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The relational integration of supply chains: Project for the implementation of a collaborative digital platform

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Abstract
In recent years, a wave of major changes have been observed in all the business processes of supply chain actors. From the shipper to the freight forwarder to the carrier and the driver, the entire supply chain ecosystem is currently undergoing an increased digital transformation and is opposed to processes that are less or more efficient. This is mainly due to the advent of new innovative logistics information systems, in the form of collaborative platforms or applications that enable the dematerialization of e-mails or telephone calls. It is in this line that the digitalization of logistics activity has begun to impact business processes such as transport. This transversal approach combined with a process approach has led us to propose an innovative digital solution adapted to the transport sector and to each of its participants in the relational integration of the supply chain. It will allow the exploration through the testing of qualitative variables linking the different chosen theoretical constructs.

Keywords: SCM; Transportation; integration; relational; IS, collaborative digital platform

1. Introduction
Morocco's road haulage sector is an essential link in the development of the Moroccan economy. Its proper functioning is essential for the development of national production and the promotion of trade within and outside the country. Currently, the sector is dominated by the informal sector and suffers from countless organizational, social, economic and environmental problems. The existing system is classic, it is made up of formal brokers who are called freight forwarders, then others who operate in the informal sector whose role is to connect the actors of the sector by means of a very abusive commission that sometimes exceeds 50% of the amount of the journey. Most of these actors rely on non-technological or non-innovative tools (telephone, word-of-mouth) and are not able to obtain or maintain a competitive edge or advantage by creating added value. Most of the time, the service provided is of poor quality since their service is limited to the extent of their network.

The companies involved in this transport are led to change their vision and paradigm of so-called traditional management with regard to the transport activity, and must lead to the so-called digitized company whose processes are digitized. They have to focus on their core business and be able to plan and manage their various transport flows in real time to better respond to the fluctuations of a market characterized by its complexity in terms of its multiplicity of players.
and its opacity. These companies are now aware not only of the uncertainties of the global economic environment, but also and above all of the prowess offered by information and communication systems in optimized management in one of the most complex sectors, that of road freight transport.

Thus, the consolidation of inter-organizational relations via innovative information systems has proved to be not only a choice, but also an unavoidable necessity in an increasingly digitalized but also highly fluctuating economic context, thus necessitating joint efforts, the consolidation of relations and the establishment of partnerships likely to ensure the durability of relations and the creation of value.

These collaborative digital platforms obviously play a key role in this digital transformation. To manage the growing complexity, it is indeed necessary to be able to model all the processes and allow each user to benefit from real-time visibility of each operation relating to transport flows, allowing them to play their role in a well-defined process by collaborating with all the players in the transport-oriented supply chain in a single platform.

These digital solutions are at the basis of the innovative logistics information systems that are beginning to be discovered with the advent of what are called collaborative digital platforms. For our part, these platforms are seen as an organizational and technological pillar oriented towards predictive and proactive management of all the processes emanating from the different physical flows of goods as well as information shared in parallel with all the actors of transport in real time.

In addition to this, the strengthening of inter-organizational relations and the control of their durability between all the actors of the logistic chain. The various exchanges and interactions between partners are known as integration, characterized by fluid coordination, close collaboration, trust and commitment, so as to generate various gains, as equitable as possible, for all members of the chain.

Our research problematic is oriented towards the contribution of the implementation of information systems to the performance and maturity of logistics processes, as we seek to implement an innovative information system through a collaborative digital platform designed to connect all transport actors in real time.

Our research problematic is as follows: How does a project of setting up a collaborative logistics platform intervene in the relational integration between the actors of the supply chain? To deal with this issue, we have chosen to place ourselves in a project management and organizational evaluation perspective, which means that our research thesis will be conceived and presented as the project was carried out in the field, from the expression of the need to the delivery to the customer. Then, the evaluation component will be adapted to Moroccan and African companies, and on the other hand, we choose to extend the problem of evaluation to other dimensions than just the technical and/or financial ones.

The supply chain actors who operate in the transport of goods coordinate with each other via physical documents, using mainly traditional communication tools that generate costs and impact the processing time of logistics operations.
The loss of time and money represented by the manual and paper activities of the forwarders is considerable. Indeed, the documentary tasks and processes performed by a forwarder are numerous, not to mention the operational tasks, often manual, involved in tracking and tracing activities.

