

## Supply Chain Management – Models And New Trends

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**Abstract:** Nowadays, supply chain management is becoming more relevant problematic. Supply chains are complex and dynamic systems in which information, materials and cash flows are interconnected. Each product has its own supply chain, some supply chains can be short and simple and some quite long and complex. Supply chain activities cover everything from product development, sourcing and production to logistics, as well as the information systems needed to coordinate these activities.

Considering the numerous activities in the supply chain it is necessary to manage it. Supply chain management (SCM) is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage.

The subject of research in this paper will be the models of supply chain management, and at the end of the paper an analyses of new trends of supply chain management will be performed.

**Key words:** supply chain management, models of SCM, trends in SCM

### Introduction

Today, the supply chain and its managing is very popular in the scientific and expert public and practice. The exchange process has started since the moment when people started to exchange different products among them. Since that time up today, by continuous development of the production process, the transport system and other accompanying processes in the materials, information and finances flow, the exchange process has gained even higher complexity.

The exchange process includes more and more companies with different activities, on different geographical locations. The connecting of these companies not only from the offering place, but even rather earlier – from the place of raw materials purchase up to the place of the demand, i.e. the end user, is called a supply chain, demands chain or values. Having in mind the complexity of the supply chains, their managing is indispensable, so, in this context, some models of its management will be elaborated, and the factors influencing its management as well. At the end of the study, several trends characteristic for the supply chain and the logistics, will be given.

### 1. Theoretical overview for supply chain and supply chain management

Having in mind the complexity of this issue, there is not a unified definition. Because of that, at the beginning of this paper, the theoretic basics of the supply chain and its difference with the logistics, will be elaborated, together with the difference between the logistics management and the supply chain management.

It is considered that the first definition of the logistics was given in 1982 and according to it, the logistics is defined as managing of all inbound and outbound materials, semi-products, raw materials and ready products.

According to the European Logistics Association – ELA, the logistics is defined as organizing, planning and distribution to the end users, with an aim to meet the market demands with minimal costs and capital.

While Martin Christopher (Christofer, 1998) defines the logistics as a process of strategic managing of the supply, then the raw materials, semi-products and ready products transfer and storing through organizations and their marketing

channels in this way that will maximize the current and future profitability by cost-effective meeting of the buyers' demands.

As for the supply chain, according to Stevens (Stevens, 1989), it is a system composed of: materials, production objects, distribution services and users connected through the materials flow and the return information flow..

According to Chow (1994), the supply chain comprises all companies that participate in the production/processing, sale and distribution of the product from the raw materials source up to the end user.

As per M. Christopher, (Christofer, 2011) the supply chain is a link between the dependent and independent organizations that work together , in order to control, implement and upgrade the materials and information flow from the supplier to the buyer.

The supply chain consists of many activities and organizations for materials movement across their way from the initial supplier to the end buyers. Here, it should be noted that each product has its supply chain and some chains are short and simple, while the others are long and complex.(Regodic, 2014).

From the a.m., it can be concluded that there is not a unique definition for the supply chain, nor for the logistics, which is only one segment of the supply chain.

Also, in the professional literature and practice, there are several definitions for logistic management and the supply chain management.

So, the supply chain management comprises all activities relating to the resources purchase, conversion of those resources and all logistic activities. That means coordination and cooperation of the partners in the supply chain, that can be suppliers, mediators, logistics providers and buyers. The supply chain management includes all operative logistic activities, production, and it establishes coordination with and through the marketing, sale, the product design and information support.

„Supply chain management is the integration of key business processes from end-user through original suppliers that provides products, services and information that add value for customers and other stakeholders.” (Lambert, 2008).

While the logistics management is a part of the supply chain management and comprises the operating activities for transport, storing, materials managing, delivery, the logistic network creating, stocks management, offer and demand planning on the level of one company and outsourcing strategy managing.

## 2. Models for the supply chain management

In this context, we shall mention several models for the supply chain management and organization, such as: functional, supplying, logistic-transport, informative, strategic and a model for reengineering the business processes (Beker & Stanivukovic, 2003).

*Functional model.* This model is a kind of the supply chain management and organization and it can be seen in a large number of firms. For the firms that do not think within the framework of the supply chain philosophy, it is said that have functional model of managing. Those firms consist of independent wholes (purchase, production, research and development etc.). Each whole has its own plans. The basic weakness of those firms is the projection of the functional and business links between the mentioned wholes, while the functional and business links between the firms that constitute the supply chain do not exist at all. The assessment of these firms success consists mainly of independent success assessment of each sector. For example, the purchase assesses the success by the purchase price of the materials and the costs that additionally burden the purchasing process, the distributive centers by the distributing costs share in the final selling price etc. Should some initiative for the success increasing appears, that is a local initiative and it can, but not necessarily, mean the increase of the entire firmsuccess. When the entire supply chain is in question, its success is not considered at all, while the initiatives that will increase the supply chain success are out of question.

