Introduction to Supply Chain Management

Unit

1

Unit 1

Introduction to supply chain

Learning objectives:

On successful completion of this unit the learner will be able to:

- ✓ Define supply chain management and logistics
- ✓ Explain the vertical and virtual integration models
- ✓ Identify participants in the supply chain

Defining the Terms

What is Logistics?

The idea of logistics originated with the military centuries ago. Today, the Council of Supply Chain Management Professionals says that, "Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. […] Logistics management is an integrating function which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions, including marketing, sales, manufacturing, finance, and information technology."

(Source: http://cscmp.org/about-us/supply-chain-management-definitions)

What is Supply Chain Management?

According to the Council of Supply Chain Management Professionals, "Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies."

(Source: http://cscmp.org/about-us/supply-chain-management-definitions)

In other words, supply chain management is about the processes and activities that take a product from its conception to termination. This involves the following processes:

- Inbound and outbound logistics (receiving, storing, and distributing goods)
- Operations (how the goods are produced)
- Sales and marketing
- Customer service (including support, maintenance, etc.)

The goal of supply chain management is to reduce the complexity of the supply chain, increase its flexibility, and improve its efficiency and responsiveness. Supply chain management professionals focus on a holistic approach that tries to create long-term advantages that benefit all aspects of the business. Effective cost management and optimum profits are valued, as well as the supply chain's ability to quickly adapt to ever-changing markets.

The Six Rights

The goal of supply chain management can also be described using the six rights model: having the right product in the right place, at the right time, in the right quantity and condition, and at the right cost.

In some industries, these rights have been expanded to include "with the right documentation" and "using the right method."

Not Just for Products

The supply chain applies to any business or organization that you can think of, whether they are delivering a product or a service.

For example, you might not think that a hospital has a supply chain. Think again! What steps would need to be taken for a patient to have surgery?

- A building would need to be present with the necessary facilities (operating room, hospital bed, etc.)
- Staff would need to be hired to register the patient, draw blood, perform anesthesia, perform the operation, manage the patient's recovery, and perform housekeeping tasks
- Surgical tools and supplies would need to be procured
- The entire process would require support staff, such as finance and human resources

Regulations and Resources

Do You Know the Rules?

Many areas of supply chain management are highly regulated. This can include:

- Customs and duty requirements
- Transportation regulations (such as how many hours per day or week that a truck driver can drive)
- Labeling and handling of hazardous goods

- Tracking and traceability of products like pharmaceuticals and restricted chemicals
- Food handling and refrigeration requirements
- Security requirements

Be sure that you know what rules apply to you for the areas that you operate in.

Resources to Consider

Here is a list of supply chain and logistical organizations around the world. Please note that this list was accurate at the time of printing. We take no responsibility for any errors, whether by omission or inclusion.

Organization	Region	Website
African Center for Supply Chain	Africa	http://supplychain-africa.org/
West African Institute for Supply Chain Leadership	Western Africa	http://waiscl.knust.edu.gh/
Supply Chain Asia	Asia	http://www.supplychainasia.org/
Supply Chain and Logistics Association of Australia	Australia	https://www.sclaa.com.au/
Supply Chain Management Association	Canada	http://www.scmanational.ca/
Council of Supply Chain Management Professionals	Global	http://www.cscmp.org/
Institute for Supply Management	Global	http://www.ism.ws/
International Warehouse Logistics Association	Global	http://www.iwla.com/
Supply Chain Council	Global	https://supply-chain.org/
European Logistics Association	Central/Western Europe	http://www.elalog.eu/

