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RESEARCH ARTICLE

Organizational innovation and ports logistiques: The case of Agadir port

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Abstract

The aim of this work is to study the contribution of organizational innovation to the achievement of the logistical performance of the port of Agadir. The results of this research highlight three areas of innovative organizational practices: structure, IS, and Human Resources. The port of Agadir has an interest in adopting management practices. This fact is observed in our qualitative study where the significant impact of organizational innovation on the logistics performance of the port is positive. The mobilization of Network theory recognizes that the managerial approach is a strategic tool for the adoption of innovative organizational practices and not as a source of costs (Michel Callon and Bruno Latour (2016).

Keywords: Port logistics; organizational innovation; performance; structure; IS

Introduction

In recent years, markets have significantly evolved due to the spatial separation of production centers, consumption centers at the global level. As a result, organizations are constantly looking for strategies that would give them one or more competitive advantages (Serghini 2018). The economic globalization which refers to the integration of operations and markets in an economic area without borders (Azizi Ismail, N. (2008)) and advances in information and communication technologies (Hanna, 2010); is a central environmental force faced by organizations (MAGALA, M. and SAMMONS, A., (2008)).

In such a context, organizations are faced with a challenge to master the different aspects of performance in all phases of their supply chains; a challenge to develop their products without ignoring the quality of their services, to ensure that the resources and means invested in current production remain profitable to meet the needs of their future productions (Tidd J. and Bessant J. (2009)). For this, and given the evolution of the markets, it is not obvious that the acquisition of technological goods is sufficient to accomplish the tasks of steering and evaluating the performance of the supply chain, conditioned by the nature and diversity of flows which makes these tasks more difficult (serghini 2019; Rojo, A., Stevenson, M., Lloréns Montes, F. J., & Perez-Arostegui, M. N. (2018).

The port supply chain is a very sensitive link within a global logistics chain. Indeed, the port and maritime domain is subject to constraints related to time, cost, and quality. Port functions are changing to serve as an economic catalyst and be centrally positioned to support industries engaged in international trade. Issues of economic stability and corporate responsibility shed new sense on port operations (Wang, N., Liang, H., Zhong, W., Xue, Y., & Xiao, J. (2012). More, growing environmental awareness is stimulating ports to improve their operational viability by considering the expectations of port stakeholders (Wang, N., Liang, H., Zhong, W., Xue, Y., & Xiao, J. (2012); serghini, (2021)).

To meet the current and future needs of ports and their stakeholders, ports must balance land, labor, and technology, as well as to function as a multifunctional business centre that can produce added value and growth for the hinterland. (Wang, N., Liang, H., Zhong, W., Xue, Y., & Xiao, J. (2012)). Port logistics is a major target of organizational and technological innovation, to cope with the increases in volumes to be processed, logistics has had to reinvent itself over the last decade to show ever greater agility in order to meet customer promises that have become extremely ambitious (Jeevan, J., Salleh, NHM, Loke, KB and Saharuddin, AH (2017)) . To achieve this, new processes have been adopted and new tools are being implemented throughout the supply chains (Schmied, S., Großmann, D., Mathias, S. G., & Banerjee, S. (2020))

Continuous improvement of the operation of a port is required, due to the high costs essential to its management. A marine container terminal is a complex system whose handling and transport of containers plays a crucial role, its operation depends on the relevance of decisions, both strategically and tactically as well as operationally (Saeed, K. A., Malhotra, M. K., & Grover, V. (2011)). At each level several problems emerge, such as the scheduling of handling equipment, the assignment of ships to the docks

or the optimization of storage spaces etc .... however, managers are required to make important decisions at maritime interfaces, here the complexity is related to the existence of many unclear or uncertain decision-making variables, contradictory objectives, and unreliable information (Tsanos, C., G. Zografos, K., & Harrison, A. (2014));
Faced with the increasing flow of containers, any container terminal must ensure its growth and profitability, while knowing how to control its environmental impacts. In addition, if the space and the number of resources of the terminals are not increased, it remains to adapt the flow to existing means and to improve the fluidity of flows. (Jiang, C., Fu, X., Ge, Y. E., Zhu, S., Zheng, S., & Xiao, Y.B. (2021)).
The main objective of the research is to explain and answer these questions: How is organizational innovation likely to impact the performance of the port supply chain? To what extent is the deployment of innovative logistics practices capable of improving the productivity and therefore the competitiveness of port stakeholders?

