

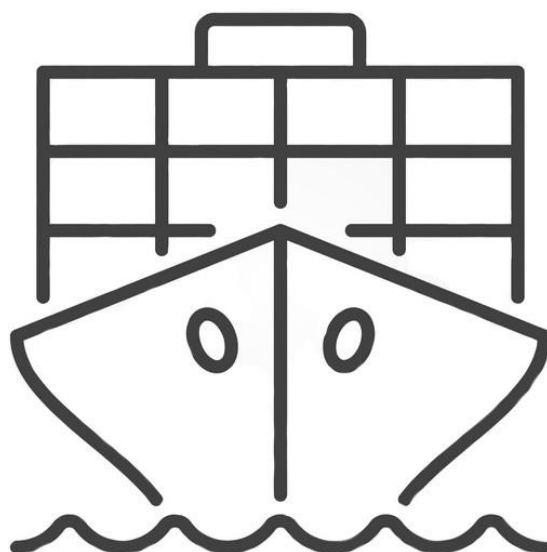
The impact of
technologies in
the Maritime
Sector from a
Ship Agent's
vision

July

2021

YOUNG SHIP AGENT OR SHIP BROKER AWARD

ANA RUIZ
GARCÍA DE
LOS RÍOS



Disclaimer: This publication represents the views and opinions of the writer (Ana Ruiz García de los Ríos) as an individual only, drawn from general experience. The content of this publication does not represent the views and opinions of the writer's employer Bergé, or any related organization. The writer shall not be held liable for consequences of actions taken by reader/s based on any information, view or opinion provided, or implied by this publication.

TABLE OF CONCEPTS

ABSTRACT.....	4
ABBREVIATIONS	5
MARITIME TRANSPORTATION THRU HISTORY	6
AUTOMATION	10
BIG DATA.....	13
BLOCKCHAIN	15
SHIP AGENT	18
COVID-19.....	23
HOW MY WORK AS A SHIP AGENT GOT AFFECTED BY COVID-19?	26
HOW ARE BIG DATA + BLOCK CHAIN + COVID 19 INFLUENCING THE SHIPAGENT ?	28
CONCLUSIONS	31
WORKS CITED	33

ABSTRACT

The present project aims to determine and understand the impact of the new technologies in the maritime sector, how automation and technologies have been changing maritime transport transforming it into a more efficient industry that will directly impact the future of the sector, including the Ship Agency services. The benefits that they have brought regarding security, and efficiency.

ABREVIATIONS

BOE = Boletín Oficial del Estado / State official newsletter

ETA = Estimated time of Arrival

ETS = Estimated Time of Sailing

FONASBA = The Federation of National Associations of ship Brokers and Agents

IMO = International Maritime Organization

IoT = Internet of Things

IPE = Individual protection Equipment

ISO = International Organization for standardization

MI = Maritime Industry

SBM = Single Buoy mooring

UAV = Unmanned aerial vehicles

UN = United Nations

VPN = Virtual Private Networks

MARITIME TRANSPORTATION THROUGH HISTORY

When we refer to maritime transportation we are talking about the shipment of goods (cargo) and people by sea and other kind of waterways. In order to enable maritime trade between trading partners, port operations are needed.

The maritime transport has been historically at the latest regarding changes, however, nowadays they are facing new challenges. The new technologies and the automation are transforming from politics, to society to economy.

Maritime transport throughout our evolution has played a crucial role, there is no doubt that the seaway is the oldest road in the world. First movement is dated when the Austronesians between 3000- 1500 BC. (Rodrigue, 2020) The objective was trading and colonizing, thus producing the development of humanity.

SPECIAL DATES ON THE MARITIME TRANSPORTATION

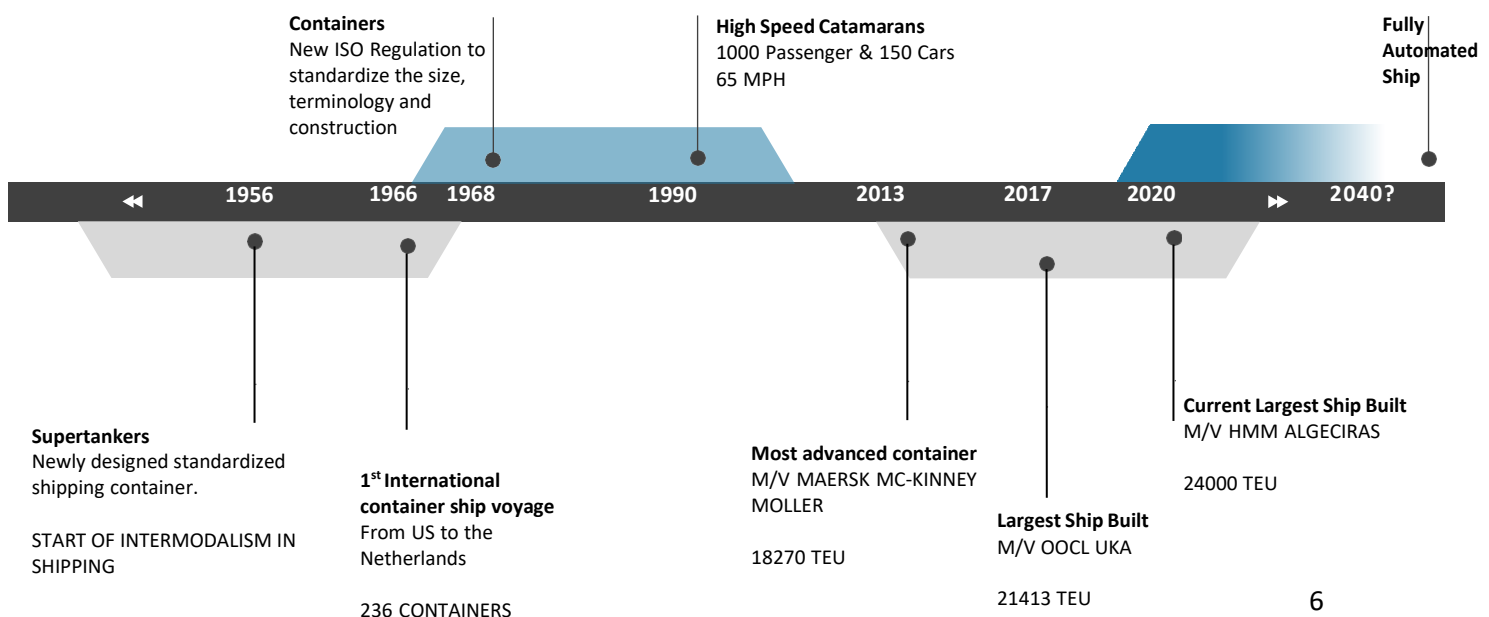


Figure 1 Source: Ana Ruiz

From this date to the present day, maritime transport has been growing since its beginnings it was of vital importance in economic development and globalization.

