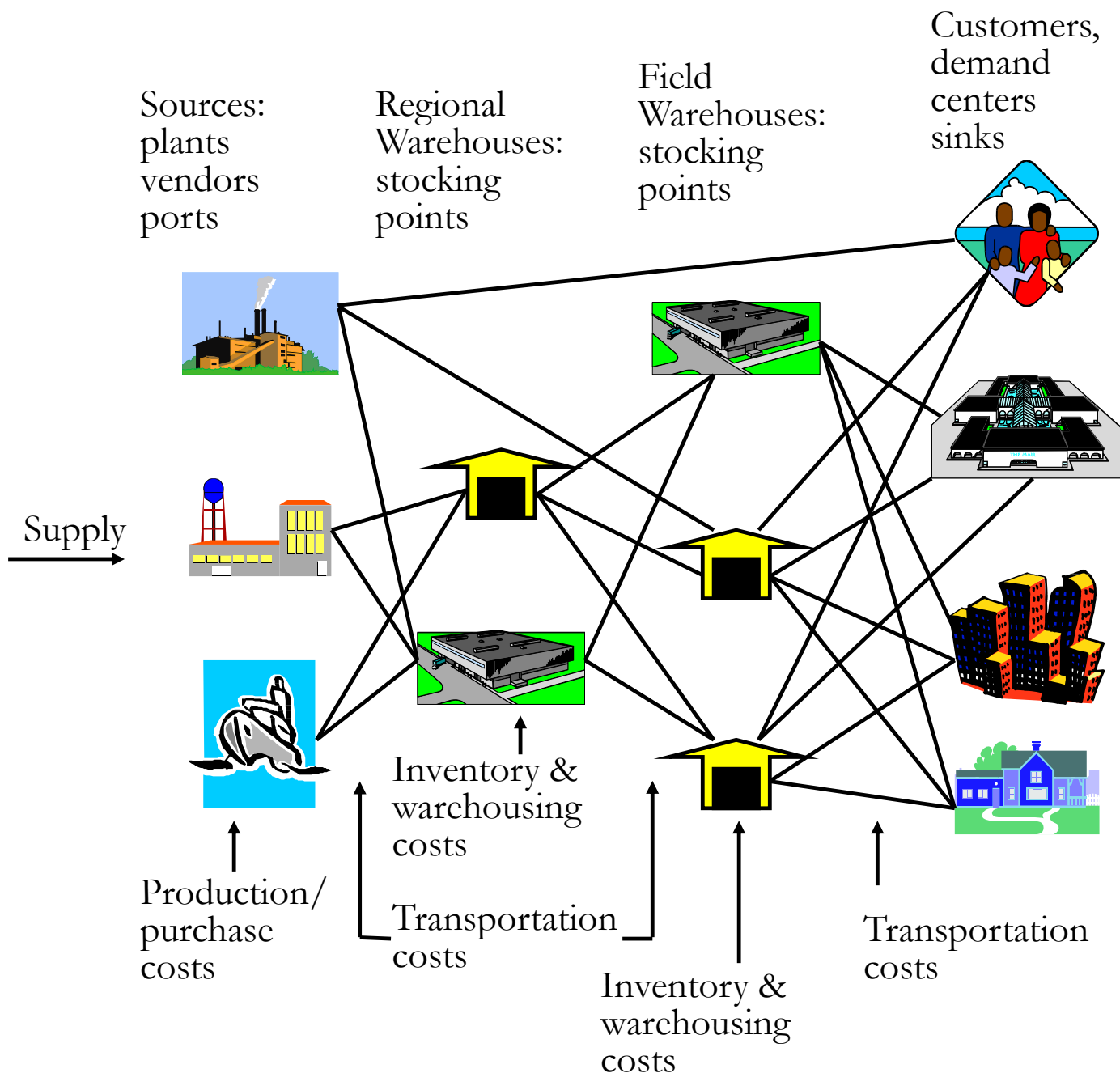


INTRODUCTION TO SUPPLY CHAIN MANAGEMENT

SUPPLY CHAIN

- A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer requirement.
- All facilities, functions, activities, associated with flow and transformation of goods and services from raw materials to customer, as well as the associated information flows.
- An integrated group of processes to “source,” “make,” and “deliver” products.



