POLYCRISIS AND PERMACRISIS IN THE INTERNATIONAL SYSTEM REFLECTIONS ON THE MARITIME AGENT IN ENTROPIC CONTEXT

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ARGENTINA

2025

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INTRODUCTION

A COMPLEX WORLD

In the last twenty-five years, the global international system and its subsystems (environmental, economic-financial, health, geopolitical, cultural, etc.) have presented a characteristic of their own as at no other time in history, the existence of numerous crises on a local scale (e.g., government crises within countries, civil wars, etc.), regional (war conflicts, trade tensions, etc.) and global (pandemic, environmental, economic, migratory problems, etc.) tending to concatenate, synchronize, accelerate and amplify, subsuming the entire international system and its individuals within the conceptual category of "polycrisis". According to Sanahuja (2024), global polycrisis is defined as the combination of crises in different interdependent global systems - environment, energy, food, health, economy, transport and supply chains, international security, and social order and governance-, whose causes are intertwined, which have cascade effects that extend to all these systems (spillover effect), and which together significantly degrade the choices and possibilities of humanity.

Added to this, the permanence and persistence of these entangled crises immerse us in a state called "permacrisis" (Castells, 2018), that is the duration of anomalous phenomena over time on different systems, and which are replicated within the various subsystems, as being the clear example of maritime transport, inserted within the world economic system. The summation of polycrisis + permacrisis results in disorder and chaos at every level, caused by the juxtaposition of actors and dynamics passed on to all activities, including the maritime agent, which I will call entropy. This conceptualization, which comes from physics but has been adopted in social theories (Schweller, 2016), determines how much disorder is in a system, the greater the disorder, the greater the entropy.

The aim of this work is not to attempt to address practical aspects of maritime agency (which were so well developed by the authors throughout the precedents YABA), but on the contrary, aims to focus on the philosophical and epistemological support to maritime agency in general and the ship agent in particular concerning the future of activity in a complex world based on the understanding of the systems in which it is immersed. Bearing in mind that many of the difficulties of the international system tend to be replicated within the activity and that, by chance, it is intrinsically related to maritime transport and its challenges. The fundamental feature of the universal figure of the maritime agent (which exists in all countries of the world) makes it irreplaceable for the functioning of the world maritime trade, because it determines everything from large-scale commercial management to nautical management at all levels of the customers. It clashes with the entropic disorder of today's world, which often interferes with its normal development and efficiency.

This complexity forces us to reflect on the performance of the maritime agent in an unpredictable and uncertain world. How does the ship's agent operate in such contexts? From the perspective of the maritime agent, how does it tackle disharmony situations such as environmental problems, geopolitical tensions, and the revolution of artificial intelligence that have a direct impact on maritime transport, port management, and ship management?

In the following chapters, I will briefly develop the basic concepts for understanding the current international system (polycrisis, permacrisis, and entropy), while we will then delve into the function of maritime agency as an activity and into the ship agent as an individual in a turbulent world.

POLYCRISIS, PERMACRISIS, AND ENTROPY: THREE CONCEPTS INTERTWINED

I start from the idea that the three concepts are interrelated in a way that makes it impossible to separate them from each other. If polycrisis is the theoretical core that allows us through the interdependence of successive and simultaneous crises to which are subjected the different subsystems of the international system explain in what world we live, permacrisis gives us the temporal notion of it and as causality of both manifests the degree of entropy to which the systems are subjected.

The idea of polycrisis owes its invention to complexity theorists Edgar Morin and Anne Brigitte Kern, who in the late 1990s, starting from a holistic approach to systems theory, identified the following crises:

a) The ecological crisis
b) The global crisis of development
c) The uncontrolled and blind development of technoscience
d) The rule of mechanistic and fragmented thinking
e) The population surge and
f) Global economic disorder, which includes issues ranging from disorder in the trade of raw materials to poor regulation of the enormous debt of developing countries (Morin & Kern, 1999).

According to Helleiner (2024: 2), “they also intend the term to refer to the fact that many of the crises and their effects have “inter- retroactions” and are “mutually implicative” in ways that “one is at a loss to single out a number one problem to which all others would be subordinated.”

