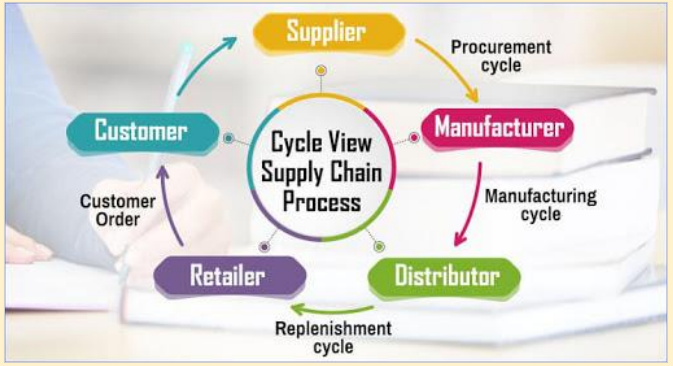
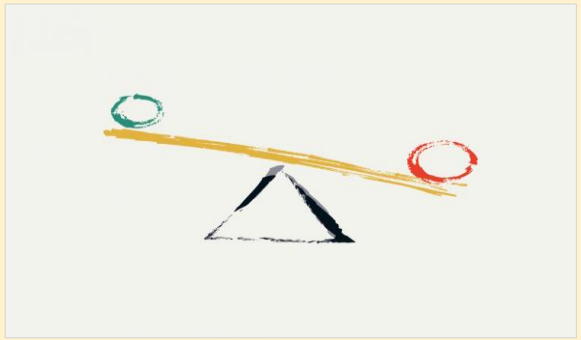
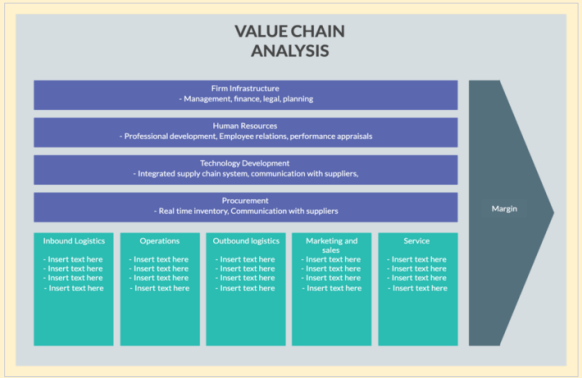
Lecture 2- SC Objectives and Competitive Advantage



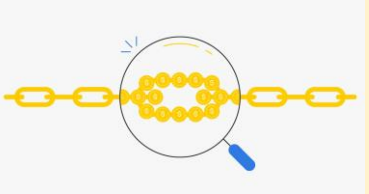


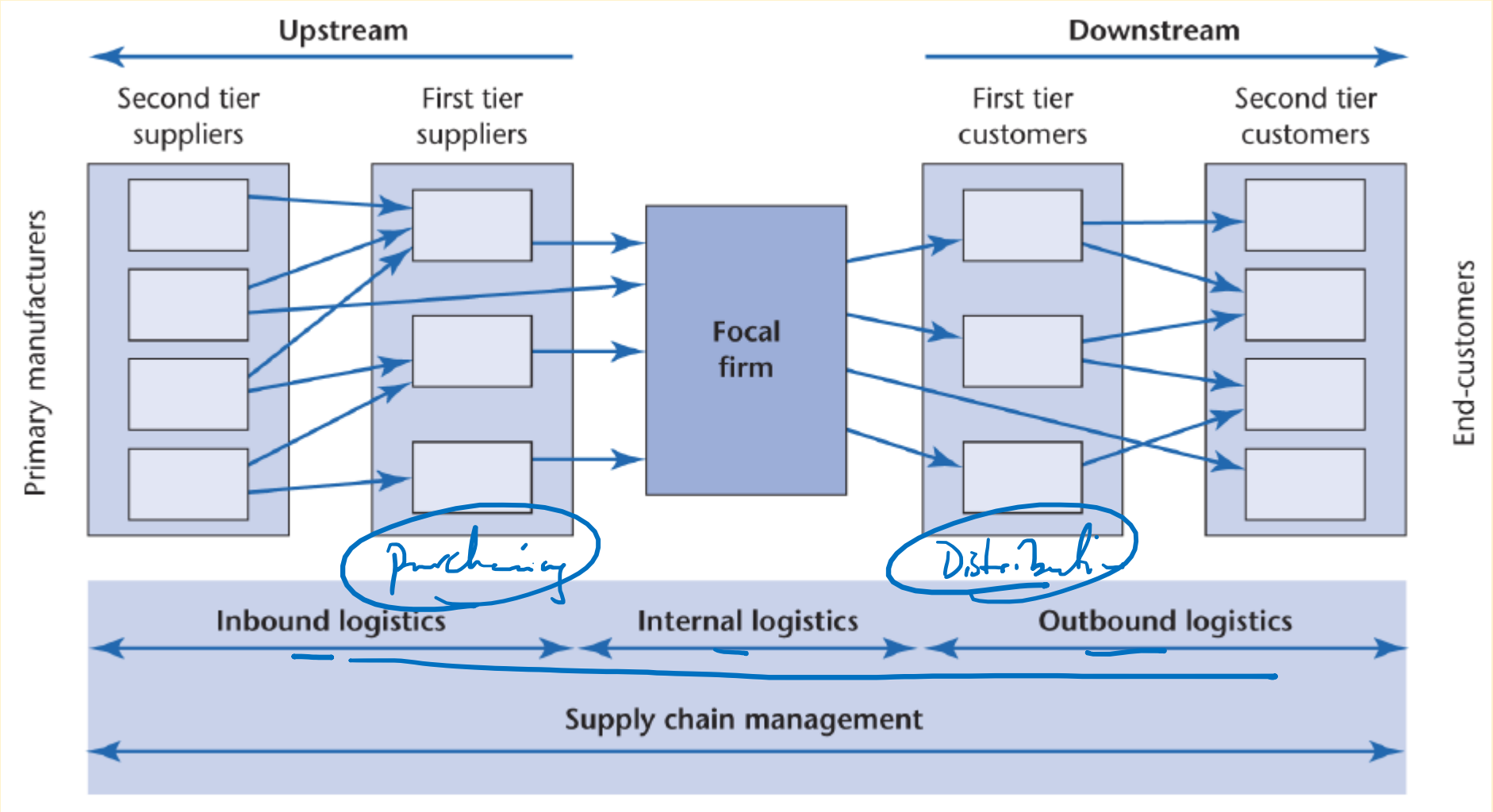


Dr Andre Samuel andre.samuel@sam.edu.tt

Recap

Supply Chains are only as strong as the weakest link

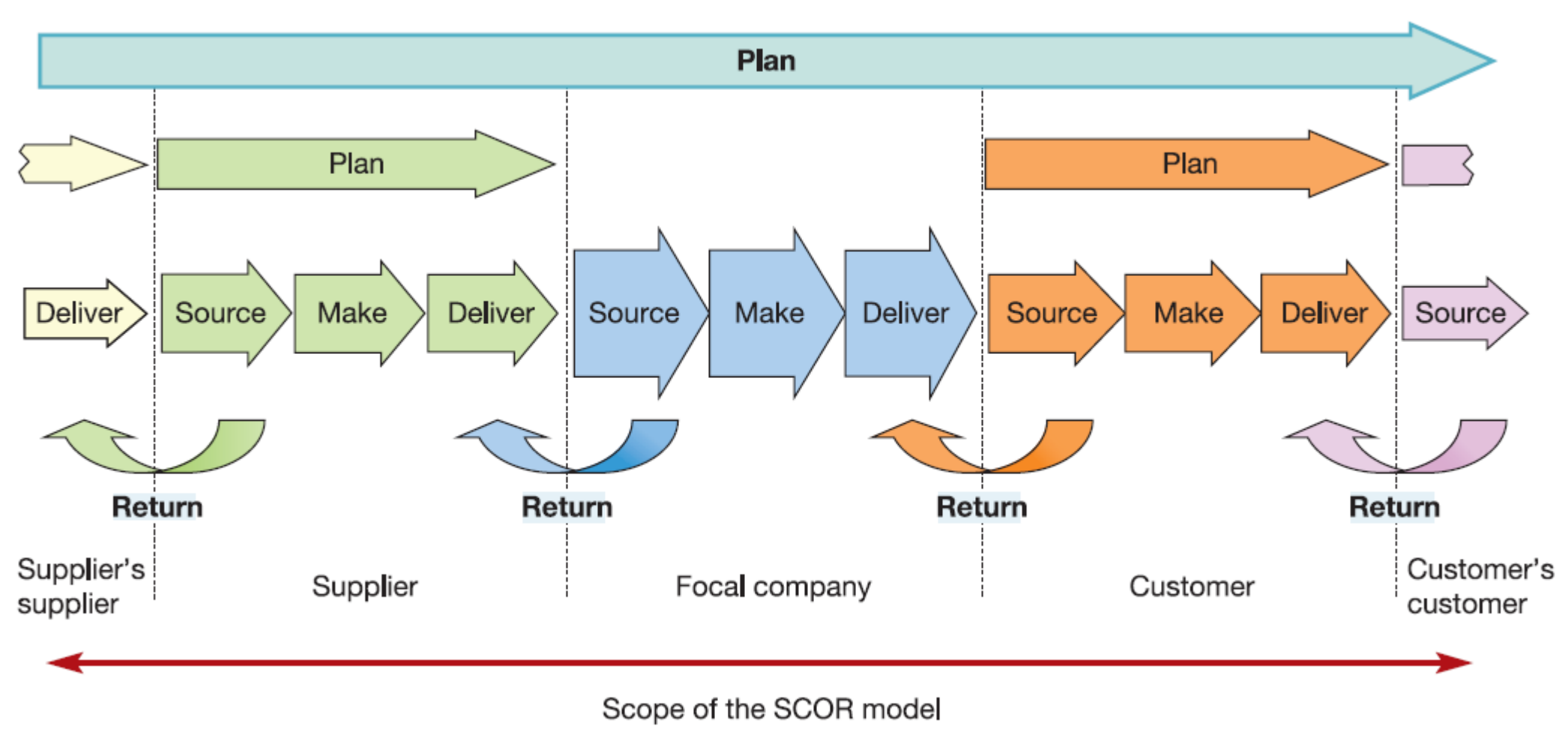




Supply chain management Defined
(CSCMP 2022)

- 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.

The SCOR Model- Five SC Processes

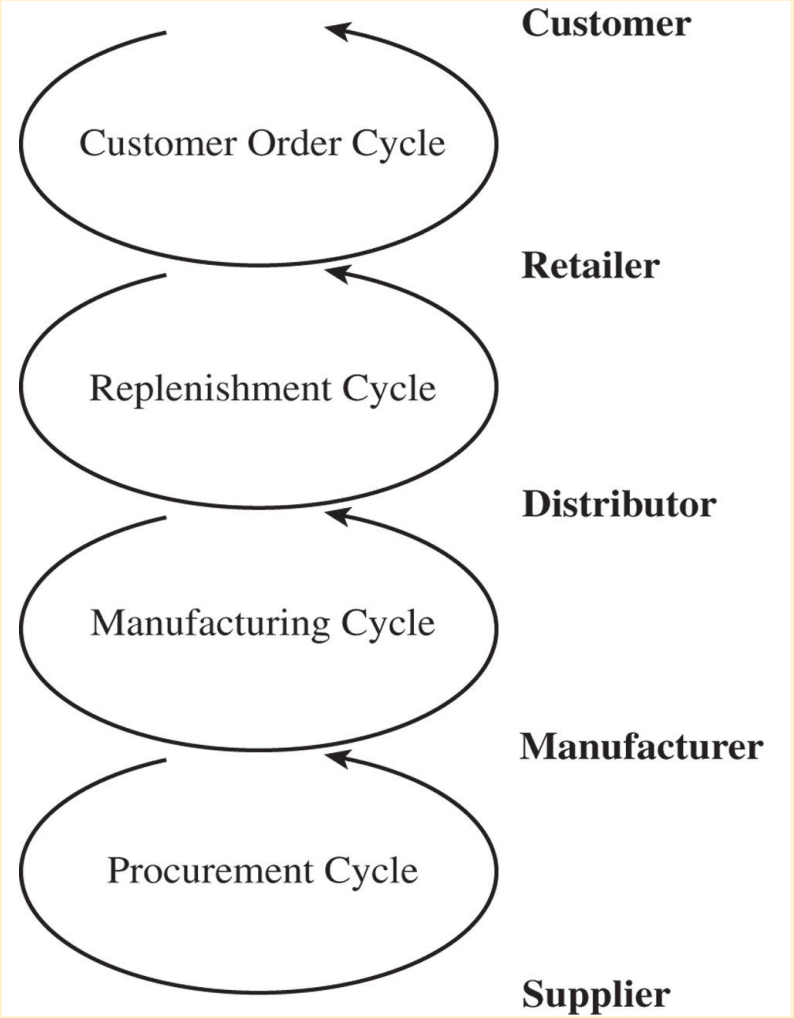


Slack et al (2013)