- Supply chain management (SCM) is the management of the flow of goods
- The goal or mission of supply chain management can be defined using Mr. Goldratt's words as “Increase throughput while simultaneously reducing both inventory and operating expense”

Supply Chain Management

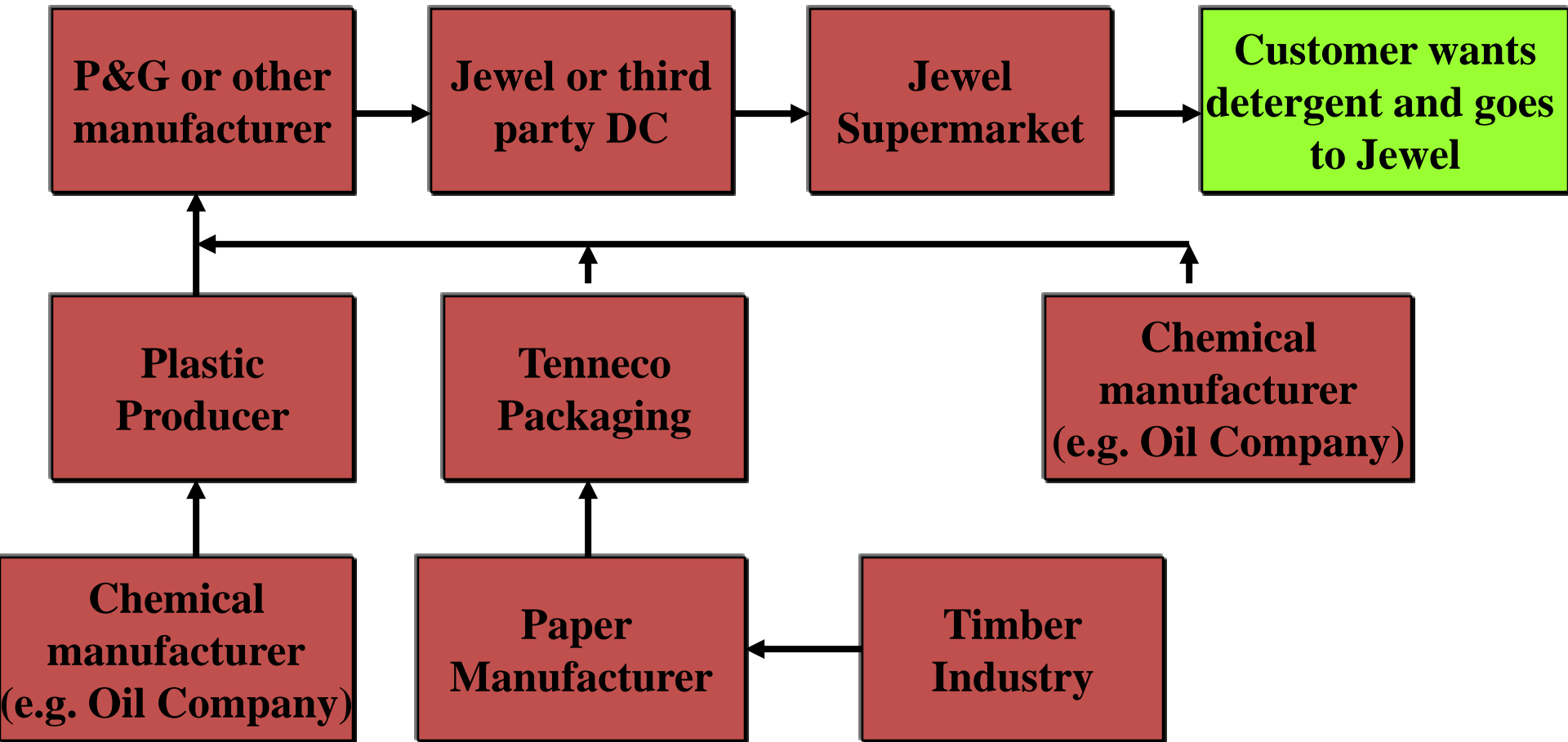
- **Definition:**

Supply Chain Management is primarily concerned with the efficient integration of suppliers, factories, warehouses and stores so that merchandise is produced and distributed in the right quantities, to the right locations and at the right time, and so as to minimize total system cost subject to satisfying customer service requirements.