Morin and Kern attribute this situation to continuous phenomena and long development in time ("long durée), not anticipating shocks and unforeseen situations. However, they were the starting point for other scholars like Tooze to delve deeper into thematics. Through its images of the crisis, the so-called "Krisenbilder" (Tooze,2022a) presents the following diagram:

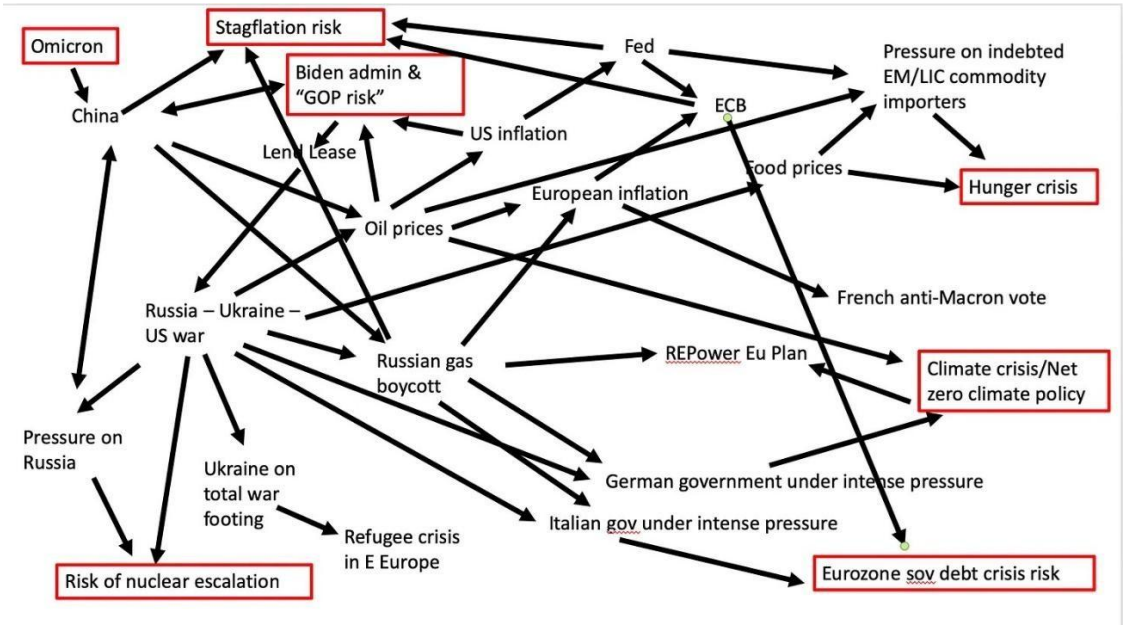

Image 1: Krisenbilder. Source: Adam Tooze (2022).

In the same we can see the total interrelation between systems and subsystems, even, I think it is pertinent to consider that to the same we can add recent events as being: a) the new mandate of Donald Trump and the reissue of the trade battle with China through a tariff war, in which the pre-eminence of the crisis of the international economic system impacts on the totality of the sub-themes and b) within our competence, the international maritime transport subsystem, directly affected by these measures.

Tooze (2002 b), in alignment with Morin and Kern, mentions that "In the polycrisis, the shocks are disparate, but they interact so that the whole is even more overwhelming than the sum of the parts."

In my opinion, the best developers of the theory of polycrisis and its conceptual and epistemological foundation are the academics Martin Lawrence, Thomas Homer - Dixon and Scott Janzwood from the Cascade Institute in Victoria, Canada, who state that:

"Our elaboration of the polycrisis concept here adopts two core implications of this systemic risk idea:

1) Intra-systemic impact: A disruption that affects one part or area of a single system quickly spreads to disturb the entire system (via multiple, ramifying chains of cause and effect, or some form of contagion, through the system's causal network).
2) Inter-systemic impact: The disruption of the initial system may spill outside that system's boundaries to disrupt other systems" (Lawrence et All, 2024:3)

And besides this, when asked if the world is in a polycrisis? Determine that:

