

# Functional Approaches to *Scor* Model in the Supply Chain Management Processes (Part I)

Gheorghe MINCULETE<sup>1</sup>  
Polixenia OLAR<sup>2</sup>

## **Abstract**

*SCOR model has been developed by the Supply Chain Council, a nonprofit association that serves all types of organizations interested in improving processes in SC. The SCOR model offers a standard set of processes and methods used to model the business activities of an SC, the indicators measuring their performance and the best practices used for solving problems identified in the steps taken for processes modeling and measurement.*

*The SCOR model also facilitates the integration of SC partners by: providing common processes; the provision of some standard indicators of performance measurement of the processes; providing the best business practices applicable to large industrial scale for accelerated performance improvement of the business processes.*

*In this article we will address in a systemic manner the five processes of SCOR model, presenting relevant issues supported by appropriate figures.*

**Keywords:** *Supply Chain Management; Model Processes SCOR; Plan; Source; Make; Deliver; Return.*

**JEL classification:** D 20, D 30, M 10, M 21, M 31

**DOI:** 10.24818/RMCI.2018.2.136

## **1. Introduction**

The SCOR reference model was created in 1997 by the coalition of a significant number of organizations and practitioners in the field of logistics. They founded the council of the supply chain to analyze the phenomenon in terms of its management from a global and inter-organizational point of view. Their goal was to provide a conceptual tool to enhance the effectiveness of the supply chain operations – and a common language for the business partners in their trade (Lockamy & McCormack, 2004).

The SCOR model applies the traditional business process within an inter organizational environment to describe all the interactions that occur in the value chain of logistics or production from generating an order requiring the return to excess product return or with hidden defects (Lockamy & McCormack, 2004).

---

<sup>1</sup> Gheorghe Minculete, “Carol Ist” National Defense University, Romania, e-mail: minculetegh@yahoo.com

<sup>2</sup> Polixenia Olar, “Carol Ist” National Defense University, Romania, e-mail: lisiolar@yahoo.com

The SCOR model has four levels of detail, the first three of them - processes, sub-processes and activities - are described in the model. The operational processes, or the fourth level, are detailed in the workflow and they are always custom to the strategy and specific requirements of the organization (Popa, 2009). At the same time, the SCOR model combines elements of engineering business processes, benchmarking and management practices in a single frame. According to SCORE, the supply chain management is defined by operational processes management (mentioned above), highlighting the flow of goods and related services from the provider's supplier to the consumer's consumer which requires an operational strategy very well built, resources and adequate information (Bai & Sarkis, 2010).

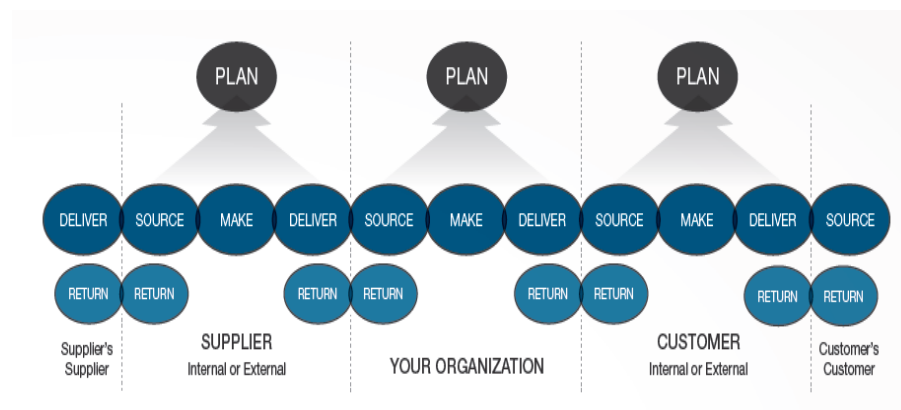
The SCOR model helps to create a common vision for the management and coordination of the five primary processes of the supply chain. The following are the briefly presented SCOR model elements: Plan; Source; Make; Delivery; Reverse flow (SCOR, 2010). These are supported by the Support Processes for the Execution of Operations in a Supply Chain (SCOR, 2010). (Figures 1 and 2).

