near the coast of Mauritius in Indian Ocean, and leaked thousands of liters of oil into the coasts of this touristy island. The authorities called an emergency situation, yet they warned that they have serious deficiencies in supplying monetary resources to clean their coasts, as thousands of tours to this Island had been cancelled due to Corona pandemic.

Seaborne vacations have also been practically brought to a halt worldwide. The picture depicting several cruise ships on Turkish shores, which are all being dismantled, signifies that their owners have preferred to sell their scarps and make up for a portion of their lost investment rather than bearing the costs of the maintenance of these luxurious vessels.

The conditions are no better in air travel sector. The number of flights has fallen dramatically, forcing world's largest airlines such as British Airways, Emirate Airlines, and Qatar Airways to lay off their staff to save themselves from the threat of bankruptcy. The large number of parked aircrafts at close distances has turned to a familiar scene in most of the world's airports ever since Corona broke out. It was foreseen in April 2020 that airlines only in England face a loss of 15 million pounds. The nosedive in the number of flights has also impacted shipping industry, which will be discussed blow.

Even though maritime industries have not laid in a safe zone from Corona-caused challenges, container ships and bulk carriers are still venturing in the open seas, given that markets are still in dire need of basic supplies. Even so, Chinese ports underwent a 6-million-TEU-container decrease in March and April 2020 compared to the pre-pandemic days. A more serious challenge, however, is the change in ships' crew. This calamity has annoyingly been going on in ports for months. Health protocols and standards are different in every country, and this has perplexed the staff. Ever since the pandemic commenced, grounding of international flights made staff changes infeasible in many destinations, and this is still going on. Various waves of the pandemic at various times in some countries means that a specific schedule for crew changes in ports cannot be put into place.

According to some reports, over 400,000 seafarers worldwide are struggling with staff change issues. These problems have been estimated to impose 10 % of extra costs to world's shipping industry, and in the long run, this can end in a massive challenge for this sector, and as hence, for the global economy, as well. Yet, international economy has adopted a short-term outlook to the pandemic. It is hoping that with the termination of Corona outbreak, all sectors of economy grow at a brisk pace and compensate the corona-extended losses.

The key to forging a bright future is the discovery of a vaccine or a cure that can harness Corona, and turn this fatal disease to a curable one. So far, the Chinese and the Russians have claimed they have made breakthroughs at this front; yet, neither has attempted at mass producing their vaccine and distributing among the common public. The final phases of producing these vaccines have not been completed yet. That is why the international community harbors doubts and suspicions regarding these claims and has not taken them seriously.

Other pharmaceuticals have also acknowledged that their vaccines are still in the pre-final-approval phase and thus not ready to be shipped off to the market. Now the question is: As long as a vaccine that could measure up to all standards is discovered, will it all end? That is a hard question asked at hard times. The nature of distributing a vaccine at the global scale, placing it at the access of all individuals, and the time and cost that it bears to maintain worldwide immunity are not easy challenges, and they certainly do not have easy solutions.

Another grave challenge is the pace of producing the vaccine. If vaccine producers manage to discover a standard effective vaccine for Corona Virus, then that would be considered the fastest vaccine achievement in mankind's history. While this breakthrough can have countless merits, at the same time, it has great potent to turn into a huge failure if it is done wrong.

In case the to-be-discovered vaccine(s) fail to respond effectively at the several-billion-people scale, and the physiological reactions of world population to the vaccine, considering diversities, are not as expected, global community will be down with devastating disappointment and hard-to-recover-from frustration. This is also prone to result in a short-term economic nosedive. In that case, world will not have a bright and promising future ahead in the long run. Nevertheless, people and global economy do not seem to want to ruin their current optimism by thinking about these issues.

A Drop in Caspian Sea Water Levels: Should We be Worried?

By: Naghi Aghaloo

In late May of this year, the media reported, quoting the National Center for Caspian Sea Studies and Research, under the auspices of the Ministry of Energy's Water Research Institute: The water level of the Caspian Sea in 2019 has continued to decline since 1995, reaching its lowest level in the last thirty years.

According to their report, the average water level of this sea this year, with a decrease of 13 cm compared to 2018, is equal to minus 27 meters and 18 centimeters (-27.18 m).

It was in September 2017 that some researchers in the field of water reported that the water of the Caspian Sea has dropped by about 7 cm since 1996, and if this process continues, the shallow waters of the northern parts of the Caspian Sea (5 meters) will dry up completely in the next 75 years.

In September 2019, news agency reported, citing the Deputy Minister of Research and Technology of the National Institute of Oceanography and Atmospheric Sciences (under the auspices of the Ministry of Science), that the Caspian Sea water level had dropped and attributed the decrease in rainfall to the "Volga" river basin.

In November of this year, the head of the National Center for Caspian Sea Studies and Research said: According to studies, the sea level in the summer of 2019 has decreased by 18 cm compared to the same period last year (2018).

Although the figures are slightly different, the media report is largely based on data from the National Center for Caspian Sea Studies and Research. The center's report says:
According to the analysis of the data of the leveling stations of the southern shores of the Caspian Sea, the average water level of this sea in the water year of 2017-2018 reached -13.27 meters and decreased 12 cm compared to the same period of the previous year (water year of 2016-2017).
According to the center, the lowest water level observed in the second half of December 2018 was -5.27 meters and the highest level was -6.26 meters in the first half of July 2019, and the range of water level fluctuations this year has reached to 24 cm.

No need to worry about lowering the Caspian Sea water level!
According to the National Institute of Oceanography and Atmospheric Sciences, The Caspian Sea (1) has experienced severe and numerous cycles of water level fluctuations since about 5 million years ago so its area has ranged from one million square kilometers to 150,000 square kilometers, and the range varied from 300 meters.
The issue of increasing or decreasing the Caspian water level is an old and permanent phenomenon and is constantly fluctuating, and therefore, the desired reduction can be temporary and return to its normal state. Some officials are concerned about this phenomenon, but some environmentalists and climatologists do not see any motive or cause for concern!
On the other hand, the head of the national mapping agency expressed concern over the decrease in the height of the Caspian Sea in the last 10 years, which he believes has reduced the volume of water in the Caspian Sea by 12 times the volume of water in the Urmia Sea. Meanwhile, a climatologist at the University of Bergen in Norway says: "What is worrying is not falling, but rising water levels in the Caspian Sea."
To measure the importance and extent of this concern, note:
If we assume that the volume of water in Lake Urmia is at its best (25 cubic kilometers) the volume of water in the Caspian Sea is equal to 78,200 cubic kilometers. It means; 3128 times the volume of water in Lake Urmia. Therefore, the words of official of the Mapping Organization about a decrease equal to 12 times the volume of water in the lake from the Caspian Sea, can be respectcfully neglected and does not matter much.

Causes of Caspian Sea water reduction
Experts in water and climate science and climatologists inside and outside the country usually attribute the reduction in water or the water level decline in the Caspian Sea to two main factors:
1- Excessive evaporation caused by increased temperature of the earth due to increased greenhouse gases in the atmosphere.