While we could go deeper into the subject, I would rather focus in the latest development of the century, which are truly related to the industrial revolutions. (Jeppesen, 2015)

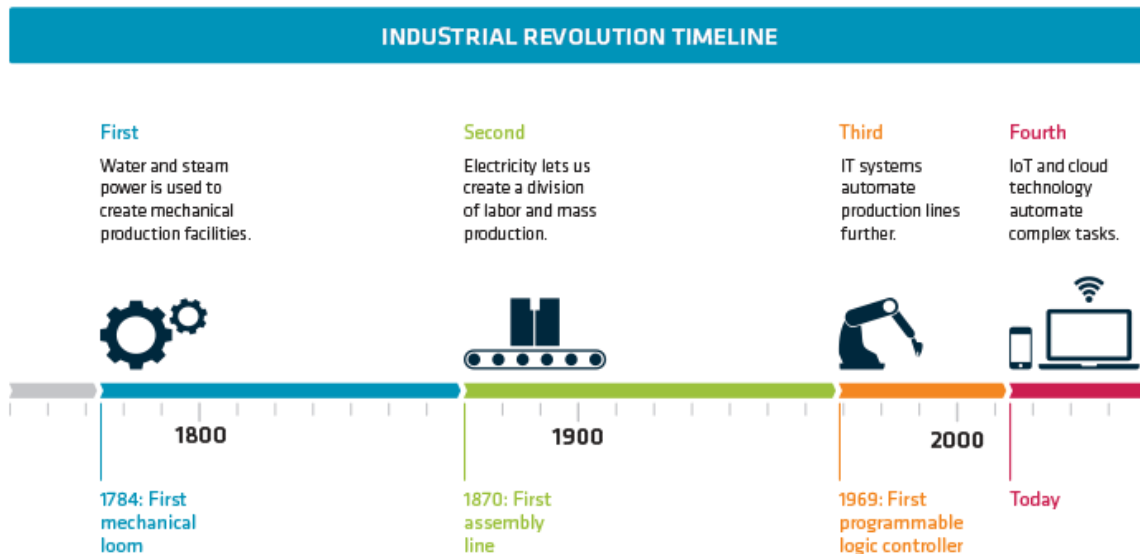


Figure 2 Source: Mjolner

As you can see in the above chart, the last century was all about technologies and development in the maritime sector.

Going back to 1956 when the intermodal shipping container was built, by Malcom Mclean (American Entrepreneur) which revolutionized shipping as how we know it nowadays. First container ship was in 1956 its cargo were 58 containers and it went from Newark to Houston. The container by then was 20 foot long, 8 foot high and 8 foot wide. (Thompson, 2018).

Moving forward we have the first international container ship voyage which took place from US to The Netherlands and it was in 1966 and it carried 236 Containers (Nowadays it would be impossible to make such a trip with such a small quantity of containers).

All of the above could have been a complete chaos, nevertheless it was not due to the ISO back to January of 1968 issued the first notice defining what a shipping container was, with terminology, dimensions and ratings. (ISO, 2020)

While all this transformation of course more vessels were about to develop, at the beginning of the 90s, we could see high speed catamarans which were able to carry around 1000 passengers and 150 cars at a maximum speed of 65 MPH.

Maersk did the next important movement that we could see, was the first Triple-E ultra large containers ship in 2013. The vessel, which was named after the late Maersk Mc-Kinney Moller (who passed away in 2012), was able to carry up 18270 TEU, and was the largest ship in the world with 400 meter in length upon delivery (Maersk, 2020).

Nowadays, as January of 2020 the latest and biggest ship containers is HMM Algeciras. It is 400 meters length, and its beam is 61 meters. It has a capacity of 24.000 TEU.

Sea lanes begin and end at ports. Around 3,000 ports participate in the commercial maritime interchange, that is the reason why they advance fast and with technification in the maritime transport. It makes workers develop at the same speed, and both the carrier and the user must know the transport techniques, however it does not mean its workers are capable.

This caught absolutely my attention, I have read something which has led me to think, it said as follows “For developing countries ports, adapting to containerization was consequently a slow process as they generally had an abundant unskilled labor force available to them” (Nations, 2018). And my question is: how technology is supposed to be implemented equally worldwide, when we do not have the same resources or available budgets?

What I believe that it could be an answer is that in maritime transport, the adoption of novel technologies has happened in gradually steps, but it does not mean that it has been done or that will be done equally.

Looking worldwide, there is a need of investments in high-technological products which will help into the manufacturing productions to be able to increase efficiency. The world is nowadays more connected than ever with the global commerce, which is creating new jobs or even impacting in the current ones.

We, as a society, can do many things to stop the harmful effects of technology, like securing regulations.

Workers as well, should use the new technology to organize. By working together with all stakeholders, we can ensure that the technologies make working and living life better.

AUTOMATION

Nowadays, technological advancements, including automation, are making transportation more complex and sophisticated, which undoubtedly will bring changes as well as opportunities.

Vessels could be assisted by any type of technology which involves automation. With the implementation of this technologies, we are looking at a big improvement regarding speed control, fuel saving or security.

We have to keep in mind that sooner or later we will be talking about autonomous vessels, which means that we will be having vessels without human supervision, nevertheless until then, vessels will work autonomous however with human supervision.

Some of the greater impact of the autonomous shipping will be as follows:

1. The increase in operational safety of vessels: most of maritime accidents (75% - 96%) are caused by human error as per Allianz Global Corporate & Specialty in its Global Claims Review: Liability in Focus study, which means that introducing a full autonomous or semi-autonomous vessel may help reducing these number of accidents.
2. The reduction of crew size: as crew is reduced, that involves some fixed costs which the owner will save, cost which will not be needed to be paid like the salary, insurance or even food supplies.
3. The increasement in the efficiency on the energy, it is a matter of time that beside autonomous vessels we will be facing as well fully-electric and zero-emission vessels, helping to reduce pollution all around the world.

