Proposal of professional referential evaluating the performance of downstream supply chain in Moroccan automotive industry

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Abstract

Industries working under Just in time [1] as Moroccan automotive companies, are always searching to optimize their spending by minimizing cost without impacting customer satisfaction, performances continuous improvement is the best tool. The principle is to detect and correct weaknesses to achieve target. We can find a lot of professional referential in automotive sector all over the supply chain that evaluate process or decisions, and judge performance or impact.
Our research contains proposal of a tool of diagnostic and evaluation of downstream logistic chain based on combination between these existing referential.
The paper contain five parts, first one present a literature revue of professional referential that evaluated performance of automotive industry in Morocco. The second part explain the problematic and research methodology ; the third demonstrate weaknesses of these referential in terms of evaluating downstream logistic chain ; the fourth one propose a model that respond and correct these weaknesses ; we end by a conclusion and perspectives of this work.

Keywords
Automotive sector, Customer satisfaction, Performance, Evaluation referential, Downstream logistic.

1. Introduction

The current automotive industry is characterized by an increasingly variable and volatile demand with significant competitive pressure. One of the biggest challenges facing companies in this sector is the need to meet customer requirements.
To meet this challenge, companies offer different products while improving their responsiveness and flexibility.
To maintain their competitiveness they must make competitive products in an agile supply chain that adapt quickly to the varied demands of customers [2]. Downstream parts of these supply chains that are in direct contact with customers must be efficient and flexible.
To support this strategy, these companies will seek to identify and evaluate their performances on which they will act to achieve their objectives.

Several professional references are used in the automobile sector to evaluate the performance of the supply chain, each reference has its strengths and weaknesses, there are those who target the process, others who aim at decisions, and others who judge the performance or the impact.
In this context, our study aims at proposing a reference for diagnostic and evaluation of the downstream of the supply chain based on complementarity between existing references to have an ideal tool that judges the performance of processes and decisions combined.

2. Performance measurement reference for the automotive sector: state of the art

Performance measurement references of the supply chain allow companies to mark the management of their activities and processes internally, but also at an inter-organizational level, from the moment they do not control their partners.
Based on our research, there are a large number of professional references in the field of logistics, operations management and SCM [3][4].
We have highlighted two main references used in the Moroccan automotive sector: SCOR and MMOG / LE
-the SCOR reference (Supply Chain Operations Reference) of SCC (SC Council) [5], its purpose is to model and describe the supply chain , analyze all business processes from standardized processes, it helps Benchmarking processes by proposing best practices, standardized performance measures and process linkages. Its structure follows the following pattern:
Plan→procure→Make→deliver→return
Its evaluation consists of classifying practices according to leading practices, best practices, common practices and poor practices.
According to its structure, it is clear that it aims at improving processes.
-The Global MMOG/LE reference (Materials Management Operations Guideline / Logistics Evaluation) for Odette and AIAG (Automotive Industry Action Group)) [6] [7] , its goal is to design a common reference that helps to set up continuous improvement plans, to establish elements of a logistics system for suppliers of goods and services specifically in the automotive industry. It is structured in 6 chapters: strategy and improvement, work organization, capacity and production planning, the customer interface, mastery of product / production and finally the suppliers interface. First of all, it assesses the risk of a customer's operation interruption with the emergence of additional costs in the near future, then, customer satisfaction and organizational performance and finally, the competitiveness of the organization.
We can say that its structure is decisional, it aim at the areas of decisions.
Finding:
We then note that the SCOR reference was designed to evaluate, correct and improve processes, while the MMOG / LE is intended for the analysis and evaluation of decisions related to SC.

3. Problematic

Companies must adapt to the challenges faced by customers, their downstream logistics must have a better performance with a much higher reactivity and a clear improvement of the quality of service [8]. For this, companies in the Moroccan automotive sector seek to have an analysis and evaluation tool covering all aspects and all dimensions of the supply chain. On the other hand, in the workplace, every evaluation reference existing in the sector has shortcomings, either it focuses on the processes and does not consider the decision-making domain, or the opposite.
Our goal then is to combine these references in order to have a single reference covering all logistical dimensions; the aim is to have complementarity between the SCOR model and the MMOG / LE model.

4. Methodology

In this article, and after a critical study of performance measurement references of the supply chain, we will propose a tool to analyze and measure the performance of the downstream part of the supply chain in the automotive sector based on a combination of two references for automotive companies: a reference evaluating the processes being the SCOR, and another reference reserved for the evaluation of the decisions which is the MMOG / LE.

5. The weaknesses of the references studied (SCOR and MMOG / LE) concerning the judgment of the performance of the downstream part of the supply chain.

