The basics of supply chains

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Main objectives:

- Understanding supply chain objectives and the impact of supply chain decisions on the business results;
- Identifying the main phases of decision-making inside supply chains. Clear out the importance of each phase;
- Identifying the main processes and groups of processes in supply chains. Keywords: supply chain profitability, supply chain elements, supply chain decisions, supply chain processes

Introduction, aim and objectives of the course

"*Supply chain management is a set of approaches utilized to effectively integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize systemwide costs while satisfying service level requirements.*" David Simchi-Levi, 2003

Supply chains consist of all organizations involved directly or indirectly in fulfilling the requirements of end customers. A supply chain does not only consist of a manufacturer and a supplier, but also includes organizations involved in transportation, warehousing, retailing, as well as the customers themselves. Within any organization—for example, a manufacturer—the supply chain includes all functions involved in fulfilling customer orders. These include new product development, marketing, manufacturing, distribution, finance and customer service. In a supply chain, a manufacturer receives materials from several different suppliers and in turn supplies finished products to various distributors. Most supply chains are actually supply networks, an example diagram is shown in the following figure:
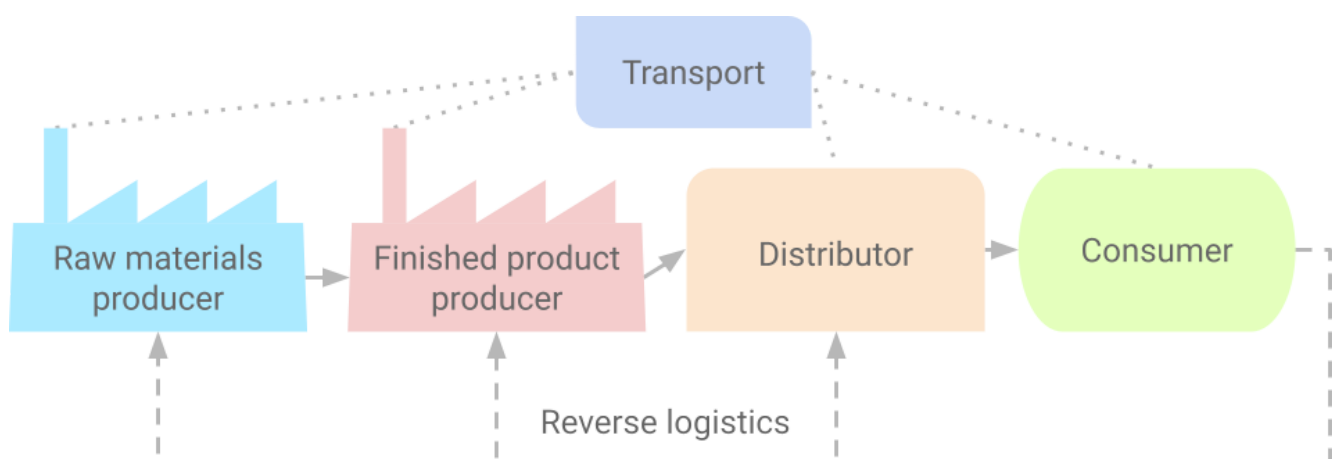

Figure 2. A simple supply chain structure

Main tasks

Supply chain management focuses on automation and optimization of logistics operations throughout the product life cycle, performing the following tasks and functions:

- Supplier relationship management - search for suitable suppliers, evaluation, procurement, cost management;
- Distributors Relationships Management - design and construction of distribution channels, control over the quotation processing;
- Warehousing - stock control, rules for storing goods (often called stock-keeping units (SKU) / products / articles);
- Forecasting - consumption modelling for materials and consumables, modelling of production demand, used for purchases and production planning;
- Pricing - accurate assessment of logistics costs, assessment of added value;
- Distribution - compariing transport means and routes options, warehouse positioning;
- Optimization - reduction of logistics costs (transportation, storage), improving of logistics processes;
- Integration - flow analysis (internal and external material and information flows), research into the possibilities of combining efforts with partners.
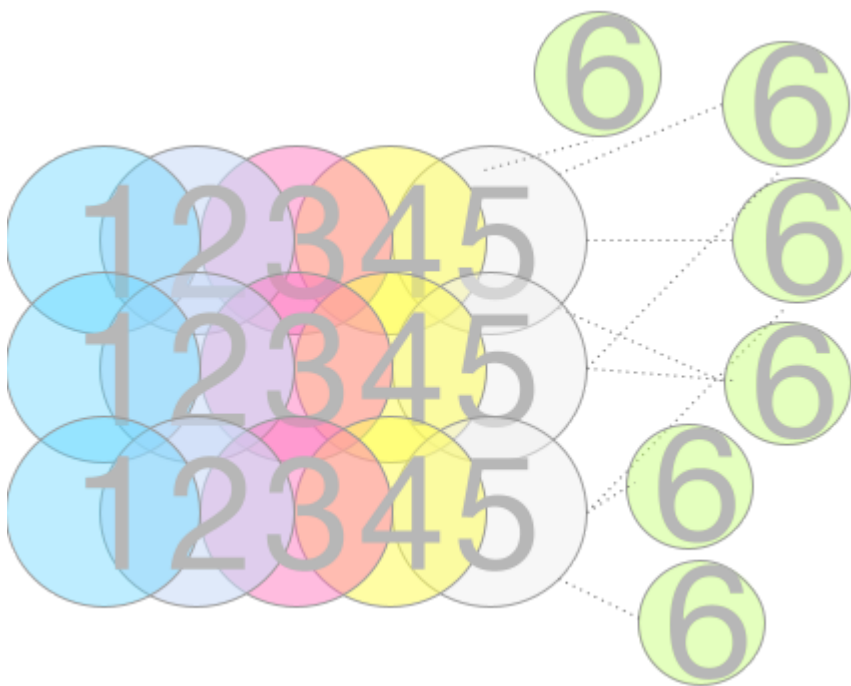

