

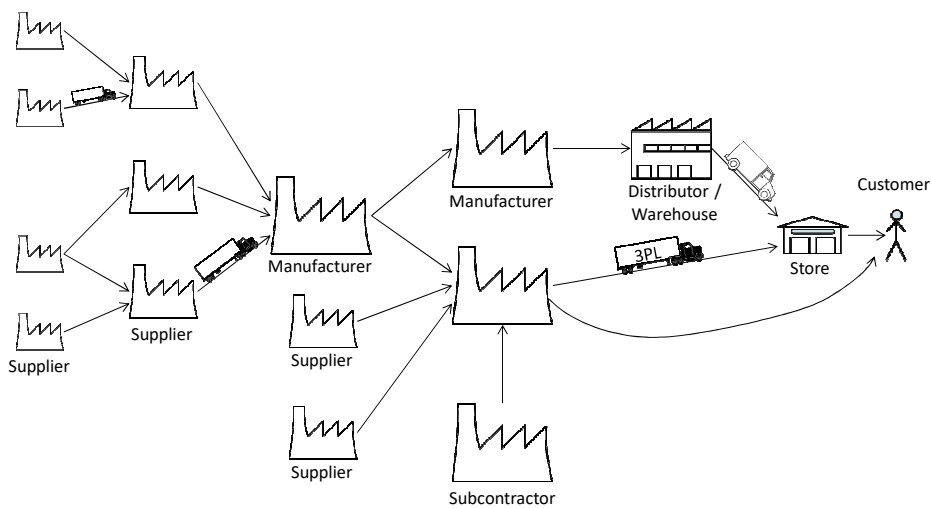
Introduction

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What is a supply chain?



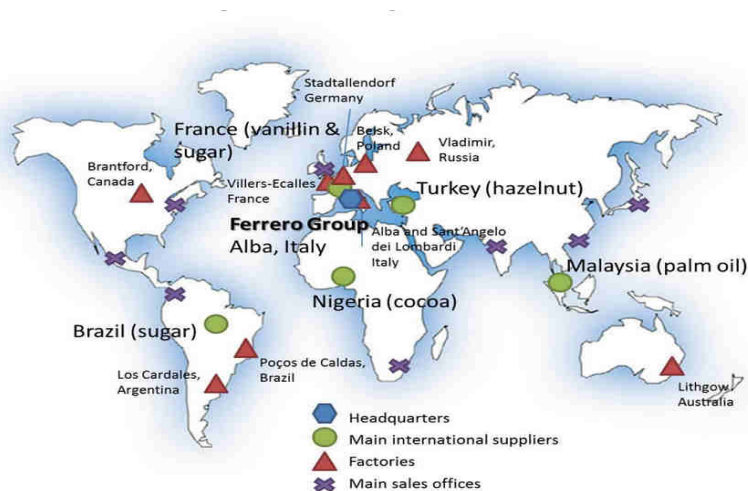
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What is a supply chain?

- A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request for a product or a service
- Many actors are involved:
 - Manufacturers
 - Suppliers
 - Wholesalers / Distributors / Retailers
 - Transporters/3PL
 - Subcontractors
 - Customers



What are we going to talk about?

