

Introduction to Operations Management

Lecture: Introduction to Supply Chain Management 2

2024 – 25

Supply Chain relationships

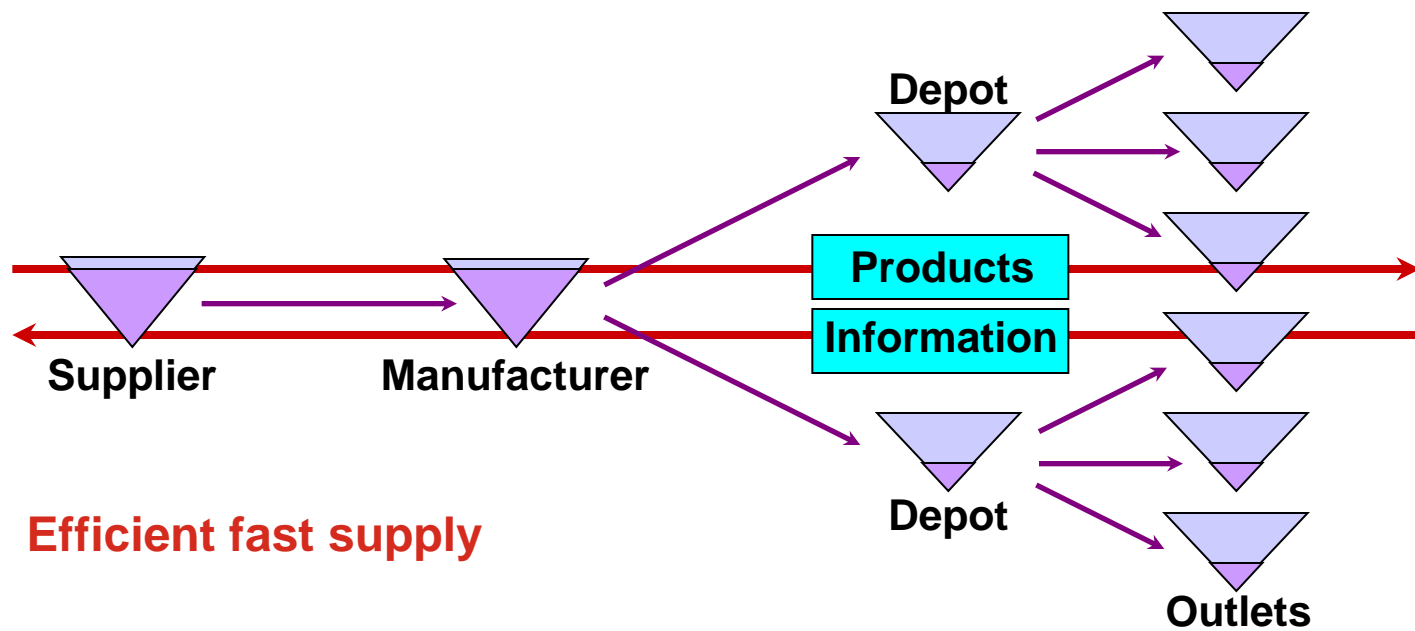
- Crises often put great pressure on supply chains:
 - they can be severely disruptive
 - present existential threats
 - create sudden increases / slumps in demand for products and services
- Firms sometimes use the 'power' they have over suppliers
- Abuse of power damages social relationships
- And can undermine a supply chain effectively operating as a whole

SC Design – what is the right supply chain for your product?



Functional vs Innovative products

	Functional	Innovative
Product life cycle	> 2 years	3 months – 1 year
Margin	5% - 20%	20% - 60%
Product variety	low	high
Average forecast error	10%	40% - 100%
Stockout rate	1% - 2%	up to 40%
Markdown rate	0%	10% - 25%
Lead time	6 months – 1 year	few days to few weeks