Theoretical and empirical foundations of research

The port is the crossroads of the performance of multiple supply chains in which several economic actors participate and or collaborate. The performance and fluidity of port passage is not an addition of isolated individual performances but the result of coordinated collective performances (Mongin O (2013)). Performance in ports takes different forms due to the complex nature of port operations (De Martino M., Errichiello L., Marasco A., Morvillo A. (2013)). However, the resulting challenge is the difficulty of measuring the performance of a port with this wide multitude of actors and strategies (Sohier J., Sohier D. (2013)).

Theoretical basis

Most of the indicators used as productivity, production, service, and utility indicators do not reflect the reality of port operations. However, researchers in the field of strategic and logistics management have suggested a wide range of determinants of measuring port performance without agreeing on a comprehensive port performance measurement tool Hult, G. T.M., Ketchen, D. J., & Slater, S. F. (2004). Thus, performance indicators are the common thread in measuring the quality of port service, performance determinants can be qualitative or quantitative (Liu, Y.; Lu, S.; and Zhang, P. (2013).
However, the qualitative determinants are those that can be interpreted subjectively and are related to the port's marketing efforts, and the degree of cooperation between stakeholders. (D'Este P., Rentocchini F., Vega-Jurado J. (2014)).
Faced with various economic, logistical, and environmental challenges, it has become essential that the port logistics chain follows an innovative approach and that its organization is agile. These conditions push for the introduction of new management methods, techniques, and tools as well as the mobilization of innovative solutions and best practices (Curado C. (2018)).
Organizational innovation is studied in many disciplines, such as management and strategy, entrepreneurship, and marketing. Literature offers two perspectives for organizational innovation. The first perspective holds that innovation is a form of learning (Damanpour F., Evan W.M. (1984)) the second suggests a new idea (Damanpour F., Gopalakrishnan S. (1998)).
Damanpour F., Gopalakrishnan S. (1998) suggest that innovation is a means by which organizations respond to a variety of environmental changes,Another stream of researchers perceives innovation as a multidimensional organizational trait. Dubouloz S. and Bocquet R., Fariborz Damanpour(2016) consider innovation to include five dimensions: creativity, risk-taking, openness to change, future direction and proactivity. Similarly, Garcia R., Calantone R. (2002), proposes that innovation has four elements, namely creativity, strategy, application, and differentiation. Gay C. and Szostak B. (2019) classify organizational innovation into two categories:
Technological innovation: including products, services, and processes. And administrative innovation; including organizational structure, administrative process, and programs.Thus, innovation takes many forms, it can be tangible (as a product) or not (as new services and work practices). New or improved products, processes, management, and evolution of the organization (Isaksen S. G., Ekvall G. (2010)).
For this research, we use the following definition of organizational innovation: "Organizational innovation is an innovation comprising organizational and managerial practices, tools, processes, techniques and structures, new to the company adopting them and intended to improve the effectiveness and efficiency of internal organizational processes" (OECD, 2005).
Adopting an organizational innovation approach refers to various managerial and administrative behaviors, which vary greatly depending on the company (Julien and St-Pierre, 2015).
Different stages were highlighted: the exchange of information and the search for new ideas, while considering the "cost-benefit" analysis and paying particular attention to the pre-followed planning of development and ultimately the execution (Calabretta et al., 2017).
However, the objective of this work is to propose an integrative analytical framework for the adoption of the organizational innovation approach and its levels of analysis: internal background and interactions, external background and interactions, and relationships between organizational innovation and technological process innovation (Pichault F., Picq T. (2013)). To do this, we will exploit three axes: infrastructure, IS and HR management.