"We argue here that the world is currently experiencing a global polycrisis and that this situation is worsening. Constituent crises include the lingering health, social, and economic effects of the Covid-19 pandemic; stagflation (a persistent combination of inflation and low growth); volatility in global food and energy markets; geopolitical conflict, especially between assertive authoritarian regimes (including China and Russia) and the democratic West, which is leading to a partial decoupling of American and Chinese economies; political instability and civil unrest in countries both rich and poor arising from economic insecurity, ideological extremism,

political polarization, and declining institutional legitimacy; and increasingly frequent and devastating weather events generated by climate heating. These crises are destroying livelihoods and lives around the globe and are undoubtedly diminishing humanity's prospects. Moreover, they are certainly interconnected, although exactly how remains unclear."
Below we can see the following graphical representation:

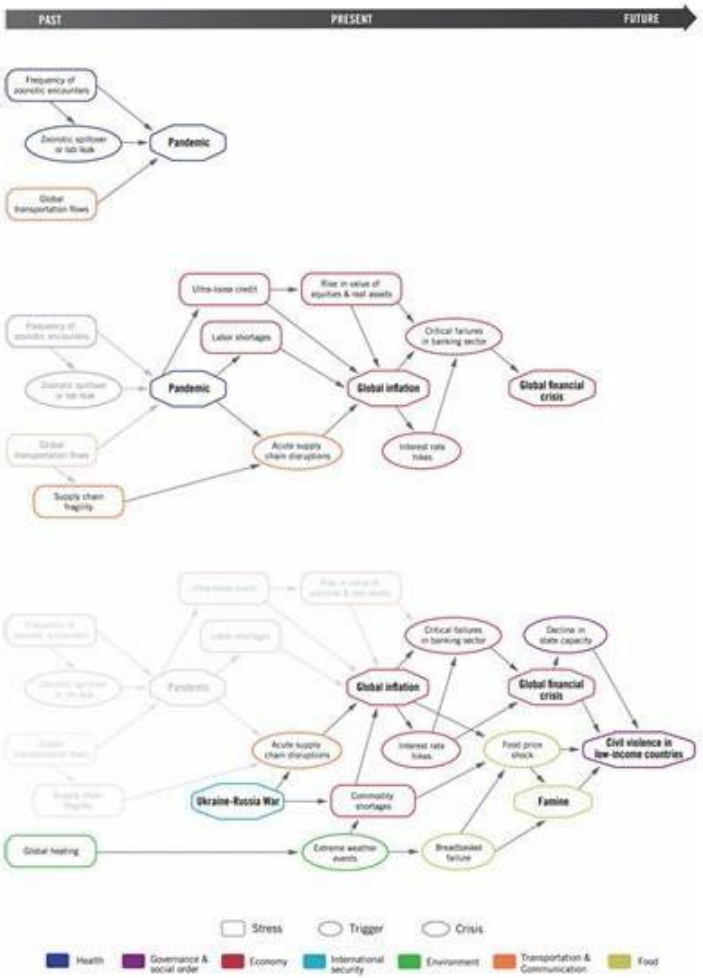

Image 2: Polycrisis representation. Source Jacob Buuma in Lawrence et all (2024)

The graph shows us the temporal evolution of the polycrisis, It should be emphasized that a substantial point of its proposal is the combination of long-term processes with unforeseen events in the configuration of the crises. Underlying the idea of "Black Swan" by Nassim Taleb (200), facts that seem impossible, but sometimes occur, have an extreme impact, endow systems with an unequalled level of uncertainty, and then later try to rationalize and explain themselves.
But perhaps most relevant of all is that the concept of polycrisis as a systemic explanation of present-day events was not only anchored in the academic sphere, but also extended it into the realm of policymakers, becoming a central topic of debate at the World Economic Forum (WEF) summit in Davos 2023, leading to heated discussions about whether or not we are immersed in a global polycrisis.