Cycle View of a Supply Chain

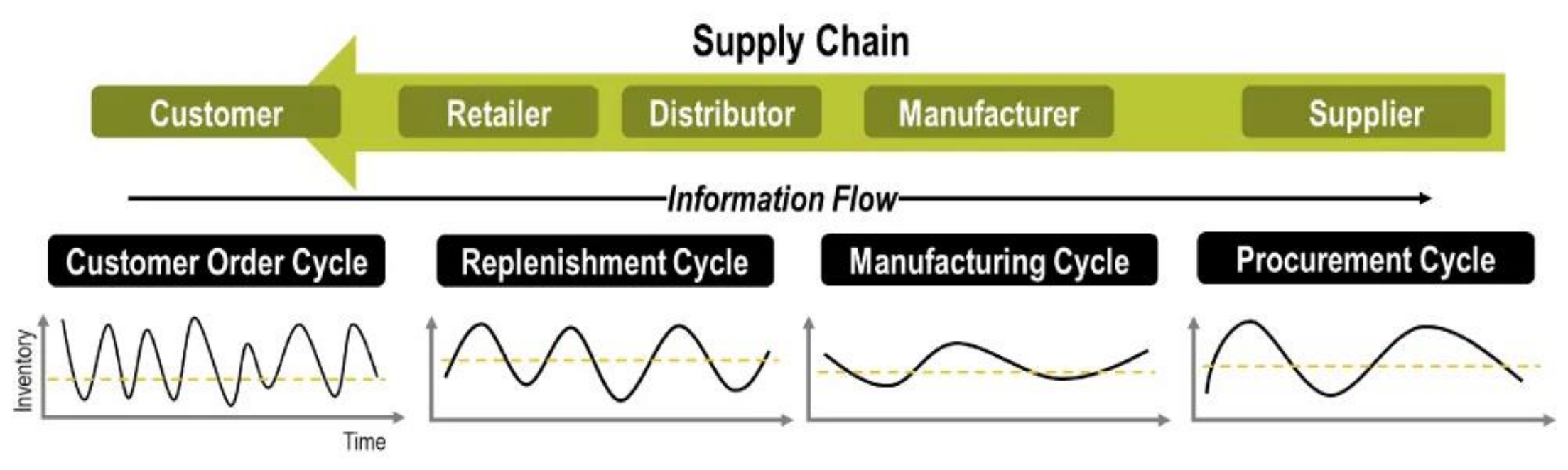
Cycle View of Supply Chain Processes

- The processes in a supply chain are divided into a series of cycles
- Each cycle occurs at the interface between two successive stages of a supply chain
- Not every supply chain will have all four cycles clearly separated
- For Example:
  - A Grocery supply chain is likely to have all four cycles separated.
  - Dell, in contrast, bypasses the retailer and distributor when it sells directly to customers.



Chopra and Meindl (2013, p. 8)

Supply Chain and its Cycles



Rodrigue (2020)

Goal of Each Cycle

- Within each cycle, the goal of the buyer is **to ensure product availability** and to achieve economies of scale in ordering.
- The supplier attempts to **forecast customer orders** and **reduce the cost** of receiving the order.
- The supplier then works to **fill the order on time** and improve efficiency and accuracy of the order fulfillment process.
- The buyer then works **to reduce the cost of the receiving** process.
- Reverse flows are managed to reduce cost and meet environmental objectives.

Differences among the Cycles

- In the customer order cycle:
  - **demand is external** to the supply chain and thus uncertain.

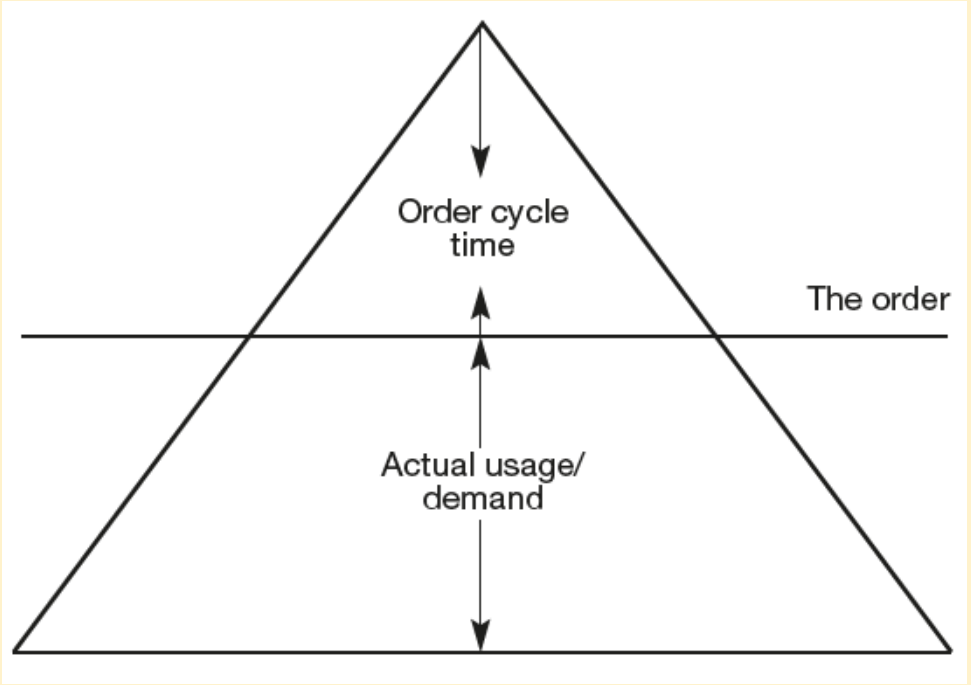
- In all other cycles:
  - **order placement is uncertain but can be projected** based on policies followed by the particular supply chain stage

  - For example, in the procurement cycle, a tire supplier to an automotive **manufacturer can predict tire demand precisely once the production schedule at the manufacturer is known**.

- The second difference across cycles relates to the **scale of an order.**
- Whereas a **customer buys a single car**, the dealer orders multiple cars at a time from the manufacturer, and the **manufacturer, in turn, orders an even larger quantity** of tires from the supplier.
- As we move **from the customer to the supplier**, the number of **individual orders declines and the size of each order increases.**
- Thus, **sharing of information and operating policies across supply chain stages becomes more important** as we move further from the end customer.
- Natural DEMAND AMPLIFICATION- volume

The information iceberg

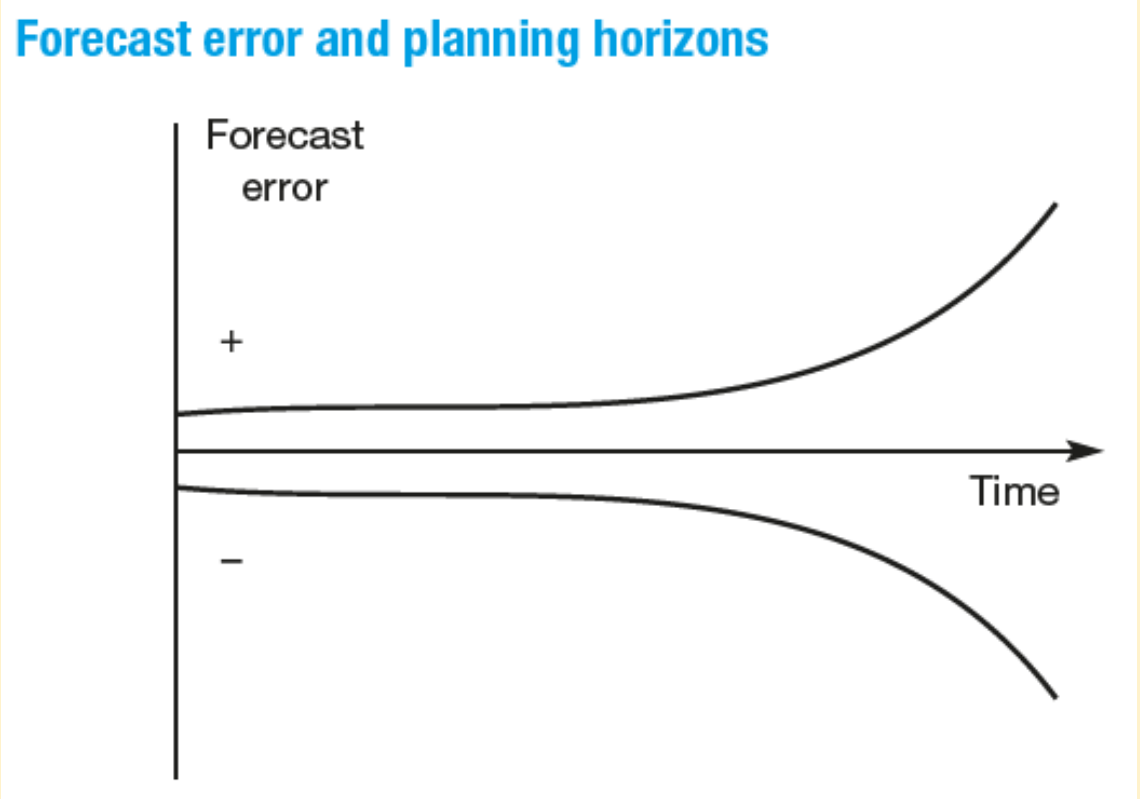
- In so many cases the supplying company receives **no indication of the customer's actual usage until an order arrives**
- For example the customer may be using ten items a day but because he orders only intermittently the supplier sometimes receives an order for 100, sometimes for 150 and sometimes for 200.
- **If the supplier could receive 'feed-forward'** on what was being consumed he could **anticipate the customer's requirement and better schedule** his own logistics activities



Source: Christopher (2016)

The Challenge- Forecast Error

- The goal is very simple – to try to match supply and demand.
- However, there is the **presence of uncertainty** in the practice of running a business on the basis of a forecast.
- The levels of **volatility and turbulence** that typify today's business environment add to the problem
- All forecasts as prone to error and the further ahead the forecast horizon is, the greater the error



Source: Christopher (2016)

Objective of a Supply Chain

Customer Value

- Christopher (2016) cites the Customer Value ratio (Johansson et al, 1993).
- Customer Value =

The functionality, performance and technical specification of the offer.

The availability, support and commitment provided to the customer.

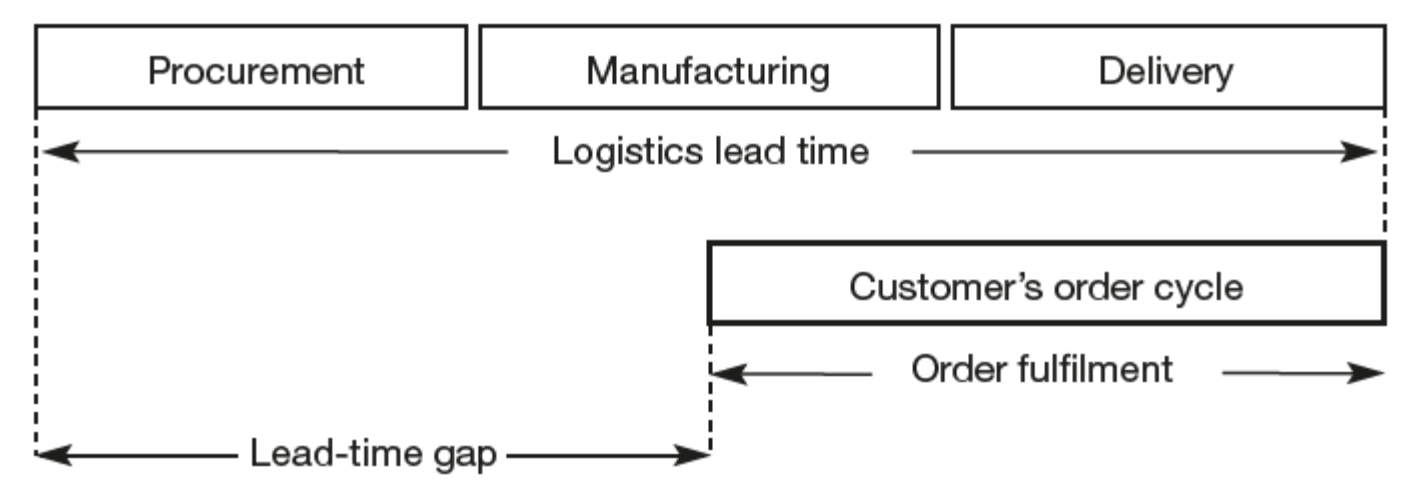
$$\frac{\text{Quality} \times \text{Service}}{\text{Cost} \times \text{Time}}$$

The customer's transaction costs including price and lifecycle costs.