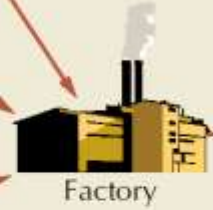
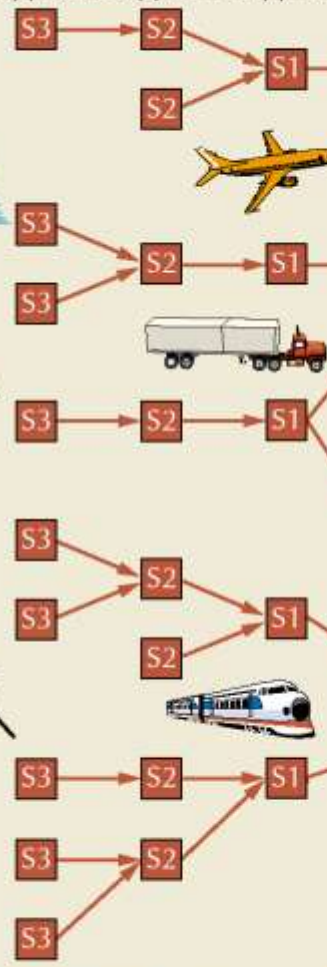
Continue

- Supply chain management has been defined as the "design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally.

What is a supply chain?

