

## **Relational Proximity Management in Maritime Clusters: The Case of Morocco**

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**ABSTRACT:** *The role of ports has changed profoundly in the last two decades because of the strategies initiated by Supply Chains, but also because of the strategies developed by terminal operators and shipping lines.*

*The goal of our research is to put in perspective the possibilities of relational integration of ports Moroccans Supply Chains, and to show how this integration could have a positive impact on their triptychs "Costs, Quality, Deadlines".*

*During the confrontation of our literature review, we were able to identify a series of research hypotheses influencing the relational integration of the port with Supply Chains.*

**KEYWORDS** - *Relational proximity - Maritime clusters - Port Industry - Supply Chain.*

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### **I. INTRODUCTION**

On import and export, the organization of logistics chains usually passes through a port. As a result, logistically, ports are expected to play a key and essential role in the competitiveness of Supply Chains.

In addition, the strategies of outsourcing and globalization, as well as the revolution brought about by the advent of the container on the complexification of international flows, have had consequences for the stakes of the port. These have changed the criteria for performance and competitiveness with regard to logistics chains.

In the face of these significant developments in logistics chain strategies, ports are no longer considered to be obligatory places of passage, but as actors in the process of evolution, given the new functions performed and the role played, which have undergone significant changes in a number of areas. by becoming logistics hubs for international trade and high added value centers seeking to optimize variables such as deadlines, quality of services and costs.

As a result, our research problematic revolves around two main questions that are theoretical and methodological in nature. The first question aims to define and measure the practice of relational integration of Supply Chains by the port.

The second question raised by our research problem is of a methodological nature. It concerns the causal relationship between the integration of Supply Chains by the port and its triptych "Costs, Quality, Delays".

To do this, a quantitative study was conducted among the companies in charge of port operations in Morocco.

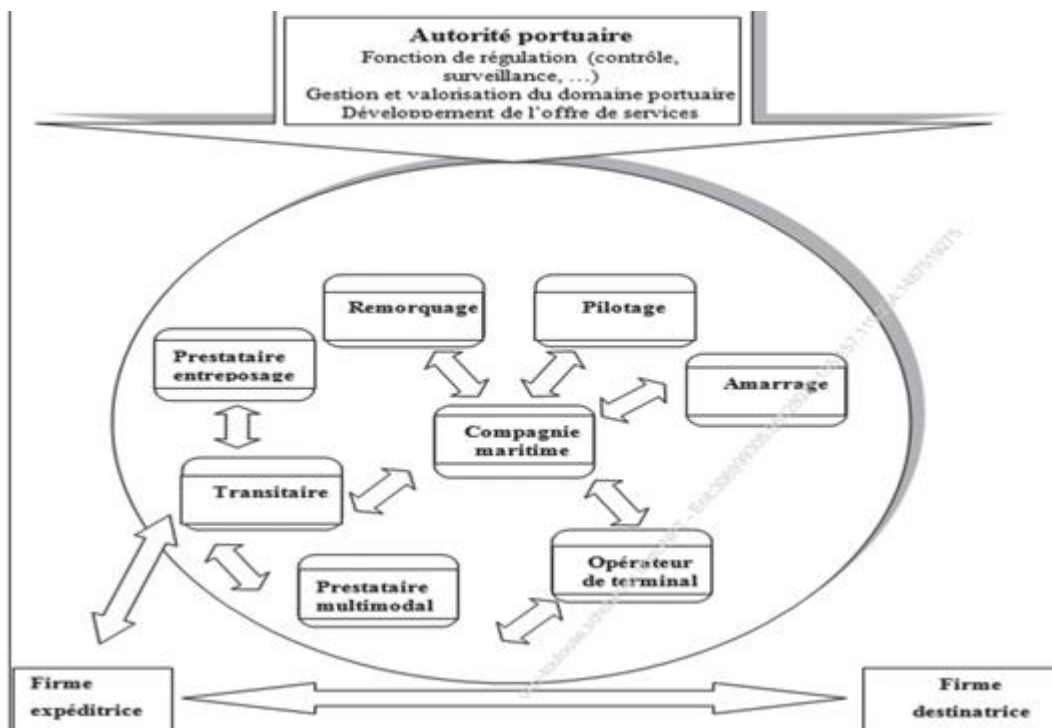
### **II. THE LITERATURE REVIEW**

#### **1. Concept of Relationship**

Anderson JC, Narus JA, (1990) define the relationship as "a process in which two actors form over time powerful and extensive social-economic-technical-service linkages in order to reduce costs and / or to increase the value received and thus to derive mutual benefit".

