

Optimization of upstream supply chain for supplier of 1st rank in automotive industry

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Abstract

Automotive sector is one of the biggest emergent industries in the latest years; known by its highly competitive environment and to be able to keep good position in the market firms working in this sector are no longer considering quality of service as an advantage but a necessity.

The advantage now is to reduce all related costs to the product and provide new technologies. To ensure this; firms need to control all composite of the supply chain and encourage Research and development.

In this paper we will propose way to optimize upstream supply chain for supplier of 1st rank in automotive industry by monitoring al it's composite, correct week ones and provide ability to react on time

The paper contains five parts, first one presents a literature revue of professional research evaluated performance of automotive industry. The second part explain the problematic and research methodology; the third one propose a Key performance Indicator to follow upstream logistic . the fourth one provide impact of using this method on monitoring upstream logistic and react on time to not be the week composite on the overall performance of the supply chain . we end by a conclusion and perspectives of this work.

Keywords

Supply Chain Management, Automotive industry, Just in Time, Key Performance Indicators, Upstream logistics, and impact of inventory.

1. Introduction:

Supply chain management is a group of chained composites starting from the suppliers of the suppliers and finishing into the customer of the customer other ways named final customer.

This group of composite are all chained by huge number of informatically and physical flux, this why information's must be shared on time and correctly to avoid any oversize or miss understanding between partners .

The mastery of this supply chain is nowadays a must and not only an advantage if the operator in automotive industry want to keep its position between the big amount of competitors.

Our research problematic focuses on how to optimize our upstream logistics and follow its entire composite with a performing dashboard that includes all the needed Key Performance Indicators.

2. Literature Revue:

The just in time notion meanly for inventory reduction was introduced by Toyota in the 1950s and adopted by operators in Automotive industries, this method consist to put all the Supply chain under pressure; as it pushes all the composite of this supply chain to follow directly the customer need.

In a way to Pilot Supply Chain working under Just in time conditions we need to have one or several Key Performance Indicators using the forecasted need received from customer; we can define two driving mode Centralized management and decentralized one [1].

The mastery of logistics chain has become a vital need for the development of a company operating in the automotive sector due to the increase in the diversity of demands the Aim of this study is to design a common supply chain that helps to set up Plans for continuous improvement.

The ASLOG [2] framework established by the French Association for Logistics, aims to place logistics within the company, analyze logistical processes strategically, tactically and operationally, evaluate performance and propose actions. It is composed of 10 chapters: Management strategy and planning, logistics in design and projects, procurement, production, moving, storage, sales, return, performance management indicators and continuous improvement. It has 3 levels of evaluation, either by risk, by method or by continuous progress.

The SCOR repository of SCC [3], its objective is to model and describe the logistics chain, to analyze all the processes of the company from the standardized process, it helps Benchmarking the process in proposing best practices, Standardized performance and matching of processes; Its evaluation consists of classifying practices according to leading practices, best practices, common practices and poor practices.

The Global MMOG / LE (Materials Management Operations Guideline / Logistics Evaluation)of Odette and AIAG (Automotive Industry Action Group) references [4] [5], its objective is to design a common reference framework that helps to set up Plans for continuous improvement, establish elements of a logistics system for suppliers of goods and services specifically in the automotive industry.

3. Problematic:

Today's automotive market has become a highly selective market, and as a result the companies operating in this market need to control the supply chain to satisfy the customer while keeping the gain and resist to this competition. In this sense, operators in this field must analyze their strengths and weaknesses to offer a service that can keep them in a good position in the market, and therefore a control of all the compositions of the logistics chain is necessary as well as development of the upstream supply chain.

With regard to our studied case as much as a wiring factory; Supplier of the first rank, the ideal is to have a standardized product with raw materials and components well defined, but nevertheless and in view of the great diversification known in this sector, we have a multitude of components of several Suppliers scattered geographically in the world and with reduced supply batch sizes not to generate excess stock or obsolete. This

multitude components and different sizes are impacting the performance of the upstream supply chain and the overall performance of the company.

4. Logistics in companies:

The logistic concept was born since ancient antiquity especially for the military and it was developed in the filament of time.

In the 1960s, we talked about logistics related to transportation, handling, warehousing, in order to maintain a good level of efficiency, which created a conflict with the production function.

In the 1970s, we began to talk about the management of flows in order to increase the responsiveness and the flexibility which the notion of logistics function was created, namely the creation of the ASLOG [6] model, the interest of the general management.

In the 1980s, the anticipatory dimension was discussed; Strategic planning and forecasting and dimensions including inventory management and control, which has created support for financial management that search to reduce inventory costs.