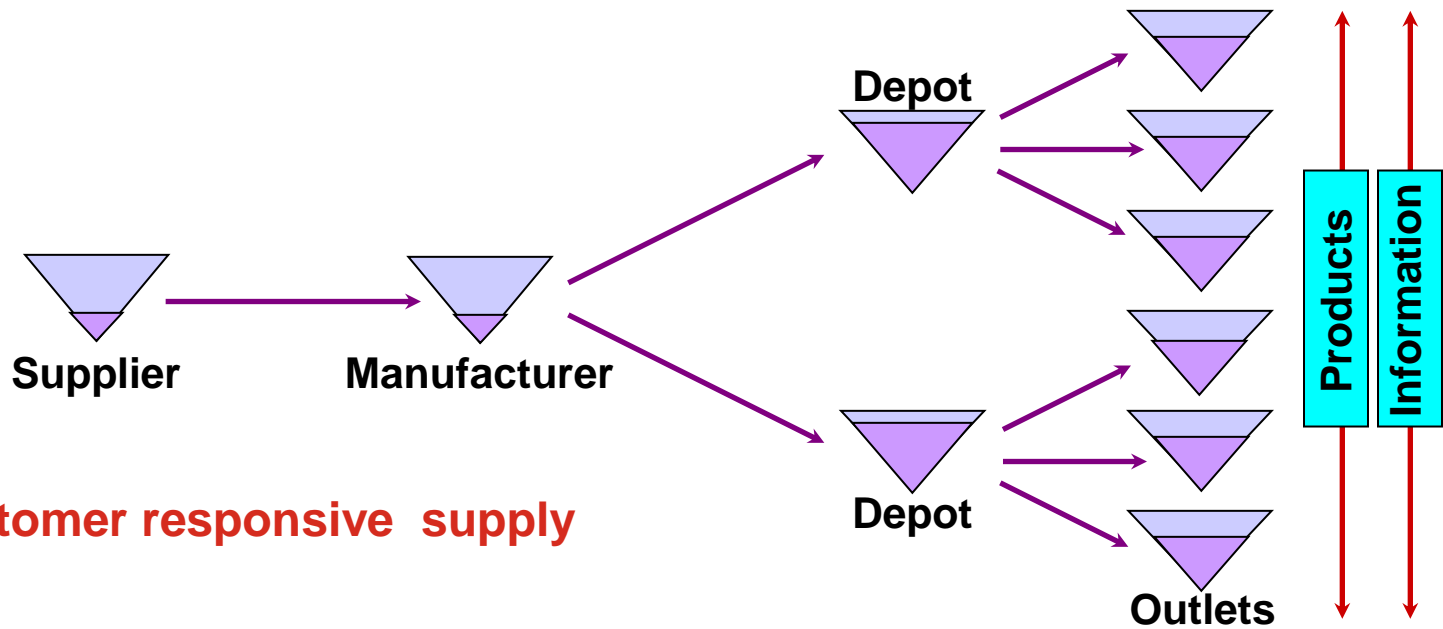


Sources – Fisher, 1997;
Slack et al, 2004,

Performance objectives:

- **Cost**
- **Delivery reliability**
- **Conformance quality**
(relevant requirements)

Customer responsive supply



Performance objectives:





- **Flexibility**
- **Specification quality**
(predefined design and perf specs)

Sources – Fisher, 1997;
Slack et al, 2004

SC Design – Different types of SCs

- **SC responsiveness** includes a SC's ability to do the following:
 - Respond to wide ranges of quantities demanded
 - Meet short lead times
 - Handle a large variety of products
 - Build highly innovative products / services
 - Meet a high service level
 - Handle supply uncertainty.
 - Responsiveness, however, comes at a cost.
- **SC efficiency** is the inverse of the cost of making and delivering a product to the customer.
 - Increases in cost → lower efficiency
 - Minimum inventory
 - Low-cost suppliers

Categorising products

	Functional Products	Innovative Products
Efficient SC		
Responsive SC		

Supply chain as unit of management

1. A better understanding of vulnerabilities and risks which are inherent in supply networks
2. Taking steps to ensure the balance between efficiency and resilience
3. A Better understanding of opportunities in the network
 - E.g. local sourcing instead of relying on int'l suppliers
4. Sharing information for better performance across the supply chain
 - E.g. forthcoming vehicle product plans
5. Identifying structural changes in industry
 - E.g. chip shortage (reevaluate supply chain model)
6. Stronger grasp of instability
 - E.g. fluctuations in demand and supply