The time taken to respond to customer requirements.

The lead-time Gap Problem

- The time it takes to procure, make and deliver the finished product to a customer is longer than the time the customer is prepared to wait for it.



Source: Christopher (2016)

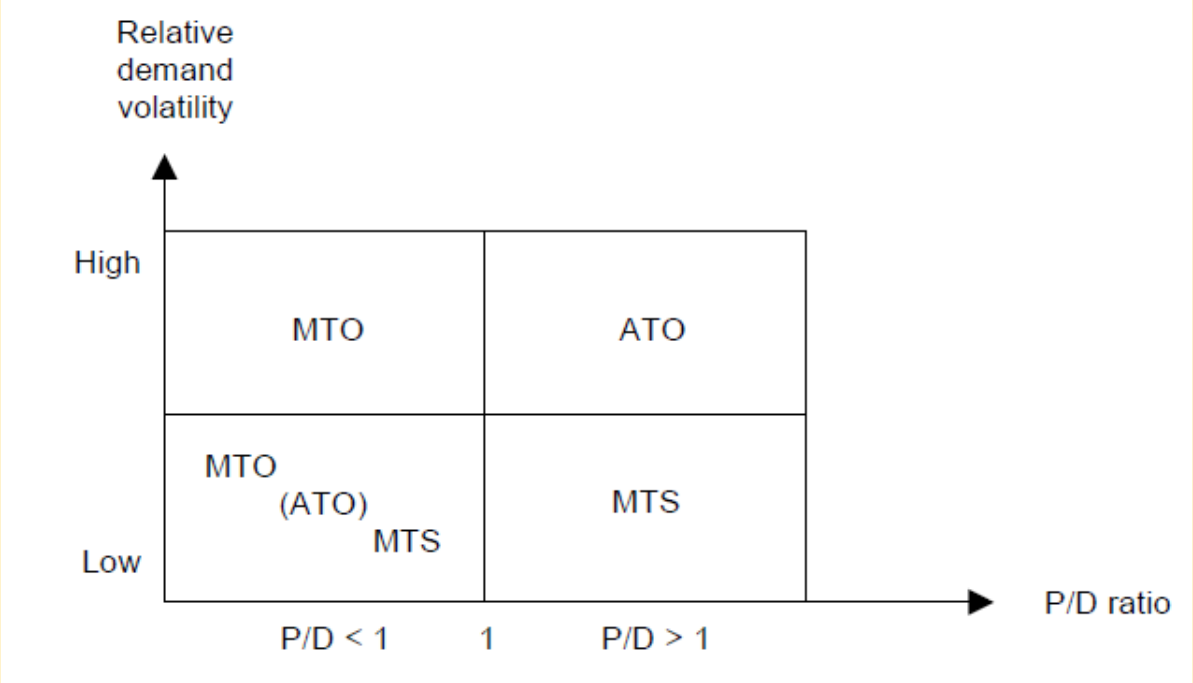
A model for choosing the right Product Delivery Strategy

- P/D ratio is the production lead time to delivery lead time ratio
- RDV is the coefficient of variation

Generally:

- IF P:D > 1- Push/MTS

- IF P:D < 1- Pull/MTO/ATO



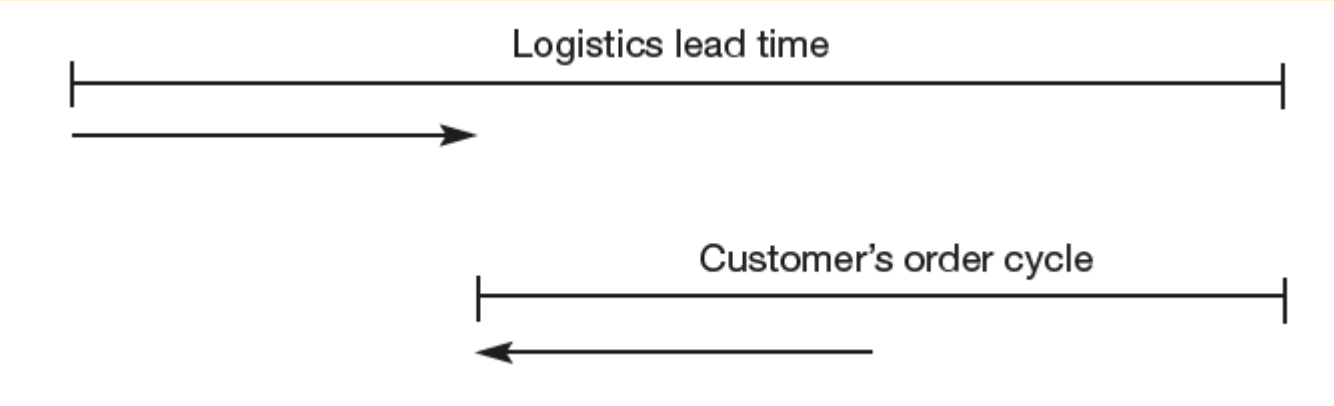
Olhager (2003)

Reducing the Lead Time Gap- The Problem

- In the conventional organization the only way to bridge the gap between the logistics lead-time and the customer's order cycle is by **carrying inventory**.
- This normally implies a forecast.
- Hence the way most companies address this problem is by seeking to forecast the market's requirements and then to **build inventory ahead of demand**
- **BUT** forecast accuracy is always less than perfect
- Resulting in inventory problem –too much or too little!

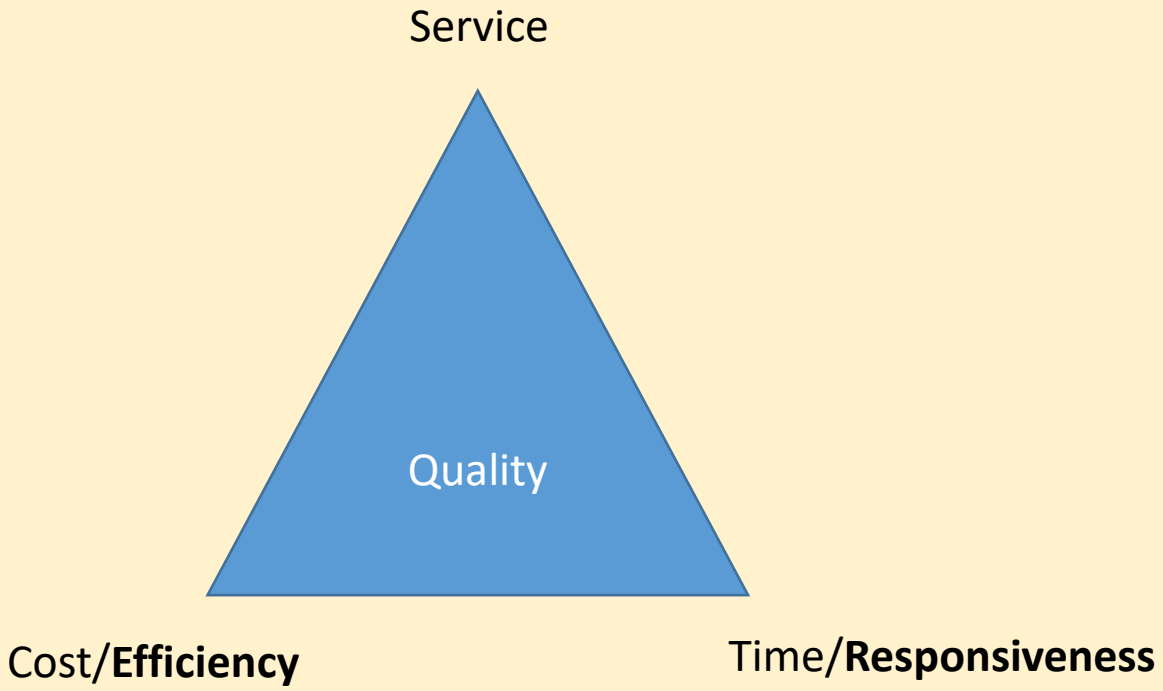
Reducing the Lead Time Gap- The Solution

- Reducing the gap can be achieved by:
  - **shortening the logistics lead-time** (end-to-end pipeline time)
  - whilst simultaneously trying to move the customer's order cycle closer by gaining earlier warning of requirements through improved **visibility of demand**



Source: Christopher (2016)

SC Strategy affect three measures of performance



Matching Supply Chain Strategy with Customer Value Proposition

- No firm can compete successfully on all dimensions of customer value
- Management needs to pick its goals
- Then design a supply chain strategies to deliver that specific value proposition

Examples Supply Chain Strategy matching Customer Value Proposition

Five ways to compete in the market

Customer Value Proposition	Example	Operations Strategy
High fashion content at a reasonable price	Zara	Speed to market
Customer experience	Dell Direct	Responsiveness through configure-to-order
Product innovation	Apple	Efficiency through outsourced manufacturing and logistics
Everyday low pricing	Wal-Mart	Cost efficiency
Product selection and availability	Amazon	Efficient and reliable order fulfillment

Simchi-Levi (2010)

Shein Produces up to 10,000 New Designs Daily | WSJ

https://youtu.be/gWotBPtsulo?si=wZo6-e3nPgQnWC4L

Responsiveness and Efficiency Defined

- **Responsiveness** includes a supply chain'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
  - Meet a high service level
  - Handle supply uncertainty

- **Efficiency** is the inverse of the cost of making and delivering a product to the customer
- **Increases in cost lower efficiency**

Efficiency Focus

- The firm **focuses on low-cost strategies** across all functional areas.
- This includes supplier selection, manufacturing, product design, and distribution and logistics.
- Typically, in such a strategy, production and distribution decisions are based on:
  - **long-term forecasts**,
  - **inventory of finished goods is positioned close to market demand**,
  - supplier selection is based mostly on component costs.
- Hence, **sourcing from low-cost countries** is often the mantra.

Responsiveness Focus

- By contrast, a responsive strategy **focuses on speed**, order fulfillment, **service level**, and customer satisfaction

- Here, the objective is **not necessarily to squeeze as much cost out** of the supply chain as is humanly possible but

- Rather to **eliminate stockouts** and satisfy demand by competing on response time and speed to market.

Comparison of Efficient and Responsive Supply Chains

	Efficient Supply Chains	Responsive Supply Chains
Primary goal	Supply demand at the lowest cost	Respond quickly to demand
Product design strategy	Maximize performance at a minimum product cost	Create *modularity* to allow postponement of product differentiation
Pricing strategy	Lower margins because price is a prime customer driver	Higher margins because price is not a prime customer driver
Manufacturing strategy	Lower costs through high utilization	Maintain capacity flexibility to buffer against demand/supply uncertainty
Inventory strategy	Minimize inventory to lower cost	Maintain *buffer inventory* to deal with demand/supply uncertainty
Lead-time strategy	Reduce, but not at the expense of costs	Reduce aggressively, even if the costs are significant
Supplier strategy	Select based on cost and quality	Select based on speed, flexibility, reliability, and quality

Source: Adapted from "What Is the Right Supply Chain for Your Product?" Marshall L. Fisher, *Harvard Business Review* (March–April 1997), 83–93.

Source: Chopra and Meindl (2013)

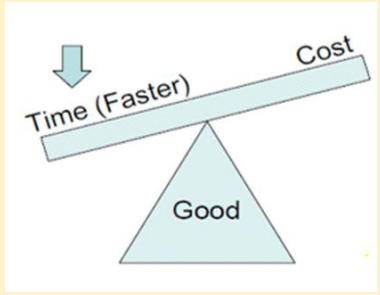
Supply Chain Trade-Offs

The Challenge

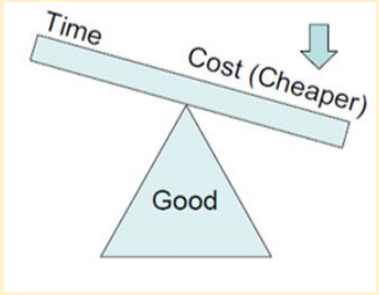
- Traditional operations strategies have often focused on efficiency **OR** responsiveness **OR** a combination of the two
- **Difficult to be both:**
  - **extremely efficient,** and thus compete on price
  - and at the same time **highly responsive**,
  - while maintaining an **extraordinary service level**
- When business is booming, executives concentrated on maximizing speed
- When the economy headed south, firms desperately tried to minimize supply costs

Conflicting objectives

- **Responsiveness** will generally incur higher operating costs
- Because inventory and capacity must be increased, which increases costs.
- So **Responsiveness comes with an increase in cost**
- **Increase cost means lower Efficiency**



- An **efficient** supply chain, in contrast, lowers cost by eliminating some of its responsive capabilities
- Therefore, a high efficiency level, that is, a low-cost operations strategy, **typically increases time to serve customers** and does not emphasize a high level of service.