4. The increase in data collection which will help at the same time regarding supply chain connectivity. Autonomous ships will be able to collect voyage data through their “autonomous systems” making this information a way of communication with supply partners about their shipments, or regarding optimization of the future routes.

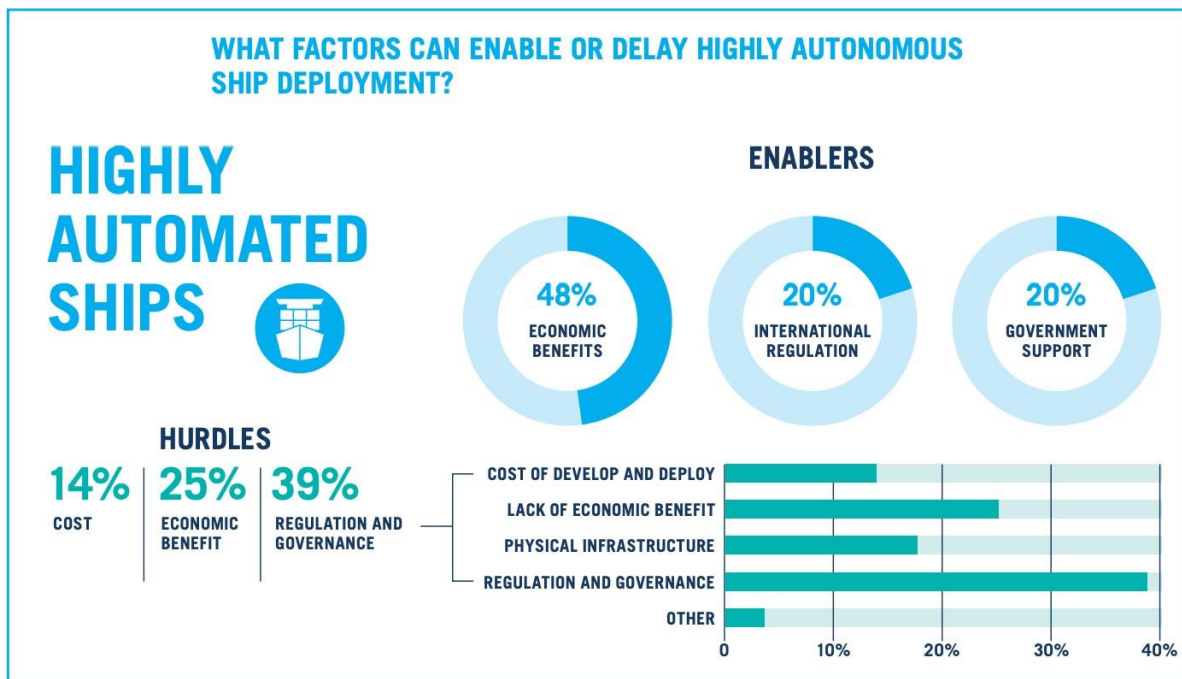


Figure 3 Source: World Maritime University: Transport 2040 – Automation, Technology and Employment – The Future of Work

I have taken the above chart that I believe it makes a really good summary of which are that factors that could enable or delay the implementation or development of autonomous ships.

Basically because of the current situation that we are living in the whole world regarding the Covid-19 pandemic, the costs of developing and deploy plus the lack of economy benefit that will

bring, I believe that it will take more than expected, as we are going to face an economic recession that has nothing to do with the one experienced in 2008. Of course, the regulations and governance has to do a lot as well, and we can see the big impact that autonomous car law regulations are having.

Autonomous can be also applied to security, and I am talking about machines doing our jobs, for example: drones or UAVs. Lately they have been used in so many fields like search and rescue, pollution monitoring and even delivering pieces, and so on. However, the biggest benefit has come from owners or charterers in order to optimize vessel's inspection, drones doing subaquatic inspections or even survey operations. Some classification societies, like DNV GL or Lloyd's Register are already working with both UAVs and drones as their survey methodologies for some type of vessels. While DNV GL confirms that they have carried out these surveys in different kind of vessel like oil tankers, chemical tankers, bulk carriers, ore carriers, or container carriers (GL, 2018) Lloyd's Register does not specify regarding it.

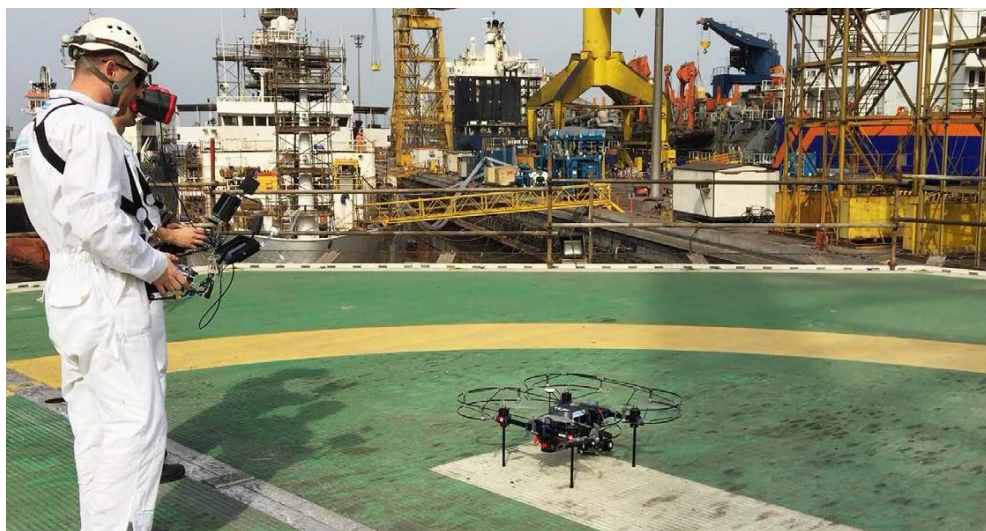


Figure 4 Source: DNV GL

BIG DATA

When talking about MI we refer to a convoluted system that requires a quick adaptation to changing conditions and in which decision-making needs to take into account a large number of parameters.

