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# The relationship of logistics to supply chain management: developing a common industry definition

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## Abstract

Over the past few years there has been confusion and disagreement among general business practitioners and operations professionals concerning the terms "logistics" and "supply chain management". Various formal definitions have been offered for both terms. In addition, the common usage of each term in industry varies. Business terms are often defined over time, by the common use or application of the term. Examines the historical definitions of both terms, looks at current practitioner views of the terms, and proposes a hierarchy for the relationship between logistics and supply chain management.

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## History and definitions of logistics

It is a common notion that logistics involves the movement of physical goods from one location to another. As long ago as the construction of the great pyramids, man was concerned with how to move materials to a construction site. The expansion from Europe to the Americas is another example of significant logistical challenges. Early references to logistics are found primarily in military applications. In an article as early as 1898 (Simpson and Weiner, 1989) logistics is discussed as:

Strategy is the art of handling troops in the theatre of war; tactics that of handling them on the field of battle ... The French have a third process, which they call logistics, the art of moving and quartering troops.

A 1947 publication (Simpson and Weiner, 1989) on the science of war stated:

The Americans use the word "logistics" to describe the technique of packing stores ... It is derived from the French *maître du logie*.

Logistics received much attention from the military during both World Wars. The Second World War necessitated greater movement of troops and supplies than any other period in history. *A Dictionary of Modern War* (Luttwak, 1971) described logistics as:

... all the activities and methods connected with the supply of armed force organizations, including storage requirements, transport and distribution. Since in modern conditions a wide range of equipment and supplies is employed in widely varied "mixes", logistics involves a great deal of planning and calculation as well as physical activities. The aim is to provide each echelon of the armed force organization with the optimum quantity of each supply item, in order to minimize both overstocking (which restricts mobility and causes diseconomies) and shortages of essential equipment.

Over time, the application of logistics has moved into the business arena. Although several business fields have separately defined logistics, one organization, APICS (Cox *et al.*, 1998), defines logistics in both the military and the business contexts:

In an industrial context, the art and science of obtaining, producing, and distributing material and product in the proper place and in proper quantities. In a military sense (where it has greater usage), its meaning can also include the movement of personnel.

In a true business context, Cavinato (1982) has defined logistics as:

... the management of all inbound and outbound materials, parts, supplies, and finished goods. Logistics consists of the integrated management of purchasing, transportation, and storage on a functional basis. On a channel basis, logistics consists of the management of the pre-production, in-production, and post-production channels. The term logistics should be distinguished from physical distribution in that the latter normally applies to only the post-production channel.

It should be noted that this definition expands logistics beyond merely physical distribution by including both incoming and outgoing materials.

The professional organization most closely associated with the logistics profession is the Council of Logistics Management (CLM). CLM (1998) defines logistics as:

... the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements. Note that this definition includes inbound, outbound, internal and external movements, and return of materials for environmental purposes.

Even though the common definition for logistics is very broad, the individuals actively working in logistics as a profession



are involved with the transportation of goods. The CLM (1998) stated:

There is a tendency on the part of other trade and professional associations to treat the Council of Logistics Management as a “shipper” organization. Most council members in fact are logistics service users – but the organization also has a significant number of logistics service suppliers (warehousers, carriers, consultants, etc.). The Council does not disagree with the connotation of a “shipper” organization. The members are considered “logistics service users”, which may or may not imply transportation and warehousing services.

From this background in the military and then into business usage, the term “logistics” has emerged as relating essentially to the movement and transmittal of goods, services and information. What is not always clear is how logistics differs from the more recently used term “supply chain management”.

### **History and definitions of supply chain**

The early beginnings of supply chain management can be traced to the textile industry with the Quick Response program and later to Efficient Consumer Response (ECR) in the grocery industry. More recently a variety of companies across many industries have begun looking at the entire supply chain process.