Reduction of rainfall in the most important watersheds of the Caspian Sea, i.e.; Volga River Basin
In the case of the first factor, research shows that by reducing the temperature by one degree Celsius, the rate of evaporation is reduced by up to 6%.
According to the World Meteorological Organization, 2016 was the warmest year on Earth, and researchers say the Earth has not experienced such a large amount of carbon dioxide in its atmosphere since 4 million years ago.
But in the case of the second factor, the views are more similar, with a slight difference in reference to the details of reduced rainfall, water inflow and outflow in the Caspian Sea basin.
Experts, including the heads of some of the country's research organizations, have considered the decline in the Caspian's water level caused by the decrease in rainfall in the Volga basin. Therefore, it is wrong for some to attribute the increase in water consumption in the Volga basin to the decrease in the Caspian water level, because from 1991 to 2018, water consumption in these areas decreased from about 55 billion cubic meters to 43 billion cubic meters, according to research center findings.
The issue of the Caspian Sea drainage basin is significant because these areas have an area of about 9 times the area of the Caspian Sea and should be considered. All the evidence suggests that declining rainfall, especially in Kazakhstan, Russia and Azerbaijan, has been the main reason for the decline in Volga's inflow of water into the Caspian Sea.
According to official data, more than 240 billion cubic meters of water flows into the Caspian Sea annually from the Volga River (2). That means, 80 to 85 percent of the total volume of water flows to the Caspian Sea, while the total water intake from the river basins of the northern provinces of the country to this sea, which is estimated to be less than 5 percent.
However, it is not to deny that in this story, the footprints of the builders and the uncontrolled construction of dams - just like in Iran - can be seen among the northern neighbors!
According to some experts, the construction of new dams at the entrances and tributaries of the Great Volga River in Russia in recent years has caused the Caspian Sea to retreat (up to 400 meters) in Iran's coastal areas, especially in Gorgan Bay. As a result, even Gaz Port in Golestan province has been taken out of use for the transportation of passengers and goods! Therefore, it is an important issue that deserves the attention of the economic, commercial and political development officials of the country.
Footnotes:
1- The Caspian Sea, known as Mazandaran Sea among Iranians, which is the largest lake in the world, is known as the sea because of its size, has an area of about 420,000 square kilometers. Its water volume is 78,200 cubic kilometers with an average depth of 187 meters and an environment of more than 6,500 kilometers. It has 400 aquatic species and in terms of oil and gas reserves offshore and subsoil, it is the third largest in the world after the Persian Gulf and Siberia. About 130 large and small rivers flow into the sea, mostly from the northwest, the largest of which is the Volga River.The water level of the Caspian Sea is about 5.26 to 28 meters lower than the level of the world's seas and oceans.

Volga River in Russian Волга
If Danube is the longest river in Europe, the Volga, with a length of 3692 km, is the one with the most volume of water. This river is one of the national symbols of Russia. Volga delivers 80 to 85 total Caspian inlet water. As a result, fluctuations at the entrance to the river can cause reduction or increase in Caspian water. The river connects to the Sea of Azov via the Volga-Dan Canal.

Future Directions of Dry Bulk and Tanker Market

The outbreak of the coronavirus has affected all aspects of the shipping industry, and this uninvited guest has drastically reduced the growth prospects of demand for 2020 in all sectors

The outbreak of the coronavirus has affected all aspects of the shipping industry, and this uninvited guest has drastically reduced the growth prospects of demand for 2020 in all sectors. The downward trend in the dry bulk market and tankers is predicted to stay in the same state in the coming months. Drewry has written in its latest analysis: Although many countries have resumed their economic activities, the spread of the coronavirus continues to have a negative impact on charter rates in the dry bulk market and is expected in countries other than China to take three to four months for the production centers to get back on the track.

China's steel production is projected to rise steeply in the next few months as China's iron ore imports grow by recovering China. However, for two reasons, iron ore supply is considered a concern. Firstly, Brazil is battling an increasing number of people with Covid-19, which keeps operations at the main iron ore mines low. Secondly, the recent dispute between China and Australia over the origin of the Covid-19 virus has affected the trade between the two countries. And this is evident in the export of iron ore from Australia. China may be looking for other options to import iron ore, including South Africa, Iran and India.

On the other hand, India is slowly resuming its economic activity after three months of national quarantine. However, many factory workers have returned to their hometowns, and in such cases, construction work will be short of

skilled labor. Demand for coal is expected to remain low in this country in the current and also next month, affecting charter prices in the dry bulk market.
Improving soybean and grain trade in South America-Asia, following high demand and very good supply, could make things a little better for the dry bulk market.
The report goes on to say that the prices of freight in the crude oil tanker market will continue to decline in the third quarter of 2020. After the upward trend in the market in April, the floating income fell sharply in mid-May, as a large number of floats returned to their operations, so the tonnage supply showed an upward trend.
According to OPEC's recent clues, production of crude oil will be extended to 9,300,000 barrels a day which means a shift in the oil market. Therefore, the downward trend in oil reserves will be steeper in the next two to three months. However, the risk of the second wave of Covid-19 remains strong, which may disrupt the trend of improving oil demand.
The supply sector continues to expand the capacity of the high-speed crude oil tanker fleet, as bond activity will be relatively weak over the next two or three months following seasonal storms in Monsoon, South Asia. On the other hand, the reduction of production will mean lower shipping this year, which could keep the overall growth of the crude oil tanker fleet significantly lower than in 2019.

Two different scenarios for the tanker market!

If Covid-19 continues to expand in the second half of 2020, we will have the downward trend in crude oil trade, demand decline and falling freight rates in the tanker market.
According to Drewry: Normally, the freight rates in the crude oil tanker market is based on oil demand. Weak oil demand naturally leads to lower refinery activity and weak crude oil trade, which means low freight rates. But given the current high demand, the equivalent of crude oil demand - freight rates - will show the opposite to 2021. As crude oil demand gradually improves in the second half of 2020 and 2021, crude oil prices will show a declining trend. However, the rate of improvement in oil demand determines how fast or slow rents will fall. The unprecedented 30% drop in global oil demand in April 2020 forced refineries to cut production, which means a brake on global oil trade! But the question that remains unanswered is that why freight rates took a different turn and, despite the decline in demand, showed an upward trend in April.
The report continues: If the spread of the coronavirus outbreak suppresses oil demand in the second half of 2020, trade growth in 2020-2021 will show a slower trend than expected, leading to a sharp decline in freight rates in the second half of the year, the report said. The second is 2020. Also in 2021, due to the weak demand and high oil reserves that remain from 2020, weak trade growth is expected to show a slower rate of return.
It should be noted that, apart from the uncertainty in demand, due to the outbreak of Coronavirus, US policies are a risk to the tanker market. For instance, any lifting of US sanctions against Iran will lead to the entry of NITC tankers into international trade. Moreover, if the decline in US oil production occurs more than expected, the body of tonnage demand in the tanker market will be damaged, as the share of Middle East crude oil in Asian markets will increase.
Another scenario says that if the quarantine period is reduced and the economy improves significantly in the second half, most oil reserves will be quickly pulled out of storage and trade will jump by the end of 2020; Therefore, the freight rate will be lower than expected.
The report goes on to say that after the construction order market has been strong over the past three years, it is expected that manufacturing order activity will decline in 2020. This is because of the decline in bunkering prices, and on the other hand, the weak outlook for crude oil trade and uncertainty about carbon disinfection laws, reduce the attractiveness of the manufacturing order. In 2019, many owners turned to upgrading their fleets by up to half a percent due to the need for marine fuels. Bonds are also expected to be significantly higher in 2020 than in 2019.
Following the low delivery of the fleets and the increase in the capacity of the bonds, the capacity of the giant tanker fleet will decline in 2020. Although 62 giant tankers joined the global fleet of giant tankers in 2019, in 2020, that number is expected to be 25 tankers only. The Suezmax tanker fleet will experience a contractionary trend similar to the giant tanker tankers, while in 2019, 21 Suezmax tankers were delivered to the global fleet. But by 2020, only five such tankers are expected to be delivered. No orders were registered in the Aframax tanker market during the first three months of 2020, and the absolute silence of the manufacturing order market is expected to continue for the second and third months. It should be mentioned that in 2019, 34 Aframax tankers entered the global fleet.