The 1990s saw the emergence of management by flows namely supply chain management (SCM) which allows the opening to other functions like sales, management project...

From the 2000s to the present day we have been talking about sustainable logistics and SC of responsibilities, virtual chains and Supply Chain Management GSCM, which also opened the door to the emergence of HRM Human Resources Management and Customer service management; Customer Relationship Management namely CRM.

Years	Logistic function	tools and models (examples)	Organisation
1960	Transport Handling Storage	Wilson(1934) ; Forester (1985) ; Use of Operational Research	Arbitrary and disjoint optimization of the different functions of the company
1970	Flow management	Use of MRP Operational Research	Search for dyadic logistical compromises between functions linked by the same flow.
1980	Importance of information systems. Appearance of the concept of subcontracting	Appearance of: MRP2 DRP Logistics basics distributions. Kanban. JAT.	Dual dimension of organizational and operational logistics.
1990	Supply Chain Management (SCM)	Appearance of : ERP. Cross docking. GPA. EDI. ECR. CPFR.	"Strategic management options over-determine the firm's organizational choices" (Colin, 2005) Inter-organizational dimension with the SCM
2000- 2016	Supply chain management (GSCM)	Mutualization; "Logistics factories" of e-commerce	Extensive social responsibility for the supply chain; Hyper competition between supply chains

History of logistics in companies

5. Optimization of upstream supply chain for supplier of 1st rank in automotive industry:

5.1 upstream supply chain :

The supply chain is a system of subcontractors, producers, distributors, retailers and customers, between which the material flows are exchanged in the direction of the suppliers towards the customers and the flow of information in both directions.

Each member has its input and output flows of goods and associated services that attach it with the outside world before and after production takes place.

Based on this definition, we can base five main management processes of this chain



Logistics chain management process

We then distinguish the upstream logistics that attach the company to these suppliers (procurement and supply), internal logistics (planning and production) and downstream logistics linked directly to customers (delivery and customer contact)

Upstream logistics consist in maintaining the continuity and fluidity of flows, from suppliers and / or subcontractors to workshops, production sites or logistics chains.

Bad inventory management can lead to two scenarios:

- Inflation of the stock and therefore the money not immobilized is an extra financial charge.
- Out of stock which directly generates chain stops and therefore enormous special transport costs and delivery times for customers.

Procurement has become the key element of good management of upstream logistics.

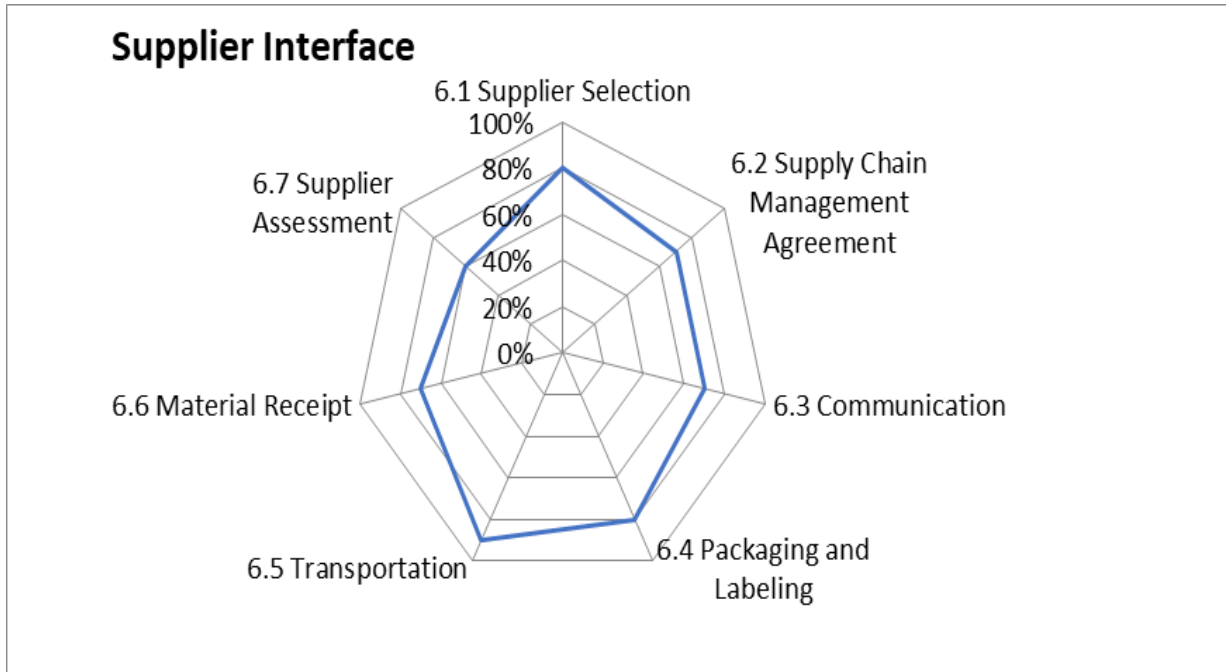
Several factors impact good inventory management like the bad production planning, the bad forecasts, the bad communication between the 5 processes of the logistics chain.