In this inaugural panel of the 2023 WEF summit, “De-globalization or Re-globalization?” Historian Niall Ferguson dismisses polycrisis as an “illusion” or “mirage” and argues that humanity’s present troubles are “just history happening”, on the opposite side to Adam Tooze. Finally, the WEF’s risky reports (2023:6) conclude that:
“The world is facing a set of risks that feel both wholly new and eerily familiar. We have seen a return of “older” risks – inflation, cost-of-living crises, trade wars, capital outflows from emerging markets, widespread social unrest, geopolitical confrontation, and the spectre of nuclear warfare, which few of this generation’s business leaders and public policymakers have experienced. These are being amplified by comparatively new developments in the global risks landscape, including unsustainable levels of debt, a new era of low growth, low global investment and de-globalization, a decline in human development after decades of progress, rapid and unconstrained development of dual-use (civilian and military) technologies, and the growing pressure of climate change impacts and ambitions in an ever shrinking window for transition to a 1.5°C world. Together, these are converging to shape a unique, uncertain, and turbulent decade to come.”

Image 3: Interconnection Map. Source: WEF. Global Risks Perception Survey 2022-23

Continuing with the development, I focus on the following concept, which provides the temporary notion of crisis in the system, called permacrisis. Although the enunciation of the concept dates back a little over five years (Castells, 2018), it gained notoriety in the incipient phase of the exit from the pandemic when it was declared "word of the year" by the Collins dictionary. He defined it as "a prolonged period of instability and insecurity, especially the result of a series of catastrophic events".

In line with this, Merejo (2023:19) argues that "Permacrisis is a term describing the state of permanent crisis, in which crisis sequences are unpredictable, and one has not emerged from a crisis when we enter into others" and in such harmony Mendez (2023:8) highlights that "The surprising accumulation of critical situations, which began to permeate the collective consciousness in recent years and even gave rise to the concept of permacrisis, seems to endow this time with a certain identity and continuity."
If we go back in time, despite the absence of the term 'crisis', I believe that the economic crisis of 2008 initiated a continuous process that was unable to be overcome. Suppose the sum of crises of the various subsystems has plunged us into a crisis over the last 25 years. In that case, the permanence in time of periods of instability has added to their temporality.
For Instance, the international maritime transport subsystem is of great interest to us. Logistics and navigation of ships have experienced more disruptions than ever in the past five years, and it doesn't appear that this dynamic can be reversed.

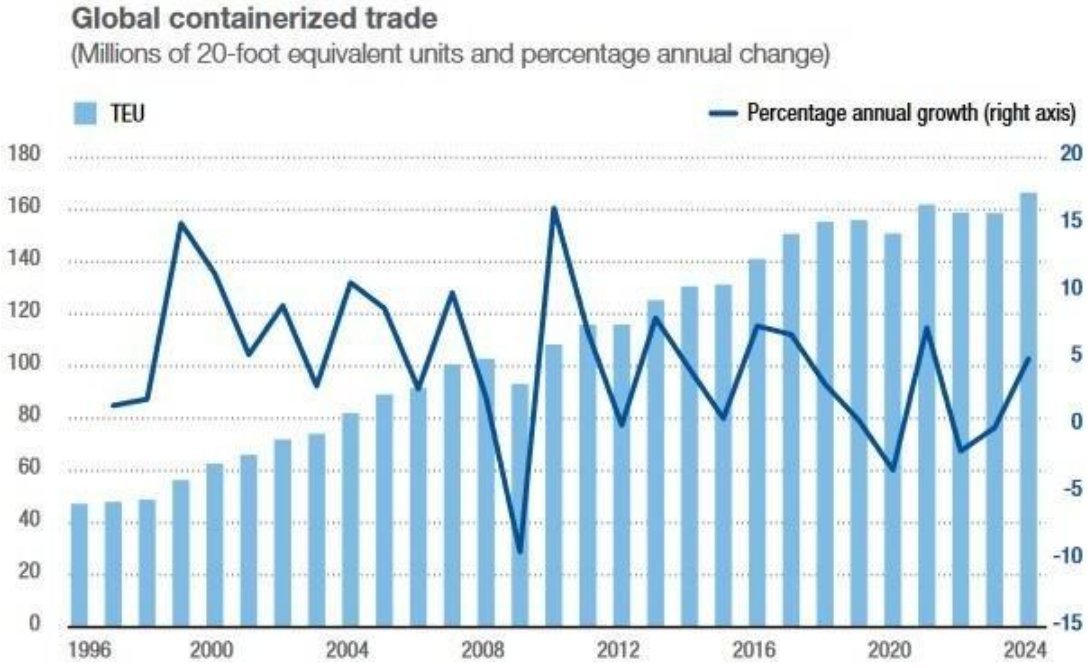

Image 4: Global Containerized trade. Source: UNCTAD (2024)