*Supplying model.* Usually, this model comes from the firms that have applied the functional model, but then have decided to cut the material costs. The material costs present the largest part of the total costs especially with the production enterprises, but the servicing ones should not be excluded because they also purchase material goods and pay for services that are basic for offering new services. The procedures used for costs decreasing are:

- The market research in order to find out a product/suppliers of higher quality/low price;
- Unified stocks (reduction of similar/different items that enable decreasing of the suppliers number, purchase of larger amounts of one item etc.);
- Direction to suppliers that for the needs of their buyers keep stocks, necessary amounts and ranges in their storehouses.

In this model, the purchase manager can take over the control over the supply chain management.

These changes cause consequences even out of the company's framework and spread through the entire industry to which the suppliers belong, and establish strong relations between the producer and the supplier, so their trade relation becomes a partnership.

*Logistic-transport model.* The idea for the companies connecting originates from the logistic way of thinking. It is logic for a product to be transported (raw material–semi-product-transport-product-transport-distributor-transport-seller-transport-buyer). Therefore, the transport is very important and presents an integrative factor for the supply chain. In this model of the supply chain management, when we start forming the chain and when we look for a person who will be responsible for the chain successful functioning and managing, the best logic solution is a transport manager. By using this model of the supply chain management, it is expected the costs to be decreased and the profit increased.

*Informative model.* This model aims to the costs decreasing by upgrading the relationship between the producer and the supplier, and inside the production company itself. New ways of information exchange appear – through computers and computer networks, with a special stress on the internet. EDI is one of the first examples for upgrading the communication between the enterprises. Problem for the effective information exchange is the lack of an integrated software for communication within the company itself and between two companies. In the world today, the intensive efforts for standardizing the data structure and the process of information exchange, are very actual. This will enable standardized data exchange across the entire supply chain.

*Strategic model.* The firms struggling for their survival on the market where there are more and more new requests from the buyers, consider the

supply chain as an integral element of their strategy for the survival on the market. For them, the strategy to survive on the market is not directed only to the product, but also to those activities that are connected with the product. In fact, those activities are key when the buyer chooses which product to buy. All resources in the supply chain are directed towards the buyer's satisfaction.

*Model that implies reengineering of the business processes.* Reengineering of the business processes implies radical changes in the processes in order to decrease/eliminate the costs/losses and to upgrade the product/service quality. Up to now, usually the reengineering has been applied to one company, but by the firms connecting into a supply chain, it is customarily to apply the reengineering to all firms within the chain.

### 3. Key factors influencing the supply chain management

Many factors influence the supply chain management, and the most important ones are: (Jelena Bošković, 2013)

- Decreasing the suppliers number,
- Competition increasing;
- Shortening the product life cycle;
- Technology.

Today, each enterprise in the supply chain intends to decrease the suppliers number and to keep long-term collaboration with them. The managers believe into establishing long-term relations with several suppliers and it is more often situation the company to have smaller number of suppliers, and to offer a wide choice of products for its buyers.

The increased competition also influences the supply chain. Today, in the conditions of higher globalization, the competition is even higher, and the result of that, is the chain growth back towards the suppliers in other countries and forward towards new buyers in these same other countries.

Another factor is the product life cycle decreasing. The products life cycle is shorter due to the appearance of new products and in order a company to be competitive, it has to react in due time, in order to response to the new buyers' requests.

The most important factor that influences the supply chain management is the technology. Information technologies that have significant influence on this concept development, are systems ERP (enterprise resource planning) and APS (advanced planning and scheduling).

ERP systems comprise financing, forecasting, order monitoring, sales analysis, distribution and quality control. They possess power tools for monitoring and informing, but are rather rigid and their application demands well defined data.

There is not some accurate definition of APS systems, but it can be said that they compensate the disadvantages of ERP. APS systems take into account the raw materials and the available capacities for generating new plans and on the basis of the given targets (minimal stocks, delivery terms etc.) they form detailed optimal activities schedule.

The electronic data interchange (EDI) provides good link between the buyers' database and the suppliers' database. In every shop with laser scanning of the product's bar code, its sale is automatically recorded. Selling information is transmitted to the main distribution center and the suppliers included in the system. Each supplier has an access to the database that comprises selling information on its products and the trend of the production line movement. By accessing the database, the suppliers are able to see delivery, sale and stocks data, and with that they get information on the stocks/sale relation.