In the sense of Czepiel (1990) the relation is "is a mutual recognition of a special status between trading partners", whereas Mourey (2008) finds that "the relation is a set of links and relationships between entities and persons constituting the foundations of an inter-organizational relationship".

The port is a community of many interdependent and complementary actors. In fact, the services rendered in a defined geographical area for goods and ships (including mooring, pilotage, towing) involve the direct and indirect intervention of a multitude of organizations. These include in particular: (the port authority, shipowners, cargo handlers, customs, maritime affairs, logistic service providers, veterinary services, agent companies (forwarding agent, freight forwarder: carrying out on behalf of third parties, exporters or importers, the formalities necessary for the export or import of the goods).



**Burn D., Guerin F. (2014)**

In order to provide a logistical service, the port actor composed of various actors operates on the physical flows and information flows necessary for the port passage. This network composed of actors, bring their resources and their skills, in order to ensure the transit and or the valuation of the goods.

This piloting is complex because the organization of the port activity and its terrestrial extensions must take into account the diversity of goods, and the need to achieve a degree of integration of the various actors (consignees, shipowners, freight forwarders , customs broker, road transport, etc.). As a result, it has become necessary to develop partnership relations with these different actors, to define the respective roles, as well as the evolutions of these roles.

### **III. Regional integration of ports**

Chlomoudis et al (2003) note that the main role of the port is to develop the culture of trust between ports and its users, to follow market trends and trends. They add that it is important to have a strategy based on the management of the network of market players, but also on the setting of objectives in cooperation with the various partners (public authorities, municipal authorities, scientific institutes, etc. ) and the setting up of information and inter-modality systems.

Thus, by analyzing the way in which port operators can meet the challenge of integration, Carbone V ., De Martino, M (2003) indicate that port operators are involved in several processes, but high competitiveness requires a higher level of integration.

Notteboom, T E (2004) notes that structural change in the container shipping industry has had an impact on port performance criteria. They are required to strengthen their terminal operating capacity, develop a network of partnerships and achieve Integration along the supply chain.

Burn D., Guerin F. (2014) note that the piloting of the port is complex, because the organization of the port activity and its land extensions must take into account the diversity of goods, and the need to achieve a degree of integration of the different actors (consignees, shipowners, freight forwarders, customs agents, road transport, etc.). As a result, it has become necessary to develop partnership relations with these different actors, to define the respective roles, as well as the evolutions of these roles.

Haugstetter, H. Cahoon, S (2010) argue that the port is required to get involved and collaborate with a network of actors who are even outside the port boundaries. According to the same authors, this collaboration comes first and foremost through the acquisition of knowledge and the integration of information.

In order to study the impact of the integration of the port on Supply Chains on the performance of (quality, cost, responsiveness, personalization), Song DW and Panayides PM (2008) conducted a global survey of a sample of 300 container terminal ports. The respondents are essentially the port managers and container terminal managers.

Song D.W., Panayides P.M. (2008) identified 11 variables to measure the level of integration of the port with Supply Chains. These are: Use of Information and Communication Technologies, Shipping Line Relations, Value-Added Services, Integration of Modes of Transport, Relationship with Land Transport Operators, Practices and Performance of integration of channels, costs, quality, reliability, customization, responsiveness.

<p><b>Relations with shipping companies (shipping line)</b></p>	<ul style="list-style-type: none"> <li>- Line armament is considered a strategic partner in mutually designing the flow of goods and information.</li> <li>-The relationship based on mutual trust, rather than on contractual obligations.</li> <li>-The collaboration with the armament of line to assure a quality of service and to reduce the costs</li> </ul>
<p><b>Relationship with land transport operators</b></p>	<ul style="list-style-type: none"> <li>The use of EDI integrated electronic data exchange to communicate with ground transportation operators</li> <li>-Use integrated information systems to share data / information with ground transportation operators</li> <li>-Implementation of computerized port service systems</li> <li>-The importance of studying how rail / road transport operators use port facilities</li> <li>- Listening to land transport operators in the development / upgrading of our port facilities</li> </ul>

**Song D.W., Panayides P.M.(2008)**

Song D.W., Panayides P.M. (2008) indicate that there is a strong positive relationship between the adoption of technology and the quality of services rendered. However, quality is a major criterion for the selection and evaluation of port services.