Owing to intense competition in the textile and apparel industry world-wide, leaders in the US apparel industry formed the Crafted With Pride in the USA Council in 1984 (Kurt Salmon Associates, 1993). In 1985, Kurt Salmon Associates were commissioned to conduct a supply chain analysis. The results of the study showed that the delivery time for the apparel supply chain, from raw material to consumer, was 66 weeks long, 40 weeks of which were spent in warehouses or in transit. The long supply chain resulted in major losses to the industry due to financing the inventory and lack of the right product in the right place at the right time. The result of this study was the development of the Quick Response (QR) strategy. QR is a partnership where retailers and suppliers work together to respond more quickly to consumer needs by sharing information. Significant changes as a result of the study were the industry adoption of the UPC code used by the grocery industry and a set of standards for electronic data interchange (EDI) between companies. Retailers began installing Point of Sale (PoS) scanning systems to transfer sales information rapidly to distributors and manufacturers. “Quick Response maximizes

the profitability of inventory by placing the company’s dollars where and when they are needed based on point of sale data plus sales history” (Mullin, 1994). Quick Response incorporates marketing information on promotion, discounts and forecasts into the manufacturing and distribution plan.

In 1992, a group of grocery industry leaders created a joint industry task force called the ECR Working Group. The group was charged with examining the grocery supply chain to identify opportunities to make the supply chain more competitive (Kurt Salmon Associates, 1993). Kurt Salmon Associates was engaged by the group to examine the grocery supplier/distributor/consumer value-chain and determine what improvements in cost and service could be accomplished through changes in technology and business practices.

The results of the study indicated that little change in technology was required to improve performance, other than further development of EDI and PoS systems. However, the study identified a set of best practices, which, if implemented, could substantially improve overall performance of the supply chain. Through implementation of Best Practices they projected an overall reduction in supply chain inventory of 37 percent, and overall cost reductions in the industry in the range of \$24 to \$30 billion (Kurt Salmon Associates, 1993).

A further development from ECR was the concept of Continuous Replenishment (CRP). CRP is a move away from pushing product from inventory holding areas to pulling products on to grocery shelves based on consumer demand (ECR Performance Measures Operating Committee, 1994). Point of purchase transactions are forwarded by computer to the manufacturer, allowing them to keep the retailer replenished and balanced just-in-time.

Various definitions of a supply chain have been offered in the past several years, as the concept has gained popularity. APICS (Cox, *et al.*, 1998) describes the supply chain as:

- 1) the processes from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies; and
- 2) the functions within and outside a company that enable the value chain to make products and provide services to the customer.

Another source (Lummus and Alber, 1997) defined supply chain as:

- ... the network of entities through which material flows. Those entities may include suppliers, carriers, manufacturing sites, distribution centers, retailers, and customers.

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The Supply-Chain Council (1997) uses the definition:

The supply chain – a term increasingly used by logistics professionals – encompasses every effort involved in producing and delivering a final product, from the supplier's supplier to the customer's customer. Four basic processes – plan, source, make, deliver – broadly define these efforts, which include managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer.

In addition to defining the supply chain, several authors have further defined the concept of supply chain management. As defined by Ellram and Cooper (1993), supply chain management is:

... an integrating philosophy to manage the total flow of a distribution channel from supplier to ultimate customer.

Monczka and Morgan (1997) stated that:

... integrated supply chain management is about going from the external customer and then managing all the processes that are needed to provide the customer with value in a horizontal way.

They believe that supply chains, not firms, compete and that those who will be the strongest competitors are those that

... can provide management and leadership to the fully integrated supply chain, including external customer as well as prime suppliers, their suppliers, and their suppliers' suppliers (Monczka and Morgan, 1997).

From these definitions, a summary definition of the supply chain (Lummus and Vokurka, 1999) can be stated as:

... all the activities involved in delivering a product from raw material through to the customer, including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer, and the information systems necessary to monitor all of these activities.

From this background in the textile industry and grocery industry, supply chain management has emerged as the term defining the integration of all these activities into a seamless process. It links all of the partners in the chain including departments within an organization and the external partners including suppliers, carriers, third-party companies, and information systems providers. It encompasses the processes necessary to create, source, make to and deliver to demand. It includes the technology to gather information on market demands

and exchange information between organizations. A key point in supply chain management is that the entire process must be viewed as one system. The performance of each member of the supply chain (suppliers, manufacturing plants, warehouses, customers, etc.) affects the overall performance of the supply chain.