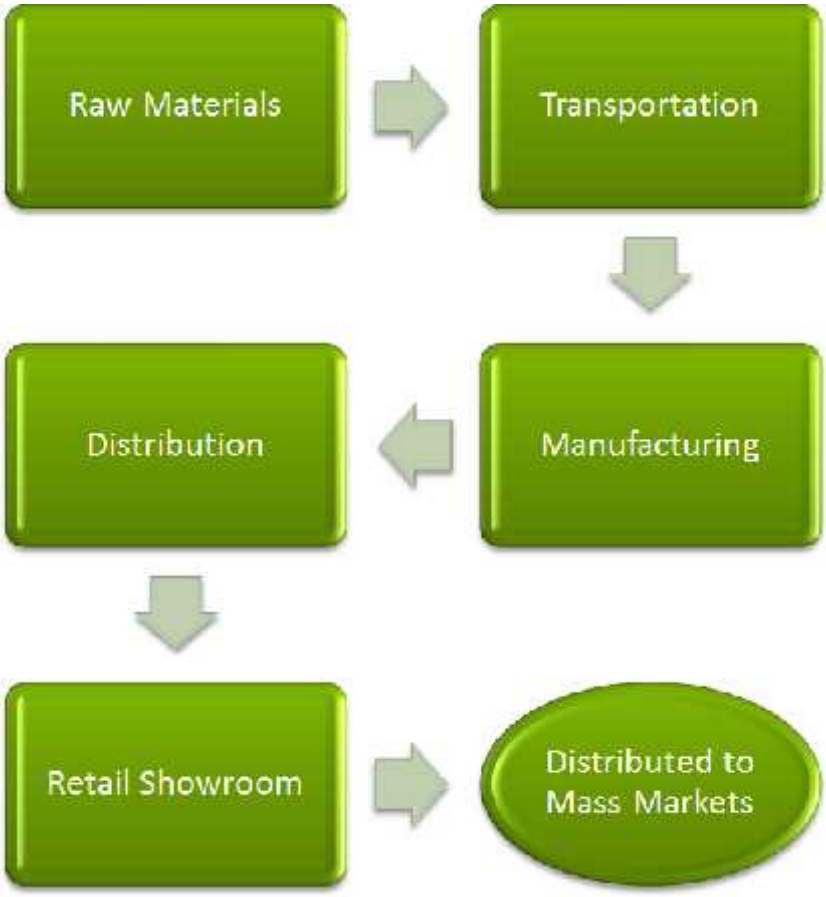
Organization	Region	Website
Supply Chain Institute of Southeastern and Central Europe	Southeastern/ Central Europe	http://www.scisce.eu/
Logistics and Supply Chain Management Society	Singapore	http://lscms.org/
American Production and Inventory Control Society (APICS)	United States	http://www.apics.org/
American Society of Transportation and Logistics	United States	http://www.astl.org/

The Evolution of the Supply Chain

Vertical Integration Model

One of the earliest iterations of the industrial supply chain was the process used by Ford to make cars. They owned farms, mines, and factories to make all of the different elements needed for a car. Raw materials like steel, lumber, and cloth were then turned into parts, tires, and seats, and then assembled together to make a car.

With this model, all supply chain functions are done in-house, as shown in the model below.

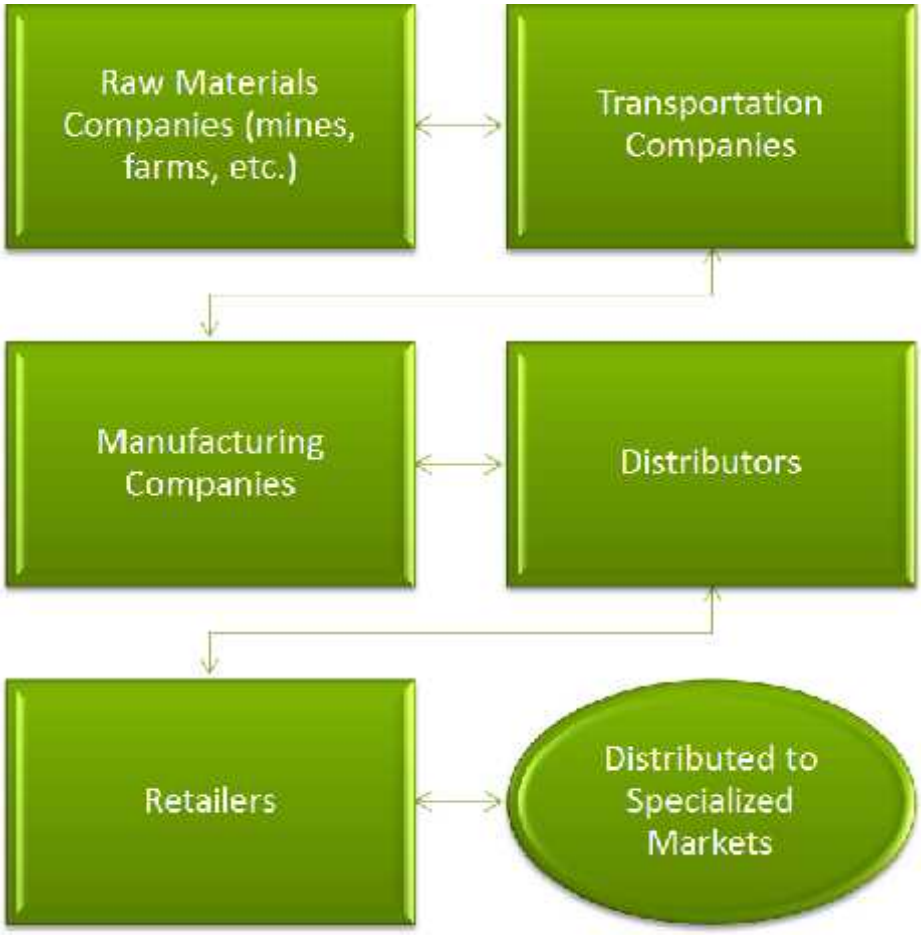


Virtual Integration Model

As the 20th century progressed, more products became available for purchase and customers began to expect more options and higher levels service. Henry Ford's old motto of, "Customers can have it [the Model T] in any color, as long as it's black," no longer sufficed.