## 2. Plan

This process is responsible for the proper planning of the requirements meant to achieve a balance between supply and demand in order to optimize logistics and production resources. At the same time, it involves providing all members of the supply chain with the plans in order to coordinate and update the other processes.

Each of the supply chain process has inputs and outputs. The planning input is given by the information about demand, supply and supply chain resources. This information will enable a better decision making and guide all activities related to supply chain execution processes - purchasing, manufacturing, delivery and return. Each of the execution processes has a planning element. For example, the supply planning and the production planning outline the necessary raw materials, their source and the quantities of inventory items (Cachon & Fisher, 2000).

The delivery planning provides the necessary information to customers' orders. Planning returns provides the information necessary for programming returns and replacement orders (Popa, 2009).



### Figure 1. SCOR model elements in dynamic

Source: (SCOR, 2010)

Within the supply chain each process involves inputs and outputs. The inputs appropriate to the planning mainly outline the information about demand, supply and supply chain resources used by the components of the supply chain to deliver effective decision-making processes and the orientation of all activities specific to supply, production, distribution and reverse logistics processes. Thus, each of the execution processes reveals the appropriate planning elements. For example, the supply and production planning reveals the need for the necessary raw materials, the sources of supply and storage, conversion and logistical actions for finished products. The delivering planning builds and projects the information needed to honor the customers' orders. At the same time, within the reverse logistics mechanism, the planning of return flows adequately provides the information needed to program the products and quantities that are the subject of the return-specific actions and the honoring of the replacement orders (Sameer, 2014).

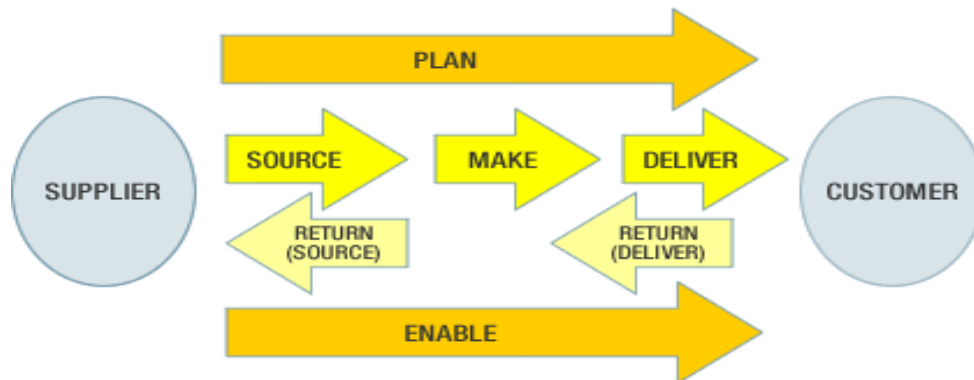


Figure 2. SCOR Model. Five Core Management Processes

Source: (Sashi, 2011)

### 3. Source

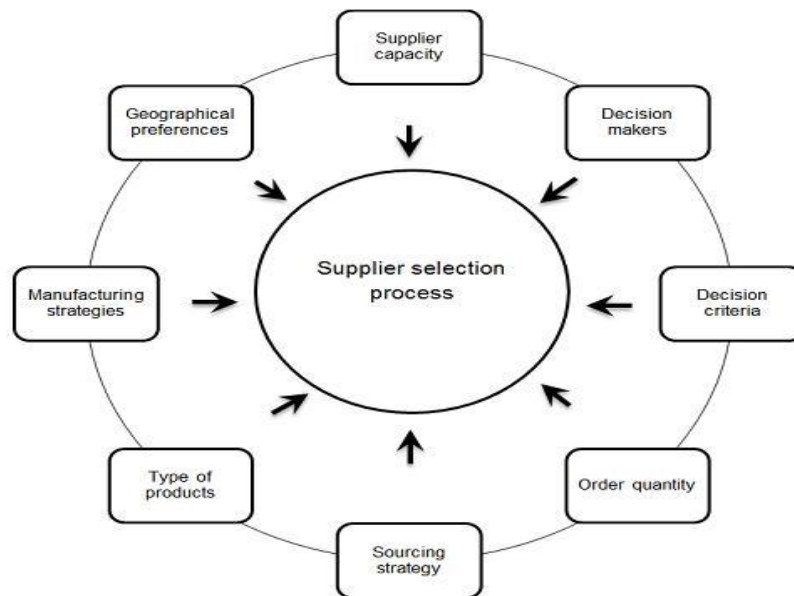
This process is responsible for evaluating and selecting suppliers based on the set criteria authorizing further payments to them. At the same time, the process determines the regular scheduling supply of raw materials, in order to maintain the optimal stock levels. The processes ensuring procurement of goods and services meant to meet planned or actual demand are obvious here. The next step we are taking is to treat: the importance of acquisitions; supplier selection; transaction management; monitoring performance (Ying & Yang, 2011).