While navigation systems become more advanced, there is a significant amount of ship performance and navigation data generated. The Big Data analytics tools makes possible to analyze these big amounts of data in order to gain the insight that supports decision-making.

The automation of the processes and the introduction of “big data” in the maritime operations will lead to the development of the engine monitoring, remote maintenance, and real-time weather data and routing.

This future technological approach of connectivity will aid shipowner to minimize cost by preventing high-priced repairs and by enhancing operational performances.

For example, the adoption of autonomous ships under human supervision is expected to reach 11 to 17 per cent by 2040 (University, 2019) and the expectation is that these ships will be operating in national and regional jurisdictions and specialized trades.

Big data offers a boost in operations with ship calls, renewing port assets and ensuring optimum cyber-security. Additionally, big data is able to provide information in which solution providers, ports and agents along the supply chain can share.

Big data remains “untapped” in the shipping industry, therefore there are huge opportunities for innovation, usage, driving optimal performance and leveraging assets better (Siddiqui, 2016).

What differentiates Big Data from any other type of information processing that the sector has known so far is the orientation towards results. It is not about working with how much more data the better, but precisely choosing, among the wealth of data available, what are the indicators that we must put in relation to solve our problems.

Also, we have to keep in mind that not all non-traditional data is quantifiable and we can face to problems such as changes in the weather or delays in the ports due to strikes that cannot be solved with GPS figures, nevertheless, Big Data can help find a solution using this information. For example, using the information provided by the GPS, a boat or truck can be redirected, helping to avoid delays in delivery times, loss of fuel, etc. When we make corrected use of Big Data, it enables an intuitive decision to be made and a measurable and viable reality.

Big Data is capable of including both internal and external information, and the combination of both is the main point that can produce an infinity of solutions that satisfy as many needs as there are shipping companies and clients.

The velocity of development of the Big Data will depend on the eagerness of the port and all the logistics role players to share sensitive data, and the availability of the Port Authorities and their governing bodies to promote or even set this transparency. Furthermore, the automation and real time data handling between port players converge with the application of artificial intelligence and predictive forecasting using big data collated from devices throughout the port, for example, the “Internet of Things”. (Nations, 2018)

BLOCKCHAIN

Technologically, blockchain is incipient, but it is growing very fast and there are already many technological solutions for the use of both public blockchain and private blockchain oriented to support applications in the corporate field, focusing on the privacy of information and performance.

Since 2017, there have been several blockchain initiatives carried out by liner shipping firms like (Maersk, Hyundai Merchant Marine, Bloklab..) (Comben, 2019) which have been exploring blockchain and its evidence regarding proliferating of concept in all sectors, seeking the materialization of the advantages of the paradigm in applications on real use cases.

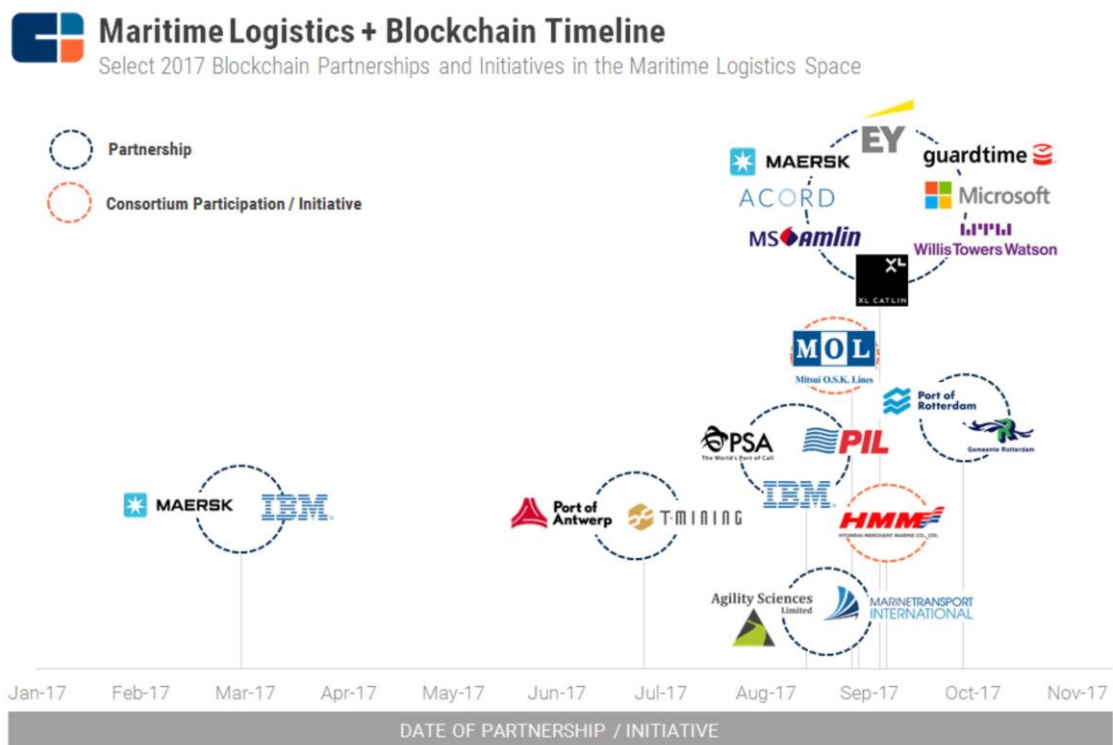


Figure 5 Source: CBInsights

The field of logistics and transport is not far away to the development of initiatives around blockchain and, although it is currently in an initial phase regarding other sectors, like Banking & Finance, Insurance, or healthcare, we begin to observe a relevant activity and the expectation is that it will increase in the short term.

As of today, they are already being carried out various projects concerning international trade, ground transportation of goods, traceability of product.

The potential impact of blockchain requires all sector performers in a position in this regard, as well as a rigorous assessment of threats and opportunities that you can introduce, in order to avoid staying on the sidelines in business transformation, being able to respond to new models that may emerge and define a strategic approach that allow to obtain competitive advantages.