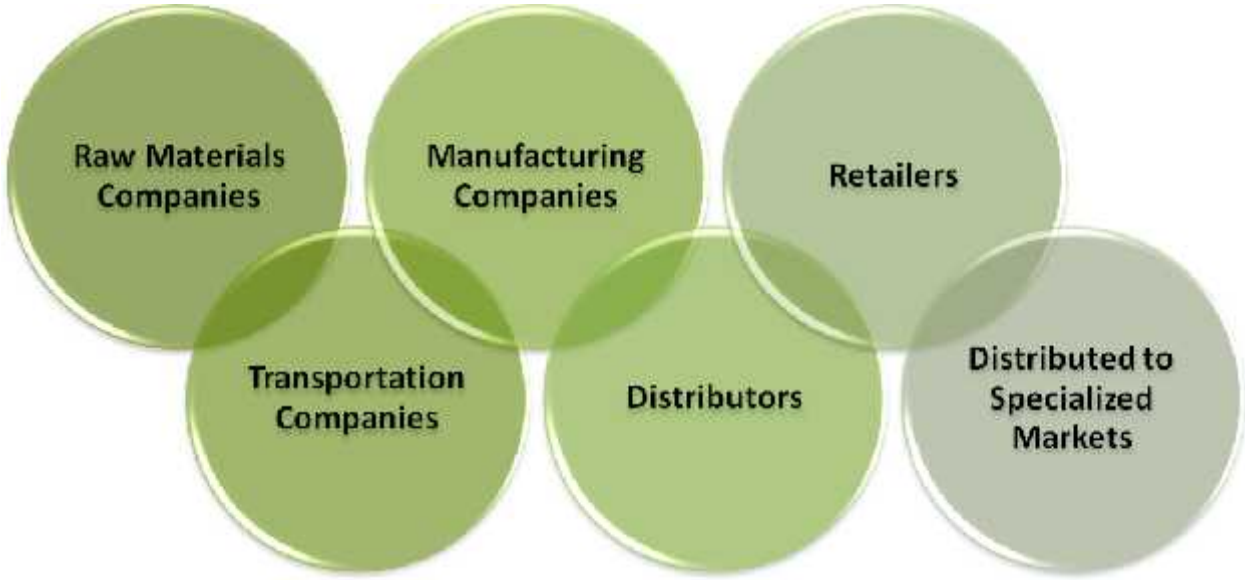
As products became more specialized, companies started to become more specialized as well. Instead of producing everything themselves, they leveraged partnerships so that they could focus on their core skills. This enabled companies to be more responsive and flexible, and to produce a wider variety of products.

This results in a model where different companies come together to perform different functions of the supply chain, as shown below.



What's Next?

The pace of change has accelerated greatly as we enter the 21st century. Companies have taken the virtual integration model to the next level, with real-time supplier integration, online tools to manage flow and products, and improved tracking and metrics. As a result, many supply chains today are more flexible and responsive than Henry Ford could have ever imagined.



The Basic Supply Chain Structure

The Links in the Supply Chain

The SCOR model (developed by the Supply Chain Council) is one of the most common representations of the flow of a typical supply chain. Its simplified version typically involves the stages described below.

Plan

The first stage involves planning what will happen in the subsequent stages. This includes:

- Forecasting product demand
- Prioritizing requirements and requests
- Assessing current and required resources (people, machinery, technology, raw materials, etc.)
- Planning to bridge resource gaps
- Planning production and inventory levels
- Establishing price points and sales strategies

Source

The next stage involves procuring the items necessary to make the product. This includes:

- Ordering, receiving, and inspecting materials required
- Ensuring that all necessary resources are in place
- Receiving or issuing payment
- Organizing materials and distributing goods to manufacturing

Make

Once all the pieces are in place, the product can be created. This includes:

- Requesting and receiving the materials and resources required
- Manufacturing, testing, packaging, and releasing products
- Managing manufacturing facilities

Deliver

The fourth stage is all about getting the product to its destination, including:

- Customizing the product or service
- Creating price quotes
- Receiving, fulfilling, and invoicing customer orders
- Managing data about customers and products
- Managing accounts receivable, credit, and collections
- Warehousing processes (such as picking and filling orders)
- Shipping and transportation processes

Return

The final stage is handling any products that need to return to the distributor or manufacturer. This might include:

- Processing returns and defective merchandise
- Managing recalls
- Overseeing the process to replace merchandise
- Managing warranties and guarantees
- Recycling and re-use programs

Participants in the Supply Chain

There are five main categories of participants in the supply chain.