Out of the economic practice we have the following results: • the manufacturing companies spend about 55% of every dollar on goods and services purchased; • the acquisition costs represent about 60-80% of the operating costs; • the direct manufacturing costs decreased to 5-15% of the total operating costs (less than 2% for

some high-tech industries); • the service industries spend less for purchased materials than for manufacturing ones. Thus, the role of procurement has reached a greater importance because the cost of materials accounts for 50-60% of the cost of goods that are sold (Sashi, 2011).

The supplier selection generally involves five elements within the supply chain that are briefly treated below. A mechanism of the selection of suppliers is shown in Figure 3.

- The identification involves the idea of drawing up a list with all the potential suppliers. A buyer could study the database or directories sources for purchases of the company (Thomas Register of American producers, Trade Register in Romania) evidencing adequate information about the existing firms.



**Figure 3. A process of the supplier selection**

Source: [www.engineeringcivil.com](http://www.engineeringcivil.com)

- The evaluation involves the idea of identifying the criteria for the supplier selection and the collection of information on performance that can be used to evaluate and compare potential suppliers.

- Frequently used criteria: the quality, price, delivery reliability, capacity (current and future), reaction functional capacity, technical expertise, managerial (attitude, skills and talent) and the financial stability.

- The approval involves the idea of identifying suppliers who are eligible to receive a command. The number of suppliers on the approved list depends on the nature of the item being purchased. For commodity-type items, generally speaking, more suppliers are used; for single articles, it may be preferable a single arrangement of supply (Shaw, Yadav & Thakur, 2012).

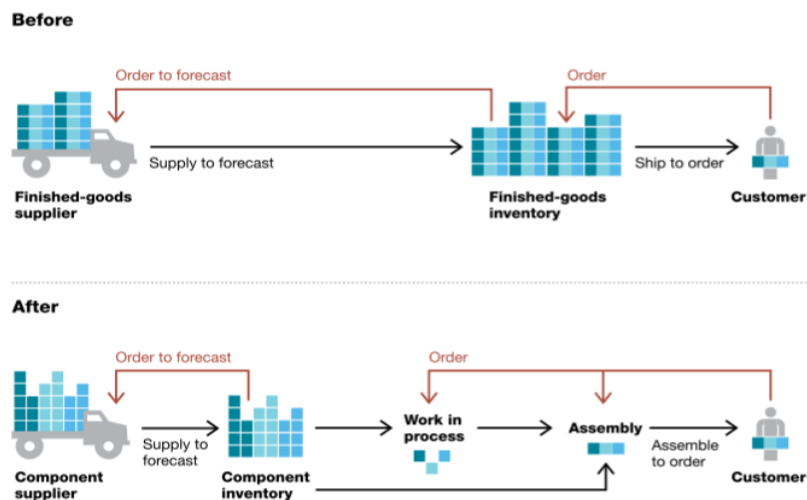
- Monitoring ensures a high level of performance. Scorecards are often used to provide an overall rating of the supplier.

The transaction management reveals the mechanism of the exchange set up in the sale. In this framework, the price is the factor most frequently used to evaluate the performance of the procurement/supply process. In order to use the best pursued price things like these have to be taken into account: the list price - for low volume items or little valued; the competitive biddings - rely on the market forces to achieve a fair price; the reverse auctions can achieve reductions of 10-30%; the negotiation - for large values to articles involving a high risk or when a long-term relationship is desired (Stedman, 2000).