#### **4. Trends in the logistics and the supply chain**

The development of technology and internet has caused significant changes in the logistic activities and the supply chain. So, today we have electronic purchase, while the automation of the processes in the logistic activities, from purchase, through storing, stocks keeping, materials managing, transport, to delivery, has significantly eased the complex activities, especially on a global level. The time for making transactions has shortened, and with the development of global sources for supply, the companies can select a supplier from the world market. Global retailers become leaders in the distribution channels. The producers, especially the small and medium ones have no choice but to accept the wish of the global retailers and adjust themselves to their needs. Furthermore, the way

of distribution has been changing, where partnerships become more relevant etc.

As trends in the logistics we can mention the following ones: (Regodic, 2014)

- Electronic purchase and electronic catalogues
- Development of global supplying sources and global purchase
- Connection in the supply chain
- Centralization of the delivery through big and multi-effective distribution centers that carry out the activities for the product packing and marking
- Appearance of a delivery chain
- Growth of the integrated supply chains
- The suppliers take more care about the stocks of the company-producer
- The producers take more care about the stocks of the companies-sellers
- The work for storing is completely computerized and automated.
- Bigger importance of the mathematical models, modeling and techniques for simulation in the stocks management, storing area, transport routes etc.
- The communication is based on EDL technology within the ERP systems and
- Growth of the effectiveness and productivity in the logistic working.

The trends in the supply chain are intertwined with the trends in the logistics, having in mind that the logistics is a segment of the supply chain. However, in the professional literature the following six key trends in the supply chain can be set aside: (Banu, Rao, 2015)

- demand planning
- globalization
- increased competition and price pressures,
- out-sourcing

- shortened and more complex product life cycles,
- closer integration and collaboration with suppliers.

Today, demand planning have increased, more companies have moved away from focusing efforts on plant-level production planning and are adopting more of a demand driven focus of trying to influence and manage demand more efficiently. Advanced demand planning systems and proper strategies can also help uncover data and identify trends buried in a company's information systems.

The globalization is dramatically impacting the way business is managed. No area of a business is affected more by the trend to a global business environment than the supply chain. Manufacturing, distribution, sourcing of materials, invoicing and returns have all been significantly impacted by the increased integration of a global customer and supplier base, and many companies find that existing processes and technology are not flexible enough for this new business environment.

Due to globalization the competition is increased and companies need better ways to distinguish themselves.

In one case, a large global consumer goods manufacturer saw prices around some of its commodity products drop as much as 60-80 percent. Product innovation and brand equity no longer were allowing them to command a higher price in the market. In order to continue to compete with that commoditized product they made significant cost improvements with supply chain re-design and technology. In the fourth place owing to outsourcing some realize that outsourcing parts or all of a supply chain can be advantageous. With marketplace improvements around (1) information media and systems (2) cost and quality of global manufacturing and distribution, and (3) product design capabilities, companies are gaining additional synergies by outsourcing all or parts of their supply chain. In fifth place where shortened and more complex product life cycles many MNCs, TNCs, IBCs, are under pressure to develop innovative products and bring them to market more rapidly, while minimizing cannibalization of existing products, which are still in high demand. In order to meet the needs of both customers and consumers, companies need more efficient product lifecycle management processes. This includes heavy

emphasis on managing new product introduction, product discontinuation, design for manufacturability and leveraging across their entire product and infrastructure characteristics.

Also more corporates are moving towards more intense collaboration between stakeholders' customers and suppliers for extended supply chain. The level of collaboration goes beyond linking information systems to fully integrating business processes and organization structures across companies that comprise the full value chain. The ultimate goal of collaboration is to increase visibility throughout the value chain in an effort to make better management decisions and to ultimately decrease value chain costs.

## **Conclusion**

From the above elaborated text, we can conclude that the supply chain management is not a simple process at all, having in mind that it consists of many participants and activities. Here, it shall be taken into account that there are also a lot of factors that influence its management. Having in mind the a.m., the most frequent characteristics of the supply chain management can be the following ones:

- Total elimination of the boundary among the firms in a chain
- The management is continuous process consisting of three basic flows: products flow, information flow and values flow.
- Stocks visibility at each level of the supply chain
- Risk sharing among the members
- Planning of the activities in the supply chain
- Creation of logistic alliances as an organizational precondition for integrated logistic flow.

In supply chain management can be differentiated many models such as: functional, supplying model, logistic-transport, informative, strategic model and model that implies reengineering of the business processes.

Today the environment where the companies operate is quite dynamic and it is necessary to

accept the new trends in supply chain management such as: demand planning, globalization, increased competition and price pressures, out-sourcing shortened and more complex product life cycles and closer integration and collaboration with suppliers.

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