The digitalization of logistics processes is currently one of the only ways for these companies to meet the growing challenges of a digital market. Technavio highlighted in its 2017 report on the potential savings of digitization in the freight sector, estimating that the increased operational efficiency and increased satisfaction that would result from digitization could save freight forwarders up to 12%.

This transversal approach combined with our process approach has enabled us to propose an innovative digital solution adapted to the transport sector and to each of its stakeholders in the relational integration of the supply chain. It will allow the exploration through the testing of qualitative variables linking the different chosen theoretical constructs.

The implementation of the project to set up a digital and collaborative logistics platform is part of a perspective of constant evolution and adaptation of any organization operating in the field of supply chain and road transport of goods, to respond to technological changes related to logistics and transport with simple and practical digital solutions.

Our research falls within the framework of research-action, which required back and forth between theory and the field in order to bring a global transformation at the level of technological, organizational and human components to the road transport sector of goods in Morocco but also internationally, and must be the starting point for a diagnosis of the existing and foreseeable impacts of digitalization on a sector dominated by informal management and a multitude of actors.

The aim of our project is to enable the company and all of its employees to understand the stakes of the digital transformation applied to the logistics activity, particularly transport, and then to be able to master the content and the different options of the platform and to use it in an effective, efficient and sustained manner in order to simplify exchanges between the ecosystem involved in the supply chain.

The objective is to optimize the organization's intra-organizational processes internally and inter-organizational processes with its various partners in order to explore the relational variables that promote relational integration and the maintenance of relationships between stakeholders.

2. Theoretical and conceptual framework
   a. The New Institutional Approach (NIT)

Talking about organizational environment allows us to address the question of the relationship between the NIT underlines and the question of the institutional environment (normative, cognitive and coercive) in force within companies.

On this subject, it is the work of Meyer & Rowan (1977) as well as that of DiMaggio & Powell (1983) that made it possible to make a break with the structural-functionalist approach that prevailed previously, by attempting to explain, in particular by the social context, the readiness of firms to adopt similar formal structures.

These authors explained that this pressure from the institutional environment implies on the part of
firms "a cognitive rationality (which consists in) providing elements that make past actions understandable and acceptable to others and that make the organization accountable for its past actions" (Scott W.R. & Meyer J.W., 1991, p. 124). Such a position is likely to highlight the importance of the issue of institutional scope in the context of NIT. Indeed, a firm is not to be understood solely as an organization operating solely in an economic environment. The social environment within which this firm operates is also to be taken into consideration because it represents a diverse set of actors who are active within the same institutional context. This is illustrated by DiMaggio's proposed definition of the institutional field, which, for this author, corresponds to "the place of intense interactions between certain organizations, which lead them to define stable rules and relationships among themselves, through an exchange of information and mutual recognition" (DiMaggio P.J. & Powell W.W., 1983, p. 148).

b. **The theory of social exchange**
Numerous authors such as Granovetter (1985) or Gulati, (1995) will focus on the analysis and conceptualization of the ways in which social dimensions intervene in the implementation and regulation of exchanges between partners, thus promoting the emergence of the theory of social exchange or its corollary, the notion of social embedding, both of which aim to highlight the fact that the social environment cannot be concealed during any transaction and that the individuals involved in a transaction rely, in different ways, on different social aspects to regulate their exchanges. On this subject, Ganesan (1994), emphasizes that social exchange, especially through its variables, participates in the consolidation of long-term relationships between the partners of the Supply Chain, by reducing the potential risks of behaviors harmful to the stability of the relationships between partners such as opportunistic behaviors or conflicts.

c. **Game Theory**
The research community is almost unanimous in believing that effective and proactive management of the partnership relationships that unite the various actors in the supply chain essentially involves the exchange of information, which is one of the most important vectors in the decision-making process that concerns, on the one hand, each partner individually and, on the other hand, all the partners collectively. Game Theory, retained as a tool for modeling the behavior of actors, has in this sense as its main objective the analysis of situations where individuals can interact with each other in a strategic way, where the future of each actor depends on the decisions he undertakes but also on the decisions taken by others. This is explained by the scarcity of resources, but also by the fact that each actor of the Supply Chain does not have a total monopoly on decisions. Thus, in order to model the coordination between partners within the Supply Chain, particularly through information sharing, many authors have relied on game theory. Indeed, Cachon and Larivière (2001), Chen, (2003), Corbett et al. (2004), among other authors, have taken advantage of game theory to analyze the beneficial effects of coordination games between supply chain partners.
on supply chain performance.