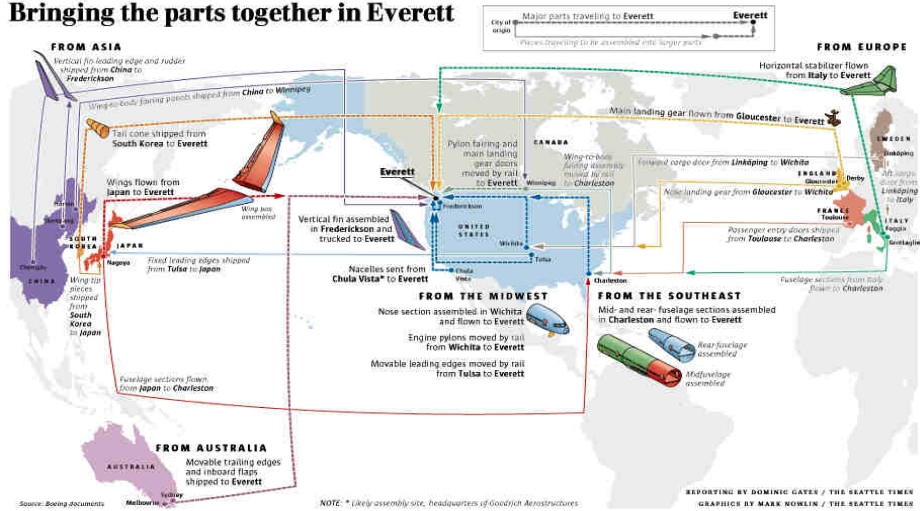


Source: [washingtonpost.com](http://www.washingtonpost.com)



What are we going to talk about?

Bringing the parts together in Everett



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Source: seattletimes.nwsourc.com

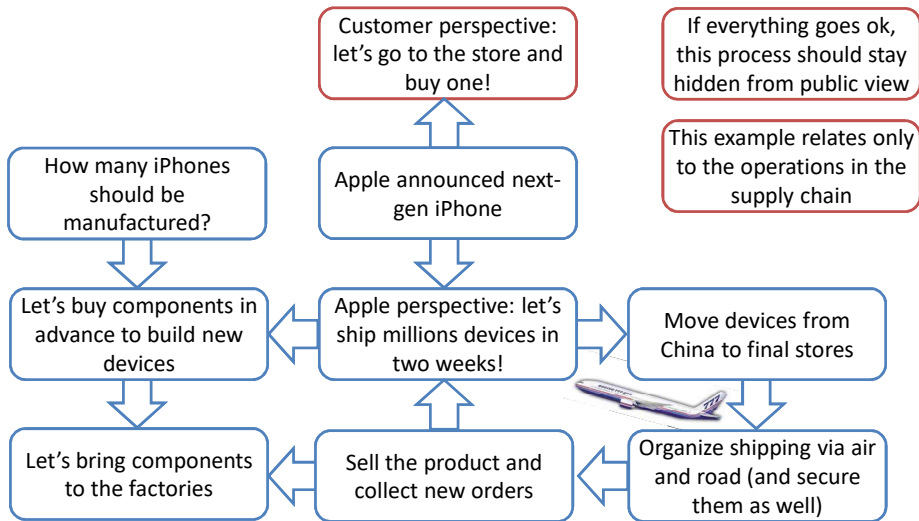
What are we going to talk about?



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Source: iter.org

A real-life example



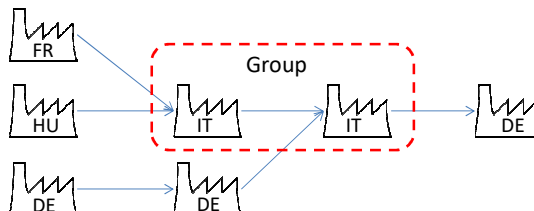
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Adapted from: bloomberg.com

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SC configuration characteristics

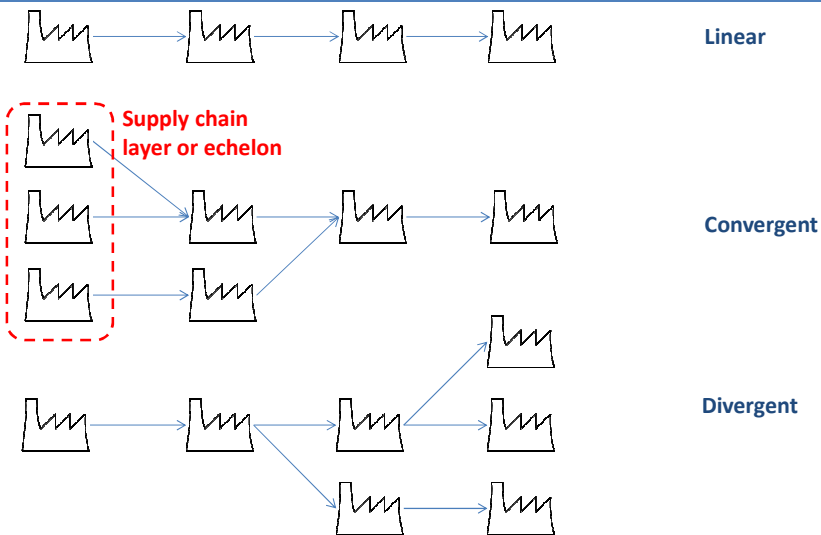
- Number of levels
- Number of facilities per level
- Level of integration
- Geographical extension