The concept reverse bidding appeared in the 90s when it was discussed and firstly used an E-procurement. In short, the concept of reverse bidding works like this: the specialists in Procurement enter the e-procurement specifications into the platform (the technical specifications, the draft contract, the quality conditions and the maximum accepted estimate for the service or product in question) and suppliers are invited to explore the documentation and then provide the lowest price starting from the maximum proposed price, obviously the lowest price wins the bidding. The method of reverse bidding may also work just as well in the case when an e-procurement platform is not used (SCOR, 2005; SCOR, 2010).

The purchase orders specify the terms and conditions of the purchase contract and the action taken by the supplier. There appear complex orders (blanket orders) that specify the general terms of agreement for a set period of time and they include the entire quantity to be purchased; smaller amounts are delivered periodically under this agreement (Figure 4).

For example, a consumer durable device lowers its cost of inventory by moving production closer to the customer's demand.



**Figure 4. Streamlining purchase orders**  
*Source: (Building-Supply-Chain-of-Future, 2013)*

The sending highlights the efforts required to speed the delivery of an order to the recipient/beneficiary. In the purchase agreements (purchase agreements, understandings etc.) penalty clauses can be used for non-compliance shipment.

The receipt and acceptance ensure the physical-numerical correspondence of the quantity and quality of the product /article content with the data on the invoice and on the delivery note of the goods.

The main reasons for the failure of the receipt and acceptance: •the counting highlights facts that do not correspond with the invoice and the delivery note of the goods (larger or smaller quantities); • the quality is lower to the standard provided in the acquisition contract (documents) (Baker, 2003).

The certification programs of the suppliers focus on improving their skills to manufacture high quality products while eliminating the receptions necessity.

The registration involves invoicing effective elements: • the established relationships with the suppliers for the conditions (terms) for the sale agreed; • own financial performance (possible discounts for prompt payment).

The performance monitoring allows the identification of the supply conditions for the increased collaboration and long-term relationships with suppliers.

To this end, four types of information must be pursued: • the current status of all purchase orders; • the selection of the evaluation criteria for all providers; • information about the goods purchased; • information on contracts relationships (Vasiliu, 2010).

#### **4. Make**

This process is used to schedule production and logistics activities, including product design and testing, and the packaging and application to achieve specific production rules and regulations. However, the focus here is on the performance measurement and the management of the inventory (stock).

This function is relevant by the processes that transform the raw materials, materials etc. into a finished product in order to meet the demand. Next, we are going to treat the production management.

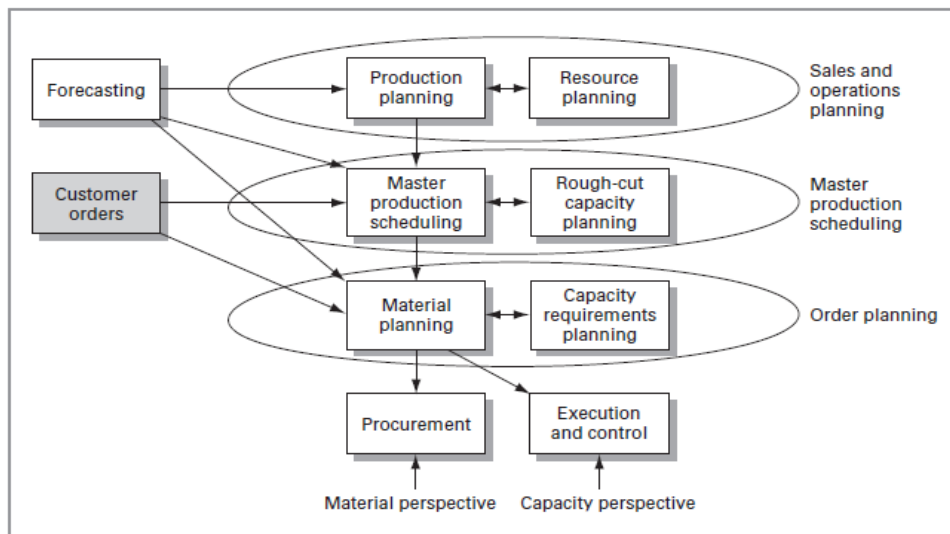
The production management is known as the operations or management of production due to the employment of capital, technology and labor in creating value through the conversion of purchased materials in goods and services with high quality features.