Empirical foundations

Over the last ten years the Commercial Port of Agadir has experienced a distinctive growth (14% by last year), it contributes to the export of highly perishable products including packaged fruits and vegetables and seafood (frozen or canned mainly) (ANP 2020). The port of Agadir handles 10.1% of national traffic and a third of all citrus and early exports. It plays a very important role in the economy of the kingdom and participates massively in regional activity (ANP 2020).
The port of Agadir is experiencing a growth in the containerization of traffic and has several stakeholders in the containerized maritime transport chain; and more specifically about the management of the port supply chain where the management of time, costs and quality of service are complicated (Serghini 2019).
The port of Agadir is the only port open to the entire southern region (before the port of Laayoune was built). Its influence extends to Ouarzazate since minerals extracted in this region are exported to the port of Agadir (EGSM Review n°32, (2020))
The choice of the port as a field of study is since today it is beginning to consider new market constraints and has sufficient potential for evolution and wants to be a privileged outlet for diversified transit. Thus, the modernization of the port of Agadir is at the heart of the national and regional concern that will contribute to the rationalization of port operations and the strengthening of its competitiveness.

Purpose and problem of the research

The port context is often characterized by the various issues that hinder the achievement of the level of performance requested. Thus, ports are recognized by their heterogeneity and the contradiction of the objectives of these actors, each of them to its own expectations and requirements. Also, port stakeholders are required to meet certain standards of costs and economies of scale, to meet the requirements of deadlines, and to provide a high rank of quality to the service provided (Serghini 2021).
In recent years, the port community, like other industries, has been required to adopt solutions that are less polluting, ecological and with the same level of quality of service, as well as to create and invent solutions and procedures that are more respectful of the environment (Mongin O (2013)).
We have listed some logistical issues that arise throughout the processes of the port logistics chain:

- Use existing facilities more efficiently to avoid overcapacity,
- Ensure a certain level of operating profitability
- Respond more quickly to structural and cyclical changes, such as new information technologies, just-in-time logistics, etc.

Faced with this multitude of challenges, stakeholders in the port logistics chain are forced to innovate to overcome these challenges, which encourages our choice and explains our motivation to study: how does organizational innovation influence the performance of the port logistics chain?

Research Methodology

To understand the impact of organizational innovation on port logistics, we cannot be located outside the phenomenon, by going back and forth between theory and the field of research, so the present work is in an intermediate approach between positivism and interpretativism (F Wacheux (1996)).
The positioning adopted to carry out this research is characterized by a deductive logic, and an approach of a qualitative nature.This approach will be carried out in two phases: a first observatory and the second qualitative one.

Observatory phase

We carried out a site visit, namely the equipment park, the wharf, the restricted area, the container park, and the cold storage space. Thus, we witnessed a set of operations, such as customs clearance, loading and unloading, the passage of trucks to the scanner, handling of containers, as well as the various operations of pointing and checking loading and unloading lists, sequencing of boats, stowage plans, receipt vouchers, etc.
This first contact helped us to understand the reality and practices of the port community of Agadir and it allowed us to assess its adequacy with the pre-set objective and the research question targeted. This phase also allowed us to collect secondary data on the Sous Massa region, the port of Agadir and the containerized transport circuits of agri-food products exported from the Sous Massa region.

The qualitative phase

In this qualitative study we approached a variety of industries in the agri-food export sector, services (carriers, shipowners, freight forwarders, insurers) and public administration (Harbour Master's Office, Customs, Taxes, ANP) within the port of Agadir. We interviewed 18 operators, with a panel of interviewees of 45 individuals and brings together directors, technical service managers, engineers, site managers and logisticians. These are managers who carry out different tasks of port operations.
We got interesting information, through direct contacts. And we were able to confirm the effect of organizational innovation on the efficiency of port operations.

Choice of organizational axes studied

The selection of these axes is based on two considerations. First, it is a reasonable choice given that each component of organizational processes certainly influences

responsiveness. Secondly, we focused on Knowledge Management. Perspective rather than performance. In this work, the focus is on illustrating and interpreting how and why the adoption of organizational innovation practices contributes to the acquisition of more efficient ports. Therefore, the axes chosen are sufficient to provide the evidence required for the analysis.
In this research, reliability and validity were considered in different ways. In terms of reliability, interviews were recorded, and in terms of validity, the theoretical framework was used as the basis for developing the relational model and assumptions. The choice of people involved in port processes for interviews has also increased its validity.