The above graph, which was selected at random but is inserted within the maritime transport subsystem of interest to us and shows the exchange of containerized cargo over the last 25 years, gives us a parameter of the beginning of the polycrisis. The dramatic fall in the global economic crisis of 2008, which resulted in negative growth, gives us a sign of the origin of that crisis that continues to this day.
As a corollary of the above concepts, we come to the consequence derived from the combination of polycrisis + permacrisis and is the notion of entropy or "entropic world". This concept, taken from physics, was quickly adapted by various authors, since it measures the reality of the international system. The notion of entropy is used to measure the disorder of a system; that is, the greater the entropy, the greater the disorder. As Randall Schweller (2014) states, "we have moved from the age of order to the age of entropy," which is characterized by:

“a chaotic period where most anything can happen and little can be predicted; where yesterday’s rule takers become tomorrow’s rule makers, but no one follows rules anymore; where competing global visions collide with each other; where remnants of the past, present, and future coexist simultaneously. In this world, global interdependence is increasing, power is diffusing, and multilateral cooperation is dwindling; capabilities to block, disable, damage, and destroy prevail over those to adopt, enable, repair, and build; where geography no longer distinguishes friends from enemies, and no one can be trusted.” (Schweller, 2014:14) and following this… “Rising entropy is not only a structural problem that affects states at the macro- or global level of world politics. It is also engulfing the system’s processes at both the macro-level (e.g., the diffusion of power; the increase in the number and variety of influential transnational actors) and the micro-level—the level of individual agency and human social interactions—with enormous implications for regular people in their everyday lives.” (Schweller, 2014:40).

On the contrary, some authors certainly see the entropic context as positive, considering that “global entropy doesn’t solely imply fragmentation. To the contrary, the system exhibits characteristics of self-organization, even aggregation, into new patterns and formations… The universal reach and penetration of connectivity enables authorities of all kinds to forge bonds more effectively real than the many states that exist more on maps than in their peoples’ reality. The world comes together — even as it falls apart” (Khanna, 2024).

However, by Actis & Creus (2020), I consider the global entropy (both in its normative and philosophical framework) as a pessimistic version of the theory of complex interdependence in uncertainty, and the unpredictable elements that undermine the ability to order. For our case analysis, I consider what Schweller has expressed as nodal, since it will allow us to analyse our activity from the macro level and the individual maritime agent from the micro level.

THE SHIP AGENT IN ENTROPIC CONTEXTS

Considering that the previous theoretical development shows us the world submerged in the condition of entropy, we must go back to the questions of the problem that we stated in the introduction: How does the maritime agent operate in this type of context? From the perspective of the ship agent, dealing with such disharmonious situations as environmental problems, geopolitical tensions, and the revolution of artificial intelligence has a direct effect on maritime transportation, port management, and ship management.

The first thing to highlight and which allows us to analyse activity on a global scale is the "universal" status of the maritime agent, as defined by the Oxford dictionary "made by or involving all people in the world or a particular group", that the ship agency and the agent perform functions similar throughout the globe. From my point of view, I understand the maritime agent from a broad vision, fundamental and necessary since it executes the performance of formalities with the competent authorities (Coastguard, Customs House, National Migration) for the vessel's entry, stay, and departure from port. He may be designated by the master, owner, shipowner, or charterer of the vessel, and the regulations grant him the status of legal representative of the ship. In turn, among the many functions, it assists the captain in the nautical management of the vessel as being supply (Bunkers, provision, Spare parts etc.), coordination of services of pilotage, mooring, etc. and in commercial management

(preparation and signing of documents such as manifests, bills of lading, etc.) with their nuances of each country. In this case, if there are inequalities in the levels of entropy according to the country concerned, it is not the same activity of a maritime agent in countries affected by, e.g., war conflicts (Ukraine) or by latent threats (area of the Red Sea) as in areas absent from conflict.