Another scenario says that if the quarantine period is reduced and the economy improves significantly in the second half, most oil reserves will be quickly pulled out of storage and trade will jump by the end of 2020

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Continuation of Technical Changes of Ships to Protect the Environment:

Green Ships Are on the Way

By: Reza Hemmat Joo, Mansoor Najafi, Mohammad Reza Bechari

After the acid rains of the 1960s, industrialized nations began to think about industrial reform, in line with environmental protection, and made appropriate efforts. Shipping, like other industries, has taken steps to protect the environment and sustainable development through change and evolution. One way to address the crisis of pollutant emissions in the shipping industry was to introduce the "Green Ship" project. Green ship is built in a completely neutral and preventive manner, according to the four categories of ship pollution in the environment, which are air pollution, water pollution, beach pollution and other pollution such as noise pollution.

Advanced hull design, engine modifications, and the shaft and propeller system, along with the installation of navigation aids such as solar sails, are the first examples of changes in shipping. In general, shipping technology helps to improve shipping activities in the direction of sustainable development. It is hoped that the importance of this project will increase as the solutions are reviewed.

Shipping, as an ancient industry, underwent a transformation in the transportation system with the advent of the Industrial Revolution. For the first time, a steam engine was used to move the wheels of the paddle steamer ships. By improving technology in the field of engine upgrades and the construction of steam turbines, the shaft and propeller system, the wind power was gradually replaced with engine to move ships at the seas.

It has been a long time that ship engines have been using the thermal energy of petroleum fuels to provide the required power. Due to its low cost as well as the high energy content of oil refining residues, HFO fuel was used to power ship engines. However, the high amount of sulfur soluble in heavy fuels releases a lot of sulfur oxide into the atmosphere, which leads to acid rain. The ship's engine lubrication and cooling system also creates an oil sludge on the bottom of the vessel, which enters the ocean with water tanks. In the shaft and propeller system, lubrication system is used to prevent the erosion of blub-bearings, special caps are used to prevent oil leakage and oil retention in the chamber. However, over time, the lid will wear out and the oil will spill in the water. These are only parts of the environmental pollution caused by maritime transformation.

Throughout history, mankind has undergone many changes in different areas. As the period of human life was divided into different periods. Each period is named after a factor due to its great influence, such as the Age of Fire, Stone, Bronze, Iron, Agriculture, Industry, Technology, and Science. In the present age, which is called science and technology, issues such as automation and environmental protection are of great importance, as we will see the realization of the goals of sustainable development and widespread use of technology in industry in the future.

"Green Ship" is one of these technological achievements, which refers to the use of technology in the construction of new ships to reduce environmental pollution. Green ships have been instrumental in controlling the emissions from ships. As mentioned earlier, shipping pollution is generally divided into four main categories:

1- Air pollution such as sulfur pollutants, nitrogen, greenhouse gases, soot and the release of compound organic matter

2- Water pollution such as oil leakage in water, oil residue, water balance

3- Land pollution such as waste, chemicals and oil entering the coasts

4- Pollution from the ship's recovery and reconstruction cycle, such as paint, plastic, chemicals, etc.

Green actions to change the ship's engine

Experts, shipping companies and fuel industry activists outlined a total of three key strategies to address the pollution crisis and the free movement of ships in pollution control areas:

A) Using a Scrubber gas purifier in the exhaust of ships that use heavy oil fuel, as well as the use of Xbee chip technology and microcontrollers to measure the pollution of ships

B) Using light diesel fuels that do not contain sulfur compounds when burned. However, to reduce the nitrate pollution of diesel engines, dual-burner diesel engines (Auto engines that can simultaneously burn diesel fuel with gas) can be used in these areas.

C) Using alternative fuels such as liquefied natural gas, methanol, and biogas that do not produce pollutants when burned

The advantages of using LNG as a fuel for ships are as follows:
1- Reduces 25 to 30 percent less carbon dioxide compared to burning fuel
2- Excessive reduction of sulfur pollutants (almost zero) when burning LNG
3- Significant reduction in nitrogen pollution compared to petroleum fuels
4- 100% reduction in soot from incomplete oil burning (Milner, 2014)
5- Low price of LNG compared to other petroleum fuels (Oh, 2014)
6- Abundance of natural gas and easy supply of LNG
On the other hand, the benefits of LNG vary depending on the economic, environmental and regional conditions of the countries in the maritime sector. Disadvantages of using LNG include the high cost of equipment, the cost of maintenance, the lack of adequate refueling centers, the greater occupancy of the ship's space than oil fuels, and the uncertainty of its pricing basis.
Located in Northern Europe and the Scandinavian region, Norway is one of the countries that has a wide use of LNG as a floating fuel on the agenda. At the same time, the country is one of the largest exporters of oil, benefiting from abundant gas resources.
In conclusion, it could be said that "Green Ship" is optimized by making changes to the engine and fuel consumption of the ship, designing the hull and propulsion system to reduce the emission of pollutants from shipping to protect the environment and achieve the goals of sustainable development. In general, it is possible to implement similar projects by identifying the problem and solving it by upgrading technology. Advances in shipbuilding technology and major shipping equipment have been instrumental in preserving the environment and achieving sustainable development. Scientific research on the fuel system of ships to use environmentally friendly fuels instead of heavy oil fuels, the use of solar sails and renewable energy technologies with fuel cells and new ship designs are among the ways to reduce ship pollution. However, the implementation of such large projects requires comprehensive participation and large investments. Green ships have less capacity to carry cargo than non-green ships, which reduces profits for ship owners. Nevertheless, to achieve the goals of sustainable development and environmental protection, reducing profits and increasing investment is the cost of having clean air, water and beaches.

Advances in shipbuilding technology and major shipping equipment have been instrumental in preserving the environment and achieving sustainable development.

A Glance at IMO

By: Mehrdad Mahmoudi
Maritime Sciences Researcher

Introduction

The development of civilizations has always been organically tied with the evolutionary trend of maritime economy. Hence, the necessity of developing maritime rules and codes for regulating maritime trade has been in the spotlight of attention ever since civilizations commenced to flourish and thrive.

In historic references, Rhodian Law has been mentioned as the basic foundation of maritime laws for Roman and Byzantine Empires, Hanseatic League, Kingdom of Aragon Maritime Council, and Italian nation states such as Trani, Venice, Genoa, and Amalfi.