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### **The relationship of logistics to supply chain management**

With the increased interest in supply chain management, several authors have discussed the differences between this newer term, supply chain management, and logistics. Cooper *et al.* (1997) stated that a "contemporary understanding of SCM is not appreciably different from the understanding of integrated logistics management". However, these same authors suggested that a broader understanding of supply chain management was emerging, one that "includes the integration of business processes from end use through original suppliers that provides products, services, and information that add value for customers. Supply chain management is not just another name for logistics. It includes elements that are not typically included in a definition of logistics, such as information systems integration and coordination of planning and control activities."

As Giunipero and Brand (1996) stated, "in its broadest context supply chain management is a strategic management tool used to enhance overall customer satisfaction that is intended to improve a firm's competitiveness and profitability." They added that "CEOs of companies leading the drive to implement supply chain management visualize the necessity to go beyond the logistics function and focus on making business processes more effective and efficient." Johnson and Wood (1996) similarly concluded that "supply chain management is somewhat larger than logistics."

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### **Logistics and supply chain definitions in practice**

To get a sense of the application of the terms "logistics" and "supply chain", as used in industry, we surveyed a small sample of materials management professionals. The authors solicited responses from two large manufacturing firms, two large retailers, and two third-party logistics providers. These firms might represent partners in a typical supply chain. This is not meant to be a

definitive sample, nor are we implying that the sample can be generalized to all professionals and industries. Instead, it shows examples of how the terms are currently used in industry and demonstrates the lack of common agreement on a definition by all parties in the supply chain.

The manufacturing companies were both *Fortune* 500 companies that produce consumer goods. The retailers were two of the top ten retail companies in the USA by sales volume. The logistics providers were regional logistics companies that provide transportation service, warehousing and reverse logistics capabilities. All the respondents were senior managers or above in their organizations with titles such as manager of supply management and vice-president of supply chain management.

Each respondent was asked to reply to the following questions:

- How do you define supply chain?
- How do you define logistics?
- How are the areas related?

The results are summarized in Table I.

As shown in Table I, the industry practitioners' definitions of logistics essentially discuss the physical flow of materials. Each of the respondents mentioned transportation or physical movement of goods. There is no specific mention of information transfers. Some of the definitions allude to logistics as a functional operation within the organization.

Common to the definitions of supply chain management are "processes" (included by four practitioners) and "integration". Other distinguishing words in these industry definitions are "solutions" and "delivery to the final/ultimate consumer". One practitioner also mentioned information and finances.

Some of the respondents indicated that logistics takes place within the realm of the supply chain. In this context, logistics seems to be more tactical or operational, and could be considered the execution of supply chain management activities. Supply chain management might be viewed as more strategic in nature (as indicated by retailer no. 2).

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## Discussion

The variety of definitions indicates that there is a general agreement on what logistics entails. What is common throughout all definitions of logistics is that it entails the process of planning and controlling the flow and storage of goods and services from the point of origin to the customer, conforming to

customer requirements. This definition is generally considered to include inbound, outbound, internal and external movements, and return of materials to the company and the movement of both raw material and finished goods. This definition is reinforced by the information provided by the materials management practitioners summarized in Table I. It is interesting to note that one of the third-party logistics providers expanded the definition to include all of internal operations from sales forecasting to delivery to the client.

Based on the earlier definitions of supply chain management and logistics, it is important to understand the hierarchy of the relationship between logistics as a profession and supply chain management. Supply chains include all the activities involved in delivering a product from raw material to the customer, including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer, and the information systems necessary to monitor all of these activities. Supply chain management links all of the partners in the chain including departments within an organization and the external partners including suppliers, carriers, third-party companies, and information systems providers.

This definition of supply chain implies that the logistics function is performed within a given supply chain at multiple locations. A factory's logistics function would include managing raw material shipment and finished goods delivery; while the retail node's logistics function would include transferring finished product from manufacturers, distribution centers or wholesalers to the retail location. As one of the third-party logistics providers summarized it, "logistics is the implementation of just how this flow in the supply chain is accomplished". This concept of logistics is consistent with the definition provided earlier and with the CLM definition. Figure 1 describes the logistics function within a consumer goods supply chain. The straight lines in the Figure represent the information needs throughout the supply chain. Each node in the chain must have information on both demand and supply throughout the chain.

