TECHNIQUES REGARDING THE PERFORMANCE EVALUATION OF LOGISTIC SYSTEMS

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Abstract. Logistics through its activities is vital in creating such an advantage, it can positively influence market share and profitability of the enterprise and it is viewed as a strategic resource, not just a simple activity. This paper aims at presenting the logistics and supply chain contribution to competitiveness and customer satisfaction, operational principles of industrial management and logistics of modern techniques and strategies flow management and functional integration within enterprises and between enterprises. It is important to identify which performance measurement tools are correlated most with the success of a performance measurement system. The aim is to develop a model for evaluating and analyzing the logistics performance in the supply chain to manufacturing and service firms of the business field. It follows thus, performance evaluation of logistics systems through the introduction of "key indicators" of performance, efficiency, with minimal costs.

Keywords: production systems, supply chain management

1. Introduction

Increasingly competitive environment forces companies to examine restructure and redirect activities to achieve competitive advantage. Logistics through its activities is vital in creating such an advantage, it can positively influence market share and profitability of the enterprise and it is viewed as a strategic resource, not just a simple activity. Logistics should be seen in terms of reality current developments in the Romanian and European business. With the awareness of the importance of logistics for a relevant organization increased the need to acquire a thorough knowledge in the field.

Management of logistics operations contribute to deepening the problems of modern logistics, peculiarities and its complexity, an approach feasible, efficient supply chain relationships and the transition to implement the concept of Supply Chain Management.

Currently, logistics has become a tool to enhance competitiveness and market positioning. Worldwide, it is considered that logistics has become one of the essential areas of activity of the organization [3].

The literature provides a limited number of publications that deal with performance measurement tools and indicators in the supply chain. SCM concept development, especially in recent years has led to the need to introduce tools for measuring performance in the new business environment. In literature [2, 3] is considered in logistics performance measurement is "a key component" necessary to obtain global performance management, together with three other components: positioning, integration and flexibility.

2. Models of supply chain performance

Measurement performance is achieved through a set of indicators used to quantify the efficiency and / or effectiveness of an action [9].

Performance measurement system (SMP) should provide managers with sufficient information to address issues such as finance, customer internal processes, innovation and improvement [7]. Have been developed several emerging performance measurement systems: Strategic analysis measurement and reporting technique (SMART); Performance measurement questionnaire (PMQ); The Balanced Scorecard (BSC); Comparative Business Scorecard (CBS) [5, 6, 7, 9]. Some emerging management systems are based on self-assessment of performance for example, Deming Prize in Japan and Asia (Deming 2004), Baldrige Award in the USA (NIST 2004), and the European Foundation for Quality Award using the EFQM Excellence Model in Europe (EFQM 2004).

It is important to identify which performance measurement tools are correlated most with the success of a performance measurement system. This can be determined by two independent assessments of the supply chain, namely: performance measured by actual outcomes; performance indicators measured through several pre-selected. An important part of a supply chain involves rethinking key processes to be met consumer demands. Redesign is a process thought to make dramatic changes in a very short time [2].

2.1. Measurement performance of logistic system

Global logistics subsystem considers all logistical operations that are performed on the length of the

path that starts at predicting sources of raw materials to the end customer, including supply - logistics upstream production - internal logistics (industrial) and distribution - logistics downstream (commercial), based on the tools and concepts of logistics.

The idea to formalize and evaluate the performance of a supply chain has led, since 1990, international group of professionals consisting of large industrial groups, propose global and comparative analysis approaches available to businesses. The performance of a logistics system can grow by applying the following methods [10]:

- ⇨ Alliances with suppliers, which work together to improve prediction processes executing orders, planning, scheduling production, packaging, delivery, replenishment, billing and inventory management;
- ⇨ Outsourcing of supply chain functions by sub-contractors best placed to take over that activity; outsourcing is a strategic solution increasingly more often used;
- ⇨ Increasing importance of logistic function allied chain enterprises through fundamental under-standing of the three vectors that measures any accomplishment for a client, be it an individual or organization; quality, cost / price, time / term;
- ⇨ Massive use of information technology and communications (e-mail, EDI, Internet / HTML, Internet, XML, etc.) for establishing links between all links of the supply chain by removing manual operations and paperwork, and all operations that do not add value.

2.2. A classical problem of logistics supply chain. *Bullwhip* effect

Described by Forrester since the 1960s, the effect of Forrester or bullwhip effect is the amplification of the physical flow, starting from the downstream customer chain to the last upstream provider [1]. The principle of this effect is that a small variation amplitude consumer demand is translated by a variation of the increasingly important in each step upstream, to the upstream supplier chain.