The second affirmation, partly clarifies the first of the questions about how to operate in entropic contexts and lies in the very nature at micro level of maritime agency which consists in an activity that is born, it grows, develops and dies in situations of entropy; generally the notion of order is absent in the maritime agency, and this can be determined by the following points:

A. As activity derived in the first instance from the worldwide marine transport, and in the second instance from the port operations, the availability 24/7 "Around the clock" of the marine agent determines temporary disorder. Not only availability is required for the arrival of the ship to the port complex, but all prior communication in two ways (on the one hand between agent - ship/ customer and another agent - national actors (terminals/ authorities, etc.) and on the other the post leaves ship (customer request for clarification on scale, request for documents, etc.) make it unpredictable.

B. As integrator of all actors in the chain, during the vessel's port of call, a ship agent is the articulator of multiple actors with sometimes conflicting interests. Agents representing the shipowner, agents representing the charterer, stevedoring companies, surveyors, shippers, customs brokers, pilotage companies, terminal representatives, etc, which always concentrate the consultation and requirements on the agent. As Delfino (2018) states, "plans its tasks intending to ensure that the ship performs an effective and efficient operation, minimizes delays and costs under criteria of simplification and competitiveness." paradoxically is considered the weakest link in this chain, on which complaints are usually presented against the inconveniences of both its client and external ones, but it is who diagrams and executes the solutions, resuming Delfino is in itself a link where legal, commercial, logistical and technical requirements and knowledge converge. A real pivot, without which the maritime trade could not develop". This again shows us the entropic character at the micro level.

C. And finally, on the level of inter-agency competition, according to Lupano (2023:33), "corresponds to the degree of uncertainty that a company faces, given a market structure, to keep a random customer. The higher the entropy level, the greater the uncertainty of a given company to retain a customer, and the greater the competition in the market". In this sense, the common denominator in most countries is a highly entropic atomised market of agencies offering services. The users (shipowners, charterers, etc.) miss a level of performance in management that is related to the quality of services and the speed with which they are provided to the ship. To paraphrase Talley (2009), the conjunction of maximum performance must be related to the level of resources and cost optimization in customer service. In the quest to obtain their statistics, the application of the Theil index would allow us to have an image of the entropic level of this type of market.

On the other hand, at the macro level, and to answer the second question of the problem, it is necessary that the maritime agent can have a holistic view of the world in which he operates and where he goes. This tool can be utilized to enhance activity. Considering the complexity of today's world and the overlap of the crises, I will detail three subsystems that intersect with the World Economic System and international maritime transport, resulting in distortions of activity as we know it, which the agent needs to understand, assimilate, educate, and upgrade to provide superior service:

1) Geopolitical: I mentioned earlier that those geopolitical issues partly determined the degree of entropy because it is not the same to be in conflict zones as in peace zones. On the other hand, unresolved conflicts such as the War between Russia and Ukraine, the Houthis threat in the Red Sea, the notion of "Geopolitics of the Trump administration's accesses", even mentioning the need to buy Greenland or regain control of the Panama Canal to dominate the predominant trade routes, as well as the new trade war implemented by Trump that links economic - political aspects must be understood by actors in the context of the same impact on global, regional and local scale in the flows of ships arriving at ports. In this same section, I think it is necessary to develop also the internal aspects of the countries themselves. In developing countries, as well detailed by Aldrick (2017) in his analysis of the maritime agency situation in Africa, countries present the following characteristic:

a) Poor infrastructure - road, rail, electricity, water, telecommunications
b) Low per capita income and inadequate social support systems
c) Low level of ICT capabilities
d) Complicated Government procedures
e) Poor security
f) Corruption
g) Inadequate or antiquated legislative regimes.

This situation can be extrapolated to other developing areas, such as Latin America, and progress is much slower than in developed zones such as Western Europe. If we look at the World Bank's annual logistics index, we can see this reality. There is a need for the exchange of information between maritime agents from more entropic areas to those from less entropic areas to condense different realities and how to operate in uncertainty.