From the High Medieval Period up to Maritime Exploration Period, France and England gradually ratified Admiralty Law to handle the legal matters related to maritime commerce, and later on, similar laws were developed in the United States of America. These laws paved the ground and laid the foundations for the contemporary maritime treaties.

With the emergence of industrial revolution in the 18th and 19th century, international trades were expanded among Europe, America and Far East, and as a result, maritime traffic increased and modern maritime fleets were shaped up. In the light of these developments, the pace of developing and signing maritime treaties were accelerated.

History

The countries that owned large maritime fleet always emphasized the importance and the necessity of setting international maritime regulations to promote the safety in seas and oceans.

In line with this necessity, in the mid-19th century, several maritime treaties were approved and signed among some European countries.

At the end of the 19th century, plans were proposed for the establishment of a comprehensive maritime organization that could devise and develop maritime laws; nevertheless, the conflicts and disputes among European nations heated up and the First World Was broke out. This break out delayed the foundation of such an organization, even though international collaborations still continued with the signing of several key treaties. Following the sinking of the Titanic, one of the most crucial treaties regarding maritime safety was ratified and signed in 1914. This was the first version of International Convention for the Safety of Life at Sea (SOLAS).

The end of World War Two, the increase in the volume of maritime trade, and the emergence of the United Nations brought the world an opportunity to accomplish its long-term delayed-for-long dream of founding an international maritime organization. On the 17th of March 1948, an international assembly met in Geneva, Switzerland, and the Inter-Governmental Maritime Consultative Organization was officially born by the signature of all participants. In 1959, the first meeting of this convention was held in London, and in 1982, it was renamed as - International Maritime Organization (IMO). This organization today has turned into a prominent component of the United Nations, and it is deemed as the most specialized organization in the realm of maritime regulations and maritime transportation.

The first item in the agenda of IMO, in 1960, was to reform and update the SOLAS, which had been the most significant maritime safety of the world up to that year. Later on, IMO commenced to place other maritime issues on its spotlight – namely facilitation of international maritime traffic, Plimsoll line for the purpose of determining the maximum licensed loading, transportation of hazardous cargos, and setting criteria of measuring the tonnage of ships. With the growth in the transportation of oil and petroleum products, the increase in the tonnage of tankers, and following the collision SS Torrey Canyon in 1967, IMO began to include maritime pollution and preservation of maritime environmental protection to its programs.

In the course of several years, IMO managed to propose a number of solutions for the prevention of collision in tankers and the reduction of the consequences of such incidents, the pollution caused by washing tankers' storages, dumping ship engines' pollutant material into seas, pollution made by chemicals, and ships' garbage and wastewater. Eventually, in 1973, the International Convention for the Prevention of Pollution from Ships (MARPOL) was signed. In addition, rules regarding compensation for financial damage caused by sea pollution, legal commitments, and the facilitation of legal matters related to it were ratified by the IMO members in 1969 and 1971.

Even though at that time, based on the seafaring culture and maritime safety convention, helping distressed ships was emphasized, no global unified framework was available for help at the time of emergency. To address this deficiency, following the establishment of International Maritime Satellite Organization (INMARSAT), International Convention on Maritime Search and Rescue (SAR) was signed and ratified in Hamburg conference in 1979 for the purpose of promoting search and rescue systems.

Training, nurturing highly-skilled human resources and promoting seafaring skills of ships' staff is tightly entangled with safety at sea. To organize this matter, International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) were reformed in 1995 and 1997. Other than the promotion of standards, the amendment pioneered another significant development. Through them, for the first time, IMO was given the power and authority to supervise its members in terms of fulfilling their commitments based on the convention clauses. With the ratification of Manila amendment in 2010, reforming and updating took place in the fields of training, certification and watchkeeping.

In summary, ever since it was established, IMO has ratified a large number of conventions in a wide array of shipping and maritime transportation fields such as safety, safe navigation, prevention from marine pollution, maritime environment protection, search and rescue, standard measurement of tonnage, licensed loading volumes, managing ballast water, maritime signs, removing maritime obstacles, facilitation of seafaring, prevention from collisions, commitments and compensation of maritime collisions, recycling ships, training standards and skills, ports safety and ships' routes.

Member States

In order to join the IMO, countries must sign the Convention on the International Maritime Organization. By the year 2020, 174 countries, which are UN members, as well as the 3 autonomous regions of Macao, Hong Kong, and Faroe Islands had joined IMO. Of these countries, 23 are landlocked countries, which emphasizes how significant maritime trade in their economy is, and how important convergence with global mechanisms is. Britain was the first nation to sign IMO convention in 1949, which is why the headquarters of IMO is stationed in London. Iran, also, is one of the old-timer members of IMO, joining it in 1958.

This organization is funded by its members, and the share of each country is determined by the tonnage of its commercial fleet. The budget of this organization in 2019 was over 33 million Sterling Pounds.

It is noteworthy that World Maritime University in Malmö, Sweden, and International Maritime Law Institute in Malta are the two main academic centers of this organization that serve the purposes of research, promoting its members science-wise to accomplish IMO missions and goals, as well as building capacities and qualifications for sustainable development based on United Nations Objectives. Annually, these academic institutions grant scholarship to the candidates referred to them by IMO members.

Goals and Objectives

The goals and objectives of IMO, in the Article 1(a) of its convention, are as follows:

- To provide machinery for co-operation among Governments in the field of governmental regulation

The mission of the International Maritime Organization (IMO) as a United Nations specialized agency is to promote safe, secure, environmentally sound, efficient and sustainable shipping through cooperation.

and practices relating to technical matters of all kinds affecting shipping engaged in international trade

- To encourage and facilitate adopting the highest practicable criteria and standards in the field of maritime safety
- To enhance efficiency in the field of navigation, and prevention and control of marine pollution from ships.

Besides, this organization is in charge of handling all the administrative and legal matters related to the aforementioned acts and goals.

Mission

Based on the above-mentioned goals and objectives, IMO, in its website, defines its missions as:

The mission of the International Maritime Organization (IMO) as a United Nations specialized agency is to promote safe, secure, environmentally sound, efficient and sustainable shipping through cooperation. This will be accomplished by adopting the highest practicable standards of maritime safety and security, efficiency of navigation and prevention and control of pollution from ships, as well as through consideration of the related legal matters and effective implementation of IMO's instruments with a view to their universal and uniform application.

Structure

IMO's organizational structure is made up of an assembly, a council and five main committees: the Maritime Safety Committee; the Marine Environment Protection Committee; the Legal Committee; the Technical Cooperation Committee and the Facilitation Committee.

Assembly

Assembly is the highest governing body of IMO. The assembly is comprised of all its member states, and it meets once every two years on a regular basis. However, the assembly might also meet at the time of emergencies and special conditions. The assembly is in charge of approving work programs, voting for the budget, making the decisions regarding IMO's financial arrangements, and electing the members of the council.

Council

The council is the executive body of IMO. In each assembly of IMO, the 40 members of the council are elected for a term of 2 years. The council is in charge of executing the ratifications of the assembly, supervising IMO operations, and performing all the functions of the assembly between the sessions of the assembly, except for proposing suggestions to member states in terms of maritime safety and pollution prevention.