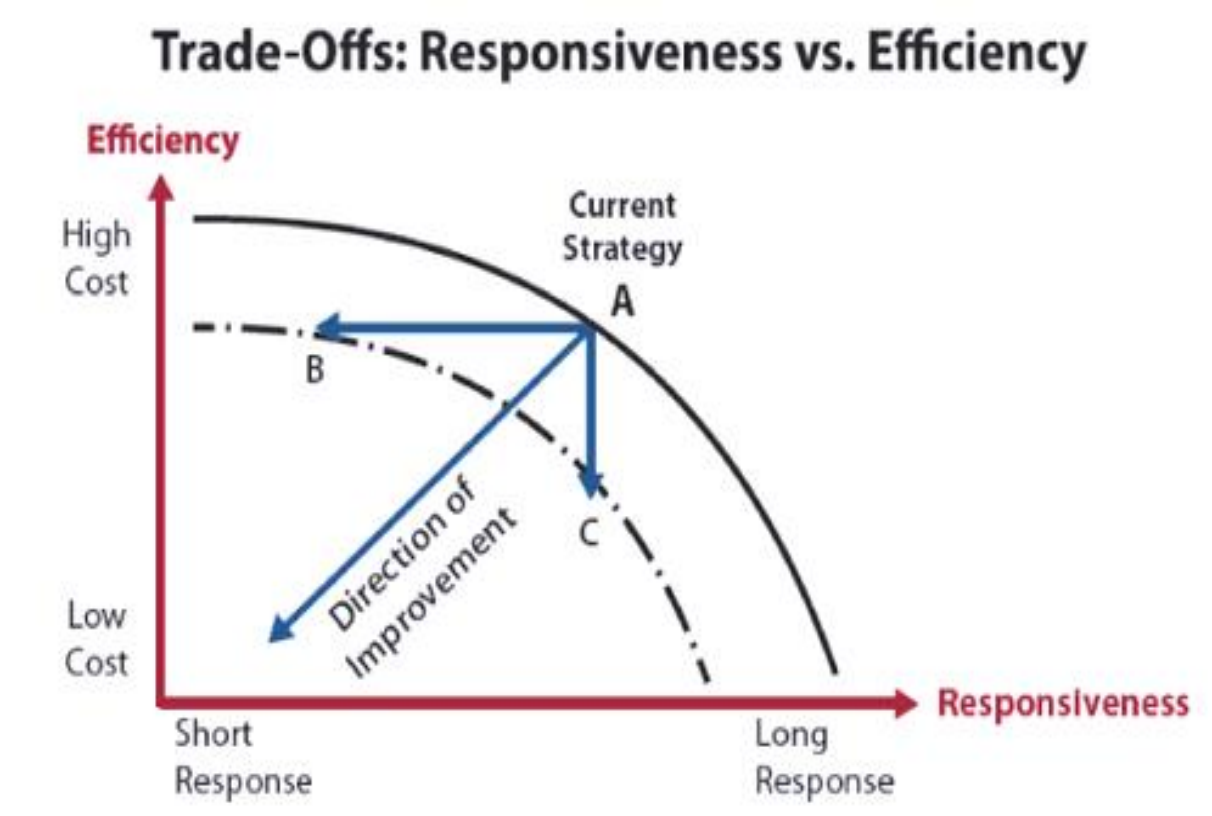


Cost Responsiveness Trade Off- **Efficient Frontier** Curve

- Represents a range of possible strategies, each with a corresponding cost (efficiency) and response time (responsiveness)
- Point A –

Your current strategy on the efficient frontier curve.

This strategy invests in a **deliberate trade-off** between efficiency and responsiveness.



Simchi-Levi (2012)

SC Optimization- Shift the Curve Downwards

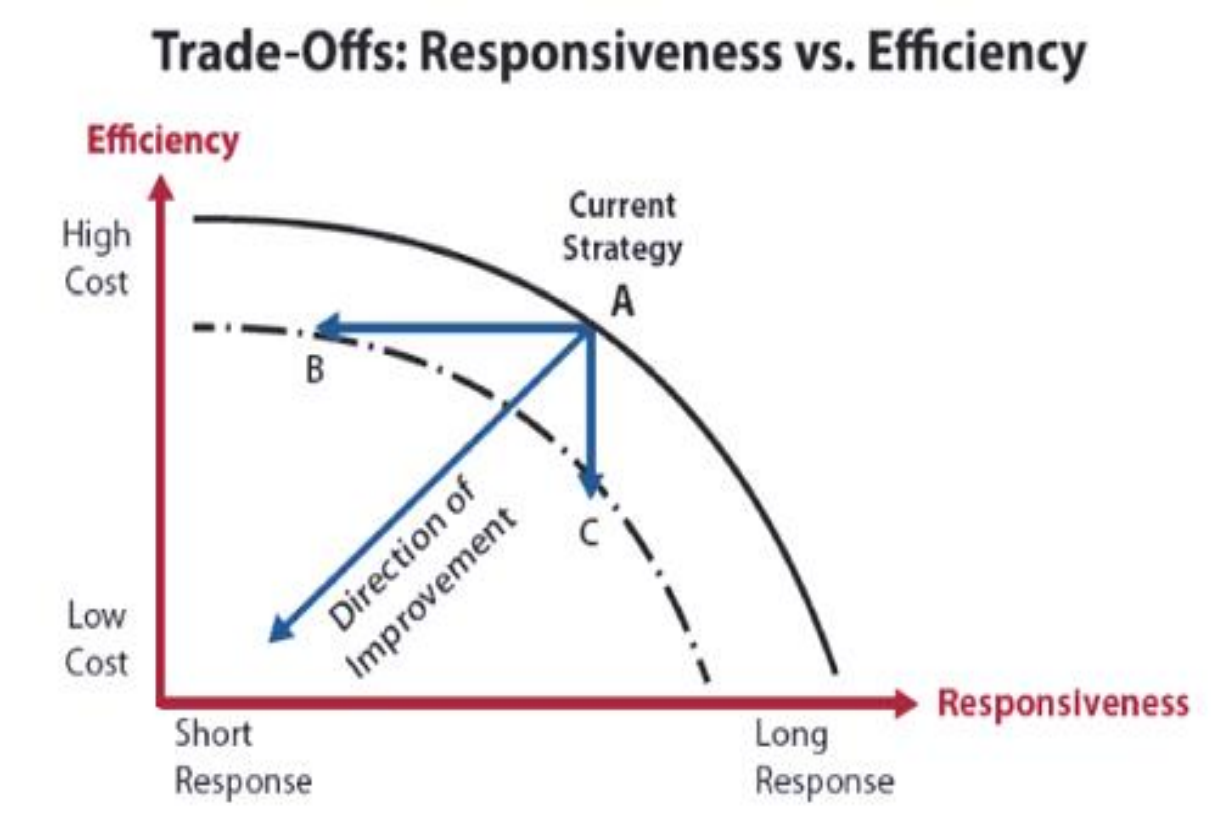
- Point B-

If this is possible, then **for the same level of efficiency, you can improve response time**

- Point C-

Alternatively, **for the same level of responsiveness, you can improve operations efficiency and hence reduce costs**

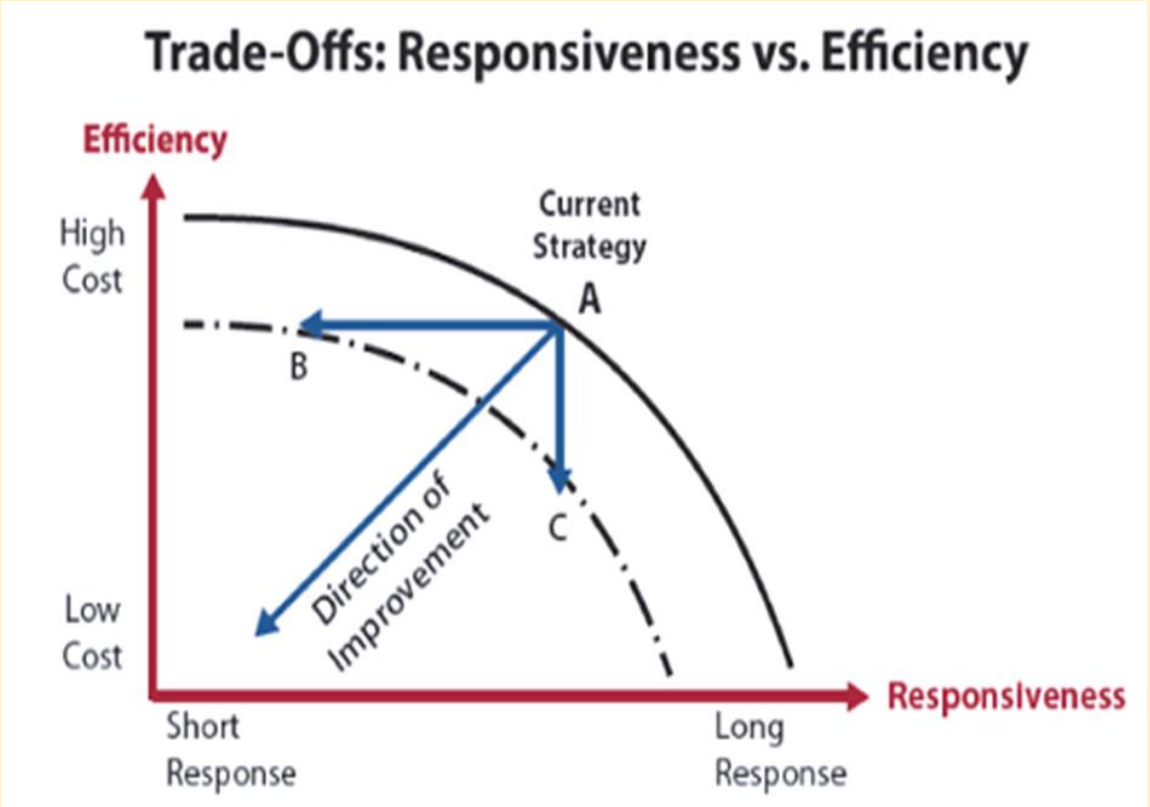
- More importantly, there is a range of strategies between B and C where the firm improves both efficiency and responsiveness



Simchi-Levi (2012)

SC Trade Off- In Summary

- A firm can improve both its responsiveness and its cost performance by moving the efficient frontier downwards
- A firm on the efficient frontier can improve its responsiveness only by increasing cost and becoming less efficient.
- Such a firm must then make a trade-off between efficiency and responsiveness



Simchi-Levi (2012)