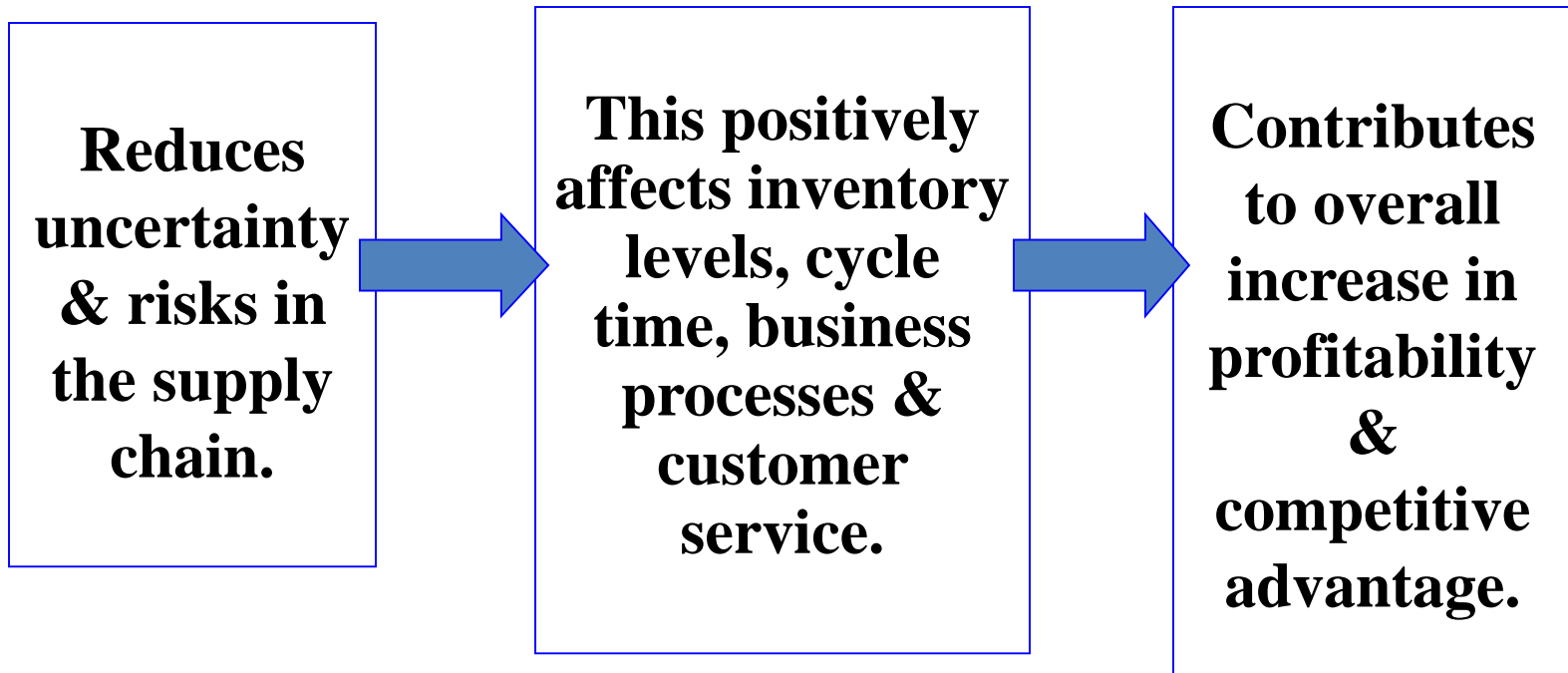


Tier 3 Suppliers
Tier 2 Suppliers
Tier 1 Suppliers



Supply Chain Illustration

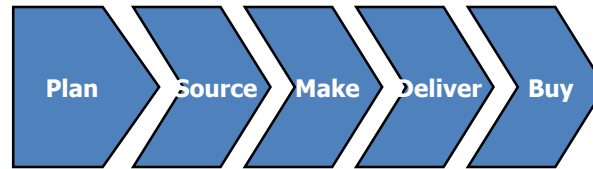
Benefits of SCM



SUPPLY CHAIN STAGES

- Customers
 - Retailers
 - Wholesalers/Distributors
 - Manufacturers
 - Component/ Raw material suppliers
- It is not compulsory that all the stages should be present in a supply chain

What Is Supply Chain Management (SCM)?



- A set of approaches used to efficiently integrate
 - Suppliers
 - Manufacturers
 - Warehouses
 - Distribution centers
- So that the product is produced and distributed
 - In the right quantities
 - To the right locations
 - And at the right time
- System-wide costs are minimized and
- Service level requirements are satisfied

History of Supply Chain Management

- 1960's - Inventory Management Focus, Cost Control
- 1970's - MRP & OM - Operations Planning
- 1980's - MRPII, JIT - Materials Management, Logistics
- 1990's - SCM - ERP - “Integrated” Purchasing, Financials, Manufacturing, Order Entry
- 2000's - Optimized “Value Network” with Real-Time Decision Support; Synchronized & Collaborative Extended Network for SCM.

Objectives

- Satisfy the customer needs.
- Maximize the overall value generated.
- Increase supply chain surplus.
- High supply chain profitability.

SUPPLY CHAIN DECISIONS

- Design>planning> execution > control>monitoring.
- Ensure effective flow of goods and information
- Clusters of store near the distribution center.
- Collaboration with suppliers.
- Active efforts to steer customer at real time.
- Centralized manufacturing

- Worth of inventory.
- Manage cash flow
- Should be flexible.

DECISION PHASES IN SUPPLY CHAIN

1. Supply chain strategy or design

- How to structure for next several years
- What is the chain configuration
- How resources allocated
- What process each stage will perform
- Out sourcing
- In house functions

- Locations and capacities of production and ware houses
- Mode of transportation
- Type of information system

2. Supply chain planning

- for several months.
- Forecast for the coming year
- Analyses demand in different markets
- Which market? Location?

- Sub contracting
- Inventory policies
- Timing
- Size of marketing
- Price promotions

3. Supply chain operations

- weekly or daily operation decisions
- Individual customer orders
- Allocation of inventory and production
- Set dates for activities

- Generate lists for warehouses
- Allocation of shipments
- Schedules of trucks.

