# To What Extent Do SMEs use Indicators to Manage the Supply Chain and Measure the Performance

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*Abstract*—: **The Supply Chain Management (SCM) topic is still attracting the attention of both researchers and professionals, especially after the Covid-19 pandemic where thousands of companies went bankrupt due to the Supply Chain weaknesses. Actually, SCM deals with the amplification and the complexity of flows among the different companies in the logistics network through the implementation of best practices as a strategic factor of its competitiveness. These practices are regularly reviewed to identify those that represent a competitive advantage or a risk factor. This article has for principle goal to assess the use of Supply Chain performance indicators in SMEs. This assessment can be done by using different standards such as SCOR model, ASLOG, SCALE, OLIVER WEIGHT and Global EVALOG. This study adopted these standards that allows identify overall strengths and weaknesses regarding the use of indicators in order to implement and monitor improvement plans that consists in consolidating strengths and developing solutions for weaknesses.**

*Keywords— Supply Chain Auditing, Supply Chain Performance. Indicators Use.*

## I. INTRODUCTION

In a context of globalization of trade, of hyper competition, the growth in sales following a significant increase in consumption has had the major consequences of an amplification and complexification of flows among the various actors of the economic system. Consequently, these flows have become difficult to rationalize. In other words, these developments have given rise to the concept of Supply Chain that constitutes a powerful lever for competitiveness. Today, this concept has become a multidisciplinary science affecting almost all functions of the company.

The objective of this article is mainly to assess the Supply Chain practices of an Algerian Small and Medium manufacturing operating in food sector with particular focus on the use of performance indicators to manage and control the whole supply chain functions. In this type of sector, Supply Chain Management (SCM) is a strategic factor of competitiveness for companies, and a determinant of their performance. In addition, this evaluation of the indicators performance use could be accomplished using many standards such as: AFNOR FD X50-605 Standards, the SCOR model, ASLOG, SC Master, SCALE and the OLIVER WEIGHT model. These standards help to focus on all the strengths and weaknesses of the Supply Chain in order to allow managers set up and monitor progress plans consisting in consolidating

the strengths as well as developing solutions for the weak points.

Thus, the choice of this subject dealing with the problem of Supply Chain indicators in this SME, which manufactures and markets dairy products, is justified by the fact that this latest responds well to customer expectations in terms of product quality and cost. compared to its main competitors, but it risks losing this advantage because of the problems it encounters in terms of flow management, inventory management and SCM performance indicators. The audit conducted with managers reveals areas for improvement and could lead to superior performance in terms of productivity, responsiveness to market changes, customer services and flexibility.

This article is organized as follows: we have defined, first, the different concepts around which our research is based, namely, Supply Chain Management and performance indicators, as well as the evaluation model adopted to assess the use of performance indicators to manage the SC, namely the ASLOG model, by addressing its missions, its structure and its evaluation method. Then, we described the studied company, the conditions and circumstances that characterized the progress of the audit and the interviews lead with managers. The results of these interviews allowed us to identify the strengths and weaknesses related to the use of indicators. These were then the subject of an in-depth analysis in order to understand the causes of the dysfunctions observed. Finally, an action plan was developed to provide the company with solutions through which managers can optimize and improve logistics processes towards excellence.

## II. SUPPLY CHAIN MANAGEMENT AND PERFORMANCE INDICATORS

Nearly 1.5 Billion responses are given by "Google" when entering the term Supply Chain. This clearly shows the importance of this concept in the academic world but also in the professional world. Thus, according to (Sanders, 2012, P.3), the Supply Chain is defined as a network of all the entities involved in the production and delivery of a finished product to the end consumer. This includes the sourcing of components and raw materials, manufacturing, production, product assembly, storage of goods in warehouses, order entry and tracking, distribution, and delivery to the end consumer. (Dan and Sanders, 2010, P.16) point out that the goal of each actor in this network is to work together (cooperation) to reduce overall costs and improve quality and delivery

services. Regarding Supply Chain Management, according to (Russell and Taylor, 2011, P.8), this can be defined as the design and management of the flow of products, information, and financial flows through the SC. This involves the coordination and management of all activities of the SC. SCM is "a very complex business concept due to the nature and type of decisions involved" (Sanders, 2012, P.3). Thus, according to (Ayers 2006, P.4), it is important to emphasize the flow of knowledge enabling learning for all partners.