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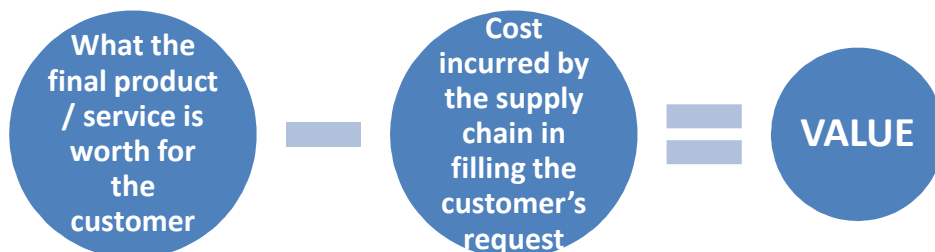
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SC configuration characteristics



What is the objective of a supply chain?

- The objective is to maximize the **overall value generated**
- What is value? A simplified definition...

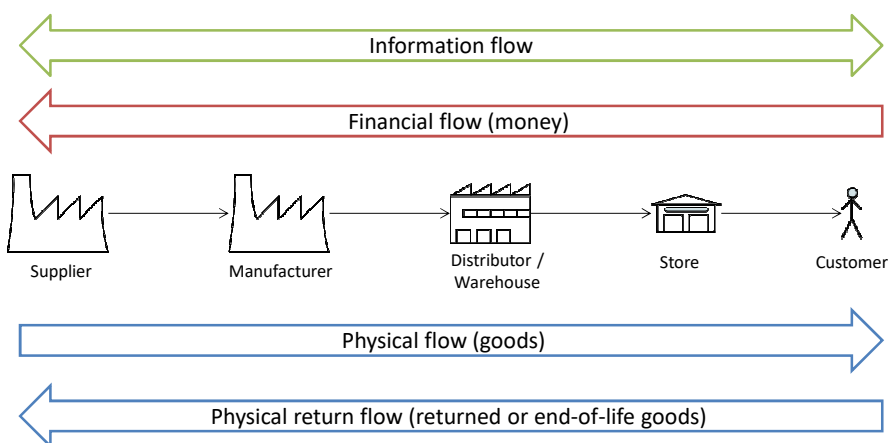


What is supply chain management (SCM)?

- Supply Chain Management (SCM) is the management of supply chain assets, products, information, and fund flows to maximize the total supply chain value
- SCM deals with efficient and effective material, financial, and information flows



Supply chain flows



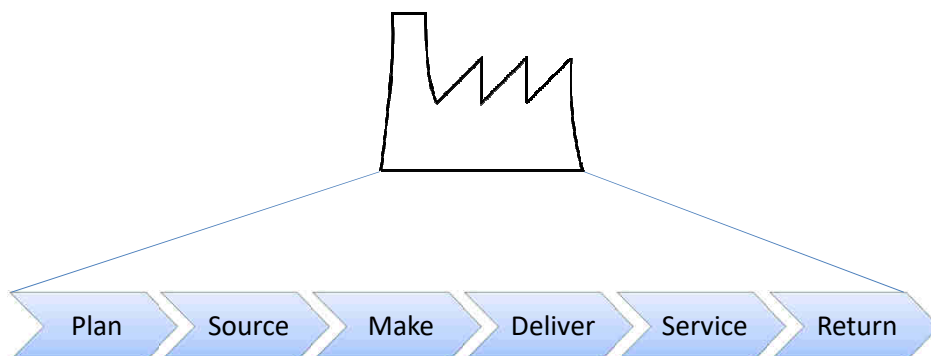
What is supply chain management (SCM)?