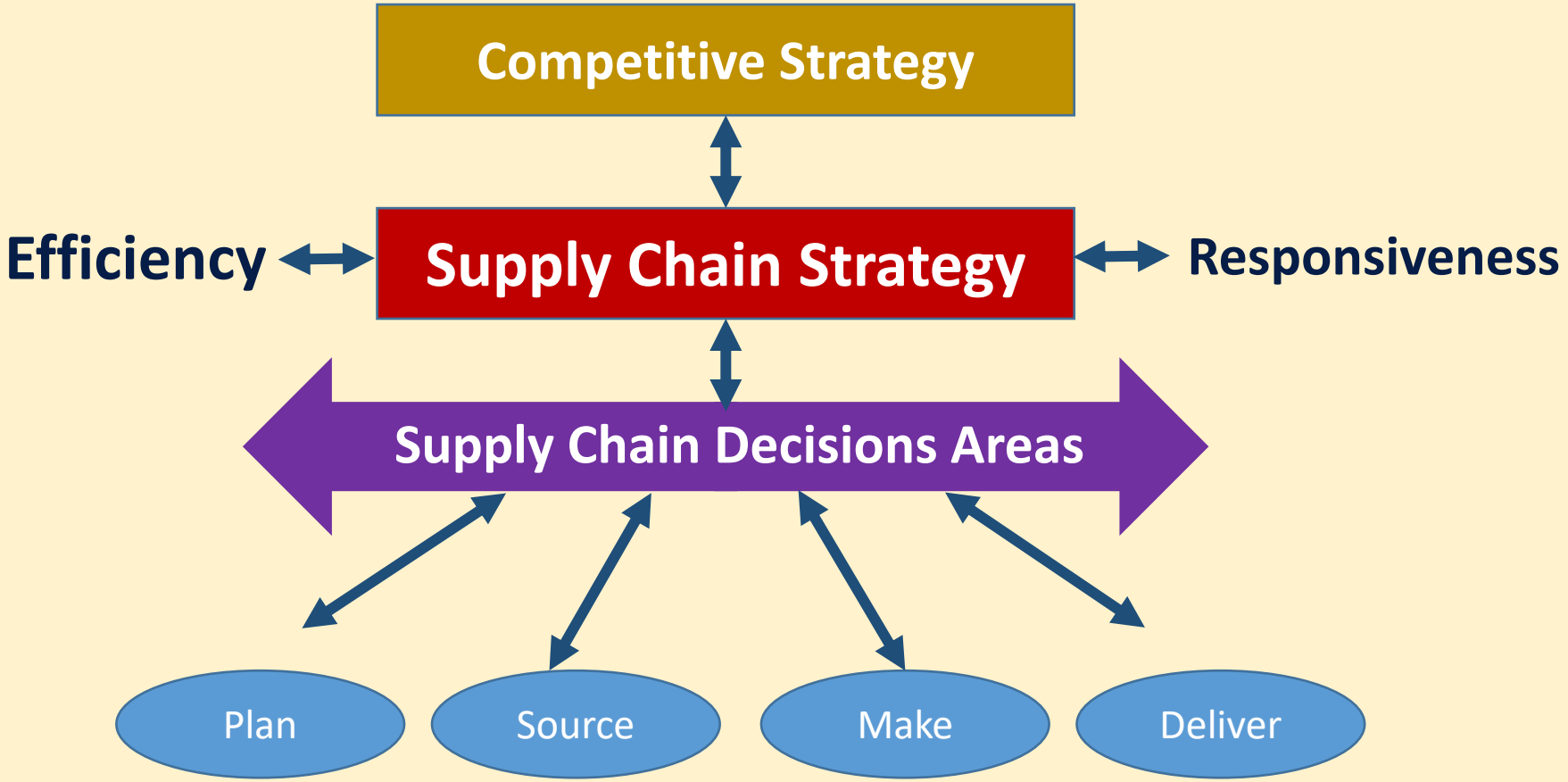
Why Making Apple iPhones in America Is So Hard | WSJ

https://www.youtube.com/watch?v=GP7QF3rEIlI

SC and Competitive Advantage

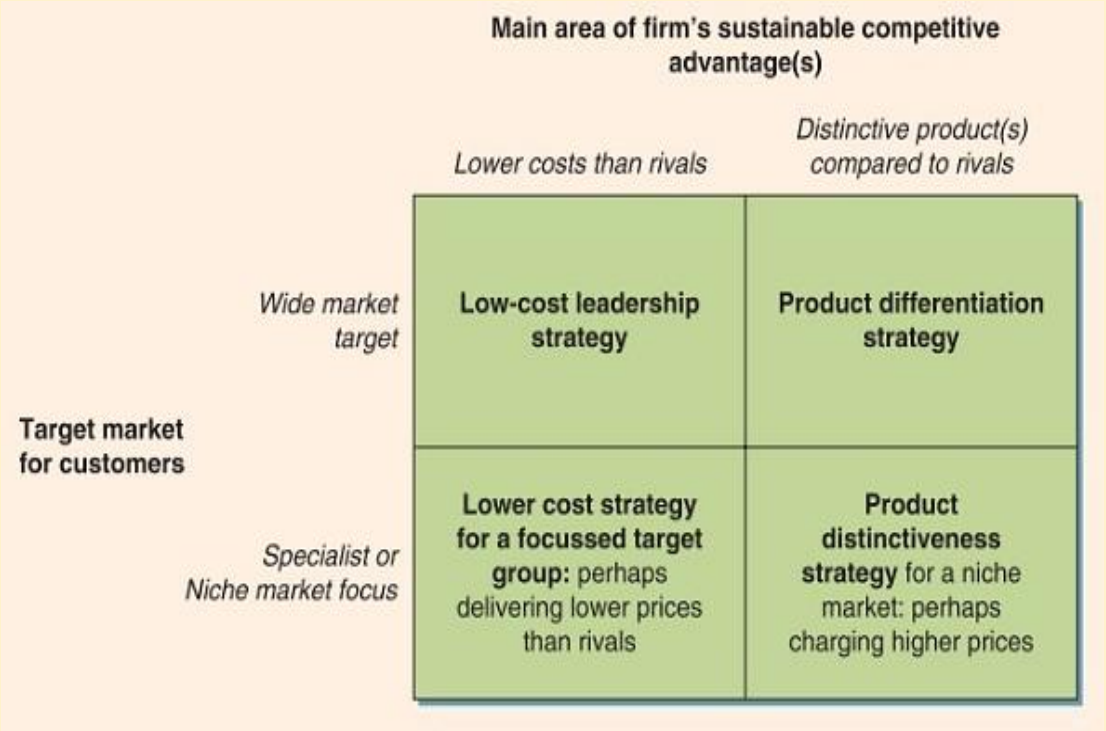
Strategic SC Framework

Adapted from Santos et al (2021)



Effective logistics and supply chain management → Major source of competitive advantage

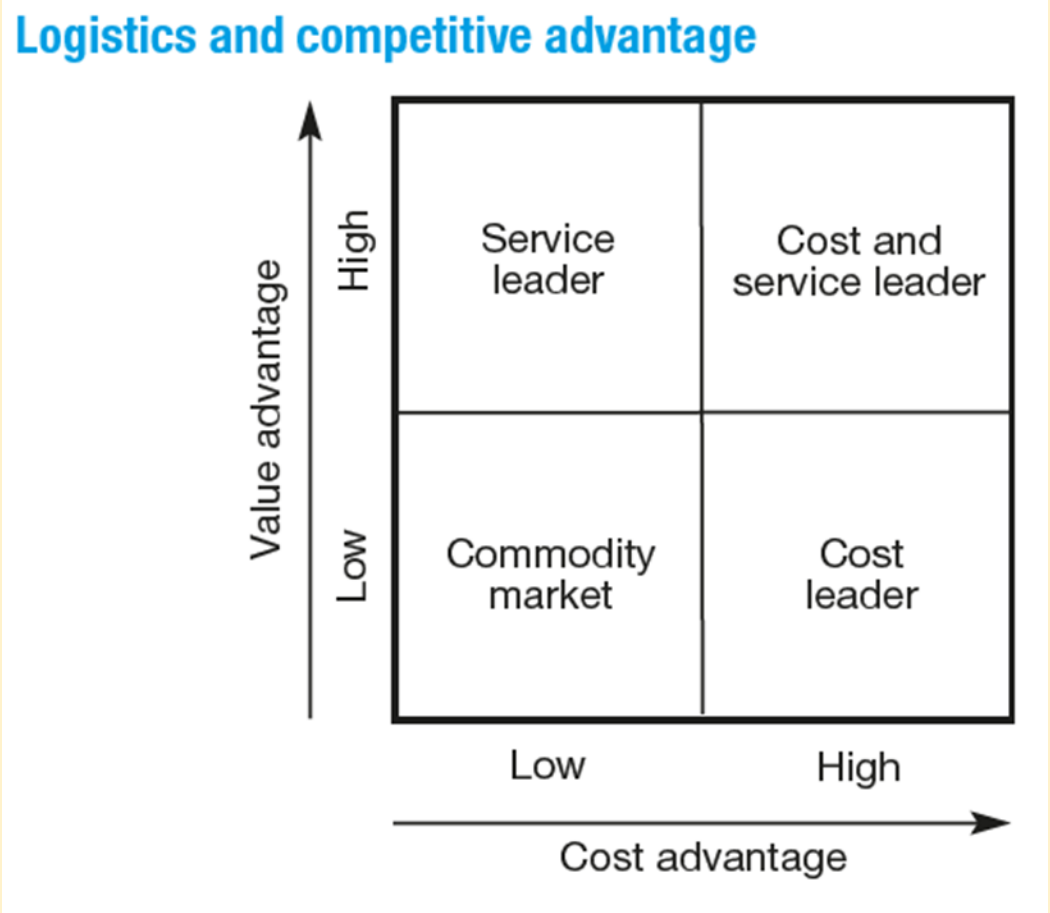
Porter's Generic Strategies



Source: Lynch (2018)

Logistics and Competitive Advantage
Christopher (2015)

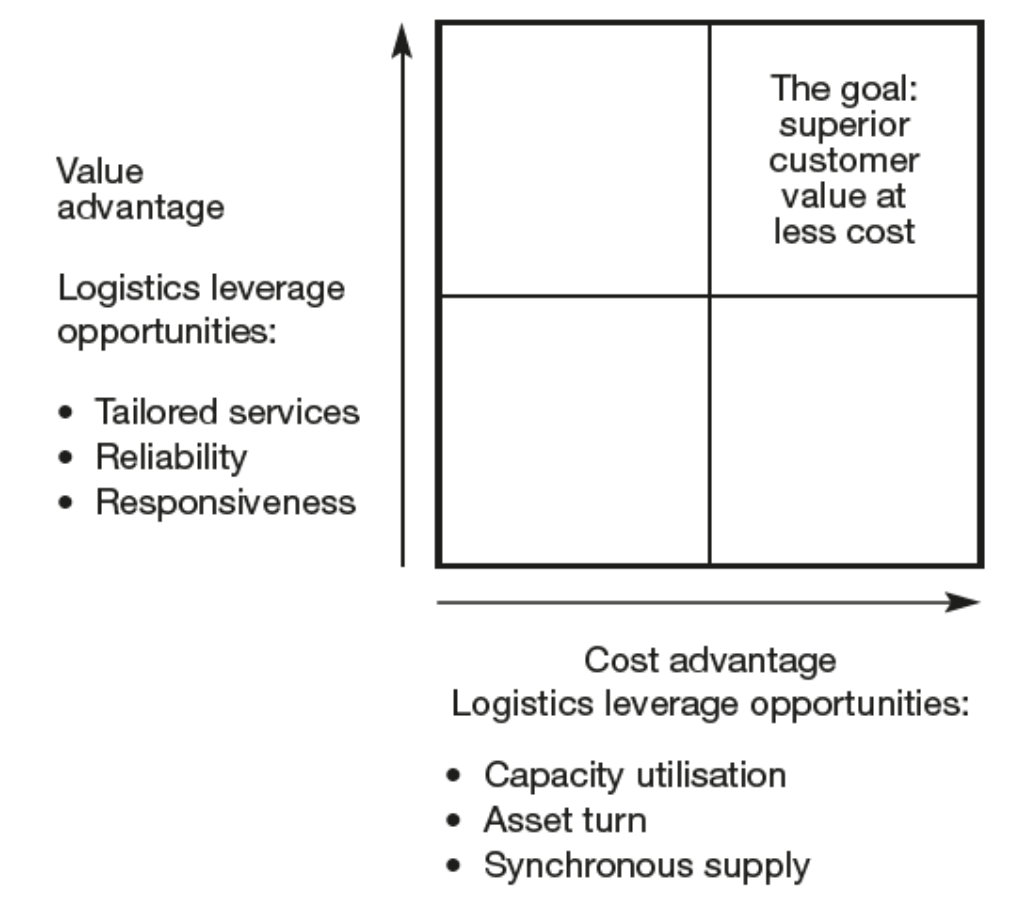
- The most profitable competitor in any industry sector tends to be the:
  - lowest-cost producer or
  - the supplier providing a product with the greatest perceived differentiated values.
- Put very simply, successful companies either have:
  - a **cost advantage** or
  - **value advantage**,



Source: Christopher (2016)

Gaining competitive advantage

- Is there a middle ground between cost leadership and differentiation
- Logistics and supply chain management, it can be argued, has the potential to assist the organization in the achievement of both:
  - Cost advantage
  - Value advantage.



Source: Christopher (2016)

To Summarize

- The Goal of SCM:
  - Planning and co-ordinating the materials flow from source to user as an integrated system rather than independent activities.
  - Thus, under this approach the goal is to link the marketplace, the distribution network, the manufacturing process and the procurement activity in such a way that customers are serviced at higher levels and yet at lower cost.
  - In other words, the goal is to achieve competitive advantage through **both cost reduction and service enhancement**.