Another important theoretical hypothesis asserted by the authors, is that the establishment of collaborative relations with customers by the ports have a beneficial effect on the reactivity and the reliability as two criteria of performance measures used in the era of the logistics and SCM.

#### **IV. METHODOLOGY**

Our research approach is of a hypothetico-deductive nature. In a hypothetico-deductive reasoning, the researcher states postulates, tests these hypotheses to validate them. Thus, "an hypothesis is a proposition or a set of propositions that a researcher makes provisionally to answer his central question, his problematic. The

hypotheses are then tested in the field. So they must be observable, testable, refutable ... "indeed, the next step is to perform the hypothesis test. These will either be confirmed or infirmed.

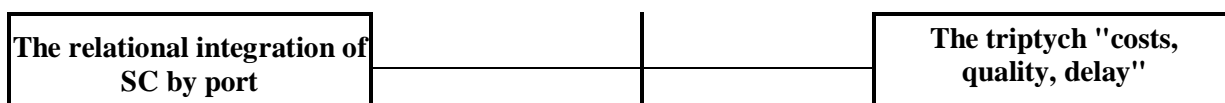
The population of our study was selected taking into account the purpose and objectives of our research. It is made up of companies operating port operations in Morocco. We have selected all the companies operating in the field of port handling. In addition, our research focuses on the practice of relational integration of Supply Chains by the port actor.

## **V. Presentation of the conceptual research model**

As part of our research, we propose what are the dimensions of the relational integration of Supply Chains by the port that influence its triptych "costs, quality, deadlines".

(Independent variable)

(Dependent variable)



The general hypothesis of our research is formulated as follows: The ports achieving relational integration with Supply Chains are best positioned in terms of the triptych "Costs, Quality, Delays".

## **VI. Operationalization of model variable**

Concerning the measures of variables, we referred to pre-existing measures taken from the literature review. These measurements were then pre-tested and translated into French. The model variables were measured in a multi-item measure using a 5-point scale (strongly agree / strongly disagree).

The dependent variables of the conceptual model are three in number: the costs of port services, the length of time the cargo is at the port, the quality of port services.

### **1.1. Operationalization of the dependent variable**

The independent variables of the conceptual model are three: the costs of port services, the delay of the port passage, and the quality of port services:

- The costs of port services

The port environment is changing and leads ports to monitor all strategic variables to maintain and strengthen their competitiveness. "The competitiveness of a port can be apprehended in terms of costs, prices, technologies, quality, ..." Elkhyat M (2002). In addition, the importance of the costs of port services, can be explained by the following statement: "A simple increase of 10% of transport costs can indeed reduce by 20% the volume of trade or cause a phenomenon of cost inflation (Carruthers, 2012)."

- The delay of the port passage

"Timeliness is the issue of greatest concern to shippers, of which they attach the greatest importance", Fassio G., Mestre P. (2009) indicate that the overall time of the goods in the minimum port is a major expectation for shippers (suppliers and consignees of passing goods), as well as, the overall time of the minimum stop for the shipowners, and the respect of a standard time to carry out the service (time of movement of a gantry ...) for the service providers of the place portuaire.

- The quality of port services

Burn D., Guerin F. (2014) identifies five dimensions of the quality of the following port services: reliability, safety of ships and goods, variety of destinations and range.

In addition, Fassio G., Le Mestre P (2009) find that "The quality of port places is associated with their reliability. It depends on the quality of the equipment, the obsolescence of which can cause breakdowns and longer lead times. "

## **1.2. Operationalization of the independent variable**

De Martino, M., Morvillo, A (2008), find that the priority role of the port is to strengthen collaboration and coordination with different stakeholders.

In the sense of (port as link) port pilotage is complex, because the organization of its activities and its terrestrial extensions must take into account the diversity of goods, and the need to achieve a degree of integration of different actors (consignees, shipowners, freight forwarders, customs agents, road transport, etc.). As a result, it has become necessary to develop partnership relations with these different actors, to define the respective roles, as well as the evolutions of these roles.