The main causes of Bullwhip effect are: the failure of transmission of information and the lack of visibility, policy protection through stocks, the existence of local rules, poor customer confidence in the supplier, the number of links in the chain.

Supply chain management in general tries to prevent the effects Forrester: reducing and dividing the various links in the chain; promoting a knowledge of final demand and a global vision of the chain and client needs; planning and allocating tasks; synchronizing activities for the benefit of the overall efficiency; sharing information between different links; accelerating transmission and distribution between different links.

Management tools used to improve the logistics process are: changing computerized data EDI, ECR; abandonment of the principle of economic quantities; shared management of supply and distribution inventory control by the manufacturer; global hierarchical planning (*Distribution Resource Plan*, ERP); platform presentation; use logistics providers; reduction cycles and implementation methods of "timely manner".

3. Implementation of SCOR model. Case study

Supply Chain Operation Reference (SCOR) Model was developed in 1997 in the USA by the organization Supply Chain Council (www.supply-chain.org), a global non-profit corporation open to accession by all companies and organizations interested in research and standardization in Supply Chain Management field.

In a context of globalization of the economy and the diversification of distribution networks: numerous factories, warehouses, platforms dispersed in several countries, SCOR model aims to facilitate communication between different participants in the same supply chain. This communication goes through formalizing a standard language of uniform performance indicators of instruments to compare the logistic organizations. This activity enables enterprises to more easily compare between them and in relation to the best. SCOR model processes are: planning, supply, production, delivery and return of products.

SCOR Model contains more than 150 key indicators that measure the performance of specific supply chain operations. SCOR Model describing the organization according to four levels:

a. Type of process;
b. Configuration of supply chain;
c. The decomposition of the process;
d. Decomposition of the process elements.

SCOR model processes are: planning, supply, production, delivery and return of products. Often, the implementation of LPM goes beyond just solution implementation and configuration and is also accompanied by organizational transformation. Process-centric management consulting along with technical systems integration is required for organizational alignment and effective change management (Figure 1).

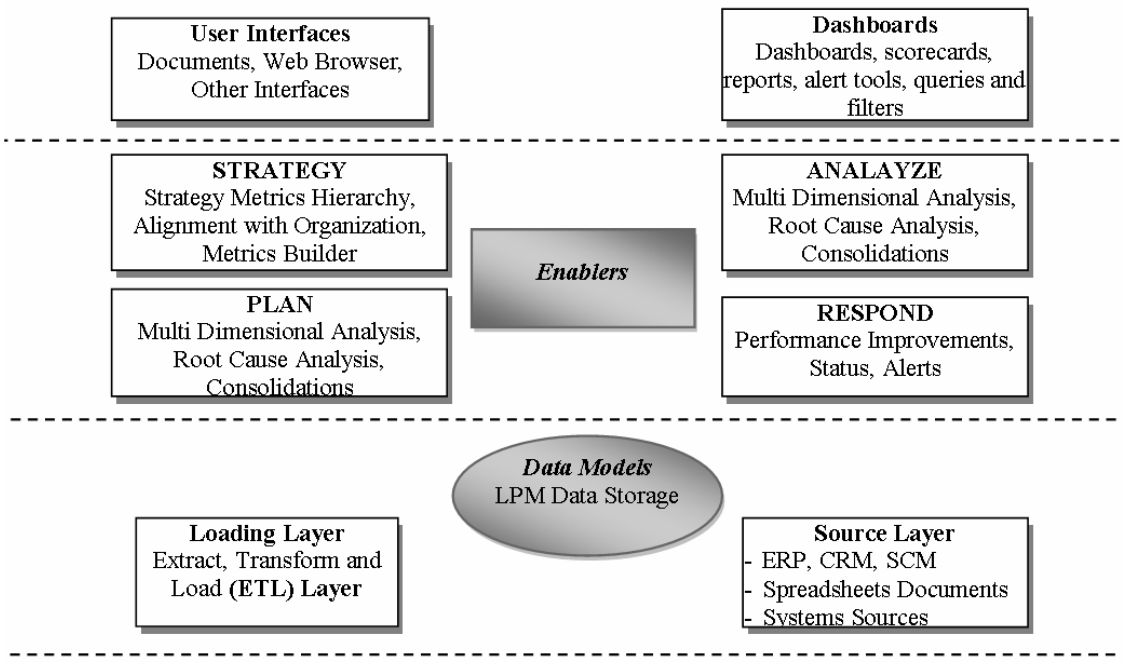

Figure 1. Logistics Performance Management (LPM) model

In this work is presented the application of these principles into practice with a case study that seeks to identify the tracing of the state an opportunity to improve system performance logistics, to measure the benefits obtained from implementing the proposed measures. Ideas for improving the performance of a system, process, and product quality or service can come from various sources, such as customer suggestions, their unwritten expectations, requests from company management, renegotiation of targets accepted tolerance, et al.