SCM helps improve business performance through two main factors. The first factor, according to (Lambert, 2006), is the inter-functional integration of key business processes and information that add value to consumers and stakeholders and this through the network of firms involved in SC. The second factor, according to (Stadler, 2005), is the coordination of physical, information and financial flows in order to fulfill the demands of end consumers with the objective of improving the competitiveness of the SC as a whole. The contributions of the SCM, through the integration and coordination of flows, are manifold. Beamon (1999) and Bowersox et al. (2013, P.368) as well as Netland and Alfnes, (2008) show that these contributions can be visible in financial terms such as the improvement of turnover, the optimization of investments as well as the improvement of efficiency through productivity and control of total costs (costs of storage, distribution, etc.). SCM also improves responsiveness and customer service (product quality, reliability of deliveries) as well as flexibility, including the ability of SC companies to respond to changes in the environment. This axis includes flexibility with regard to volume, variety of products, delivery dates, development of new products and services.

Actually, the use of performance indicators is vital to achieve the coordination and integration of activities over all internal functions or with external actors (Suppliers and distributors). In fact, using pertinent indicators to manage and control the whole Supply Chain performance is not really easy, this requires to determine which key functions and activities to be controlled and which indicators to be used in order to get the managers closers to the reality of their business. (Singh and Dutt, 2020) demonstrates that because of the sophistication of SC processes, the method of determining effective supply chain performance metrics is challenging. Actually, many researches are still paying the attention to the use of indicators in SC such as (Mor et al, 2018) who explored the key performance indicators that serve as a decision support tool to manage dairy Supply Chain.

From what has been mentioned, it becomes important for companies to develop and adopt best performance indicators to manage perfectly all the SC flows and to ensure their regular application.

## III. THE METHODOLOGY ADOPTED TO ASSESS SUPPLY CHAIN INDICATORS USE

The ASLOG standards are designed to assess the overall Supply Chain. This allows the company, regardless its size, to be assessed against a benchmark that ranges from basic practices to operational excellence. The ASLOG model, which was designed according to a process structure, presents several process axes, namely, management, strategy and planning, sourcing, manufacturing, transportation, inventory management, marketing, reverse logistics, performance

indicators, etc (Zouaghi, 2013, P.99). ASLOG has designed logistic standards based on the model developed by VOLVO in the 1990s. The ASLOG standards provides assistance to companies wishing to adopt a continuous improvement approach, with the main objective of achieve the level of excellence and implement good logistics practices. The first version of this Standards goes back to 1997. It then had 53 questions strongly oriented towards the product life cycle, but it did not sufficiently take into account the issue of downstream flow or other issues. The concept of the Supply Chain was introduced into the model in 2002. In our study, we used the 5th version, developed in 2008, which includes 124 questions.

## IV. RESULTS & ANALYSIS

The following lines will present the evaluation of different topics related to the SC indicators, namely, the way of setting logistics goals that are the basic of performance measurement, also, the logistics costs control, the quality of partnership with suppliers, the control of production process, the stock level control, and finally, which indicators are adopted to deal with customers' satisfaction and to solve all downstream activities besides customers. These results will show how mature are the company practices regarding these topics.

TABLE I. Evaluation of the use of indicators to manage SC activities.

| Questions | Scores | | | |
|---|---|---|---|---|
| | 0 | 1 | 2 | 3 |
| How are logistics goals set? | √ | | | |
| How are logistics costs controlled? | | √ | | |
| How is the quality of the existing logistics partnership with suppliers and service providers measured? | | √ | | |
| How are internal production flows controlled? | | | √ | |
| What supervision is exercised over transport operations? | | √ | | |
| How are stock levels controlled? | | √ | | |
| How is the overall service given to the customer measured? | | √ | | |
| How are the dysfunctions observed or those perceived by customers measured? | | √ | | |
| Total | 8 Points | | | |

Actually, The fact that there is no logistics manager in the company lead each manager to set their own goals separately. These objectives are then discussed with the owner and other managers (such as the creation of custodians, the relocation of sales department, etc.).

The logistics costs are not compared with the forecasts, but with the historical costs according to the normal activity of the company (considered as standard costs). The indicators that the information system provides are, for example, handling costs, oil consumption by trucks, maintenance costs for means of transport, customs costs, insurance, etc. Supplier performance is measured by delivery time, lead time and the number of delays in a given period. It should be noted that

there is no document or even the information system that provides indicators of lead time, supplier delay, the latter are assessed or known by the experience of the supply manager. This reality means that in the case of a new procurement manager, there is no indicator by which to assess suppliers.

Likewise, production flow times are roughly measured. There are actions that try to reduce these delays by restructuring the production process. Thus, the delivery times and the rate of transport service to customers are estimated approximately.

Regarding stock levels, the information system used provides this kind of indicator, but the latter does not allow real-time monitoring, stock levels are only known after they have been recorded in the information system.

In fact, there are no indicators that measure compliance with the quality of service regarding sales. Thus, some indicators on malfunctions such as delays, non-quality, shortages and breaks are only known from the information communicated by customers to the company.

Actually, Figure I provides a comparison between all the standards and actuals practices related to the use of SC indicators.