Figure 3. Complex integration of the elements in the supply chains

Key drivers of supply chain performance.

- Facilities - warehouses, workshops, terminals;
- Stocks - finished products, blanks, materials, consumables;
- Transport - roads, vehicles, transport routes;
- Information - documentation, databases and knowledge bases, methods for analysis and decision-making, software tools;
- Pricing - Cost Analysis;
- Procurement - vendor relationships, inventory control, supply optimization;

Efficiency of supply chains

SCM - effective integration of resource providers, production, warehouses, stores so that manufactured goods are delivered to end users with minimal costs of the entire system and satisfies customer needs and requirements.

Table 1. Six Target Indicators for Evaluating Supply Chain Performance

	Purpose (to be delivered...)	Indicators
Product	the right product	nomenclature scope, specific products, product customization
Quantity	the right quantity	indicators of availability, level of service, possibility of wholesale and retail supplies
Quality	the right level of quality	certificates, integrated quality control systems
Place	in the right place	territorial scope, positioning, exclusive access to the strategic resource
Time	at the right time	delivery frequency, response time
Expenses	with minimal costs	total costs, distribution of costs in the chain

Products:

- Range of products (how many SKUs it manages)
- Variety (how many different SKU types it manages)
- Products with special characteristics / requirements (short expiry date, dangerous, valuable, ...)
- Links between products (kits, ecosystem)
- Coverage of complex needs (the limits of the spectrum of services)
- Uniqueness of each item - customization - mass production
- Product/assortment renewal cycle

Quantity:

- Capacity (how many customers we can serve)
- Flexibility (no minimum order quantities)

Quality:

- Quality certificates
- Stability of quality
- Service quality

Place:

- Number of commercial establishments in the country
- Dislocation in key locations
- Average distance to object

Time:

- Delivery/Service Time
- Time management of inquiries
- Frequency and rhythmicity of deliveries

Cost:

- Price range
- Price stability
- Payment terms

Example:

Compare the efficiency of the following circuits (Ikea and Jysk):

Image sources: IKEA - https://en.m.wikipedia.org/wiki/file:Ikea_logo.svg; Jysk - https://en.m.wikipedia.org/wiki/File:Jysk_logo.svg;

Conflicts of interests between the participants in the SC

Partners may have conflicting interests that place their relationships in a competitive context. Their interrelationships are complex because their purpose must involve finding the appropriate balance between competition and cooperation. Through their connectivity, the members of the chain create conditions for each of them to concentrate on increasing the value for the end customer and reducing the time and costs of its creation.

Information system and coordination of material flows in a logistics chain

A logistics chain (LC) is a group of business entities linked by commercial contracts for joint activity with the aim of delivering goods and services to the end customer according to his requirements. The contract may be verbal. If there is no trade contract - no logistics chain - these are random transactions, not a logistics system. In this system of organizations, two levels are distinguished:

- exchange links between participants
- the production system in which resources are used and developed. Exchange relationships coordinate and direct activities in the production system where resources are used, combined and transformed into output. Due to the pooling of resources, coordination between actors is necessary to realize savings, but also to create innovative changes.

Main Logistics Operations:

- Preparation of goods for transport and warehouse operations.
- Grouping, consolidation.
- Cargo and unloading activity
- Domestic transport activities Logistics services - forwarding, cargo insurance, customs service, building a distribution network and a network for the removal of waste products.

Importance of supply chains for the Bulgarian economy

Factors affecting the economy of Bulgaria in the context of the organization of delivery processes:

- In Bulgaria, low-value goods are sold on foreign markets (EU, USA) with relatively high transport costs.
- The price of raw materials is constantly rising.
- The price of energy carriers is constantly increasing
- Bulgarian markets for raw materials and goods are becoming more and more distant.

Additional reading:

1. M. Rakovska. Supply chain management - a factor for competitiveness. Railway transport magazine. (*M. Раковска. Управление на веригата на доставките - фактор за конкурентоспособността. Списание Железопътен транспорт* original, archive)
2. M. Rakovska. Theoretical aspects of supply chain management. 2009. Scientific works UNSS (*M. Раковска. Теоретични аспекти на управлението на веригата на доставките. 2009. Научни трудове УНСС* original, archive)