2) The second subsystem to highlight is the environmental subsystem. On the one hand, and related to the previous point, certain issues are subject to new sea routes such as the Northwest Passage and the Northern Sea Route. are a consequence of global warming. By 2030, the Arctic is expected to be passable for two months a year, something that has not been thought of shortly. In addition, the drought in the Panama Canal led to a reduction in the passage of ships by almost 25% during some months of 2024 to save water. These phenomena, which are increasingly present, are linked to disruptions in maritime traffic. On the other hand, the environmental issue is very present in ship operators, many of the consultations before the arrival of a ship are about emission issues (types of fuels to be used, use of scrubbers, etc.), issues relating to the treatment of ballast water, grey water, sludge, etc., and in the treatment of waste, etc. At this point, the agent must follow the regulations of the world-leading authority, the International Maritime Organization (IMO),

and how they are internalized and applied within their countries. MARPOL and its annexes, the Ballast Water Management convention, etc, are essential for prompt customer advice during a ship's port call. As Llerena (2025:17) says, "As environmental compliance becomes more complex, ship agents help their customers meet emission standards, organize fuel alternatives (e.g., biofuels), and ensure that environmental guidelines are followed during port visits. In addition, agents help to obtain the necessary certifications and assist shipowners and operators to avoid penalties by being ahead of regulatory requirements". The environmental subsystem is expected to be one of the most affected by the inputs and outputs of the remaining subsystems in the future, and its evolution will have to be closely monitored.

3) Finally, the subsystem we will address is the Technological one, as it presents itself in the future (unlike the environmental one) with the ability for its inputs and outputs to affect the rest of the subsystems. Decentralization and speed of access to information, the emergence of AI and Big Data, as Actis & Creus (2020:108) argue "the power in the era of the fourth industrial revolution is in the management of information, and it will reside in those - states or companies- that manage to control, collect and process them efficiently". In the case of the maritime industry, for some years now, it has been undergoing a process of exploiting these new technologies, which has led to the automation of ports. As Ray (2024:159) "the smart port is part of the new technologies, and these modern systems have remotely controlled cranes, automatic cargo handling, digital displays, among other devices. The way everything works seamlessly in this operation connotes a very efficient environment to work with." On the other hand, its use in ships is particularly beneficial in optimizing fuel consumption issues, shipping routes, etc. Nevertheless, from my point of view, the Maritime agent is the latest resistance to the technological revolution of AI, as certain issues still cannot be addressed or solved by generative intelligence. It is true, as Ray (2024) points out, that new tools redefine the task of the maritime agent e.g. Electronic Data Interchange (EDI) which Automating documentation processes, reducing paperwork, and minimizing errors or Blockchain which Providing secure, transparent, and immutable records of transactions, improving trust and efficiency in the supply chain. However, the Maritime agent still must perform several field work duties, such as assisting the vessel during inspections by authorities (Coastguard, Customs House, Migrations, etc.) The Ship agent of this age must be positioned in the middle, not considering AI as an end, but as a useful tool for carrying out activity in a fast-moving world.

CONCLUSION

In a constantly changing world, which is interrelated in all areas, where an event in one subsystem tends to impact and replicate itself in another, where the primacy of technology drives the mastery of new tools, I can conclude that the current maritime agent is in good health and remains the cornerstone of a ship's port of call. And this good health is determined by being a figure with the capacity to act in entropic contexts from time immemorial. The ability to solve on the fly, to keep the customer informed in real time, its mixed mastery of both technological field and field work, and its adaptability make it the irreplaceable link of the maritime industry. In addition, it is the last land anchor of activity since it knows the port and territory as none. I share with Llerena the following reflection: "In essence, independent naval agents are reactive and proactive facilitators, helping to navigate the stormy seas of market volatility, geopolitical risks, technological change, and environmental demands, safeguard not only the ship and its crew, but also the integrity of the entire supply chain."
Not remaining in an isolated local approach of the maritime agency, being open to new tools and knowledge, and promoting a holistic view of activity will make the maritime agent a central figure of the industry until the end of days.

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