Producers

This part of the supply chain is involved in the Source and/or Make phase of the supply chain. Their role is to produce raw or finished goods, or to perform a service.

Some examples of producers could include:

- A gold mine
- A cattle ranch

- A banana plantation
- A surgeon
- A software developer
- A graphic designer

Distributors

This part of the supply chain is responsible for the Deliver and/or Return phases of the supply chain. They are the people who take the products from the producers and deliver them to retailers. They are often responsible for inventory and transportation functions.

Retailers

Retailers take inventory from distributors and sell it to customers. They are responsible for implementing, and in some cases designing, price and product strategies. Their role is to make sure that products are available when customers want them.

Increasingly, distributors are delivering the product directly to the customer without a retailer. Services like Amazon and Expedia eliminate the retailer and allow the customer to play a more active part in the supply chain.

Customers

This is the end user of a product, whether it is an organization or an individual. They may be purchasing the product to use for manufacturing another product, or they may be the final user (referred to as the consumer of the product).

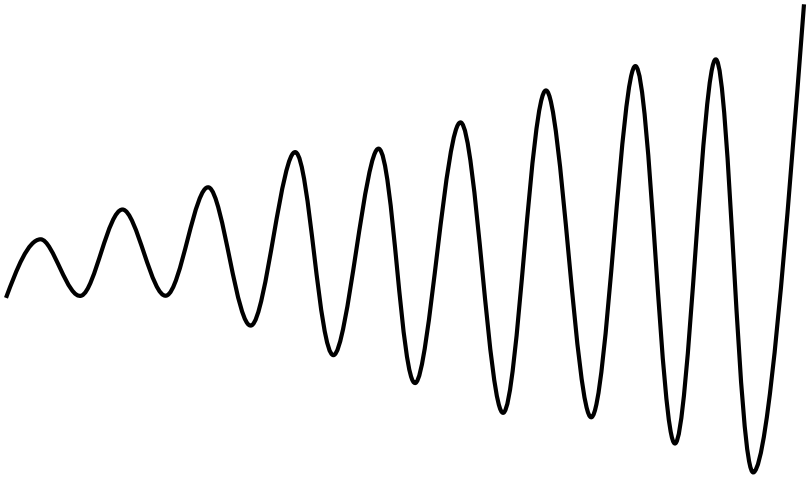
Service Providers

This is the part of the supply chain that supports other functions. Often, they specialize in a particular area, like transportation, financial services, or warehouse management.

The Bullwhip Effect

What is the Bullwhip Effect?

The bullwhip effect, also known as the Forrester effect, can disrupt flow throughout the supply chain. It describes the phenomenon where variations increase the farther that a supply chain activity occurs from the customer. It is called the bullwhip effect because that is what it looks like when represented as a graph:



Case Study

Here is a simple example. A customer orders four units of an item. The retailer orders five units since that is the minimum order amount required by the distributor. The distributor then orders 10 units to save on shipping costs. The manufacturer makes 20 units since it is cheaper than making 10. We now have a supply of 20 units to meet the original demand of four.

Let's say that 10 of these units are sent to the retailer. The retailer puts the extra six units on sale to get rid of the excess inventory. The sale causes a massive increase in demand, so the retailer orders 20 units the next time he places an order. The distributor thinks that the retailer knows something that he doesn't about an upcoming trend, so he orders 50 units. The manufacturer may then increase production even further, perhaps to 100 units. This is the end spike shown in the graph above.

What Causes the Bullwhip Effect?

The following factors can contribute to the bullwhip effect:

- Placing orders for goods based on incorrect data
- Overreacting or underreacting to demand trends
- Lack of visibility throughout the supply chain
- Waiting to place a number of orders at once
- Variations in price (such as increased/decreased price due to product availability or shortage)
- Disruption in the supply chain (for example, shipping being delayed due to weather events)

How Do You Minimize the Bullwhip Effect?

Supply chain management best practices can help minimize the bullwhip effect. This includes:

- Gathering and tracking accurate data from all levels of the supply chain
- Developing visibility
- Reducing complexity
- Frequently evaluating product supply versus demand
- Identifying risks and creating backup plans to mitigate their impact

Test Your Knowledge

What examples can you think of for the bullwhip effect?