The council is required to function effectively in the following areas:

- To coordinate the activities of IMO bodies and its subsidiaries
- To prepare drafts for IMO work programs and budget estimates, and to submit them to the assembly
- To receive reports and proposals from the Committees and to submit them to the assembly and to member states while including comments and recommendations as needed
- To elect IMO secretary general upon the approval and confirmation of the assembly
- To make agreements and arrangements regarding the relationship between IMO and other organizations upon the approval and confirmation of the assembly.

Members of the IMO council are classified into 3 different categories:

Category A: 10 countries that offer the largest volume of international shipping services. In the 2020-2021 biennium, these countries were China, Greece, Italy, Japan, Norway, Panama, Republic of Korea, Russia, The UK, and the USA.

Category B: 10 countries that have extensive maritime trade. In the 2020-2021 biennium, these countries were Argentina, Australia, Brazil, Canada, France, Germany, India, the Netherlands, Spain, and the UAE.

Category C: 20 countries that do not belong to categories A and B, but have a noticeable volume of activity in maritime transportation and seafaring. The inclusion of these countries in the council guarantees that the council represents all geographical corners of the world. In the 2020-2021 biennium, these countries were Bahamas, Belgium, Chile, Cyprus, Denmark, Egypt, Indonesia, Jamaica, Kenya, Kuwait, Malaysia, Malta, Mexico, Morocco, Peru, the Philippines, Singapore, South Africa, Thailand, and Turkey.

Main Committees

The main committees of IMO are introduced in the following:

Maritime Safety Committee (MSC)

The Maritime Safety Committee is the highest technical body of IMO and it is comprised of all IMO member states. All the technical matters that are handled by IMO fall within the concerns of this committee, including navigation-aiding devices, building and equipping vessels, safety at work, rules for preventing from collisions, handling hazardous cargoes, maritime safety, hydrographic information, log-books and navigation documents, investigations into maritime collisions, search and rescue, and any other maritime-safety-related matter.

The Marine Environment Protection Committee (MEPC)

This committee is comprised of all IMO members. This committee handles all the matters related to the prevention and control of pollution from ships. Besides this committee is in charge of rat-

ifying and reforming conventions, regulations and other measures, as well as making sure they are executed.

Legal Committee
Following the SS Torrey Canyon catastrophe, this committee was formed to investigate the legal matters related to this incident in 1967. This committee is made up of all the member states of IMO, and handles all the legal matters that fall within IMO scope.

Technical Cooperation Committee
This committee is comprised of all IMO member states and it is in charge of implementing all the technical cooperation projects under the executive management of IMO as well as all the IMO matters and activities related to technical collaboration.

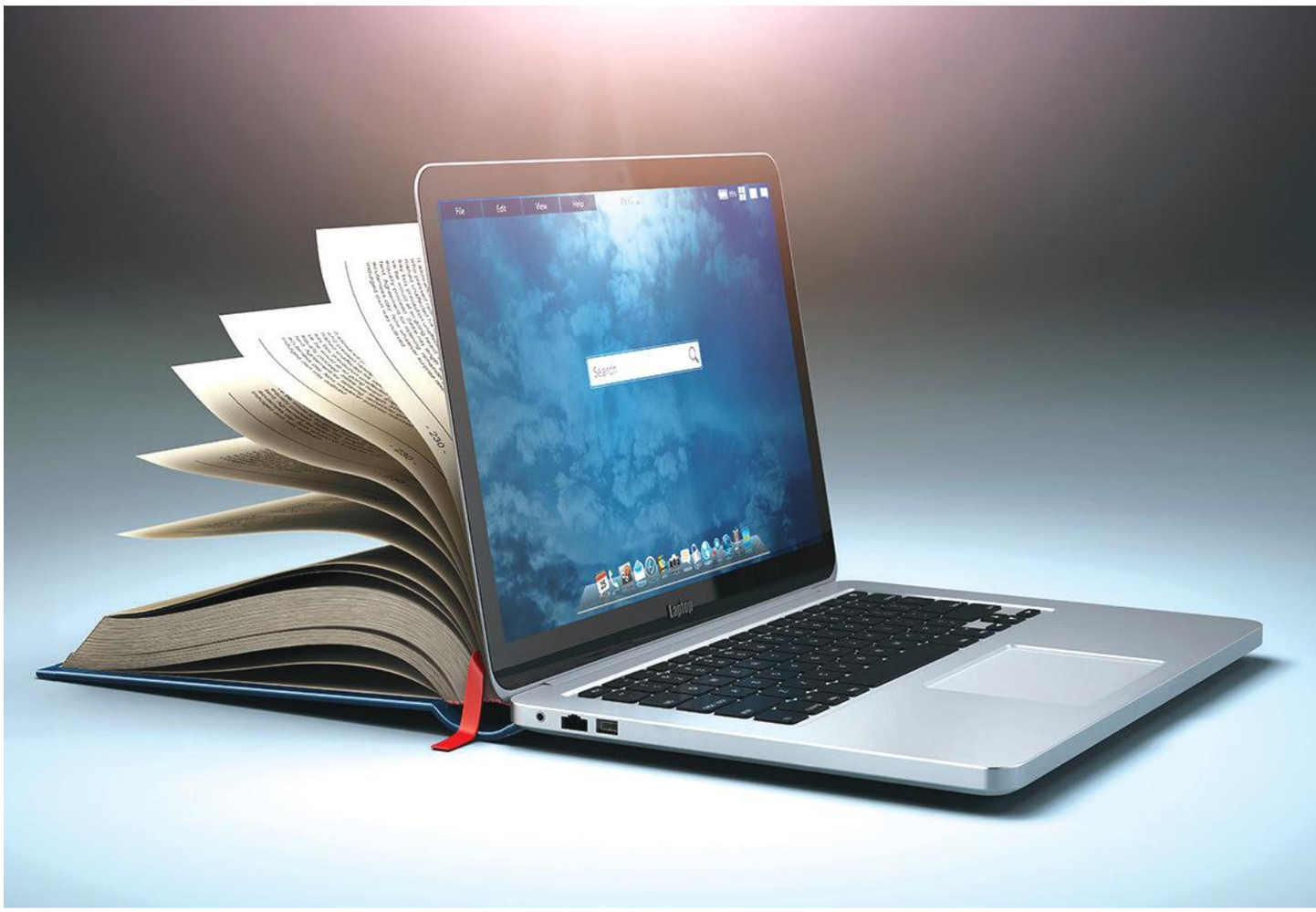
Facilitation Committee
Comprised of all IMO member states, the main mission of this committee is the removal of any sort of unnecessary formalities and bureaucracy in international shipping. The committee shall do this while all the articles of conventions are executed. This is meant to facilitate international maritime traffic, and maintain a balance between maritime safety and facilitation of seaborne trade.

Secretariat
IMO secretariat encompasses the secretary general and approximately 300 staff members. At the moment, the IMO secretary general in Mr. Kitack Lim, who was elected in 2015 for a term of 4 years, and was reelected for another 4-yaer term in November 2019.