- SCM encompasses several processes
 - Internal perspective
 - External (interface) perspective
 - Focal company perspective

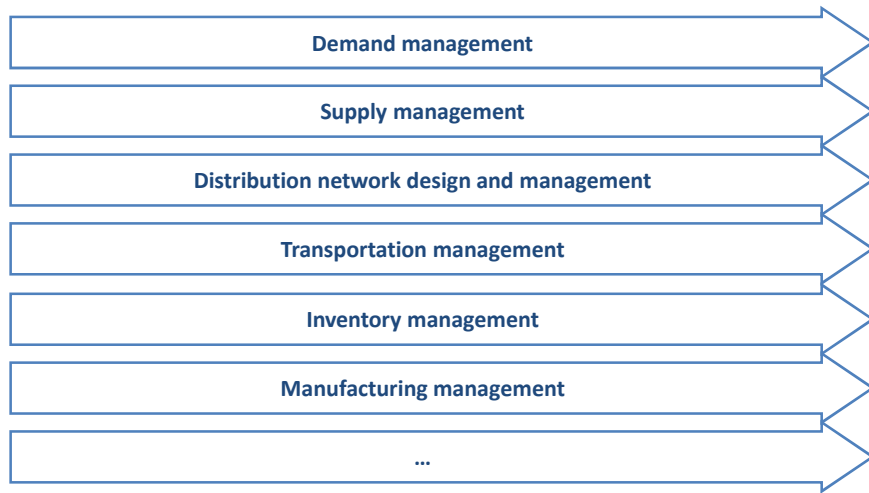


What is supply chain management?