The connection between the order process and other planning processes is shown in overall terms in Figure 5. Together with forecasts, customer orders constitute the information required for the master production schedule process. The role played by orders in relation to forecasts is dependent on the extent to which the company's products are made to stock or to order (Customer Order Management, 2009).

The production management is involved in the innovation and product development in order to meet the customers' top needs. Within this framework the operational excellence is a prerequisite for success. For this, the operational managers must manage two groups of decision variables: design decisions; control decisions.

In the design decisions the followings are envisaged: the location facility – it affects the access to the production inputs and to the markets of the customers; the easy

location - it influences the company's equipment, flow and handling of the materials/products; the product design – it has an impact on the ability to capture/gain market share profitably in the future; the design process – it involves choosing technology and plan/scheme of work.



**Figure 5. The relationship between the production, order process and other planning processes**  
 Source: (Customer Order Management, 2009)

The decisions of control assume the following elements: the forecasting - predicting what must be produced and when; the inventory control – it determines how much (quantitative) and when to be manufactured the specific products; the planning can be: aggregate planning - determining what must be produced; the process planning – it determines the activities to be performed at each manufacturing department; the quality control – the design, construction and inspection of quality both in the development of the manufacturing process and the product manufactured (Diabat & Govindan, 2011).

The operational excellence is a prerequisite for success; however, the competition is now between the supply- evacuation chains, not just between companies. Therefore, the productive company managers must understand and develop skills that focus mainly on: • outsourcing; • manufacturing integrated to supplier; • monitoring the implementation of the best practices (Lean Production, Lean Six Sigma, Agile manufacturing) (SCOR, 2010).

According to expert appreciation, a responsible social management involves decisions related to economic, social and environmental issues (Dobrea & Găman). Therefore, the SCORE model allows companies a projection and development appropriate to their own businesses, which will prevent potential risk factors. However, they will obviously lead to proactive and predictable actions determined by the organizational economic performance (Dobrea & Dinu).

## 5. Conclusions

In the modern economy, the SCOR model processes contribute to the functional performing of the supply chain management, thereby achieving logistics network that is comprised of suppliers, manufacturers, warehouses, distribution centers and delivery channels. In these conditions it is possible for a provider to be both a producer or knot storage or even a distribution center. At the same time, we believe that the other partners in the integrated delivery chain (manufacturers, distributors) may be knots storage or distribution centers. This implies, however, a more detailed division of labor, multiple requirements for the existence of a functionally modernized supply chain and the existence of as many network nodes to ensure the optimal functioning of the logistics network parameters.

A modern management of SCOR within the supply chain should firstly provide greater satisfaction to beneficiaries (improving product reliability and high flexibility in delivery) and, secondly, reducing the costs associated with delivery (reduced stocks, reduced production and delivery costs). Such a management must ensure the optimization of supply chain and extend to all external partners of the company, anticipate fluctuations in demand (flexibility) and ensure transparency of delivery process throughout the supply chain.

According to the specialists' appreciation, in the supply-chain (SC), it is necessary to design and implement a modern management, which will allow a higher customer satisfaction, with a special emphasis on increasing the product reliability and flexibility of delivery. At the same time, the reduction of the costs associated with the delivery process will be envisaged, mainly aimed at reducing stock levels, reducing production costs and delivery costs.