Future Plans at IMO
In the second decade of the 20th century, IMO has placed the goals of UN Sustainable Development Agenda as the top priority in all its plans and measures for the purpose of strengthening the role of maritime trade and international shipping in the accomplishment of this agenda. In the year 2020, the slogan "Sustainable Shipping for a Sustainable Planet" provided a chance for IMO to announce its future plans to the common public. Hence, IMO triggered acceleration and enhancement in attempts toward reducing greenhouse gases, reducing sulfur compounds in ships' fuel, more effective execution of ballast water management, protection of polar regions, reducing harmful and polluting material caused by ship operation, enhancing the efficiency of radio communications, and expanding the participation of women in maritime community.

World Maritime Day
World Maritime Day provides an opportunity for the world people to get familiar with the duties and measures of IMO, and for the IMO achievements to gain publicity. It is also an opportunity to concentrate the will and focus of governments and resources to enhance and foster global seafaring. On September 2020, the ceremonies related to this day were held at IMO headquarters in London. Besides, at the end of October 2020, a ceremony in this regard will be held in Durban, South Africa.

Reference:
www.IMO.org



Tides of Online Seafaring Training

With the outbreak of the coronavirus in the world and its impact on different layers of human life, the theory of the "world without borders" eventually emerged. However, this border crossing was not carried out by countries, governments or political, economic or commercial regimes, but by the power of a virus that is said to be transforming human life. As some theorists and economists see the spread of the virus as one of the first steps in the fourth industrial revolution. In fact, every industrial revolution has changed people's life styles and also the educational methods. So far, Coronavirus has been able to stop training and educational activities in the world for a while, and then make a shift to the evolution of electronics this time. Internet-based learning, known as virtual learning, online learning, and e-learning, can be implemented in any country and field of study – at least for the theoretical courses. The Maritime Education Department is no exception to the mandatory e-learning rule during the Coronavirus outbreak. Professors, students, and maritime education institutions, like other educational institutions around the world, found themselves in the midst of a difficult educational transformation that they had to adapt to. According to Ali Akbar Marzban, Director General of Maritime Affairs, specialized and international organizations of the Ports and Maritime Organization: "By the beginning of the Corona epidemic, appropriate measures and strategies have been devised to continue maritime training courses and to renew the certificates of competence and skills of seafarers. In this regard, the methods of holding online maritime training courses has been announced to the training center throughout the country, and virtual training software was launched."

E-learning and its advantages

When we asked Dr. Elham Akbari, a member of the faculty of Tarbiat Modares University and a member of the Scientific Association of Electronic Learning of Iran (YADA), to explain the advantages and disadvantages of distance learning, she said, emphasizing that the use of the combination of "distance learning" instead of "e-learning" is wrong: There are many differences between the two issues, such as in distance learning, educational packages are delivered to students by mail or any other means of transportation. In this educational method, not only that there is no interaction between the teacher and the student, but also conveying the meaning is not possible. However, in e-learning, the educational content is provided on a daily basis, and according to the type of e-learning, it is possible to have a simultaneous or non-simultaneous communication between teacher and student. Therefore, it can be said that any kind of e-learning is distance learning, but any distance learning is not e-learning. The first undeniable advantage of e-learning is cost-cutting. In this teaching method, the students can choose and determine their course based on their needs and time. Therefore, it is possible for students to become more in tune with the educational content and determine the appropriate time more than before. E-learning is also based on the needs of the learner, so the person goes to and uses this content based on their needs. Another advantage of this learning method is the increase in communication and interaction between the two parties (in the past, interactions were limited, but now they have expanded and they can communicate with the teacher at any time). Another advantage of e-learning is its use in times of crisis, such as during the outbreak of the Covid-19. So that if standards are met in this type of training, it can replace the traditional method in the times of crisis. Moreover, if we can develop this type of education and learning, we can move towards educational justice, which is the lofty goal of education. In this way, people in deprived areas can be better educated by educational standards. Another benefit of e-learning, especially in fields such as maritime and also in shipping companies, is that managers and employees in different areas need to update their information and training courses, that they may not be able to physically attend. However, through e-learning, they can easily take these courses and receive a degree. In other words, through this training, we can have the continuous professional development of our employees at a lower cost, time and energy.

A member of the Scientific Association of Electronic Learning of Iran (Yada) reminded: "Now most of e-learning based classes are based on chatting and conversation, which fortunately can make it possible for both sides to have more interaction with each other."

This e-learning expert emphasized that the general public is now interested in receiving information from social media instead of newspapers and television and said: "E-learning has used social networks in such a way that today these networks are considered as one of the serious and effective tools in education; for example, you can have many in-service training in shipping through social media, which is more attractive and because it is free, it also reduces the company's costs in the field of training.

The emotional dimension diminishes

So far, all that has been said about e-learning has been its benefits, while this method of teaching, like other methods, can have its drawbacks. One of the drawbacks of e-learning is that the emotional dimension is lost or diminished because you can't create that dominant space and emotional connection in traditional, face-to-face classes in e-learning. If the teachers are highly skilled in this field, they can create only a small amount of atmosphere and emotional dimension of traditional classes in e-learning atmosphere.

In this regard, Akbari mentioning that the management of these classes is also very difficult, emphasized: "In the first few months of the Covid-19 crisis, we have several reports from professors who have interesting and successful classes in the traditional way. But they don't necessarily succeed in e-learning, and have problems to present and convey the lesson well; Therefore, the success and management of students in e-learning requires a special skill that needs to be considered.

The maritime community awaits the amendment of the STCW Convention

We have mentioned and become familiar with the advantages and disadvantages, or rather say the requirements of e-learning, but it is better to know how to introduce e-learning in a specialized field such as maritime, and what has been done so far.

The Ports and Maritime Organization of Iran, as the country's maritime authority, on behalf of the World Maritime Organization, conducts training courses in accordance with the STCW Convention and in accordance with the

E-learning has used social networks in such a way that today these networks are considered as one of the serious and effective tools in education

rules and regulations of that organization and the sub-committee on Human Element, Training and Watchkeeping (HTW), which are fortunately in the whitelist of IMO Maritime certifications and training.

The latest amendment to the STCW Convention dates back to 2010, when rumors began circulating about the launch of new training methods in the maritime field in the world. However, until 2019, when the last HTW committee meeting was held, only e-Learning literature was discussed, and no courses were held in the field of maritime in the countries that are members of this Convention, but the literature of this work had been formed and various researches had been done in this field. Surely, IMO has always sought to provide and develop standards and protocols so that countries can move toward new approaches to maritime education. One of the main preconditions for this work is to provide the necessary infrastructure in the member countries. Thus, IMO and the member countries of the STCW Convention have been looking for a platform for virtual education for several years without hesitation. But in the last days of 2019, an uninvited guest entered a guest house called the world and gradually influenced all walks of life and shut down all levels of education.

In this regard, Pouria Kolivand, Head of the General Department of Seafarer Affairs of the Ports and Maritime Organization, stated that with the outbreak of the corona virus, the need for virtual training in the field of maritime education has become more urgent than before and said: "Because despite the outbreak of the coronavirus, the maritime industry cannot be shut down, and if the industry is working, so, the maritime education should not be stopped. Therefore, this compulsion must be accepted as well as the virtual way of education.