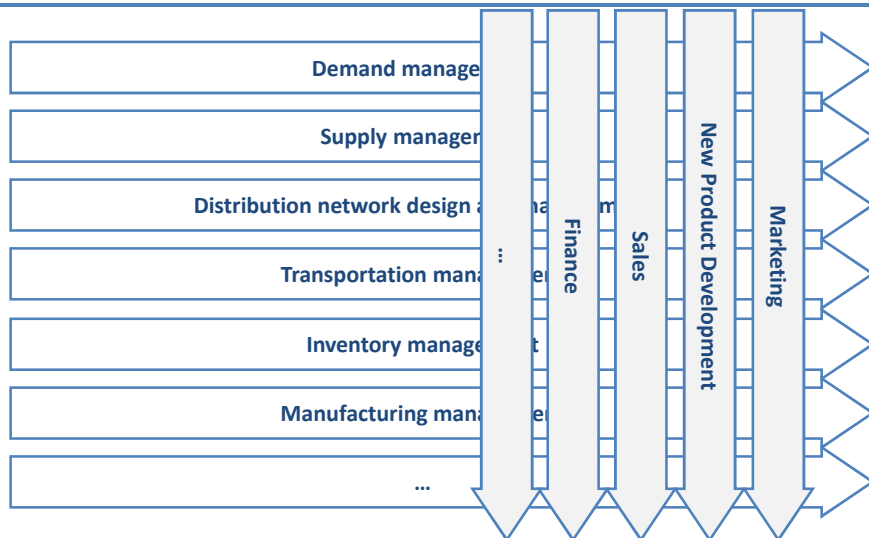
- Internal perspective



Main supply chain management processes

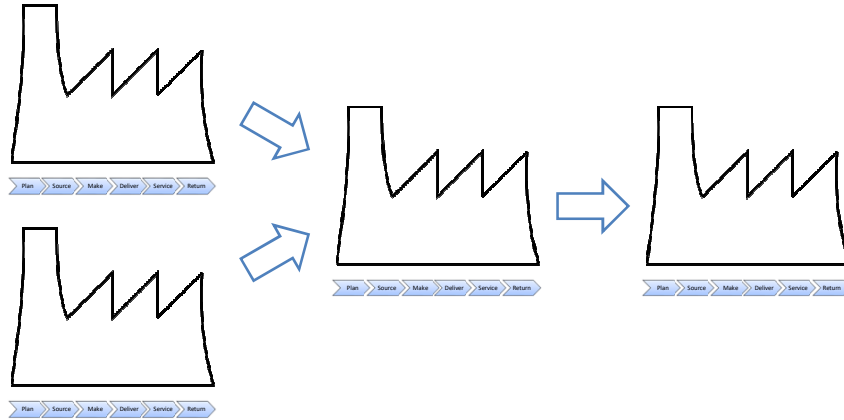


Main supply chain management processes

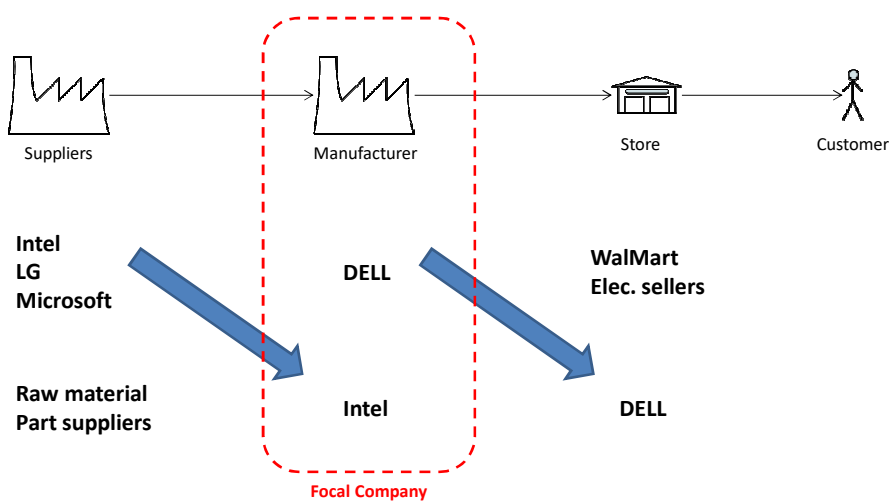


What is supply chain management?