Albeit the current changes from my point of view, industry needs to push towards the digital revolution it requires in order to achieve its maximum. It is quite obvious that industry moves by cost, and legal stipulations that need to be accomplished.

I believe that the industry's lack of knowledge regarding blockchain's possibilities might be the main reason for its slow endorsement, which hopefully will change in a short period of time.

Technology is capable of connecting the supply chain in a more efficient way, leading to exchange information which has been proved, and also by decreasing operational cost between intermediaries and last but not least, increasing security.

Basically, the main problem in order to allow innovation are the "costs", which are capable of being an empowerment and an impediment at the same time, being the element able to promote industry's readiness of blockchain application.

The right use of blockchain promises to increment the efficiency as well as the productivity in the logistics, customs operations, the finance of the commerce and the payments.

How about if we mix the IoT and the blockchain?

- Cost could be reduced drastically to the companies which secure cargo of export and import.
- Identify more precisely the timing and responsibility of insurable events.
- Speed up payments.

Example: If a container carries thermo-sensitive goods, an installed IoT device could be able to transmit to a blockchain the moment and location of the container when the temperature deviates from the prescribed range and for how long it has been. Moreover, adding a smart contract in the blockchain, could inform the insurance company of the goods lost because of the temperature and speed up the payment of its lost to the importer or exporter even in the goods have not arrived yet, or even make a backup plan.

Nothing but good can come up from applying the blockchain to the maritime sector, or international commerce.

SHIP AGENT

The figure of the Ship Agent arises from the need of the shipowner to resort to certain people who collaborate with him during the stay of the vessel in the port. We are terrestrial collaborators of the shipping company, terrestrial auxiliaries. We develop or carry out commercial functions that could not be attended by the captain or the shipowner. The appearance of these agents is located at the beginning of the XIX century⁵.

The article 319 of the Spanish Maritime Navigation Law defines the Ship Agent as follows: Ship Agent is understood as the natural or legal person in charge, by account of the shipowner, in whose name and representation he acts, of the efforts material and legal necessary for clearance and other attentions to the ship in port (BOE, 2019).

Therefore, it is the natural or legal person duly registered in the organizations of the Administration, which attends to the needs of ships during their stay in the country's port / s where the Ship Agent's lives. Wherever a ship goes in the world, a figure is necessary of the consignee agent, as well as described in the Maritime Transport Manual (Montori, Escibano and Martínez, 2015).

There are three kind of Ship Agents:

- When is acting on behalf of the charterer, is called the "Ship's agent".
- When the charterer does not trust the Agent chosen, and charterer nominated as we will be "Owners Protecting Agent".
- When acting on behalf of the owner of the ship it is called "Husbandry Agent".

⁵ According to Francisco Carlos López Rueda, expert in commercial law and maritime law, "although we cannot place temporarily, in an exact way, its appearance in maritime traffic, its physiognomy is well defined already at the beginning 19th century

The Ship Agent is in charge of intermediating and representing the ship in port on behalf of the shipowner, that means being in charge of the invoices for tariffs or other concepts which are originated by the stay of the vessel in the port, are practiced by the Port Authority or Harbour Master. In both cases the shipowner or the charterer of the ship is obliged to pay, usually before vessel's arrival.

Some of the functions that the ship Agent develops are:

- Guarantee berthing and undocking services: requesting and updating pilotage, towing and mooring regarding vessel's ETA and ETS.
- Administrative documents with the different organisms and authorities: Port Authority, Harbour Master, Health, Customs, Border Police.
- Custom clearance import / export.
- Preparation of all required ship documentation of the entry and exit authorization ("Ship Clearance") of the ship at the port of call.
- Arranging with the terminal or stevedore how to proceed with the Loading / Unloading operations.
- Delivery and collection of documentation required by the Port Authority, Harbour Master and Customs once the ship is docked or anchored (when using the SBM = single point mooring)
- Keep duly informed all parties involved regarding arrival and departure previsions.
- Monitoring of port operations.
- Arrange the supply of things or services requested by Master or Shipowner.

One of the things which I love the most about my job, is going on board to different vessels, from

Car-carriers, to tankers, to bulk carriers, to passengers' ships. All of them, with their particularities, have taught me something special about each kind of vessel.

When I board the car-carriers through the ramp, I am in the floor 5th already and they are usually 13 floors tall.

Curious fact: the ceiling is able to adapt to the kind of cargo that they have, this way, they can optimize and have more available spots for other cargo.



Figure 6 Source: Ana Ruiz

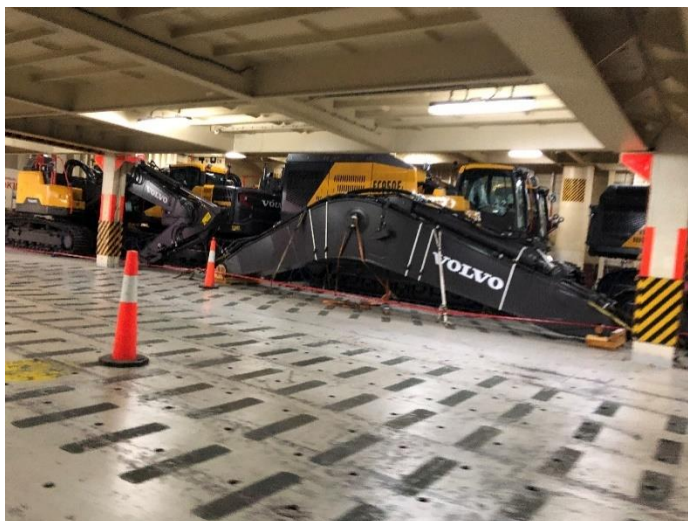


Figure 7 Source: Ana Ruiz

Above pictures belong to a car-carrier vessels, which are regular ships, berthing in a normal dock, but then, we have the most interesting vessels, that are my favorites, the tanks that goes to the SBM.

These vessels which go to the SBM are moored to a buoy in the middle of the water, so there is not a dock to embark or disembark. There is a launch/tender which will bring you to the vessel and then you basically have to jump from the launch to the Pilot ladder. If you are lucky, you do not have to change to the side ladder latter on.

Usually, the vessels which go to the SBM the operation that they do is discharging through a

pipeline which goes under the water to the main factory.