It is in this vein that Bonet-Fernandez (2006) believes that it is the games of actors within a supply chain that underpin the power relationships between them. These relations can be broken down in different ways: reward, sanction, etc. These elements are effective for analyzing situations in which an actor's decision can influence the utility function of the other actors in the game.

d. Concepts of SCM integration

Just like the concept of SCM, the concept of supply chain integration is struggling to be defined in a way that is commonly shared by the research community. Indeed, and as many authors such as Lysons, 2000; Frohlich and Westbrook, 2001); Bloomberg et al, 2002); Fawcet and Magnan (2002) admit it, supply chain integration still suffers from imprecision, even if most authors apprehend it as a consubstantial component of SCM.

In fact, the first works devoted to this issue, such as those by Bowersox and Morash (1989) or Hammer (1990), focused on highlighting this new operating mode, which, as its name suggests, consists of integrating a certain number of dimensions such as activities, relationships, functions, managerial processes, etc., in order to achieve a better understanding of the supply chain.

i. Information intégration

Of all the considerations related to the supply chain as a whole, the sharing of information between the partners in the chain is the theme that takes up a large part of the editorial production related to this subject. This is mainly due to the importance that communication has nowadays, especially when it comes to coordinating the flow of physical and information flows in real time in such a way as to save time and efficiency.


Some of the basic gains that information integration provides include, following on from Paixão and Marlow (2003) and Panayides and Song (2008), that the implementation of integrated information management and exchange systems allows for better document management, avoiding duplication, optimizing information processing times for all actors in the supply chain and reducing, de facto, logistics costs.

Because it is not only their development that is at stake, but also their sustainability, companies today cannot do without information sharing. Indeed, many authors such as Baganha and Cohen (1998), Lee et al. (1997), Gavirneni et al. (1999); D'Amours et al. (1999).

Cachon and Fisher (2000) or Chen (2003), consider that communication and information sharing has become one of the central dimensions of supply chain integration, particularly in view of the new information and communication technologies that have enabled the intensification of links between partners and the management of their complex exchanges.

This informational integration, the impact of which is enhanced and promoted by ICT, makes it
possible, as many authors point out, to link implementation actions to control actions, while at the same time putting both decisions in relation to strategic objectives and management data (Nollet and Beaulieu (2010); Lee, (2000); Saeed et al. (2005); Kim and Lee (2010); Leuschner et al., (2013).

ii. Inter-organizational information systems: the supply chain integration challenge

As numerous research studies have highlighted, the crucial usefulness of information and data sharing systems for Supply Chain is a question that is unanimously supported by the research community. And for good reason, the need to ensure, in real time, an optimized traceability of physical and information flows, is at the heart of Supply Chain Management as a device within which integration, via collaboration, cooperation, communication, etc., is a credo.

The coordination of activities between the shipper and the carrier, as well as the shared management of resources, projects, etc., would not be possible without the help of a technological tool that facilitates the processing of colossal masses of data in fractions of a second, so that the different partners can have the necessary information to facilitate their decision-making, especially in an ultra-competitive environment.

iii. The relational integration of the SCM between industrial and PLS

Along with informational integration, relational integration is the second most important aspect to which the authors working on SCM have devoted an abundance of theoretical and empirical work.

Thus, in view of the importance of the links that unite the partners of the SCM and the ensuing relationship, many authors have examined different dimensions and deployments of the relationship of relational integration using relatively different but related concepts such as collaboration or collaborative relationship (Holweg et al., 2005), partnership (Lambert et al., 1996), cooperation (Mentzer et al., 2001), and even alliance in some limited cases (Simchi-Levi et al., 1999).

One of the key ideas that abounds in the literature on relational integration within the SCM is that partners must take all the necessary steps to put in place the appropriate processes, structures and approaches so that collaboration can be optimized, with a view to ensuring that the desired relational integration is truly consistent, one of the signals of which is the removal of any predatory or opportunistic practices. In this sense, authors such as Stank et al. (2001) emphasize that true relational integration presupposes not only the implementation of procedures facilitating the rapid, even instantaneous circulation of data and information, but also and above all the consolidation of ties of mutual trust as a necessary condition for the sharing of confidential and strategic data involving the reciprocal future of the partners.