How Amazon Delivers Packages So Fast

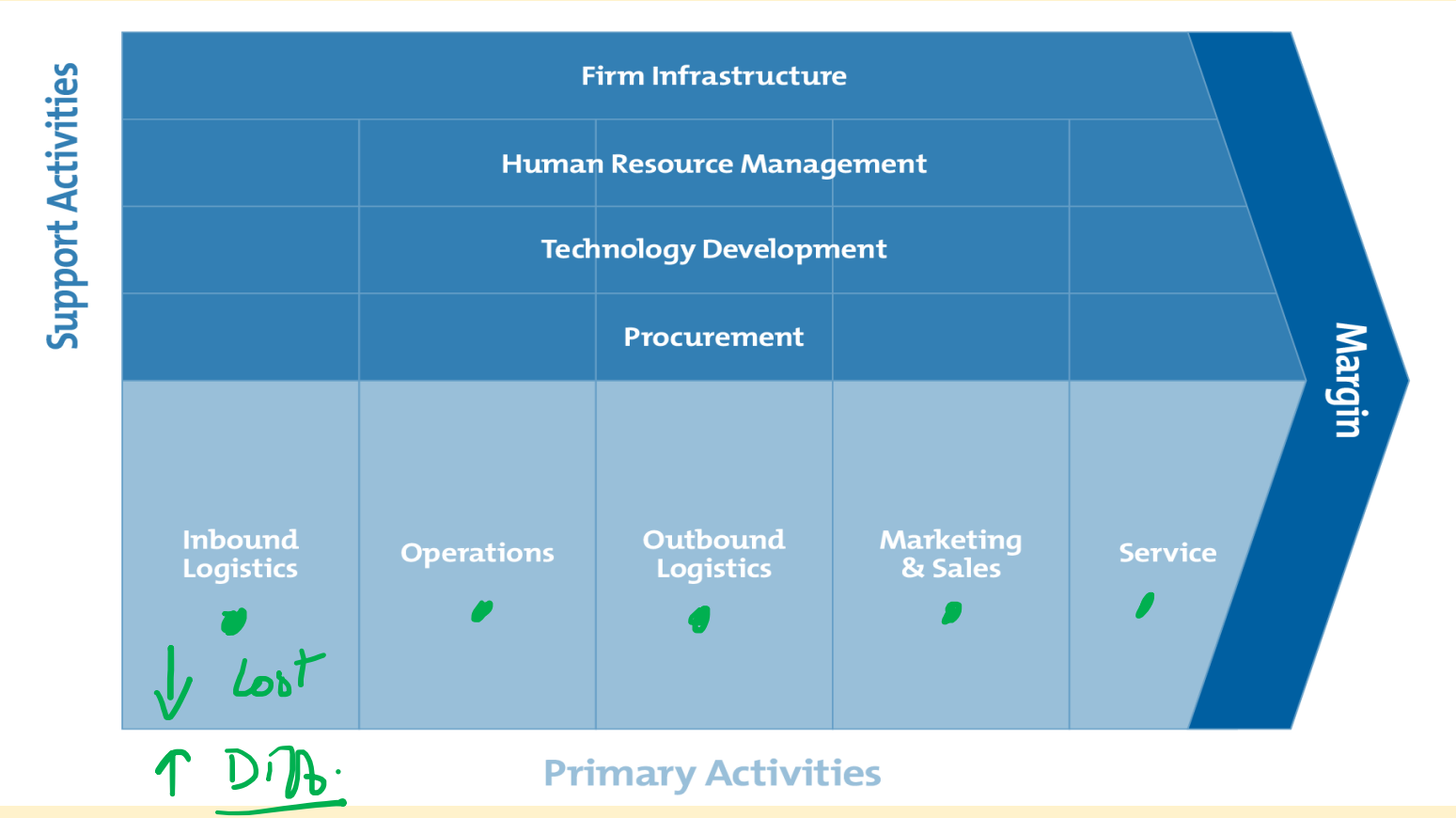
https://www.youtube.com/watch?v=91jKeKuUaDM

The supply chain becomes the value chain

Porter, M.E., 1985 Competitive Advantage, The Free Press

- "Competitive advantage cannot be understood by looking at a firm as a whole
- It stems from the many discrete activities a firm performs in designing, producing, marketing, delivering, and supporting its product.
- Each of these activities can contribute to a firm's relative cost position and create a basis for differentiation"

Value Chain Model



Competitive advantage is derived from the way in which firms organize and perform these activities within the value chain.

Implication of Porter's Value Chain Thesis

- Organizations should look at each activity in their value chain
- Assess whether they have a real competitive advantage in the activity.
- If they do not, then:
  - consider OUTSOURCING that activity to a partner who can provide that cost or value advantage

- Discussion:
  - Does outsourcing adds to the complexity of the supply chain?

Strategic choice: location and control

		Geographical location strategy	
		Concentrated	Dispersed
Control strategy	Vertical integration	1. Onshore in-house	3. Captive Offshore
	Specialization	2. Onshore outsourced	4. Offshore outsource

(Mudambi, 2007).

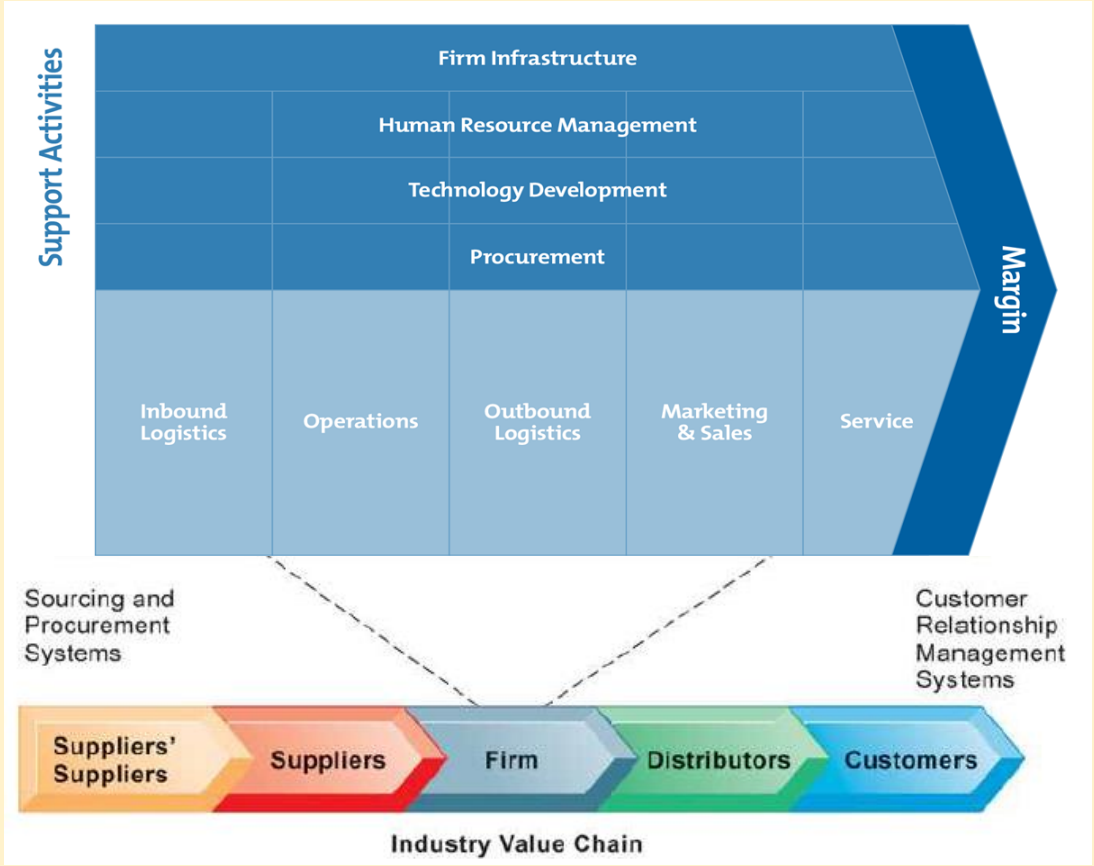
Effects of Outsourcing

- The effect of outsourcing is to extend the value chain beyond the boundaries of the business.
- In other words, the supply chain becomes the value chain.
- Value (and cost) is not just created by the focal firm in a network, but by all the entities that connect to each other.

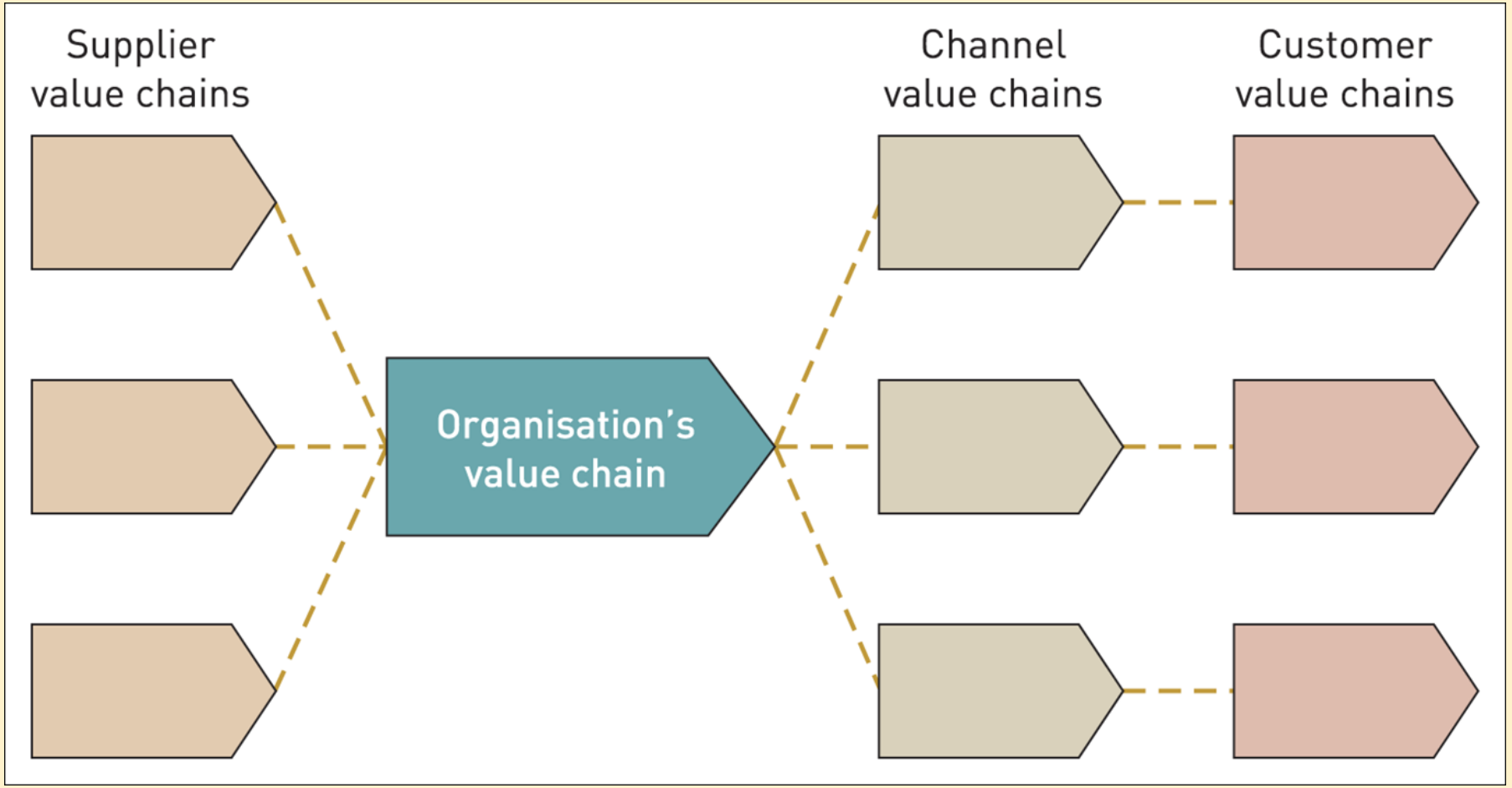
- This ‘extended enterprise’, as some have termed it, becomes the vehicle through which competitive advantage is gained – or lost.