Another curious fact is that when the vessel arrives, as it is full loaded and comes to discharge, the high is not usually too big between 10-14 meters, but, when the operations are completed and the vessel is empty or half empty, you will have to climb sometimes up to 25 meters high.



Figure 8 Source: Ana Ruiz Pilot ladder



Figure 9 Source: Ana Ruiz

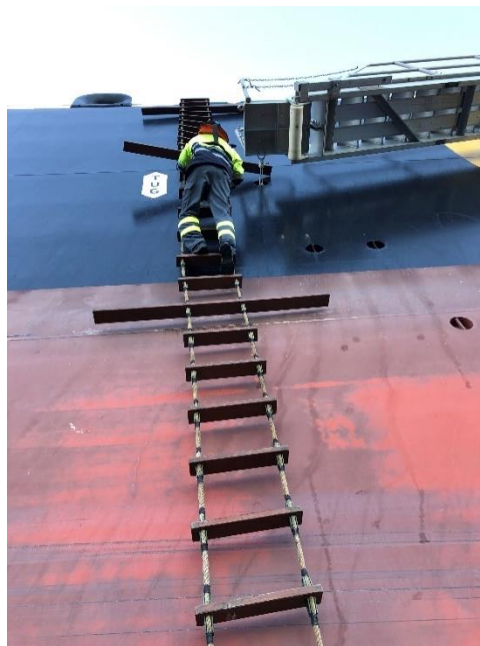


Figure 10 Source: Ana Ruiz Pilot ladder + side ladder

As ship Agent who is in the middle of the entire maritime logistics transport chain is quite complex to understand the different functions that we develop. Working in a maritime agency has led to

me to understand the requirements in the maritime traffic, such as the speed of the trips and the costs of the stays of the ship in the port, and why such an auxiliary figure is so needed in order to help the captain as well as to accomplish those requirements as well as the shipowner's ones. I believe that there are many things which can be improved in this sector, nevertheless those thoughts will be explained in the section of how the big data with the blockchain could influence the ship agency.

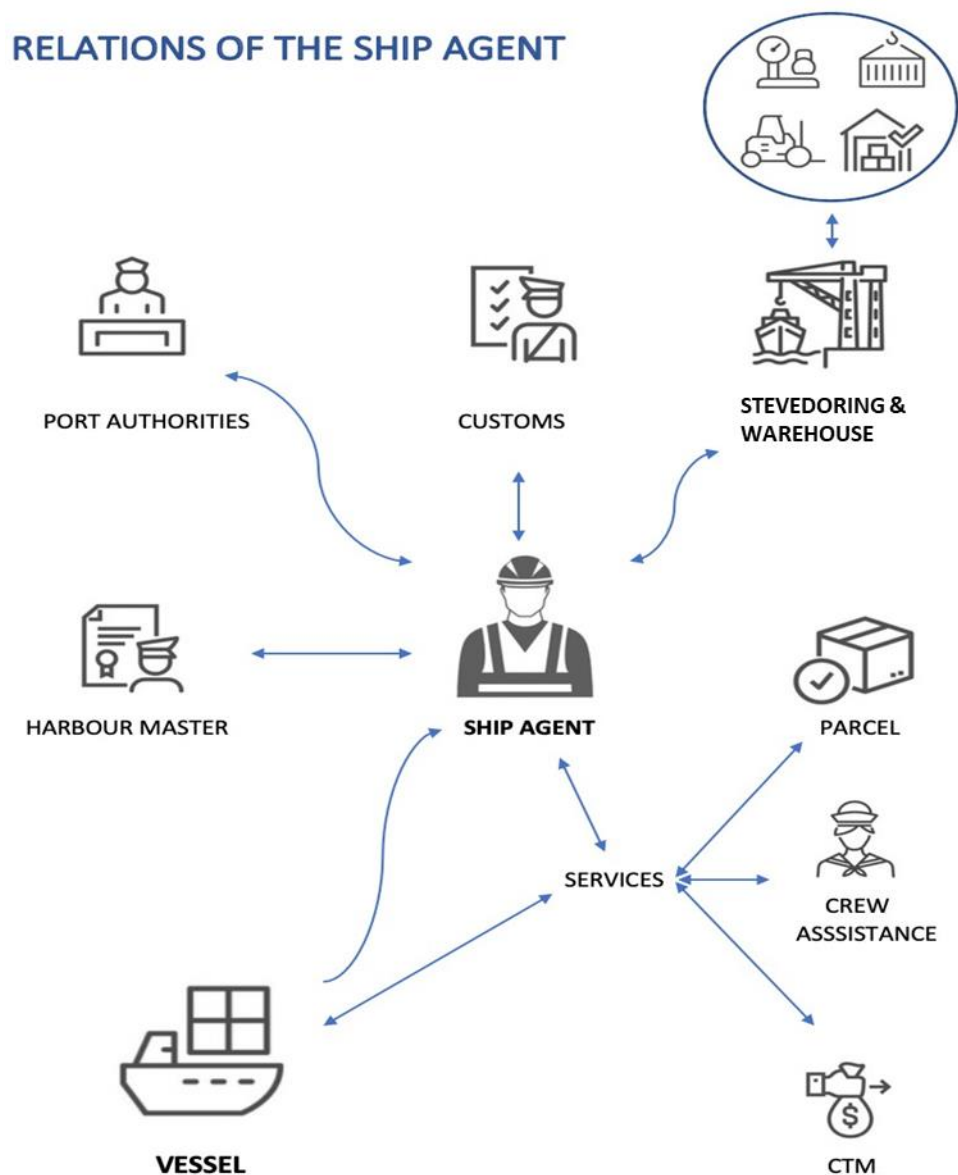


Figure 11 Source: Ana Ruiz

As the current situation that we are living in the whole world, I have decided to add a section called COVID-19 as we all have been affected in some way or another by this virus.

COVID-19

As a result of this virus, countries have done an intense amount of research resulting in data analysis, models, dashboards being created on a daily basis in order to help better understand the current impact, and visualizations of how this pandemic may have happened, and how this may be affecting near-term future.