- External (interface) perspective



The focal company perspective

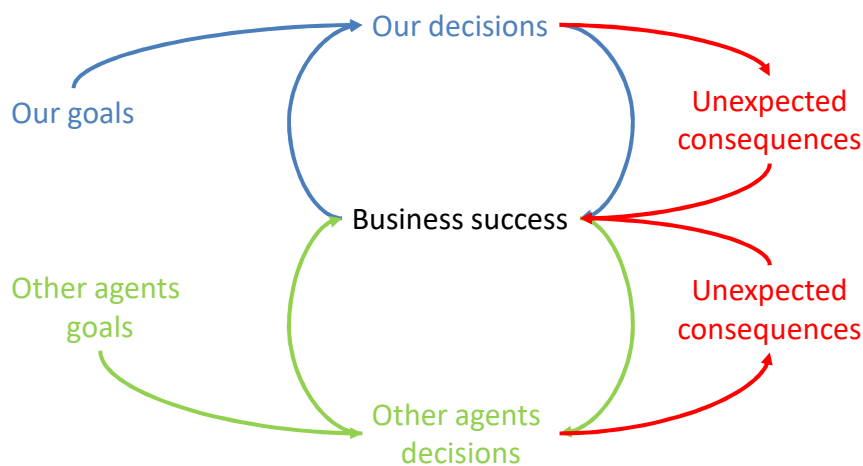


SCM impact on the balance sheet

		2016	Riduzione 10% trasporto	Riduzione 10% warehousing	Riduzione 10% inventory
Sales	S	€ 150.000	€ 150.000	€ 150.000	€ 150.000
Cost of goods sold	COGS	€ 80.000	€ 80.000	€ 80.000	€ 80.000
Gross margin	GM = S - COGS	€ 70.000	€ 70.000	€ 70.000	€ 70.000
Transportation	TC	€ 6.000	€ 5.400	€ 6.000	€ 6.000
Warehousing	WC	€ 1.500	€ 1.500	€ 1.350	€ 1.500
Inventory carrying	IC	€ 3.000	€ 3.000	€ 3.000	€ 2.700
Other operating costs	OOC	€ 30.000	€ 30.000	€ 30.000	€ 30.000
Total operating cost	TOC	€ 40.500	€ 39.900	€ 40.350	€ 40.200
Earnings before interest and taxes	EBIT	€ 29.500	€ 30.100	€ 29.650	€ 29.800
Interest	INT	€ 12.000	€ 12.000	€ 12.000	€ 12.000
Taxes	TX	€ 7.000	€ 7.240	€ 7.060	€ 7.120
Net income	NI	€ 10.500	€ 10.860	€ 10.590	€ 10.680
Asset deployment					
Inventory	IN	€ 10.000	€ 10.000	€ 10.000	€ 9.000
Accounts receivable	AR	€ 30.000	€ 30.000	€ 30.000	€ 30.000
Cash	CA	€ 15.000	€ 15.000	€ 15.000	€ 15.000
Fixed assets	FA	€ 90.000	€ 90.000	€ 90.000	€ 90.000
Total assets	TA	€ 145.000	€ 145.000	€ 145.000	€ 144.000
Ratio analysis					
Profit margin	NI/S	7,00%	7,24%	7,06%	7,12%
Return on asset (ROA)	NI/TA	7,24%	7,49%	7,30%	7,42%
Inventory turns	COGS/IN	8,00	8,00	8,00	8,89
Transportation as % of sales	TC/S	4,00%	3,60%	4,00%	4,00%
Warehousing as % of sales	WC/S	1,00%	1,00%	0,90%	1,00%
Inventory carrying as % of sales	IC/S	2,00%	2,00%	2,00%	1,80%



A systemic perspective



Major trends involving SCM

- **Shift in global economic power**
 - By 2030 the size of the leading emerging economies will overtake that of the current G7 group → new market, new territories, new rules...
- **Demographic & social change**
 - By 2025 the world's population will be about 8 billion → new customers? Less resources?
- **Technological breakthroughs**
 - New products, new services, new cost structures, new SC structures...
- **Climate change and resource scarcity**
 - An increase of 35% in food demand is expected by 2030
- **Rapid urbanization**
 - By 2025 it is expected that there will be 37 megacities (up from 23 today)



Other factors influencing SCM

- **Densification of Product**
- **Diversification of Sales Channels**
- **Decentralization of Production**
- **Digitization of Products**
- **Complexity**
- **Cost /value**
- **Technology**
- **Supply chain security**



Importance of inter-company coordination

- SCM pursues the coordination of the SC, occurring when all the stages of a SC work towards a common objective of maximizing the total SC value
- Coordination is based on information sharing
- Lack of coordination can results in significant losses



Supply chain management key decisions

- SCM encompasses three decisions phases



- SCM decisions differ in:
 - Frequency
 - Time frame of impact



Supply chain management key decisions

Decision phase	Frequency	Time frame of impact	Example of key decisions
SC Design	Very low (i.e. once every 5 years)	Long, several years	<ul style="list-style-type: none"> • SC configuration • SC facility location and size • Insource / outsource • Process definition • Transportation available
SC Planning	Medium to high (3-4 times per year)	Few months (configuration is fixed)	<ul style="list-style-type: none"> • Strategic forecasting • Supplier selection and mngt • Inventory and production policies • Market promotions
SC Execution	Very high (daily or weekly)	Short, few days or weeks (policies are fixed)	<ul style="list-style-type: none"> • Order fulfillment & shipment • Inventory allocation • Inbound / outbound logistics • Expediting • Short term forecasting