Extending the Value Chain: The Value Web

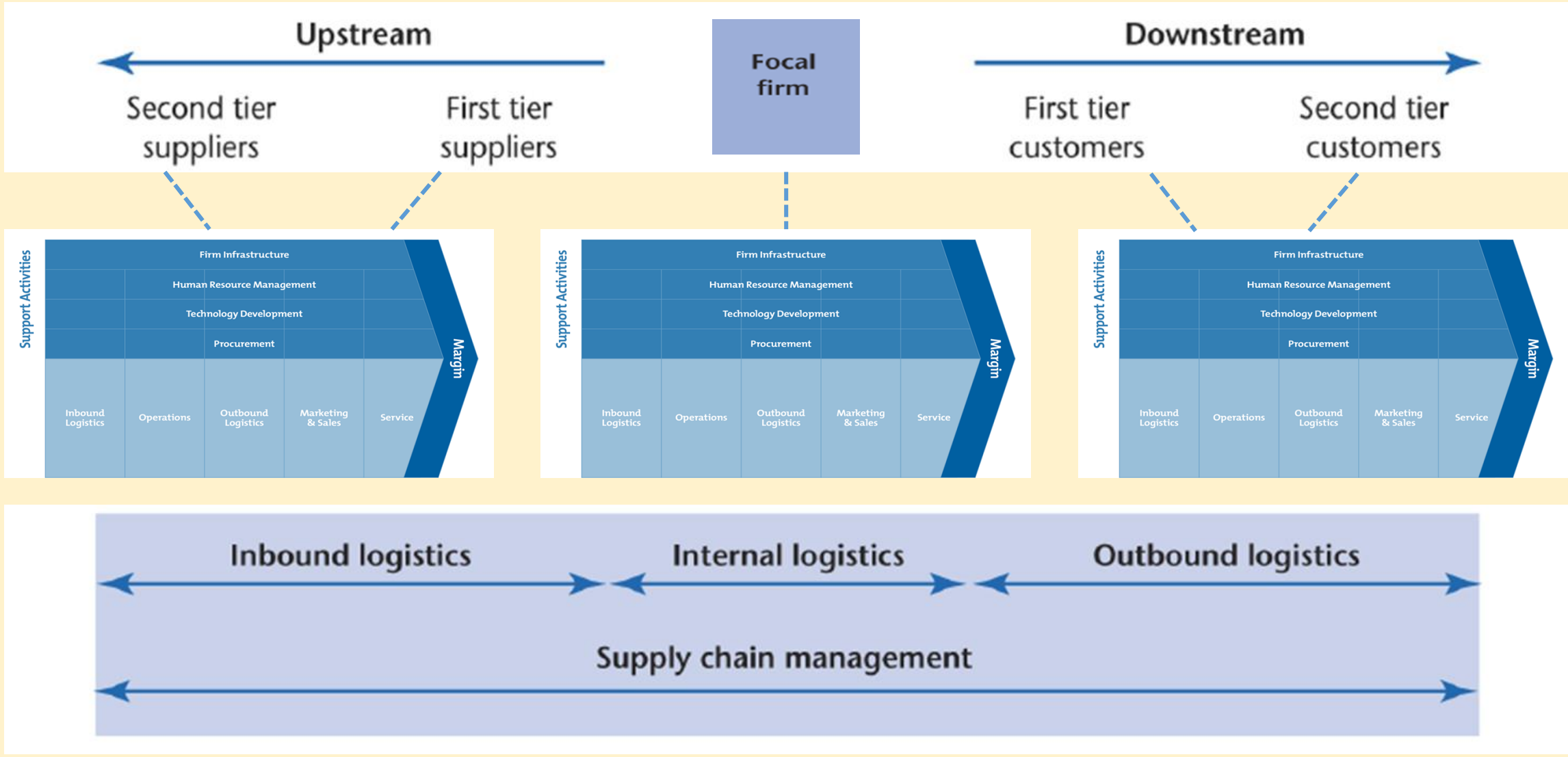
- The firm's value chain is linked to the value chains of its suppliers, distributors and customers
- This 'extended enterprise', becomes the vehicle through which competitive advantage is gained – or lost



The value network- Porter (1985, 1998)



Series of Value Chains in the Supply Network



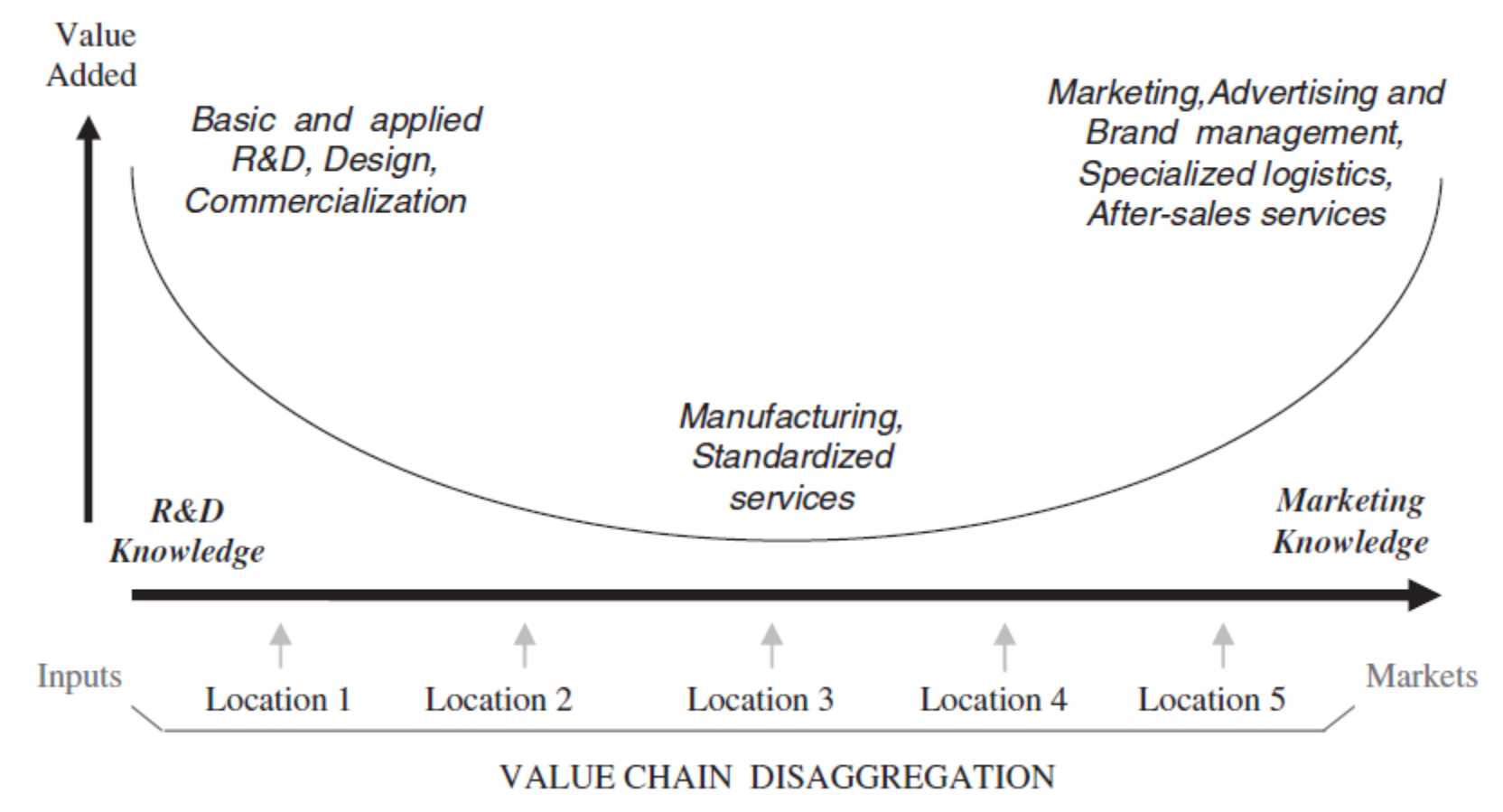
DHL Partnership with Dell Technologies: Direct Shipping

https://www.youtube.com/watch?v=szNQRftuKEY

Vertical Specialization leads to The Global Factory

- A global factory relates to the **disaggregation of the production process across a number of different firms in different countries**.
- i.e. firms are locating different parts of an increasingly fragmented production process in different countries
- Based on a number of factors including not only access to raw materials and nearness to markets but also the attractiveness of taxation regimes, other regulatory controls, and, of course, the level of wages

Value Chain Disaggregation



The smile of value creation (Mudambi, 2007).

T&C Garments Factory Egypt (Levi's)

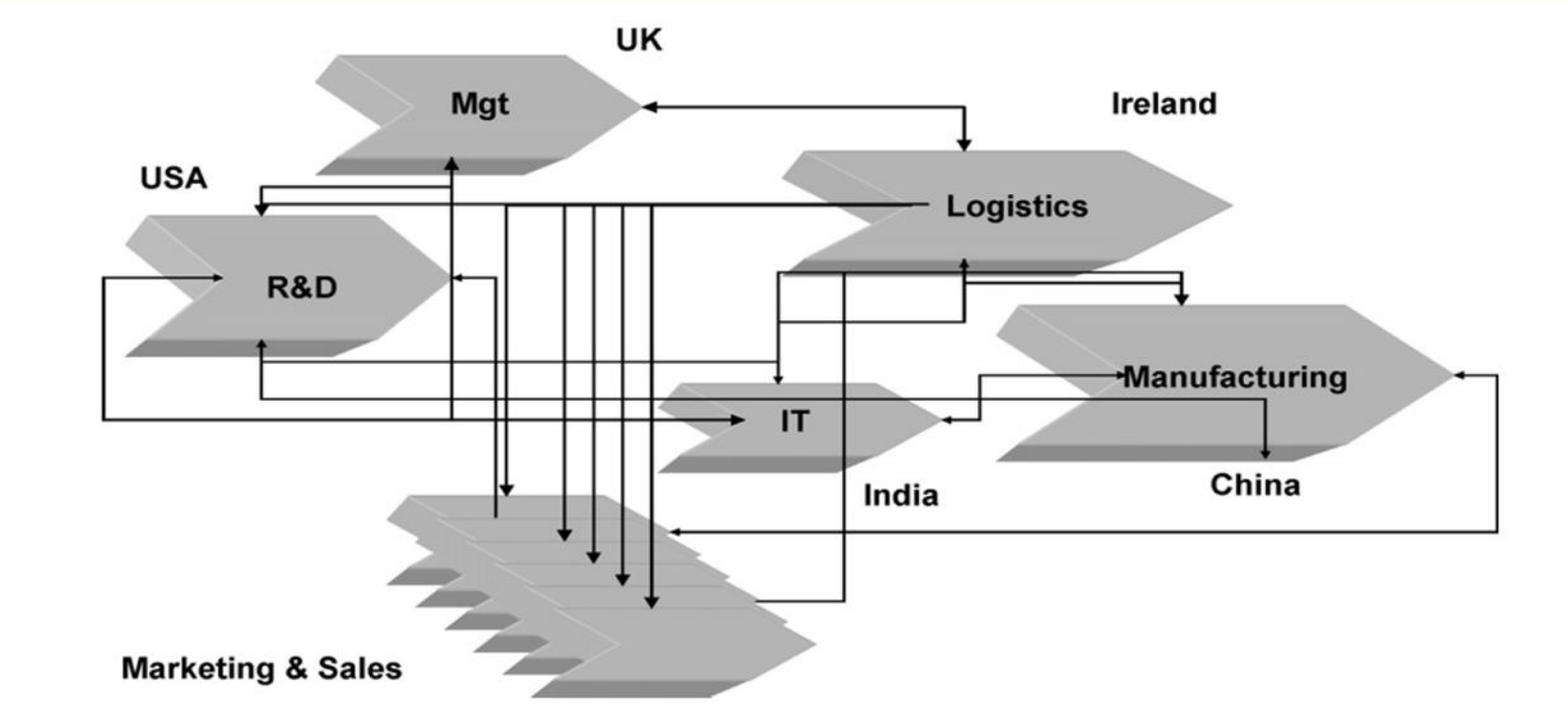
https://www.youtube.com/watch?v=C1j9ipTFjmw

What are Global Value Chains and why they matter?