Supply chain as unit of management

Bullwhip effect: a case

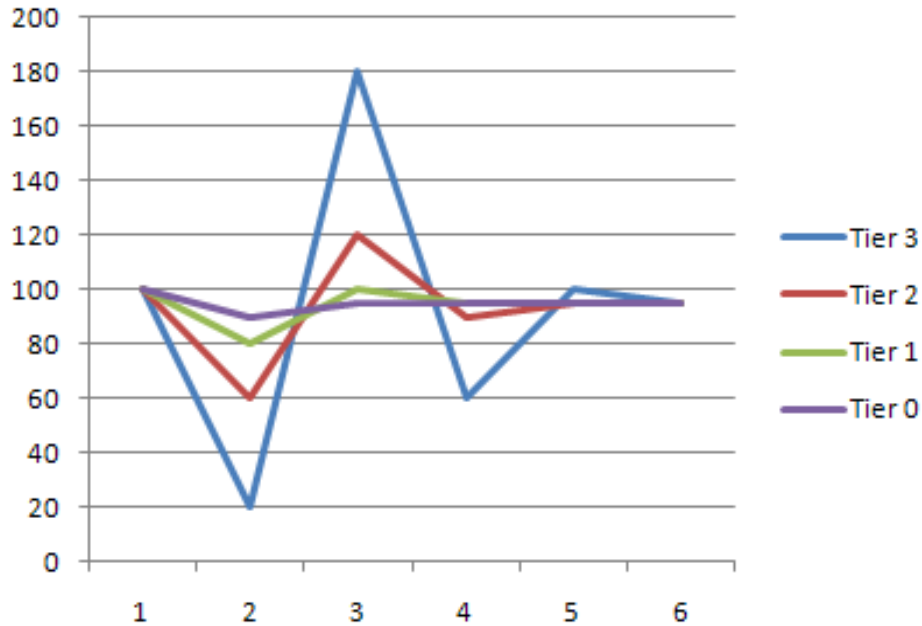
‘Not long ago, logistics executives at Procter & Gamble (P&G) examined the order patterns for one of their best-selling products, Pampers. Its sales at retail stores were fluctuating, but the variabilities were certainly not excessive. However, as they examined the distributors’ orders, the executives were surprised by the degree of variability. When they looked at P&G’s orders of materials to their suppliers, such as 3M, they discovered that the swings were even greater. At first glance, the variabilities did not make sense. While the consumers ... consumed diapers at a steady rate, the demand order variabilities in the supply chain were amplified as they moved up the supply chain. (Lee et al 1997)*

Please read the article:

[*https://sloanreview.mit.edu/article/the-bullwhip-effect-in-supply-chains/](https://sloanreview.mit.edu/article/the-bullwhip-effect-in-supply-chains/)

Bullwhip effect

- The pattern



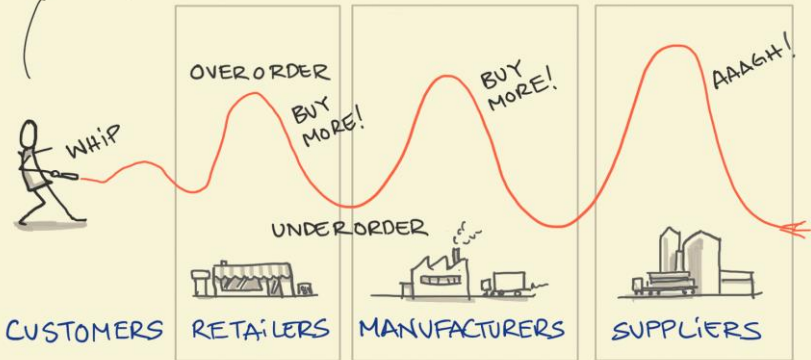
THE BULLWHIP EFFECT

SMALL CHANGES
IN DEMAND

CAN PRODUCE

A WHIP-LIKE
EFFECT UPSTREAM

QUICK! BUY TOILET PAPER



sketchplanations

Supply chain as a unit of failure *if not managed well*

1. Risks to the supply chain
 - loss of supply, especially when 'just in time': Toyota fire
2. Risks from the supply chain
 - distribution of contamination: the Sudan 1 case
3. Risks to and from the supply chain
 - product counterfeiting: the Avastin case
4. Risks from supply chain
 - Outsourcing: The Rana Plaza disaster

Supply chain as a unit of failure

- The Rana Plaza disaster in 2013
- downstream outlets face cost and speed pressures
- supply chains drawn to low cost, highly flexible sources
- typically correlated with low welfare, low safety
- sources may be several tiers removed from an entity's control
- sources may have incentives to diminish welfare lapses



Who's to blame?

- A. The cheap suppliers
- B. The retailers who put pressure on suppliers
- C. The consumers who want cheap goods
- D. Lax government regulations

Supply chain as a unit of failure

- A supply chain can be a unit of resilience as well as vulnerability
- Supply chain sustainability is possible through 'closed loop' supply chains and supplier development
- supply chains are often globalised
- often they involve anonymous markets like internet trading
- this minimises procurement prices but makes tracing hard
- it leaves them open to subversion and infiltration e.g. by counterfeiters

Seminar: Supplying Fast Fashion

- Please work on the 'supplying fast fashion' task for the seminar, it's on Moodle.

Questions



Thank you for attending, email questions to
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