Thus, some authors speak of collaboration (Holweg et al. 2005), others still of partnership (Lambert et al. 1996), cooperation (Mentzer et al. 2001), or alliance (Simchi-Levi et al. 1999). Thus, the notion of trust will be imposed within numerous works such as those of Handfield and Bechtel (2002); Barratt, (2004); Kwon and Suh, (2004); Ghosh and Fedorowicz, (2008); Prajogo and Olhager, (2012) whose common point is to
consider this notion as one of the most important conditions that facilitate the establishment of a climate conducive to full collaboration and loyal interaction between partners, over and above any opportunistic or predatory tendencies that the vagaries of the market economy may foster.

3. **Research methodology and analysis tools**
Within the framework of our qualitative approach, we will use different sources of data. These include questionnaires, individual interviews, internal documents, and participant observation (our own experience as expatriate executives living the same reality that is the subject of our research).

In our case, we opted for individual interviews because they allow us to gather important information about the representations, perceptions and meanings that company managers have about their own international HR practices.

We used individual interviews during our visit to the different departments of each company in order to observe and understand the process and operating mode deployed by each participant. Our questions were asked as the tests were carried out within the companies.

As for the actual conduct of our interviews, it should be noted that the questions were not necessarily introduced in a pre-established sequential order, but according to their degree of proximity to the themes addressed by the interviewee.

The use of case studies allowed us to focus on data contained in internal documents (procedures relating to international organizational practices within certain companies, such as large multinational shippers) and to put these data in relation to the research questions.

As an expatriate executive, we were privileged to have access to qualitative and contextualized data as well as to a better optimization of the considerations and practices that were addressed by the different people who were surveyed (by questionnaire or interview).

For as many authors such as Lalonde (2013) specify, participant observation is a method that allows the researcher an easy as well as direct access to information that is often difficult to access for people outside the field of the study. This is due in particular to the acceptance of the researcher in the field and the trust that is often established between him and the population under study, thus enabling him to carry out his work from the inside and as close as possible to the "realities" to be observed.

This being the case, we must remember the small warning made by Malinowski, as the father of the notion of "participant observation", which consists of saying that this type of observation offers us, as researchers, a major advantage in terms of access to information "from the inside" and of gaining the trust of the actors being observed, the fact remains that there are potential risks of loss of objectivity on the part of the researcher.

We proceeded to organize workshops with the participants who represent the stakeholders of the project. Each workshop is related to a specific theme. The thematic work generally represents the elements identified during the expression of the prospect's need and which will be treated, analyzed and then having recourse to an action plan and the presentation of results.
We asked the participants to express themselves freely on each of the identified themes. We did not moderate the focus group ourselves, both for professional reasons and because of the nature of the subject and the particularity of the exercise itself, which is not yet widespread in research practices. To do this, an interview guide was rigorously constructed, with a number of questions designed to make the debate intellectually stimulating (the questions must challenge the participants, otherwise silence will set in and destroy the study) and materially feasible (must not exceed two and a half hours per meeting), while creating the conditions for a group dynamic.

The facilitation of the workshops associated with the development of the guide is part of the objective to bring elements of improvement to our action plan. We formed two groups of about thirty participants each, which, in our opinion, is likely to maintain a good group dynamic. In both groups, gender parity was respected. We tried, as much as possible, to create homogeneous groups, with the objective of maximum sincerity.

Our objective was that they should be able to express themselves and formulate in the freest possible way their opinions, impressions and positions regarding the way in which relational integration within SC is implemented, its purpose, its objectives, its challenges, etc. The questions will first be simply formulated and then made explicit in a spirit of progressiveness.

4. Results and discussion

In 2018, we aimed to modernize the road freight transport sector with a simple idea that has now become a reality with a strong economic impact associated with daily challenges. Today, we have succeeded in responding to the various problems of the transport market through its players. We respond to the needs of the carriers, taking advantage of a profitable profit margin on each shipment and fair tenders allowing them to cover a satisfactory market share. Then we answered the need of shippers, a real-time planning management associated with a lower cost shipment of goods. Finally, we offered freight forwarders the possibility to create their own collaborative white label digital platform to manage their market place and benefit from transactions via each transport flow.

From the point of view of structuring inter-organizational exchanges, the Kourtim digital platform is considered as a way to introduce rigor into the relationship.

We have collected some testimonies from customers who have tested and adopted our platform over a period of time that has been sufficient for them to express themselves on the Kourtim experience.

**Kourtim digital collaborative platform and the nature of inter-organizational relationships**

According to the CEO of a company that operates as a freight forwarder: "Traceability is not only about knowing when the goods will be delivered but also about introducing rigor in the knowledge and measurement of service quality.