## References

1. Bai, C. and Sarkis, J., *Integrating sustainability into supplier selection with grey system and rough set methodologies*, International Journal of Production Economics, 124(1), 2010. DOI: 10.1016/j.ijpe.2009.11.023, pp. 252-264.
2. Baker, D., *Marketing Channels and Supply Chain Management*, Contemporary MARKETING, Texas Christian University, 2003, Slidede, 14, [http://www.cengage.com/resource\\_uploads/downloads/0324536380\\_77283.ppt](http://www.cengage.com/resource_uploads/downloads/0324536380_77283.ppt).
3. Cachon, G. & Fisher, M. *Supply Chain Inventory Management and the Value of Shared Information*. Journal of Management Science, 2000, Vol.46, 1032-1048.
4. Customer Order Management 2009, [http://highered.mheducation.com/sites/dl/free/0077117395/676304/MPA\\_C08.pdf](http://highered.mheducation.com/sites/dl/free/0077117395/676304/MPA_C08.pdf)
5. Dobrea, C. R. and Găman, A. Aspects of the Correlation between Corporate Social Responsibility and Competitiveness of Organization. *Economia. Seria Management*. Volume 14, Issue 1, 2011, p.236.



6. Dobrea, C., R. and Dinu A., F. Interdependencies between CSR Strategies and Economic Performance in Top Romanian Companies. *Procedia - Social and Behavioral Sciences*. World Conference on Business, Economics and Management (BEM-2012), May 4 - 6 2012, Antalya, Turkey, Edited by Huseyin Uzunboylu, Volume 62, Pages 1-1384 (24 October 2012), p.1208.
7. Diabat, A. and Govindan, K., An analysis of the drivers affecting the implementation of green supply chain management, *Resources, Conservation and Recycling*, 2011. DOI: 10.1016/j.resconrec.2010.12.002, <http://www.sciencedirect.com/science/article/pii/S0921344910002466?via%3Dihub>, pp.659-667.
8. Lockamy III, A. and McCormack, K. Linking SCOR planning practices to supply chain performance, *International Journal of Operations & Production Management*. Vol.24, Num.12, 2004, pp. 1192-1218.
9. Popa, V. (2009). *Supply Chain Management*, Chapter 2 [http://www.virgilpopa.com/carti/2009\\_scm\\_in\\_consumer\\_goods\\_industry\\_and\\_retail/cap\\_2.pdf](http://www.virgilpopa.com/carti/2009_scm_in_consumer_goods_industry_and_retail/cap_2.pdf), p. 67.
10. Sameer M.. 4 Comments On: Reducing the Risk of Supply Chain Disruptions, March 23, 2014, <http://sloanreview.mit.edu/article/reducing-the-risk-of-supply-chain-disruptions>
11. Sashi, K, R., *SCM Metrics*, Presentation 1, Slide 25, 2011, [http://www.ciilogistics.com/knowledge/supply\\_chian\\_metrics/SCM\\_METRICS-1a.ppt](http://www.ciilogistics.com/knowledge/supply_chian_metrics/SCM_METRICS-1a.ppt).
12. SCOR. Supply Chain Council, “Supply-Chain Operations Reference-model Overview version 7.0, 2005”, <http://www.supplychain.org/site/scor7booklet.jsp>.
13. SCOR, Supply Chain Council, *Supply Chain Operations Reference (SCOR) model, Overview - Version 10.0, 2010*, <http://www.portaldeconhecimentos.org.br/index.php/por/content/download/24758/296095/file/Supply%20>.
14. Shaw, K., Shankar, R., Yadav, S. and Thakur, L.S., Supplier selection using fuzzy AHP and fuzzy multi-objective linear programming for developing low carbon supply chain, *Expert Systems with Applications*, 39(9), pp. 8182-8192, 2012. DOI: 10.1016/j.eswa.2012.01.149.
15. Stedman, C., “Few takers for benchmarks from supply chain council”, *Computerworld*, 24 April, 2000, p. 46, Google Scholar.
16. Vasiliu, C., *Logistics and Distribution of Goods*, Course Notes, Wordpress.com, Wordpress.com, 2010, <https://adrianabuzdugan.files.wordpress.com/2010/09/carte-logistica.pdf>, p. 135.
17. Ying-Tuo, P. and Yang, C., Iron and steel companies green suppliers' selection model based on vague sets group decision-making method, *IEEE International Conference on Electronics Communication and Control*, pp. 2702-2705, 2011. DOI: 10.1109/icecc.2011.6066284.
18. <http://www.engineeringcivil.com/wp-content/uploads/2015/06/>.