On the Downstream part of the companies, logistics is crucial as it determines customer satisfaction. their downstream logistics must have a better performance with a much higher reactivity and a clear improvement of the quality of service [8], this good performance will positively impact on the one hand the performance of the company and on the other hand the performance of all companies in the supply chain. Several works and references have tried to model, analyze and evaluate supply chains and their performances, taking into account in general the upstream and industrial part without taking into consideration the important role of the downstream party which has a direct impact on the optimal performance (customer satisfaction, logistics cost, timing).
This part consists in doing a critical study of the SCOR and MMOG / LE references concerning the evaluation of the performance of the downstream part of the supply chain.
The general structure of the reference is a very important element of analysis, because it shows us the orientation of the reasoning behind each reference. Thus, this element allows us to approach the different axes around which the argumentation schema of the reference is organized.
In this, we have several structuring logic that we can group in two, like a processual structure (type of processes), the one that distinguishes several processes in life cycle logic of the product in industrial terms or in a transversal logic, or like the decision-making structure (decision area, managerial).
According to the general structure of these two references, it can be concluded that:
The SCOR model defines a set of approaches, good practices, and indicators, to represent, diagnose, and evaluate the SC for the purpose of mastering and optimizing its logistics processes [5]. Different research [9] [10] [11] have shown that measuring the performance of logistics processes and the optimization of piloting indicators remain the major goals of an SCOR model. So, it remains a static model, which seeks in the first place the mastery of logistics processes with good practices without taking into account the decision area.
In the other hand, MMOG / LE represent a lever of excellence, for the continuous improvement of the management, it links each axis to a specific objective and to be achieved through an assessment by weighting and by criteria, via an action plan to mitigate external partners dysfunctions and improve the communication and governance of the supply chain. So it focuses more on families of problems, such as strategy, information, organization, resources, which brings together homogeneous decisions in managerial terms and not exclusively operational or processual as the processes depend on the nature of the industries.

Table 1. Reference Structure

Base of structure	Process	Decision area
reference	SCOR	MMOG/LE

To highlight the shortcomings and inadequacies of each model regarding the downstream part of the supply chain we faced these two references to the different dimensions of the company namely the strategic dimension, the relational dimension, the structural dimension, the operational dimension, the informational and technological dimension, the risk dimension and sustainable development dimension.
The table below summarizes our analysis by highlighting the references weak points on the dimensions mentioned above.

Table 2. Weaknesses / Strengths points of the References

Dimension	Capacity	Strong	Weak
Strategic	Understanding the market and customer demand	MMOG/LE	SCOR
	Identify the company's capabilities to deal with the uncertainty of customer demand	MMOG/LE	SCOR

	Establish a SC strategy that aligns the company's capabilities with demand and its nature, and ensures that this strategy is aligned with overall strategy and functional strategies.	MMOG/LE	SCOR
	Develop with its customers strategic piloting indicators that help to understand the SC in its totality.	MMOG/LE	SCOR
Relational	Ensure a transversality that integrates the main functions of the company.	MMOG/LE	SCOR
	Taking into account and integrating main customers of the company in its decisions and activities.	MMOG/LE	SCOR
Structural, Organizational	Identify the structure of the SC on its downstream part.	MMOG/LE	SCOR
	Mobilize mechanisms to coordinate and organize the downstream part of the SC.	MMOG/LE	SCOR
	Dedicate human resources required for the downstream part of the SC, while ensuring their management.	MMOG/LE	SCOR
Operational	Ensure operational management multi-echelon synchronized demand, forecasts, planning, distribution, transport, stocks, supplies, production flow and returns.	SCOR	MMOG/LE
Informational and technological	Share information and expand visibility between different partners of the downstream part of the SC.	SCOR	MMOG/LE
	Manage commonly with main partners, technologies and systems information taking into account the constraints of the downstream part of the SC.	MMOG/LE	SCOR
Development sustainable and responsibility social	Take into consideration the sustainable development and social responsibility commonly with the main customers within the SC.	SCOR	MMOG/LE
Risks	Identify and manage the inherent risks to the downstream part of the SC in conjunction with the main customers	SCOR and MMOG/LE	--

As we have just seen, each reference studied covers a large part of the downstream supply chain, which remains insufficient.
The MMOG / LE reference covers the strategic, relational, structural, informational and risk dimensions; the SCOR reference covers the operational, sustainable development and risk aspects.
So, we can see that a complementarity between these two references will cover the entire supply chain downstream for all dimensions of the company; this can be the subject of a combined model design between the SCOR model and the MMOG / LE model.