As expected, the maritime sector has been also affected in a big way. At the beginning of this pandemic, ironically some ports in China have had quarantining vessels for up to 14 days before they enter the destination port, depending on whether their last port visit was in an infected country (Japan, South Korea, Iran, France, Germany, Spain, Italy, U.S., and Singapore) (Alfred Cang, 2020). All these quarantining vessels will bring a tremendous impact on global commerce attributable to vessels being held for up to 14 days before being able to exchange their goods. Obviously, the risk which these vessels were holding was defined by the location of the last port visited and if is an infected region.



Figure 12 Source: Puertos del Estado

Covid-19 has highly influenced the oil price in combination with other things of course, as the price was so low that it is the first time in history you got money to buy a barrel (Fred Pals, 2020) approximately 70% of all oil warehouses worldwide were full (Reed, 2020) , so, one option that we could think about will be about motor-tank vessels could be used as storage rather than transport possibility.

We should also take a look at the Seafarers, in march of 2020 the IMO joined many other industry representatives in calling for seafarers and maritime personnel to be recognized as key workers and therefore to be exempted from travel bans. In its letter to global governments, the organization also highlighted the importance of keeping ports open and supporting the supply chain.

This letter which confirms that, in this time of global crisis, it was more important than ever to keep supply chains open and maritime trade, transport and services moving. It calls on governments around the world to develop their policies and measures to protect public health and address COVID-19, without introducing obstacles to ship and port operations, including the movement of seafarers and marine personnel. Governments and national authorities were strongly encouraged to ensure that all visiting commercial ships continue to have access to berths in port and terminals(International Maritime Organization, 2020).

The situation in Spain regarding COVID-19 was not good, therefore there have been many restrictions regarding the movement of seafarers and how to proceed with them, nevertheless all this situation has improved one thing from my point of view, which is to work telematically.

Last year in Europe, we had the lowest matriculation of new cars ever, European Automobile Manufacturers Association says that in March the registration of passenger cars decreased -55% meanwhile the registration of commercial vehicles was reduced a 47,3%, this is another sector which has been hit by Covid-19 which involves a chain of different supplies.

Having in mind all of the above, looking at short-term, jobs that have been influenced are specially the producing companies - which focus for example on automotive industry (looking at the above information) – they have completely stopped producing cars, trucks, busses, agricultural machines and so on... - so all transport modes which offer these transports have been mostly stopped, like car-carrier vessels.

Consequently, all this can only develop to one thing, which is the unemployment. In general the high unemployment rate (Last year, Spain has the second biggest one in Europe after Greece (Expansion newspaper, 2021) and the short-term work (for example in Austria you earn only 80% of your salary, but it depends – as in every country is different) lead people to hold their savings - so even though everything opens again and retail markets open completely - people will not be willing to expend their money if it is not highly necessary, which means that a “trade opening” will not stimulate the economy as wished by everyone but only for things which have a highest priority like food, medicines (which are always both available) – also products that can make your home and garden nicer - as we were in quarantine at home and have time to refurbish things by our self instead of hiring someone to do it - so artisans will also feel a decrease in their work.

HOW MY WORK AS A SHIP AGENT GOT AFFECTED BY COVID-19?

From one day to the other, everyone's lives changed completely. Personally, mine changed every single routine I had until March 14th when we got confined in Spain. From not going to the office, to virtual meeting through "teams" every day, to surveyors calls at midnight, to even more emails than before, to new Covid-19 procedures at the office, at the jetties, on board...

However, if something good has this job, it's how rewarding it is connecting with people from all over the world, not even a virus could stop that.

Yes, we as Ship Agent, have many tasks, and when a vessel has a potential positive case on board, it can only bring more casuistry to the port call. From talking to all Port Authorities to even the sanitary minister (which will indicate us how to proceed). Also, we will need more documents that usual like medical logbook, declaration of maritime health, Onboard Health Certificate with Test Report Form, Certificate of Free Practique issued by the Sanitary Authority of the port of departure.

Vessels have their own Covid procedure on board, when boarding generally they take your temperature, make you fill up a document with some questions about your health situation and inform you to used disinfectant gel, before going inside.

Also my IPE got affected, I do not need only to wear my helmet, shoes and vest, now, it is completely mandatory to wear Mask (currently it is compulsory to wear it).

Below, you can see two photos of me, doing my job, the difference is that in the first there was no Covid. In the second one, there is Covid, and this vessel had Covid on board. It was disinfected, and none supposed to have it in the moment that I boarded, and as per company rules we could not board vessels, however in this case, it was an exception, and in order to board, I had to wear a full bodysuit, globes, double mask, and glasses. There was barely a small piece of my skin which was not protected between the glasses and the hood of the bodysuit.



Figure 13 Source: Ana Ruiz JULY 19



Figure 14 Source: Ana Ruiz SEPT 20

HOW ARE BIG DATA + BLOCK CHAIN + COVID 19 INFLUENCING THE SHIP AGENT?

The inclusion of new technologies in the maritime sector brings advances while they can be challenges as well as opportunities, that is why I believe that it is fully necessary to introduce a regulatory framework to be considered.

First of all, we should be aware of the big amount of information that a ship agent is able to handle, furthermore, using correctly that information can bring many benefits.

Once the data has been obtained, we could use it to cover demands as well maritime routes, in order to improve times and costs.

If we all would work as a team (Port Authorities, Harbour Master, Ship Agencies, Vessels and even Shipowners) much paperwork will be done more easily. For example, imagine the fact that the master will not need to send each time he arrives to a Port all the pre-arrival documentation but only if something has changed from his previous call. For sure it is a big gap to be covered as there is a huge amount of information that need to be processed, however I believe that the implementation of both Big Data and Blockchain in this aspect cannot bring nothing bad but only good things regarding saving time, which always involves saving money or costs.

From my point of view, some of the challenges of this sector includes focusing tasks like value growth actions. It was quite clear that with time most of the offices would be paper-free, however maybe it has been rushed because of Covid-19. Due to of this situation, most papers have been removed, because we had to work remotely, from home, not going to vessels unless strictly necessary.

Going into a no-papers world is the future and the exchanges of documentation will take place digitally.

For sure our work adds value, such as customer service, we help with everything that we are requested like finding cargo for the ship, looking for business opportunities for shipowners, helping the importer and the exported with their operations. We as ship agents are always trying to improve efficiency and competitiveness.