https://www.youtube.com/watch?v=_sY8nbtDTTY

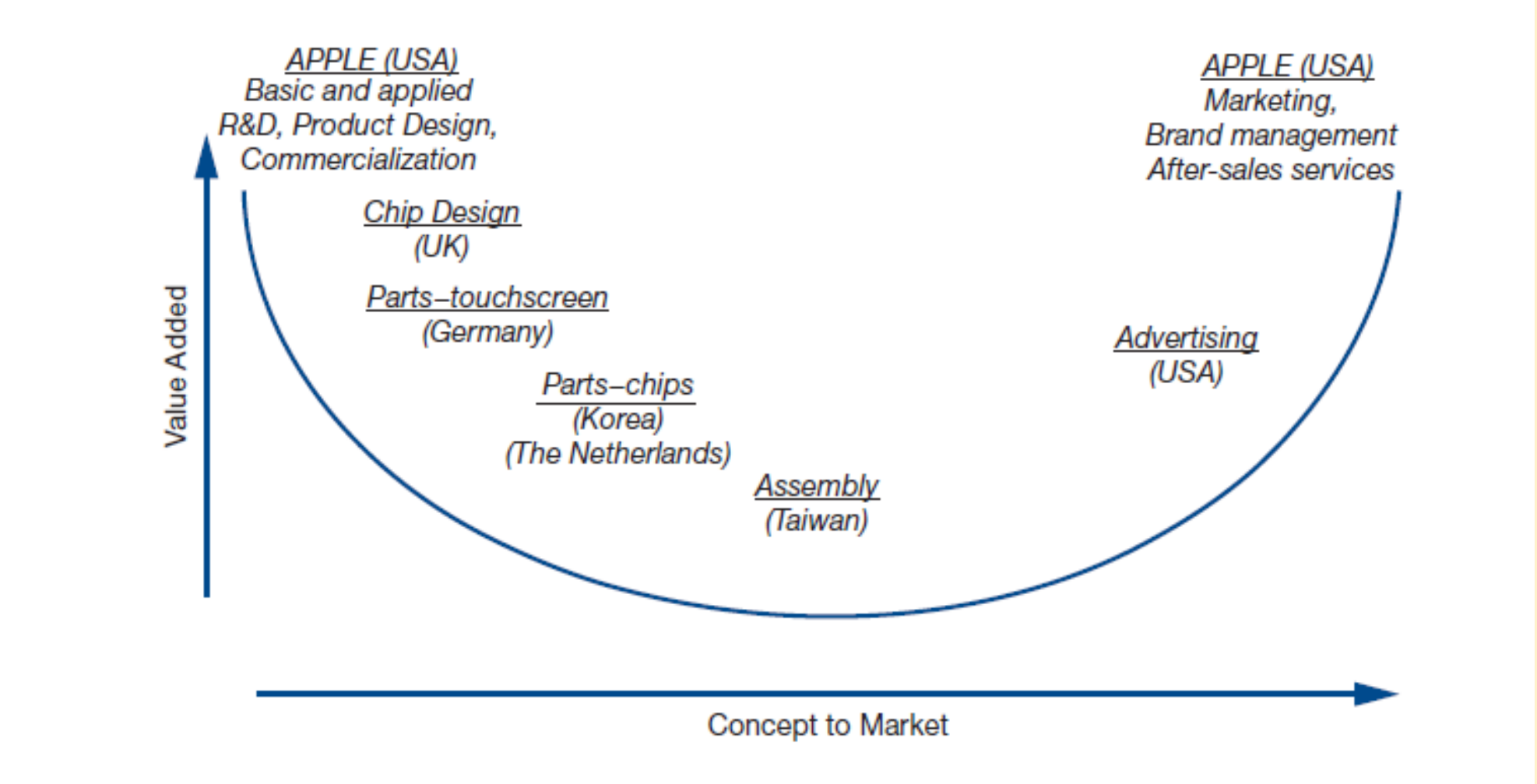
Global Value Chain (GVC)

- Represents the build up of value along a supply chain made up of a number of international partners



M.W. Hansen et al. / Journal of World Business 44 (2009) 121–130

Apple iPhone's GVC



Apple iPhone Global Supply Chain | CNBC

https://www.youtube.com/watch?v=Cw3V2x5u54Y

What's the idea?

- We can see from the value chain of the iPhone that **the key value added activities are kept in house** by Apple and include R&D, design, branding and marketing

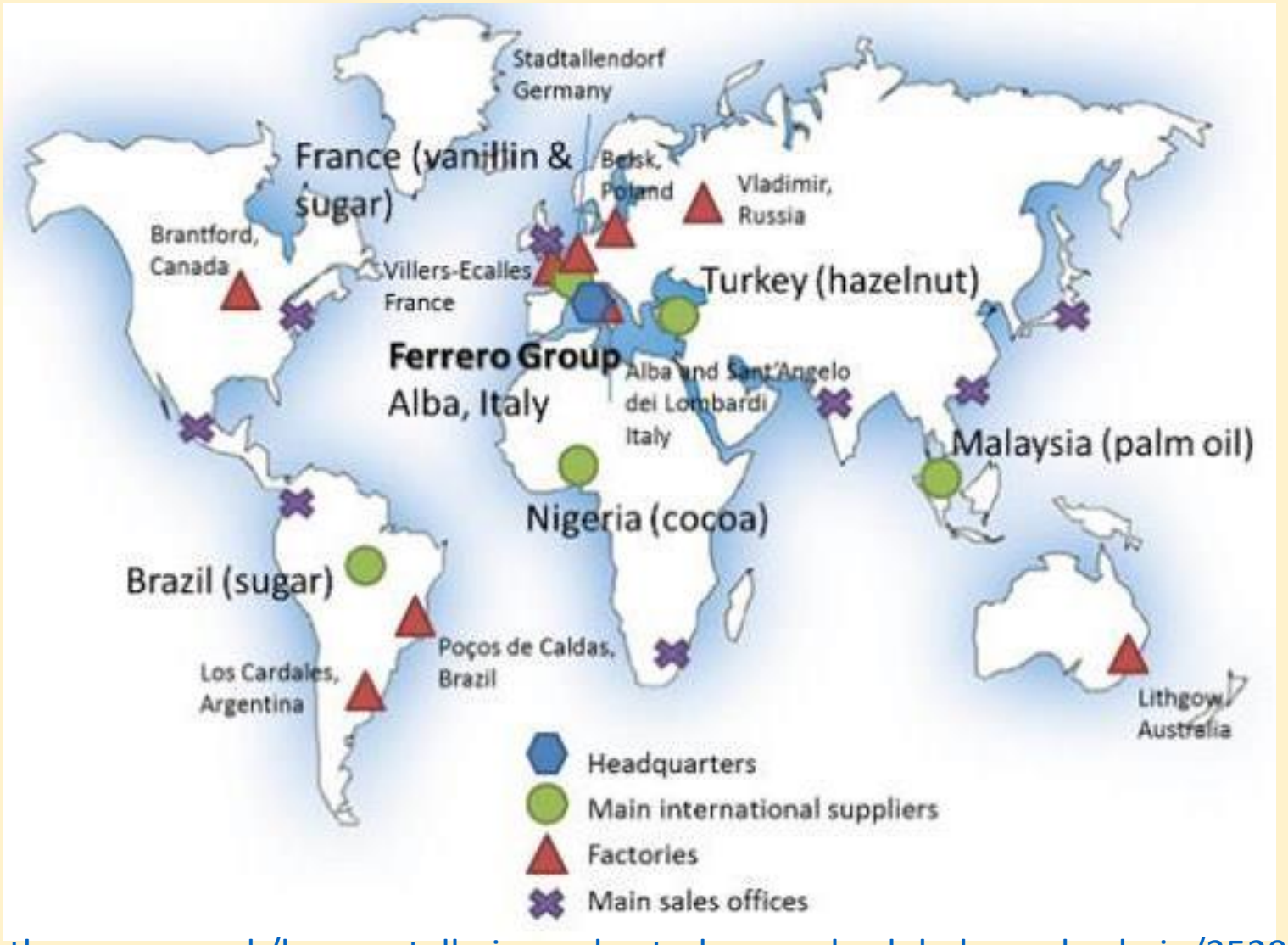
- The **least value added component is** manufacture, the assembly of the parts, which is **outsourced** either to Taiwan or China, although most iPhones are now assembled in China

- The assembly process represents only about 1 per cent of the cost of the iPhone.

- The MNC retains significant control of the entire process.

- The MNC controls less tangible, high value activities such as design, marketing, branding and management skills and consequently makes it difficult for local firms to compete since these activities are more difficult to copy

Nutella Global Value Chain

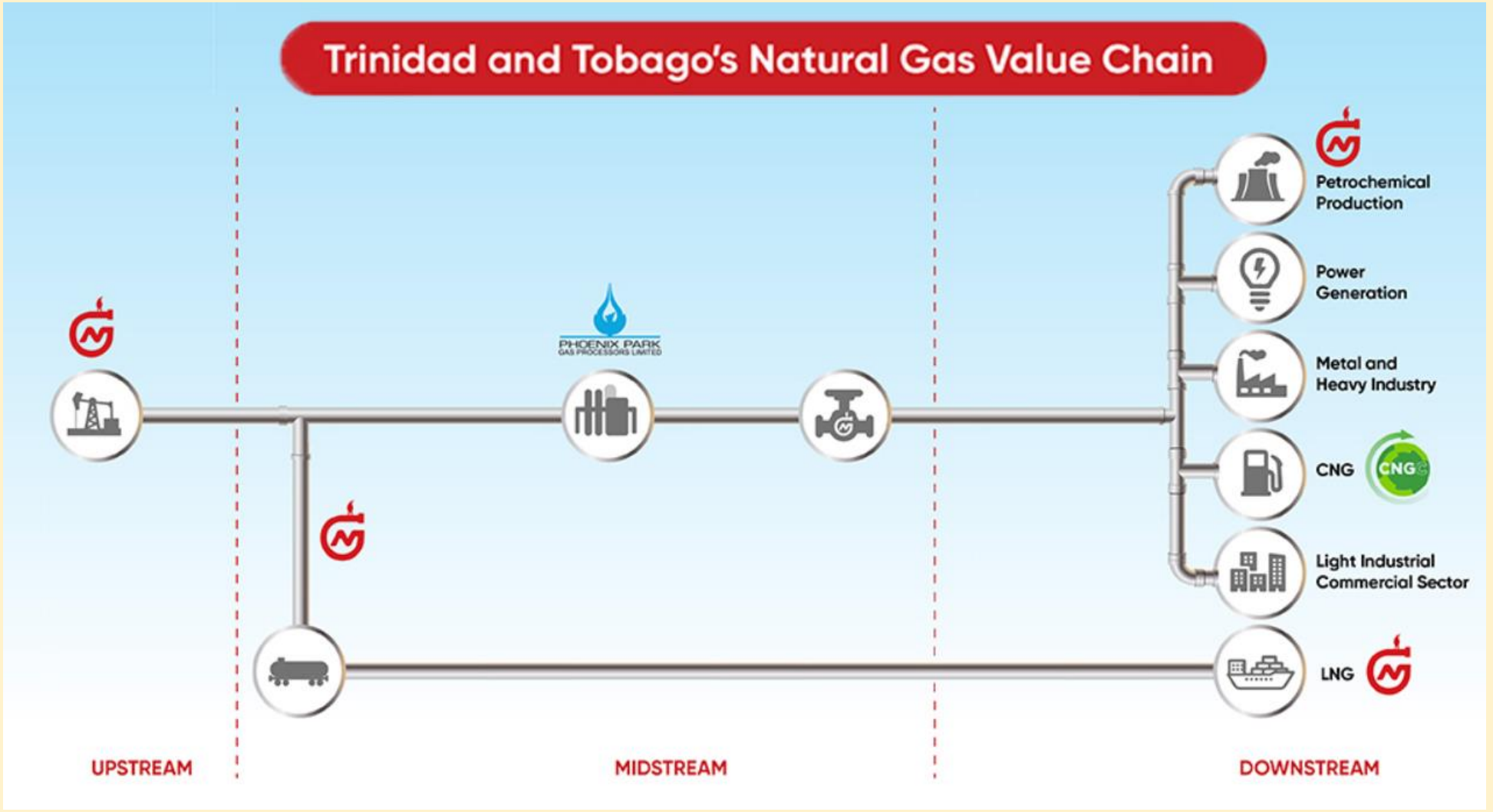


https://www.thegrocer.co.uk/how-nutella-is-made-study-reveals-global-supply-chain/352954.article

The supply chain and competitive performance

- Each of these organization in the chain are dependent upon each other by definition
- Yet, paradoxically, by tradition do not closely co-operate with each other.
- It is still the case today that some companies will seek to achieve cost reductions or profit improvement at the expense of their supply chain partners
- Simply transferring costs upstream or downstream does not make them any more competitive

T&T Natural Gas Value Chain



https://ngc.co.tt/about/value-chain/