FIGURE I. Evaluation of indicators use to manage SC activities.
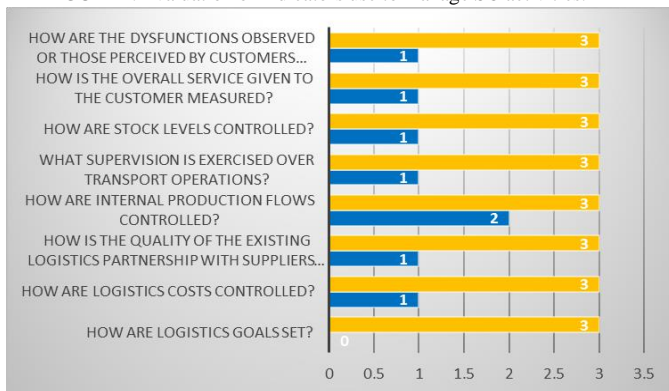


According to the global evaluation of all the above practices in Table II. It seems that the use of indicators represents a weakness with a maturity level about 33% (See Figure II). The company should adopt real practices regarding logistics activities planning.

TABLE II. Global evaluation of indicators use to manage SC activities.

| Dimension | Obtained Scores | Max Scores | % |
|---|---|---|---|
| Logistics Process Management Indicators | 08 | 24 | 33% |
| **Total** | **08** | **24** | **33%** |

FIGURE II. Global evaluation of indicators use to manage SC activities
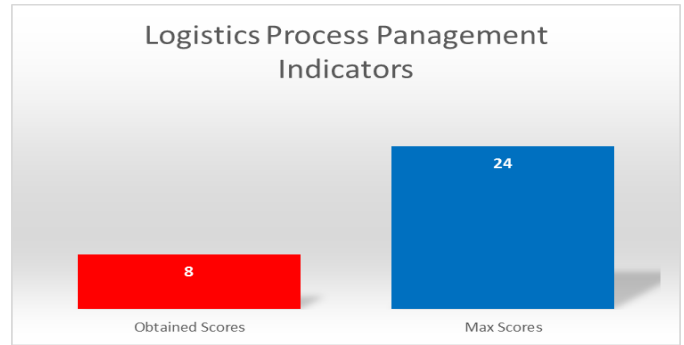


It is very clear that the company is poor in terms of the use of logistics performance management indicators. This reality is mainly due to the fact that there is no person (logistics manager) with a transversal vision of the activity of the company and who can play the role of interface of all functions. This position and role will allow him to develop indicators allowing the management of all logistics processes in a comprehensive manner. Thus, the establishment of a logistics service would allow the concordance and consistency of all the efforts of the heads of the functions in the development of logistics objectives, and the attribution to each manager of the objectives and missions that are assigned to him. appropriate. Regarding logistics costs, the company must develop logistical cost dashboards (distribution, maintenance, handling, etc.). These must provide indicators to ensure that logistics costs are kept within the planned levels. In order to ensure supplier quality, the company, can develop indicators showing the commitment and contribution of suppliers in achieving its objectives, instead of judgments based on certain criteria that the procurement manager makes on the performance of the suppliers. suppliers. As the company's competitors have more experience on the market and have more sophisticated production equipment than its own, it can conduct a benchmarking study with similar and competing companies as to the flow of material in the chain. production in order to reduce these delays and position themselves in relation to competitors. Regarding transport logistics, the company must develop indicators of quality, quantity and safety of products during transport operations. Once these indicators have been mastered, the definition of carrier indicators for all upstream and downstream flows is also important. In order to control the dysfunctions, the company must develop a list of indicators measuring the dysfunctions observed and those perceived by customers. Thus, it must set objectives and deadlines in order to eliminate and reduce the consequences of the main dysfunctions. Thus, these objectives and achievements must always be compared with those of the competitors.

## V. CONCLUSION

In conclusion, the aim of this paper is to evaluate the maturity of SC performance indicators use within a company that operates in the food products sector. This assessment was based on a benchmark designed by ASLOG after having been readjusted to the context of studied company's activity by eliminating certain questions. This benchmark allowed us to identify the sources of logistics performance that could help this SME to reduce costs and increase sales. Finally, recommendations were made to strengthen the weak links,

reduce dysfunctions and improve logistics practices. This article discusses the problems relating to the organization of work, and in particular the lack of a clear distribution of logistical tasks between the managers, as well as the lack of established procedures remain major problems in this society.

Like all research work, our work has certain limitations, the first limitation being of a methodological nature concerning the analysis of the interviews carried out with the managers and the evaluation points given to each logistics process. Indeed, another maturity scale, which extends from 1 to 7, could be used in this audit and which seems more relevant in the evaluation than from 0 to 3. Finally, the follow-up and the implementation of the plan. actions as well as the design of a logistics dashboard with pertinent performance indicators and its implementation could be the subject of future research work.

## ACKNOWLEDGMENT

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