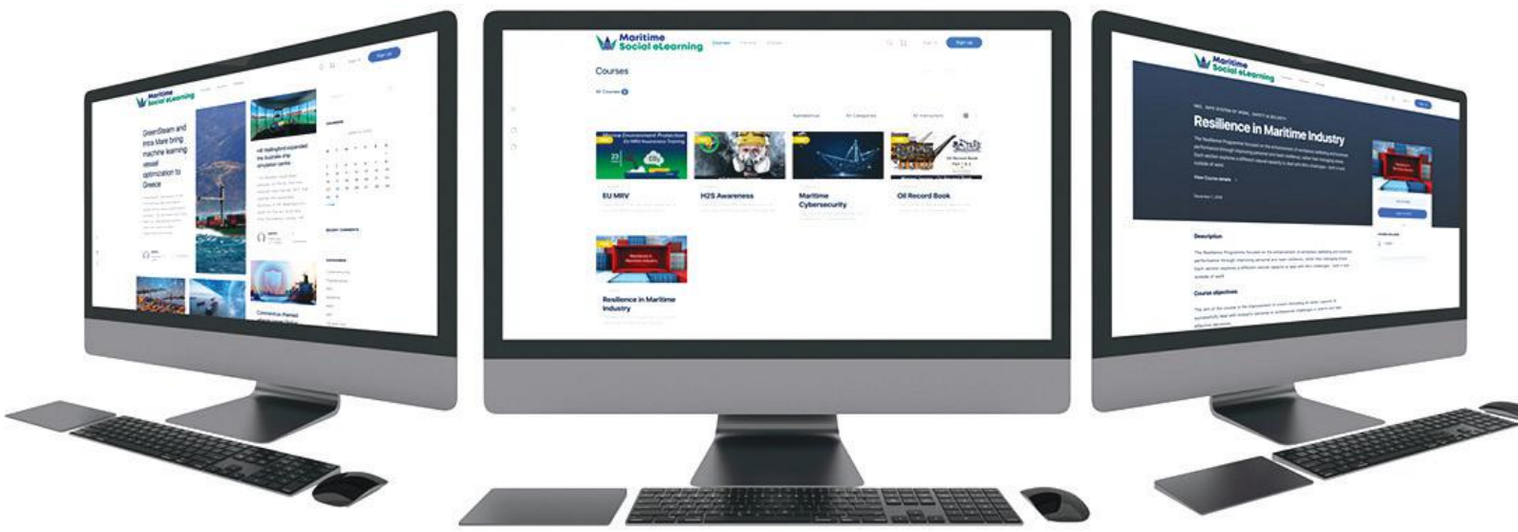
He noted that IMO is now pursuing virtual courses more seriously and explained: "However, as the approach of the member countries is to do so under the Convention, and unfortunately the Convention has not yet been amended and it needs a long-term process. Therefore, we do not yet have a reasoned training course in the Convention, but the World Maritime Organization announced before 1399 to member countries, including Iran, that you should consider maritime education.

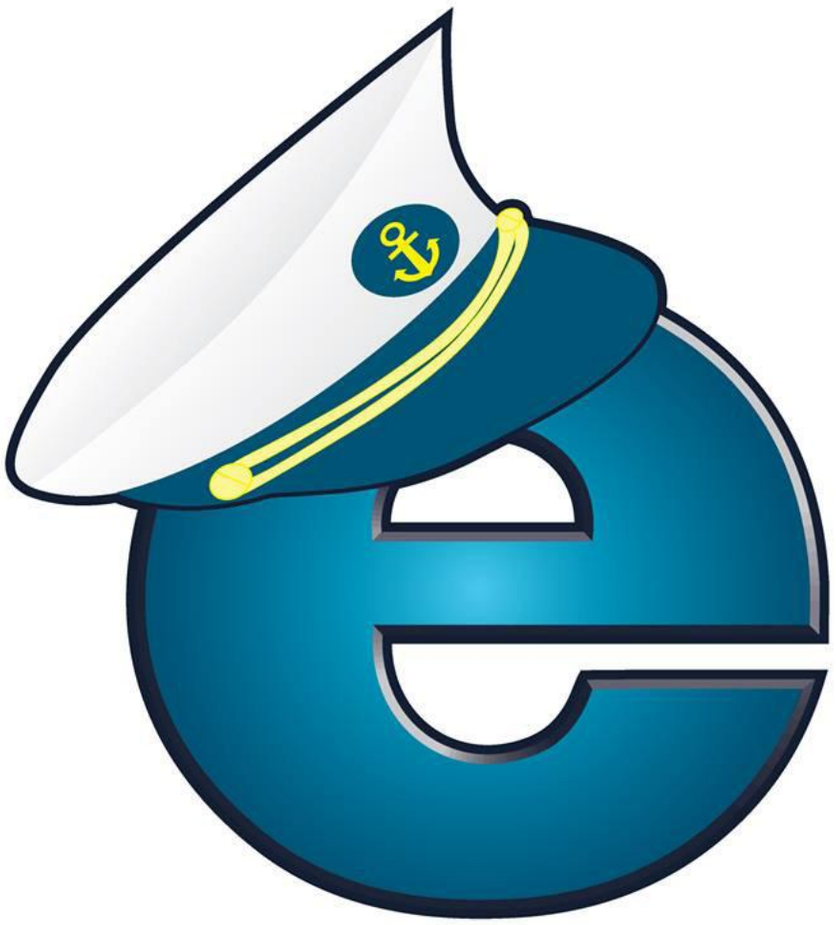
Kolivand pointed out: "In Iran, from Esfand 1, 1398 to Farvardin 20, 1399, all maritime trainings were closed. But after this IMO message, we rolled up our sleeves to run virtual maritime training classes. We started virtual teaching of theoretical courses and also theoretical parts of practical courses by developing a guideline on how to teach seafaring in the Corona Crisis and following all the guidelines and health protocols.

He stated that they also finalized the workshop section by observing the social distance and added: "Finally, during the performance, we met other needs for the courses that require other requirements such as swimming pool and jumping from a height. Due to the closure of the pools, we did our best to use the workshop facilities and in other cases, we taught by showing educational videos so we can hold the practical courses in the future."

According to the head of the General Administration of Seafarer Affairs of the Ports and Maritime Organization; Maritime training is now being conducted in the same way. If the Ministry of Science declares the educational conditions to be normal, we will also move towards normalizing the conditions and holding face-to-face classes, of course, with observing all aspects.

Kolivand said: "The rapid access of seafarers to educational content, the response to the needs of seafarers, as well as the access to experienced professors are among the benefits of these classes because most of the experienced professors are in other provinces, and before Corona, it was very difficult to access them in remote port universities, but fortunately in this way it is easy to use experienced professors to hold online training courses in some remote centers."





Maritime E-Learning

By: Sohrab Aghazadeh

Technology has changed the education landscape. In the last decade, the development of innovation - based technology along with COVID-19 pandemic has turned the potentials in new method of learning to actual.

Virtual learning is a new trend which is very different from traditional teaching and learning.
This method has been considered as one of the most significant applications in information and communication technology in the world in recent years, which is based on e-learning using electronic and computer platforms. In this method, educational content is provided to the learner using electronic methods (such as audio files, video, internet and telephone communication, etc.).
Online learning is a type of distance learning, where learning takes place over a physical distance instead of a traditional class. This method has become popular following internet boom and its growing influence among people. Therefore, many organizations and scholars have shown keen interest in applying virtual education, and it has become a trend in the world. It can be live and interactive between the teacher and the learner (Synchronous or online) or non-simultaneous and without interaction (asynchronous or offline).