The ship agent most important resources are as follows:

- Training: which nowadays there is not much of it, you learn by working. And the most important field here are languages, as we are working with people worldwide, from all around the globe.
- Experience: for sure it is necessary to develop your job properly.
- Port regulation knowledge: which you get once working there.

All of the above applies nowadays in this world of increasing globalization and modern means of communication.

It is clear that technologies will affect the way we are working nowadays, however I really doubt that a machine could do my job in a short period of time since there is a casuistry behind each operation, and it is not a mechanical but exceptional or differential job.

I refer to exceptional or differential job because each vessel demand something, each ship is different, and different rules may apply to their requests. It is not the same that an oil-tanker request me to remove slops which are not included in the ECO-TAX and I need to request a quotation to the company who is in charge of this removal and forward it to the shipowner for

the cost approval than if a bulk-carrier wants to request to stop the engine because the turbocharger need to be fixed or replaced.

The ability to check up data on the screen does not completely eliminate or totally replace the commercial initiative and creativity that the ship agent offers to the shipowner or to the charterer.

Because of all the above, that is why I believe that the ship agent will continue to be an indispensable dot in the maritime chain, as we are not only indispensable but add value to the transport chain.

CONCLUSIONS

Technological changes are increasing prominence in all areas of society and in the Ship Agent sector is no exception. We, as ship Agents have to adapt to technological changes, digitization, automation and to the most important, the paperless world.

In a world that has an increasing level of collaboration between technical systems and humans, user interfaces need to ensure that the interaction between humans and machines is both safe and effective, and satisfactory for the user.

Regarding communications, while being on board, and in open waters, not only all seafarers need to communicate with family but also, the vessel needs to communicate with other ships like pilots or tugboats, or disembarking people like ship agents, owners or charterers, and the best way to do it is through internet, however they also communicate through VHF Radio or satellite. We should have in mind that the information technology allows to ensure systems in a way that they will not have severe connectivity issues, plus VPN can prevent from cyber-attacks. Also, information systems can for sure help in the maritime trade regarding pirates and hijackers, replanning routes in order to avoid the entrance of unwanted individuals in the vessels while the sea passage.

We can also say that communications have improved safety, for example, thanks to it, if something is going to be broken like a piece from engine, master or chief engineer can always advise in order to purchase it and have it on board as soon as the vessel is berthed.

A big improvement about technologies and vessels has been regarding navigation. There is no need any longer of relying on paper maps and compass (which does not mean that they are not

being used as well as navigation). Thanks to the marine navigation, which involves satellite communications, radar, radio, and GPS vessels are trackable and are able to establish a more efficient, fastest, and safest routes.

Also, I believe that the developments in technology are necessary in order to continue driving the marine industry forward. Thanks to the smart analytics, including the performance of marine technologies, remotely as well as on board, the efficiency of the industry is transforming and reducing the economical charge of maintenance and repairs.

From my point of view the blockchain applied in the maritime industry is able to stimulate the application of uninterrupted trading platforms logistics services, in conditions of security, transparency and trust. At the same time, it will improve the collection conditions and late payment in the logistics sector as a consequence of disintermediation and removal of positions of power. Another possibility could be the creation of cryptocurrencies specific to the sector that automate payments and reduce financial costs, especially in international operations.

As the whole world around us has changed significantly over the past 10 years because of the digital revolution, the world of International Trade has been slow moving when it comes to keeping up with technology.

Thankfully, we are starting to see improvement in software and technology in the supply chain. Today we are seeing technology companies around the world dramatically improving the efficiencies of International Trade through innovative software and solutions for exporters, importers, ports, and shipping lines all over the world. No company can streamline such a massive complicated industry. The key to truly revolutionizing this industry is for these innovative tech companies to work together to make International Trade easy.

WORKS CITED

- CBINSIGHTS. (n.d.). Retrieved from <https://www.cbinsights.com/>
- Comben, C. (2019, 02 19). Coinrivert. Retrieved from <https://coinrivet.com/blockchain-at-sea-how-technology-is-transforming-the-maritime-industry/>
- Alfred Cang, S. Y. (2020, 03 18). Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2020-03-18/chinese-port-restricts-ships-from-virus-hit-nations-for-14-days>
- BOE. (2019, 03 23). Boletín Oficial del Estado. Retrieved from <https://www.boe.es/boe/dias/2019/03/23/pdfs/BOE-A-2019-4248.pdf>
- Explained, E. S. (n.d.). Eurostats Statistics Explained. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics#Unemployment_in_the_EU_and_the_euro_area
- Fonasba. (n.d.). Fonasba. Retrieved from <https://www.fonasba.com/ship-agents-and-brokers>
- Fred Pals, J. W. (2020, 04 21). World Oil. Retrieved from <https://www.worldoil.com/news/2020/4/21/capacity-almost-completely-sold-out-says-world-s-largest-oil-storage-firm>
- GL, D. (2018). Retrieved from <https://www.dnvgl.com/services/drone-surveys-the-safer-and-smarter-way-103018>
- International Maritime Organization. (2020, 04 01). Retrieved from <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/09-seafarers-COVID19.aspx>
- ISO. (2020). International Organization for Standardization. Retrieved from <https://www.iso.org/obp/ui/#iso:std:76912:en>
- Jeppesen, B. G. (2015, 01 14). Mjolner. Retrieved from <https://mjolner.dk/>

Maersk. (2020). Maersk. Retrieved from <https://www.maersk.com/about/our-history/explore-our-history>

Nations, U. (2018). 50 Years of Review of Maritime Transport, 1968-2018 : Reflecting on the past exploring the future. United Nations. Retrieved from https://unctad.org/en/PublicationsLibrary/dtl2018d1_en.pdf

Reed, S. (2020, 03 26). Retrieved from New York Times: <https://www.nytimes.com/2020/03/26/business/energy-environment/oil-storage.html>

Siddiqui, A. (2016, 10 03). World Maritime News. Retrieved from <https://www.offshore-energy.biz/interview-bahri-sees-huge-opportunities-for-innovation-in-big-data/>

Thompson, B. (2018, 08 31). IntoDocs. Retrieved from <https://incodocs.com/blog/history-of-shipping-container-1956-world-trade/>

University, W. M. (2019). "Transport 2040: Automation, Technology, Employment - The Future of Work" Reports. 58. Retrieved from https://commons.wmu.se/lib_reports/58