SCM vs Logistics

- Logistics is that part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods, services and related information
- Logistics is a part of the SCM
- SCM is a broader concept than logistics



SCM vs Logistics

- Logistics typical activities
 - In-bound transportation
 - Out-bound transportation
 - Storage / warehousing
 - Materials handling
 - Inventory control
 - Order fulfillment
 - *(Forecasting)*
 - *(Production planning)*
 - *(Packaging)*



SCM as Risk Management

- Modern supply chains are exposed to numerous kinds of events that may disrupt the course of their businesses
- These events are usually:
 - **Random** (they have a probability of occurrence)
 - **Disruptive** (they have a relevant impact on the performance)
- Managerial decisions always entail risks



SCM as Risk Management

- **Management of risk:** entails decisions and actions to:
 - **Reduce** the exposure to risks
 - **Mitigate** the consequences of risks
 - **Counterbalance** the impacts

- **SCM is all about managing risks!**



Appendix: the SCOR™ model

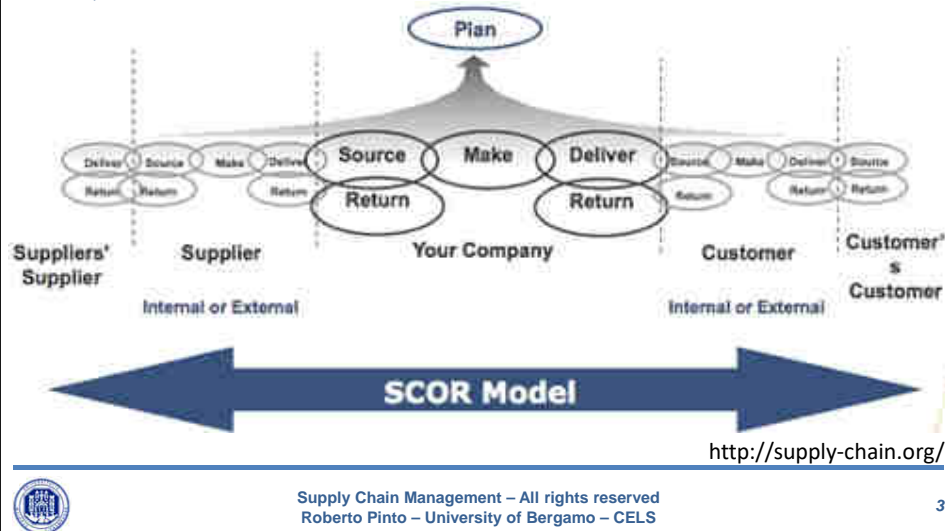
- The Supply Chain Operations Reference (SCOR®) model is the product of Supply Chain Council (SCC), an independent, nonprofit, global corporation
- SCOR® helps manage a common set of business problems through a standardized language, standardized metrics, and common business practices which accelerate business change and improve performance

<http://supply-chain.org/>



Appendix: the SCOR™ model

SCOR is organized around the five primary management processes of Plan, Source, Make, Deliver, and Return



Appendix: the SCOR™ model

- Provides performance indicators for the supply chain:
- **Reliability:** achievement of customer demand fulfillment on-time, complete, without damage etc.
- **Responsiveness:** the time it takes to react to and fulfill customer demand
- **Agility:** the ability of supply chain to increase/decrease demand within a given planned period
- **Cost:** objective assessment of all components of supply chain cost
- **Assets:** the assessment of all resources used to fulfill customer demand

<http://supply-chain.org/>



References

- Chopra, S., Meindl, P. (2010). Supply Chain Management (4th edition), Pearson
- Cavalieri, S., Pinto, R. (2007), Orientare al successo la supply chain, ISEDI
- www.supply-chain.org



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