Results and discussions

We have noted that the port of Agadir is in a transition phase, which is why it must refocus its mission on activities necessarily involving the port in the port logistics chain. Certainly, the port of Agadir has shown a great desire for improvement through a panoply of projects and corrective measures of anomalies related to the different levels upstream and downstream of its supply chain.

The Axes studied

In this research work, we focused on studying three main axes, which are:

Axis 1: Port infrastructure

The first focus of our research was on the infrastructure made available to the actors of the port logistics chain and their degree of satisfaction after the exploitation of this infrastructure. Interviewees say there are still constraints in terms of tight storage space, delays, and congestion.
According to some operators, the most widespread constraint is that of the limited storage space either for the ships loading and unloading operations or for the container's storage. This is a space fixed as soon as the concession contract is concluded. The management is the optimization of this space is not an easy enough task because of the increase in traffic that exceeds the capacity of the operating port, moreover some customers prefer to store their goods in the port than elsewhere for security reasons which further increases the challenge.
According to the interviewees the storage space is often arranged according to the dominant traffic, if today the container traffic has increased the yard area will be adapted to absorb the mass of containers, if the traffic of the various dominates the storage area will be designed to store the various. This permanent change in storage policy generates costs in terms of spatial planning, equipment since each traffic has its own processing materials and staff since a crane operator who is trained to handle bulk cannot process containers and even if he manages to do it will not be up to a specialist crane operator.
A solution for this storage problem has been adopted by the port of Agadir. This is stack storage or vertical storage which consists of increasing container storage levels from 3 levels to 4 or 5, but according to interviewed handling specialists, this solution is considered temporary because it is valid only for empty containers. According to them they can store the voids in 5 levels because their weights do not exceed 25 tons which is impossible for full containers for a reason of the heavy weight of the goods which will subsequently cause damage to the containers and to the stored goods and a degradation of the soil over time. Not to mention the constraint of the equipment because the best of the jumper carts can only stack on 3 levels.
Unfortunately, the port of Agadir suffers from structural logistical congestion to the extent that the constant nature of the infrastructure is insufficient for the level of traffic within the port or due to the lack of equipment. In addition, the new security system due to COVID-19 generates disruptions in port operations.
Administrative procedures or handling problems (customs, security procedures, etc.) can also be causes of congestion. It is very difficult to fight against occasional congestion (caused by COVID-19) because it can only be treated when it occurs, it is essential to focus on structural congestion to solve the problem and avoid degradation. Structural congestion is much more serious, as it has consequences for the entire port system. Admittedly, a ship treated late will have repercussions on the entire supply chain. A delayed unloading transfers the delay to another mode of transport. Finally, the delivery to the final customer who is marred by a delay and especially a possible additional cost. Each stage of the supply chain depends on another.
According to the interviewees, three forms of congestion are common at the port of Agadir are:

- Truck and Car Congestion: Road Degradation and Aging Weighbridges
- Congestion at unmarked or leased medians and storage areas: lack of storage areas
- Congestion at the port water body: Crane, gantry, or other handling equipment failures, etc. Also, the lack of dock for berthing and securing vessels due to unrecoverable wreckage.

The problem of delays is often related to the two constraints mentioned above; that of storage and congestion as well as customs procedures and formalities, the latter are related in the first place with international law and signed conventions, which reduces the margin of manoeuvre of the actors to fluidize them. Despite this complexity, the administration of customs and indirect taxes (ADII) is still trying to improve by dematerializing its procedures, which we will see in the following theme.
Most interviewees stated that the starting point for any organizational innovation is constraints and risks. Each through his job, they organize meetings where they

discuss the problems faced and the possible solutions. Then they move on to the post-implementation of these solutions if it works and show positive results on their performance, they try to adopt it and improve it as they go. Otherwise, they give up and continue their research. Some of them are part of a continuous improvement policy within the certification framework: MARSA MAROC is certified:

- ISO 9001
- OHSAS
- ENVIRONMENT
- 45001

They organize continuous improvement circles where they follow an approach to solve problems and achieve their performance goals.