In this depiction of supply chain management and logistics, the supply chain includes activities at the nodes in addition to the physical transfer of materials and transmittals of information between the nodes. It includes the activities and processes

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**Table 1**  
Practitioner definitions

Type of firm	How do you define supply chain?	How do you define logistics?	How are the areas related?
<b>Manufacturer no. 1</b>	An end to end process beginning with the supplier and ending at the consumer. Supply chain encompasses purchasing, manufacturing and logistics	The transportation, warehousing and physical distribution processes within the supply chain	Logistics is a subset of the overall supply chain process. In order to have an efficient chain, logistics processes must be well defined and cost effective
<b>Manufacturer no. 2</b>	Supplier to manufacturer to dealer to end-user	Logistics is made up of transportation and warehousing	Logistics works to transport material through the supply chain as cost-effectively as possible
<b>Retailer no. 1</b>	Supply chain management is the group responsible for a consistent review process of the end-to-end flow of product from the vendor (and in some cases raw material supplier) to the customer, that results in production focused “best-in-class” supply chain solutions, improving the “just-in-time” flow of merchandise	Logistics is the resource group that supports the physical movement of merchandise through the supply chain. This group includes: transportation, distribution center operations (inbound transportation, receipt, storage, processing and merchandise delivery to the stores), import, and vendor communications	Supply chain management and logistics are intertwined, as can be noted from the job descriptions. Good communications must exist between the two areas and each must have strong support from the other's upper management
<b>Retailer no. 2</b>	The sum of all overt management actions taken to integrate total pipeline solutions that directly link these or more organizations in the making, sourcing or movement of products, services, finances, or information	The art and science of adding value through the synchronized management and sequencing in the movement of related variables, events, and objects across both time and geography	Logistics is the overall umbrella that houses all functional support areas that provide planning, execution, and administrative support of delivering product to our stores and DCs. Supply chain management has three functions; a) develop strategic logistics capabilities, b) guide the planning and alignment of the retail supply chain and c) integrate logistics into our procurement processes.
<b>Third-party logistics no. 1</b>	Supply chain is the concept of looking at and managing the total process through which a product or commodity goes from acquiring the raw materials, to production (manufacturing) of the product and delivery to the final consumer	Logistics is the implementation of just how this flow in the supply chain is accomplished or physically moved	Logistics is an integral part of the supply chain. The logistics, precise planning of the flow and movement of the chain, is the key to making the supply chain work
<b>Third-party logistics no. 2</b>	Product processing by multiple organizations from raw materials through delivery to the ultimate consumer	An organization's internal operations from sales forecasting through delivery to the client including purchasing, operations, distribution and transportation of all components and final product	“Supply chain” involves multiples companies for a complete process and “logistics” is the complete applicable portion of the process within the company

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at the nodes including the identification of needs, design of products and services to meet those needs, and all other processes for planning, scheduling, processing and delivering the product.

## Conclusions

The terms "supply chain management" and "logistics" are often confused and viewed as overlapping, depending on the definition used by an organization. The intent of this paper is to clarify the activities included in each of these management functions and to develop a hierarchical relationship between the activities. Practitioners along a typical consumer supply chain were asked to provide their definitions of both logistics and supply chain management and define how the two were related.

The logistics profession involves planning, implementing and controlling efficient, effective flow and storage of goods and services from the beginning point of external origin to the company and from the company to the point of consumption for the purpose of conforming to customer requirements. Logistics is generally viewed as within one company, although it manages flows between the company and its suppliers and customers. Supply chain management includes the logistical flows, the customer order management and production processes and the information flows necessary to monitor all the activities at the supply chain nodes. This difference in the literature was reinforced through a sample of industry practitioners. A common understanding is

necessary, as firms become supply chain partners and begin working together to improve overall supply chain performance.

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**Figure 1**  
Consumer supply chain