The following could be some of the advantages of this method:
• Significant reduction in training costs by reducing class infrastructural and travel costs, as well as the possibility of attending the training process during service.
• It is flexible and could be provided in a suitable way and in accordance with the educational needs, regardless of time and place restrictions. Continuity of education and not being limited in the classroom are the best ways to learn continuously and professionally.
• The speed of presentation and production of electronic content is faster than printed and physical content, and new content can be provided to learners very quickly.
• By eliminating physical limitations, e-learning allows students around the world to be educated in line with courses offered by the world's best universities and to reap the benefits of using it, such as using experienced professors.
• It could increase pervasive enthusiasm and lead to more inclusive motivation by providing content tailored to

pervasive interests.

On the other hand, taking advantage of the above benefits requires access to learning tools, including computers and the Internet, which may not be available to everyone. Moreover, this method does not have the interactive and face-to-face feature of classroom instruction, which can reduce the appropriate feedback to improve the instruction or create a feeling of isolation and loneliness in the learning process for the learner.

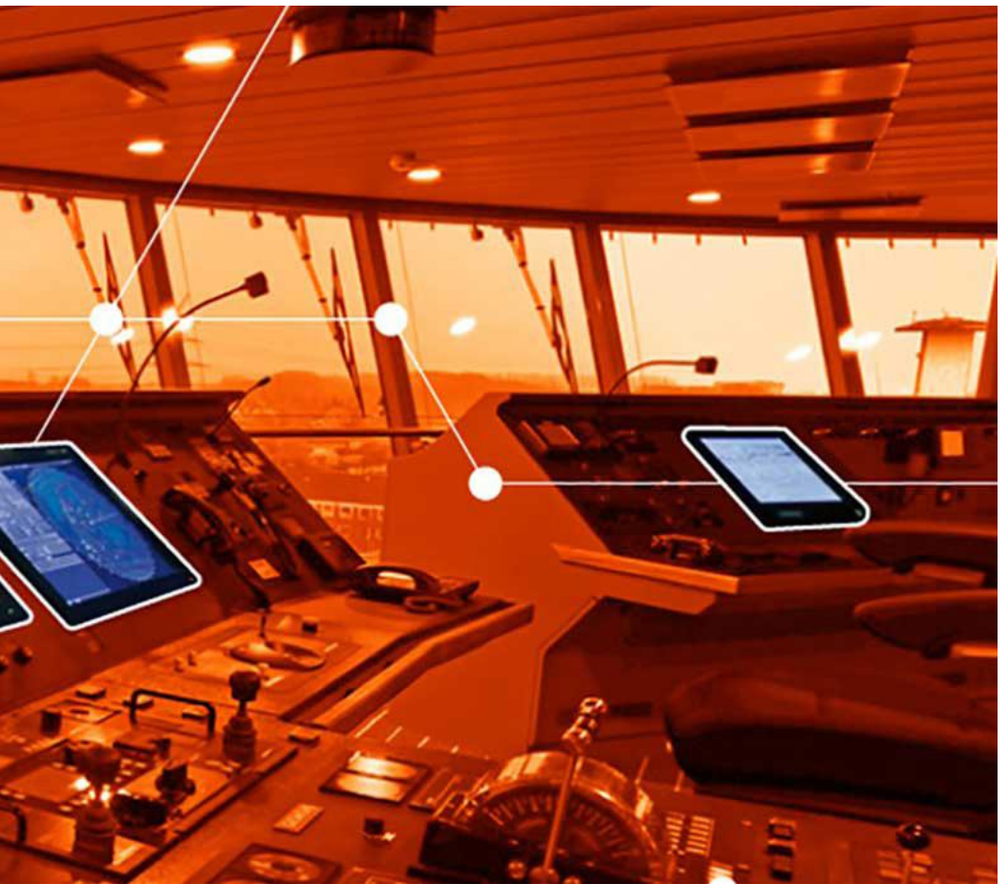
Experts prefer to teach a combination of electronic and traditional teaching methods (Blended).

The global outbreak of coronavirus and the implementation of quarantine projects and physical and social distancing that led to the closure of all educational and training centers, changed distance education from a mere educational method to the only possibility in education which the majority of educational centers were required to employ.

Maritime training centers are no exception.

Due to the characteristics of the maritime transport industry, maritime education has international characteristics, specialization and standardization. On the other hand, seafarers have many characteristics of dispersal and variety that make collective learning challenging.

In order to ensure the safety of maritime transport and effective transportation and to prevent marine pollution, the training of seafarers is regulated by the STCW Convention and the regulations of the national authorities, which provides the necessary training instructions and programs for specialized training of seafarers. In addition, the continuous improvement of maritime technology and the training of new equipment make it inevitable to update the content of the new convention and amend the laws, and consequently to update the training needs of seafarers. The benefits of virtual learning are



so much that distance learning and e-learning and their application and development as a new model of education is considered fundamental in convention of STWC 2010. Due to this fact, a lot of maritime education institutions and organizations have started virtual and remote education. Lloyds Maritime Academy, Videotel, Lloyds Registry, Coracle online and other centers in the United States, the United Kingdom, China, Norway and other countries offer distance learning for a variety of marine courses, even STCW courses. The development of VSAT technology enables these institutions to hold classes even on ships and vessels. However, that part of e-learning, including simulators and e-learning tools, has been used for many years in maritime education centers. What is at stake today is distance learning on the Internet. Even some simulator manufacturers, such as Transas and Wartsila, have tried to design simulators on the Internet so that this training can be done not only in training centers but also remotely.

Since marine training is a combination of theoretical topics, practical learning, and experience on ships, marine training institutes have naturally considered blended training to enjoy the benefits of traditional teaching and e-learning. Using a variety of learning methods, learners can learn the required knowledge, questions and answers, skills training, teacher-student interaction, and assignments from the classroom, as well as virtually and remotely.

However, in order to meet the educational standards, educational authorities must have a proper review and evaluation mechanism for the use of distance learning, which not only harmonizes with the requirements of the STCW Convention, but also improves the overall quality of students as marine specialists.

In order to implement distance learning, it is necessary to provide the teacher with the tools and resources for infrastructure and configuration (Courseware) in the first stage. Various programs and software run and support this training method. Online teaching is different from face-to-face training, so it requires different skills and approaches. Selecting and applying existing methods and programs of organizations that have created a comprehensive framework for the online learning process is one of the basic requirements for implementing this training method. Continuous, effective and safe assessment and testing by professors is one of the key parameters of this method.

In conclusion, it should be acknowledged that in order to improve learning, both during the coronavirus and in the post-corona era, the use and development of distance learning has become an accepted principle of today's education systems that cannot be denied.

In order to implement distance learning, it is necessary to provide the teacher with the tools and resources for infrastructure and configuration (Courseware) in the first stage

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Best wishes to IRISL Vice Chairman and Managing Director, Board of Directors and staff members on The Happy Occasion of IRISL's 53rd anniversary

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