Axis 2: Community information system

Interviewees reported that their structures have systems in place to exchange information in a more efficient and relevant manner. For other port stakeholders such as operating agents, information systems are at the heart of their innovative solutions. MARSA MAROC uses research and development consultants. It is in the process of implementing a Terminal Operating System (TOS) which consists of automating container movements, which will improve the management of the terminal. It will be operational once their equipment is equipped and after the installation of a control tower to track movements within the terminal.

Some freight forwarders interviewed consider the Port Net platform as a complex novelty to use, and which requires staff training as well as time to adapt with its integration, others say that it has negatively impacted their procedures.

The Moroccan Customs is also an institution involved in all international commercial operations, according to the interviewees of this establishment, the ADII is open-minded for any organizational or technological novelty that will improve customs formalities. This institution demonstrates its interest through dematerialization; for them it is very advantageous; the same applies to exporters and importers interviewed. According to the latter, the customs clearance time has been shortened compared to the dematerialization before, not to mention that they have noticed a gain in travel and a limitation of travel and consequently a gain in travel costs and shopping costs. Dematerialization has also made it possible to reduce human contact and therefore the chances for the practice of corruption.

However, constraints prevent the dematerialization policy to achieve the expected results, namely computer hardware failures, and intranet and internet networks are frequent. Also, the platforms used require more powerful hardware and considerable backup capacity. Unfortunately, the various actors are thinking about the costs of investing in technology.

Axis 3: Human Resources

Interviewees say that at the level of human resources, the essential tool to get staff to adhere to the process of implementing innovative solutions is training and support, to follow the changes.

Others require profiles that already master software, procedures, or digitization platforms.

In the context of this work the target was varied, each of its position requires certain profiles that seem important to it to improve the performance of its entity.

For Marsa Maroc, communication comes first, it has created an information architecture where each hierarchical level has its own point of dissemination. Interviewees suggested that meetings and minutes remain the preferred means by their managers to disseminate information and new solutions. For some interviewees, the disadvantage of certain solutions and the increase in the requirements for staff improvement and versatility may be the cause of the increase in the redundancy rate.

Discussion of research results

We highlighted that considering the constraints related to the port logistics chain was essential and was a pervasive problem in the port of Agadir. The actors and stakeholders of the port have become aware of these constraints and are trying to overcome and adjust them through innovations and organizational solutions. And dedicate resources and coordinate with their collaborators. Each link in this chain has its own stakes and challenges, which give rise to divergent problems and contradictory objectives.

According to this work, it appears that, for the port logistics chain to be efficient, it is necessary the support of the whole community in a policy of continuous improvement which will promote the involvement of everyone to innovate and solve the problems faced, delay, congestion, and limitation of storage spaces as well as the complexity of customs formalities. Each stakeholder has its own definition of performance, for some it is the financial profitability that matters most, for others their operational performance is the first concern. To achieve this, they have each implemented internal solutions or integrated community solutions to meet the challenges.

The results of our research show that there is a direct link between port logistics and organizational innovation, the success of this combination may depend on the efficiency of port actors to adapt to each constraint, which will allow them to achieve their performance objectives.

Conclusion

The seaport of Agadir must be able to evolve its working approach to capture long-term traffic; that is to say, not only to be a place of loading-unloading but to be a

logistics platform by the deployment of complex container massification structures and the offer of quality port services (short transit time, and responsiveness).

Certainly, the port of Agadir, like all ports, must ensure numerous links with the hinterland so we are talking about a complex network of organizations where the Port Authority (ANP and the captaincy) sees that its functions consist in leading a network and drawing up its development strategy, we are talking about a managerial mission.

We have tried, in this work, to present an overview of the logistics activities of the port of Agadir and starting from the hypothesis of port development with a managerial mode, organizational innovation is a solution to have a logistics performance. The activities considered require variable skills with a wide range of profiles, something that is little noticed at the port of Agadir, so port actors still suffer from a set of constraints in terms of limited storage spaces, delays, and congestion despite the efforts of the port authority. The concern for continuous improvement is omnipresent among the actors of the port community. Hence the use of organizational innovations and best practices and professional advice to achieve the objectives set.

This work requires a deepening because we have discarded an important dimension to make the subject understandable. This dimension is the sectoral specificity, the objectives, the constraints, the culture vary considerably from one sector to another. This will have an impact on the management of flows.

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