6. Model design that responds and corrects these weaknesses.

As we saw in the previous points, the downstream part of the SC implies the mobilization of the customers of the company for the purpose of the pursuit of the satisfaction of the customers by a better integration and coordination. Complementarity between processes and decisions can provide a powerful and ideal management mechanism with better flexibility and responsiveness.
Therefore, and regarding the evaluation and measurement of the performance of the downstream part of the SC, our model must contain modules that cover all the dimensions of the company already mentioned, modules that address processes and decisions related to the downstream supply chain.
Our proposal is then to build these modules from the MMOG / LE reference by adjusting them or adding other components from the SCOR Model.
Then our Model will be composed with 7 chapters covering the 7 dimensions mentioned above with the following criteria:

- For the strategic dimension, the criteria will cover the vision, the objectives, and the action plans.
- For the relational dimension, the selected criteria will vise the internal relations between the various departments of the company as well as the external relations with the customers and the carriers aiming at the level of communication and the integration in the decisions and the activities.
- For the structural and organizational dimension, the criteria will judge the mechanisms of the organization, the structuring and the coordination of the downstream part of the SC, also the management of the resources dedicated to this part.
- For the operational dimension, our criteria will concern the operational demand management, forecasting, planning, distribution, transportation, inventory, supplies, workflows and returns.
- For the information and technological dimension, the criteria will aim to share information and visibility between the various partners (customer and carrier) using technologies and information systems.
- The criteria of the dimension of sustainable development will take into account the common responsibility with the main customers and carriers within the SC for the continuous development of the relational in order to reach the objectives of all the partners of the logistic chain.
- The criteria of the risk dimension will vise the identification and the management in collaboration with the partners (customer and carrier) of the risks which can disturb the normal working of the operations.

Our reference will then be interested to the questions below:

Table 3. Criterion of the combined reference

Dimension	Requirement / Criterion
Strategy	The organization has a Chain Management (SCM) vision and strategy.
	There is a process in place to define SCM objectives. Objectives should be measurable, communicated, and understood within the organization.
	The organization shall have Key Performance Indicators (KPIs) defined and in place for key areas of the SCM process that support meeting both the organization's business objectives and customer requirements.
	The organization has a process in place for monitoring, measuring, and analyzing SCM performance metrics throughout the supply chain (e.g. internal, customer, and sub-supplier) on a regular basis to ensure customer satisfaction and that the organization's objectives are met.
	There is a process in place to document, implement, and verify the effectiveness of preventive and corrective actions for any deficiency within the SCM process. The timing and status of the corrective actions are reviewed with management to prioritize actions and provide the necessary resources to achieve the results.
Relational	A process is in place for managing communication inter department.
	A process is in place for two-way communication with customers, subcontractors, and service providers to resolve day-to-day issues and emergency situations.
	The organization has a process to measure and improve overall customer satisfaction.
Structural, Organizational	The organizational structure recognizes the importance within the business of supply chain management, SCM interfaces, and information and physical flows.
	The organizational structure mobilze mechanisms to coordinate and organize the downstream of SCM
	The organizational structure Dedicate human resources required for the downstream part of the SC, while ensuring their management.
operational	A process is in place to ensure operational management
	A process is in place for managing demand, forecasts, planning, distribution, transport, stocks.
Informational and technological	A process for electronic data exchange shall be in place with suppliers, customers, subcontractors, and logistics providers.
	The organization has the capability to electronically receive delivery forecasts and requirements via traditional EDI or web-based tools.

Development sustainable and responsibility social	There is a process in place that engages management, employees, and business partners in continually improving the efficiency and effectiveness of the SCM processes throughout the entire organization and with all supply chain partners.
	There is a process in place to identify and analyze constraints that limit the organization's ability to optimize throughput. Actions are taken to reduce, minimize, or eliminate constraints.
	There is a process in place to continually develop the relationship between all partners in the supply chain.
	There is a process in place to continually develop working relationships with other functions within the organization to ensure that overall business objectives are satisfied.
risks	A risk management process is in place to ensure continuity of supplies when the organization is required to deviate from normal operations.
	Back-up/contingency plans for high-risk SCM processes are in place to ensure continuity of supply and a return to normal operations.

7. Conclusion and perspective:

To meet the needs of customers in the automotive industry, companies must master the performance of their logistics chain, several professional references have been implemented to evaluate this performance in order to control either the process or the decision area. Our work then is to offer a combined diagnostic and assessment tool between processes and decisions on the downstream part of the supply chain. This complementarity will make the downstream part of the SC efficient and adapted to the expectations of the customers.

Our perspective of this work is to apply this tool within a company operating in the automotive sector and to reap the results.

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Biographies

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