### - The frame

The constitution of our frame was confronted with a set of constraints. These are largely explained by the lack of databases (a case often encountered in developing countries), corresponding to information on port handling operators in Morocco.

Thus, the leaders of the ANP (as a public actor responsible for issuing concession contracts to port stakeholders), refused to provide us with an exhaustive and up-to-date list of port handling operators in Morocco. They hold that to its confidentiality. Faced with this constraint, we decided to use the relationships that we were able to establish, during our exploratory study, with the actors working in the field of transit, consignment, and maritime transport. In total, the number of players in our population is 15. We estimate a total number of port stakeholders in Morocco which is close to 19. That is a response rate of 79%.

### - Reliability of the questionnaire

The reliability of the questionnaire aims to measure the internal consistency of the different scales of the integration of the port with Supply Chains, which evaluates how the items of the same scale are inter-related, using the Cronbach's alpha coefficient.

To verify that our scale is sufficiently accurate to be used in a questionnaire, we analyzed the psychometric properties of this measuring instrument using Cronbach's alpha coefficient. Thus, a Cronbach alpha coefficient greater than 0.70 allowed us to conclude a good internal consistency of the scales (Fayers and Machin, 2000). According to the results obtained from the test, a Cronbach alpha coefficient of 0.94 reflects a good internal consistency of the measurement scales used.

## **VII. DISCUSSION OF THE RESULTS**

We proceeded, in respect of reliability of the research, to join in annex (n ° 1) the different SPSS outputs corresponding to the treatments carried out on the data.

The Khi-2 test makes it possible to verify the absence of a statistical link between two variables X and Y. The null hypothesis (H0) of this test is the following one: the two variables X and Y are independent.

The test of the link between "" Collaborative relationships with shippers, armaments, and land carriers "and the costs of port services indicates that the constructs" Involvement in the design and development of port services "Implication in the development / upgrading of our port facilities meetings with maritime and land transport operators to discuss issues of mutual interest implication to reduce costs shipper segmentation are significantly related to the cost of services cost of the port passage of goods and cost of port passage of ships

However, the test indicates that built partnership relationship involvement to ensure a better quality of service is not significantly related cost of the port passage of goods

This result is a relative rejection of our research hypothesis that there is a positive relationship between "Collaborative relationships with shippers, shipping lines, and land carriers" and "the costs of port services. This result can be explained by the following observation: "It is certainly still premature to speak of integration (Fawcett SE, Magnan GM 2002, Chen H., Daugherty PJ, Roath AS 2009) of the Moroccan supply chain because of lack of technical infrastructure (logistics platforms) and organizational (logistics providers Houssaini 2009)

This lack of relational integration makes the results obtained insignificant, due to the proximity of the data reported by the different operators of port operations.

The test of the link existing between "" Collaborative relations with shippers, shipping lines, and land carriers "and the delay of the port passage indicates that the constructs:" the partnership relationship "," Involvement in the development / "the upgrading of our port facilities ", and" meetings with the shipping and land transport operators to discuss issues of mutual interest "and are not significantly related to the ship's turnaround time and transit time merchandise.

However, the test indicates that the constructs "Involvement in the design and development of port services" and "implication to reduce costs", "implication to ensure a better quality of service" and "segmentation of shippers" are significantly related to stopover time of ships.

In addition, five constructs of the explanatory variable "Collaborative relationships with shippers, liner shipping, and land carriers" out of a total of seven were rejected by the test.

This result allows us to reject relatively our research hypothesis relating to the existence of a positive link between "Collaborative relationships with shippers, shipping lines, and land carriers" and "the transit time of goods."

This unexpected result can be explained by the absence of collaborative relationships that integrate the variables to explain "delay" between port operators, and shippers, shipping lines and land transport companies.

The test of the link existing between "" Collaborative relations with the shippers, the armaments of the line, and the terrestrial carriers "and the quality of the port services indicates that with the exception of the built" meetings with the operators of the marine and terrestrial transport to discuss issues of mutual interest ", the set of constructs of the explanatory variable" Collaborative relationships with shippers, armaments, and land-based carriers "are significantly unrelated to the variable to explain" the quality of port services "both in terms of service reliability and ship safety.