In another register, we have underlined a strong interest in a reconfiguration of internal and external logistic processes, whether for medium or large organizations, with a strong relational
integration between the supply chain actors. According to the SCM Director of a large distribution company: "It's a question of completely rethinking the organization by trying to understand the needs and challenges, both organizational and technical. This approach is not reserved for large companies, it is also necessary to manage the integration of information technologies in small companies. The implementation issue is close to that of large structures, always seeking to adapt technologies to organizational needs and the corresponding profitability imperatives."

According to the same director, "The participation and interaction of all stakeholders is essential for a successful implementation of the platform."

For the provider AD Logistique, he stated: "there was a reluctance and concern about adapting to IT at the beginning when you had presented the solution to us and during the process of integrating your solution with my employees, especially in relation to the drivers. Indeed, the digital transformation adopted since the use of the Kourtim platform has been reflected at all organizational levels from top management to the executors, which must reach a hundred people directly concerned by the use of your system. Currently, we communicate better with each other thanks to the centralization of information in the platform, we manage to coordinate better between us because the use of the platform has redefined the roles of each, we use our phones less, we have the traceability of all operations related to the shipment of goods and we manage to control our transport costs."

Kourtim digital collaborative platform and relationship climate Close collaboration between partners and a strong involvement of management and operational managers are key factors for an optimal use of logistics information systems, especially our collaborative digital platform, which has brought fluidity and flexibility to the interactions and exchanges between the actors of the supply chain. These variables are necessary to broaden the partnership and enable stakeholders to sustain their relationships.

According to the logistics manager of the Moroccan Association of Intercontinental Transporters (AMTRI): "It seems that with a good period of use of the platform, we have noticed a certain appeasement of the confidence between the actors. Today, we can benefit from more market share thanks to the calls for tender we receive daily. We also benefit from a complete visibility of the information concerning the availability of drivers, the location of vehicles, the loading times of the goods and we manage today to anticipate the delays and to better manage the incidents thanks to the traceability and the transparency of the information shared in real time."

He also added, "Building trust and commitment among internal and external players has been done little by little and as the platform is used."

In some cases, there are conflicting situations that can be resolved with compromise. Our interlocutor in charge of purchasing at the Domaines Royales holding company said: "In reality, relations are sometimes tense between shippers and carriers. However, Kourtim has implicitly integrated into the platform functionalities that correspond to a certain number of practices to be respected with
regard to partners, such as, for example, in order to validate a carrier's registration file, he must imperatively go through a sort of audit that must respect well-defined criteria of his company in order to integrate the platform. On his side, the shipper or the forwarder is sure to collaborate with a reliable provider with whom he will not have any conflicts afterwards."

"We had expressed at the very beginning brakes and blockages that were particularly illustrated by most of my colleagues at work on the day of the installation of the Kourtim information system. The few weeks of testing showed us the importance of permanent change management and learning to collaborate with our customers and service providers to make logistics exchanges more fluid. "Expressed an operations manager of a firm that operates as a freight forwarder in Agadir.

Another aspect was mentioned by the Commercial Director of a Spanish group established in Morocco: "This has allowed us to mitigate the hierarchical aspect and to fluidify the power relations between the principals and the providers. It has been a learning process on the need to create a climate of trust, collaboration and shared objectives in order to mitigate the hierarchical and rigid aspect of the company."

We came back 4 months after using our solution to the Logistics Director of CMA CGM, who was one of the first customers to trust us at the very beginning of our solution prospecting phase. He stated that: "One of the problems identified in the management of transport flows is the consolidation of data from various sources. Kourtim's collaborative digital platform has enabled us to consolidate our relationship with our partners, through the implementation of functionalities that have structured our operating mode, while leaving a degree of freedom, in the negotiation or the wide choice of available carriers for example. Today, we have to communicate with transparency, hence the evolution of variables and the trust and commitment between partners. It is a true partnership relationship."

5. Conclusion

By setting up a collaborative digital platform covering all the issues related to the transport of goods, the digitization of the supply chain processes brings important gains resulting from the increase in the level of service, the reduction of the order-delivery cycle, the reduction of transport costs as well as the number of kilometers traveled. These gains are important factors in the competitiveness of the supply chain ecosystem and therefore of the economy as a whole.

Supply chain and transport players are faced with a multitude of possible choices when faced with new technologies and applications.

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