In most cases, the different components of the logistics chain have good indicators, however the chain in its globalities is experiencing several failures. A study has therefore been carried out to demonstrate the impact of upstream logistics as well as the various constraints that leads to mismanagement.

5.2 Impact on the overall function of the supply chain:

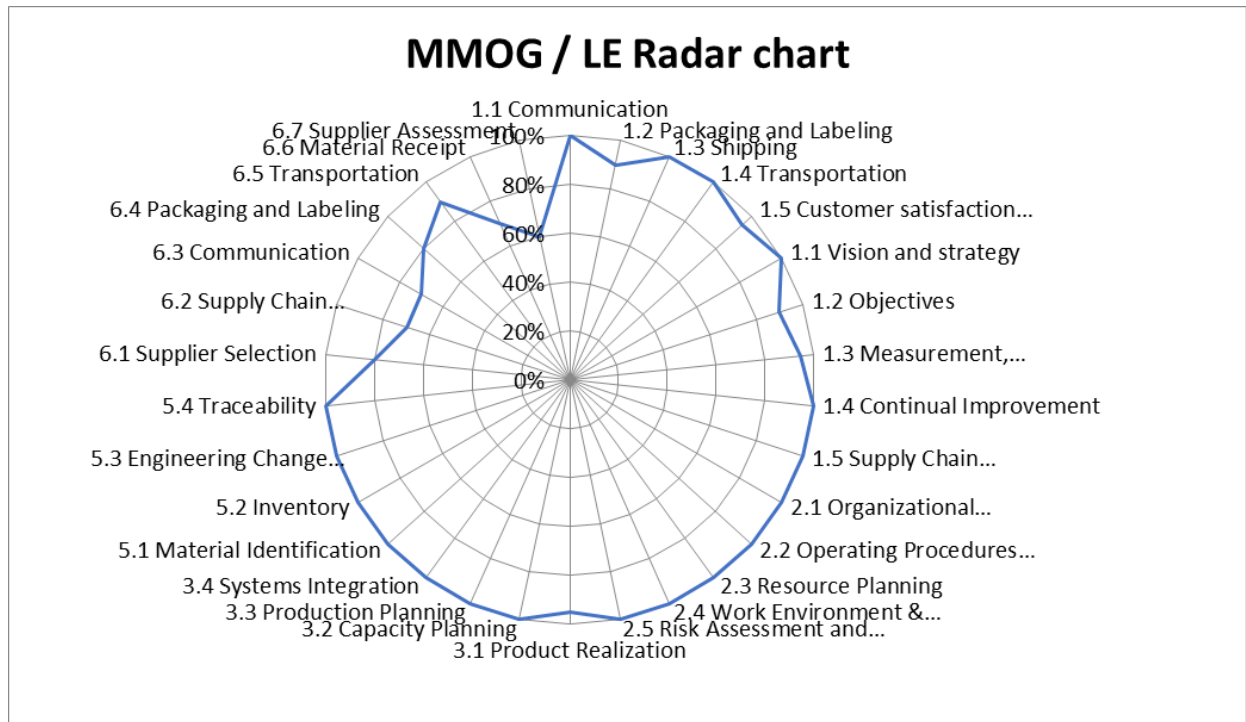
According to our study we found that the upstream logistics directly impact the overall performance of enterprises being given the input element of this process. to show this impact on the overall performance of the company in our case, we adopted the MMLOG / LE (Materials Management Operations Guideline / Logistics Evaluation) [6].

The evaluation of the Suppliers interface gave the following result:



Evaluation of the upstream logistic

The result of the evaluation and optimization of upstream supply chain in the overall performance of the company by this professional reference is schematized on the following radar



Evaluation of the overall performance of the company

6. Conclusion :

Our studies have demonstrated that the upstream logistics of a company is not impacting only the performance of the logistics chain but also its impact the overall performance of the company. So this part should be controlled and optimized to be efficient and performant.

The questions that arise now are:

How we can make our suppliers efficient to avoid all problems related to the upstream part?

How we can adapt our upstream chain to the different requirements asked from the others part?

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