Were used the interview, qualitative analysis of documents and questionnaire as a support for all this, as working tools. The research was based on several case studies that include analysis model made in companies manufacturing and trade, but also on actual studies in the literature in the field.

At the basis of preparation of audit of the questionnaires were the logistic models developed by Lambert, D. [8] and models from consulting firms, such as Supply Chain Council (*Supply Chain Council* - SCC) Forum Global Supply Chain (*The Global Supply Chain Forum* - GSCF). In its base model was developed for evaluation and performance analysis in the supply chain.

Representative questions in the questionnaire (in total of 25) respond to problems as company strategies, the profile of respondents, suppliers, inventory, customers, financial control, distribution, marketing and logistics innovations and challenges. The information contained in the questionnaire covers areas on business strategy, responsiveness and adaptability, on the competitive market.

In the graph in Figure 2 are presenting some key elements of the development strategy in order of strategic importance for the companies analyzed. Were established following strategies and their importance for the companies (C1, C2, C3) in the same area of activity:

A- Additional services to the cusomer
B- The market launch of new products
C- Order by the customers
D- New strategic partnerships
E- Teh integration a new suppliers
F- Cost reduction in SCM

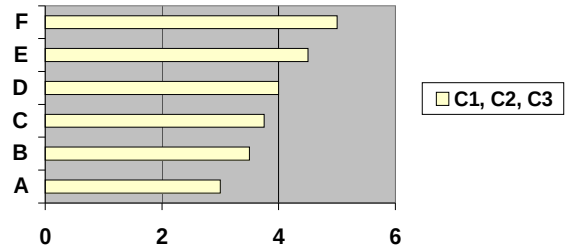

Figure 2. Strategic alternatives considered with the companies analyzed

After identifying SCM strategy in companies analyzed, was designed supply chain and have measured its performance taking into account the following indicators: the level of customer service, inventory management, transportation costs, storage costs, improve flow cash the market launch of new products, new strategic partnerships.

Based on the Balanced Scorecard method [7] were established performance measures for supply chain management: an integrated approach to customer satisfaction, quality, time, cost and current. The advantage of this method approach: provides a comprehensive overview of the company's performance; balanced score card protects from local optimization; help to avoid information overload by keeping only measures related to strategy.

Areas that are acting on reducing costs to increase performance supply chain companies analyzed are shown in Figure 3.

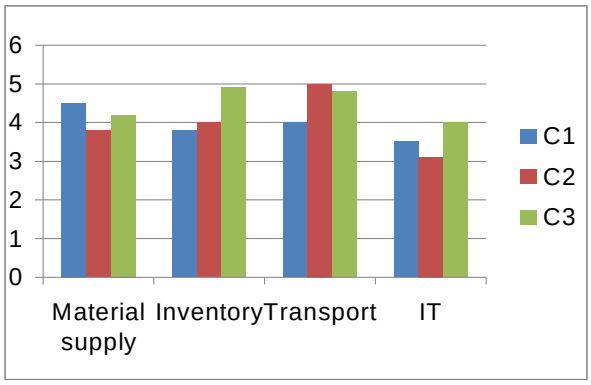

Figure 3. Decrease costs to increase performance SCM

The cost is the most important indicator that directly affects the supply chain performance. Firms seek to create a more competitive supply chain in its entirety by increasing value and reducing overall costs. The total cost of logistics for a typical company is 7% to 12% of sales and is growing due to increasing supply chain complexities. Thus, there is an increased focus from corporate management on controlling and managing this cost.

Performance measurement questionnaire (PMQ) [5] were used to measure performance to identify strengths and weaknesses in current performance measurement system, and then to propose a workshop to develop, revise and re-focus the set of performance measures.

Performance improvements are being supported through the integration of information systems to share the information and data management, all of which result in better customer satisfaction in real time and higher profitability.

4. Conclusion

A successful supply chain management must be at the improvement of customer value, and the profitability of supply chain and its members. Through data analysis were followed: the development of a structure linking the objectives of the organization and supply chain operations-delivery and achieve a systematic approach to evaluating and monitoring performance.

To remain competitive, companies are focused on the supply chain efforts to improve service delivery to customers by increasing the frequency and speed to satisfy demand. This leads to more and more partnerships between suppliers and customers. SCM represents a significant potential for value creation for the customer: quality of service, performance in terms of deadline and the reactivity.

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