In contrast, the test indicates that the constructs of the explanatory variable are significantly related to the security of the goods.

This result allows us to reject relatively our research hypothesis relating to the existence of a positive link between "Collaborative relations with the shippers, the armaments of the line, and the terrestrial carriers" and "the quality of the harbor services."

Two explanations can be given for these unexpected results. Since a number of statements state that "Ports are today forced to develop partnerships and strategic alliances to provide reliable and innovative services"

The first explanation is the absence of a mediating variable between the two variables "Collaborative relationships with shippers, shipping lines, and land carriers" and "the quality of port services. "

The second explanation that can be advanced is the lack of a relational integration of the ports. That said, the responses given did not significantly reflect the differences in reliability of the services rendered and the intensity of the relationships developed.

## **VIII. CONCLUSION**

It is certainly still premature to talk about integration (Fawcett SE, Magnan GM 2002, Chen H., Daugherty PJ, Roath AS 2009) of the Moroccan supply chain due to lack of technical infrastructure (logistics platforms), lack of development collaborative relationships with port users, and organizational (logistics providers). This delay ultimately threatens the international positioning of Morocco because the path of excellence to access the global market will primarily be through integration with global supply chains. It is the responsibility of the port



industry to initiate this integration, because it is even the existence of the port itself. A port that is not integrated with global SCs is destined to disappear.

In this respect, it should be emphasized that the changing competitive stakes require continual reorganization. We went from the individual competitiveness of the firm to the collective competitiveness embodied by the Supply Chain. This again imposes the passage from an internal individual efficiency to a collective efficiency of the SC inducing the replacement of the transactional paradigm by the relational paradigm.

**I. Acknowledgements**

**SPSS OUTPUTS**

The purpose of this test is to test the correlation of the dependent variable "port passage costs" and the independent variable "Collaborative relationships with shippers, armaments, and land carriers".

		<b>Variable à expliquer « Coûts des prestations portuaires »</b>	
		<b>coût du passage portuaire des marchandises</b>	<b>coût du passage portuaire des navires</b>
<b>Variable explicative</b>	<b>Construits</b>	<b>Test statistique P-value</b>	
<b>Relations collaboratives avec les armateurs, les chargeurs et les sociétés du transport terrestre</b>	Relation partenariale	1,94(0,378)	4,31(0,115)
	Implication dans la conception et le développement des services portuaires	5,10(0,023)	10,3(0,001)
	Implication dans le développement / la mise à niveau de nos installations portuaires	4,28(0,038)	6,23(0,012)
	réunions avec les opérateurs du transport maritime et terrestre pour discuter des questions d'intérêt mutuel	10,8(0,001)	11,5(0,001)
	implication pour assurer une meilleure qualité de service	5,20(0,073)	10,3(0,005)
	implication pour réduire les coûts	10,8(0,012)	15,0(0,001)
	la segmentation des chargeurs	6,14(0,046)	11,1(0,001)

<b>Construits</b>	<b>Variable dépendante (1)</b>		<b>Variable dépendante (2)</b>	
(1)	<b>H<sub>0</sub> accepté</b>	N.Sig	<b>H<sub>0</sub> accepté</b>	N. Sig
(2)	<b>H<sub>0</sub> rejeté</b>	Sig	<b>H<sub>0</sub> rejeté</b>	Sig
(3)	<b>H<sub>0</sub> rejeté</b>	Sig	<b>H<sub>0</sub> rejeté</b>	Sig
(4)	<b>H<sub>0</sub> rejeté</b>	Sig	<b>H<sub>0</sub> rejeté</b>	Sig
(5)	<b>H<sub>0</sub> accepté</b>	N.Sig	<b>H<sub>0</sub> rejeté</b>	Sig
(6)	<b>H<sub>0</sub> rejeté</b>	Sig	<b>H<sub>0</sub> rejeté</b>	Sig
(7)	<b>H<sub>0</sub> rejeté</b>	Sig	<b>H<sub>0</sub> rejeté</b>	Sig

- Correlation of the variable to be explained "Transit delay of goods" and the explanatory variable Collaborative relations with shippers, armaments, and land carriers.

The purpose of this test is to test the correlation of the dependent variable "Port Transit Time" and the independent variable "Collaborative Relations with Shippers, Weapons, and Land Hauliers".

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