PROCESS VIEWS OF SUPPLY CHAIN

1. CYCLE VIEW

- Process divided in to series of cycles. Each cycle occurs at the interface between two successive stages of the supply chain.
- Customer order cycle
- Replenishment cycle
- Manufacturing cycle
- Procurement cycle

- A cycle view of supply chain clearly define the process involved and the owners of each process.
- This view is very useful when considering operational decisions because it specifies the roles and responsibilities of each member of supply chain and the desired outcome of each process.

PUSH PULL VIEW OF SUPPLY CHAIN

- Divided in to two categories..
 1. Executed in response to a customer order(pull process)
 2. Executed in anticipation of customer orders(push process)

A push vs pull view of the SC operations

Categorizes SC processes based on whether they are initiated in response to a customer order (**pull**) or in anticipation of a customer order (**push**).

Examples:

- Compaq: All processes except for those involved in customer order cycle are of “push” type.
- Dell: Dell assembles its computers to order and therefore, all processes except for those involved in the procurement cycle are “pull”.

Remark: Generally, if possible, a “pull” organization of the supply chain provides tighter control of inventory costs and the ability to support higher levels of product customization.

Supply Chain Integration – Push Strategies

- Classical manufacturing supply chain strategy
- Manufacturing forecasts are long-range
 - Orders from retailers' warehouses
- Longer response time to react to marketplace changes
 - Unable to meet changing demand patterns
 - Supply chain inventory becomes obsolete as demand for certain products disappears
- Increased variability (Bullwhip effect) leading to:
 - Large inventory safety stocks
 - Larger and more variably sized production batches
 - Unacceptable service levels
 - Inventory obsolescence
- Inefficient use of production facilities (factories)
 - How is demand determined? Peak? Average?
 - How is transportation capacity determined?
- Examples: Auto industry, large appliances, others?



Supply Chain Integration – Pull Strategies

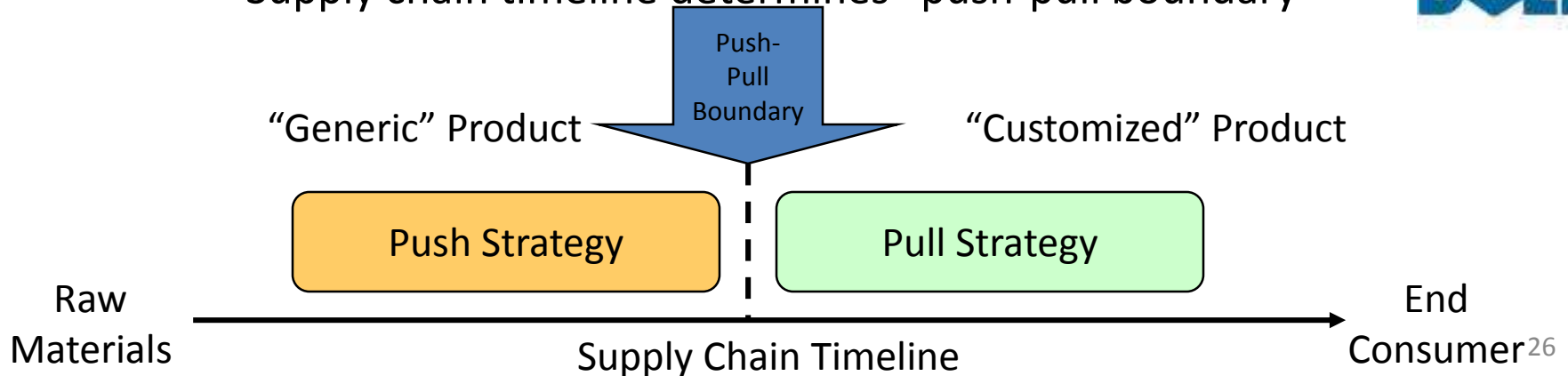
- Production and distribution are demand-driven
 - Coordinated with true customer demand
- None or little inventory held
 - Only in response to specific orders
- Fast information flow mechanisms
 - POS data
- Decreased lead times
- Decreased retailer inventory
- Decreased variability in the supply chain and especially at manufacturers
- Decreased manufacturer inventory
- More efficient use of resources
- More difficult to take advantage of scale opportunities
- Examples: Dell, Amazon



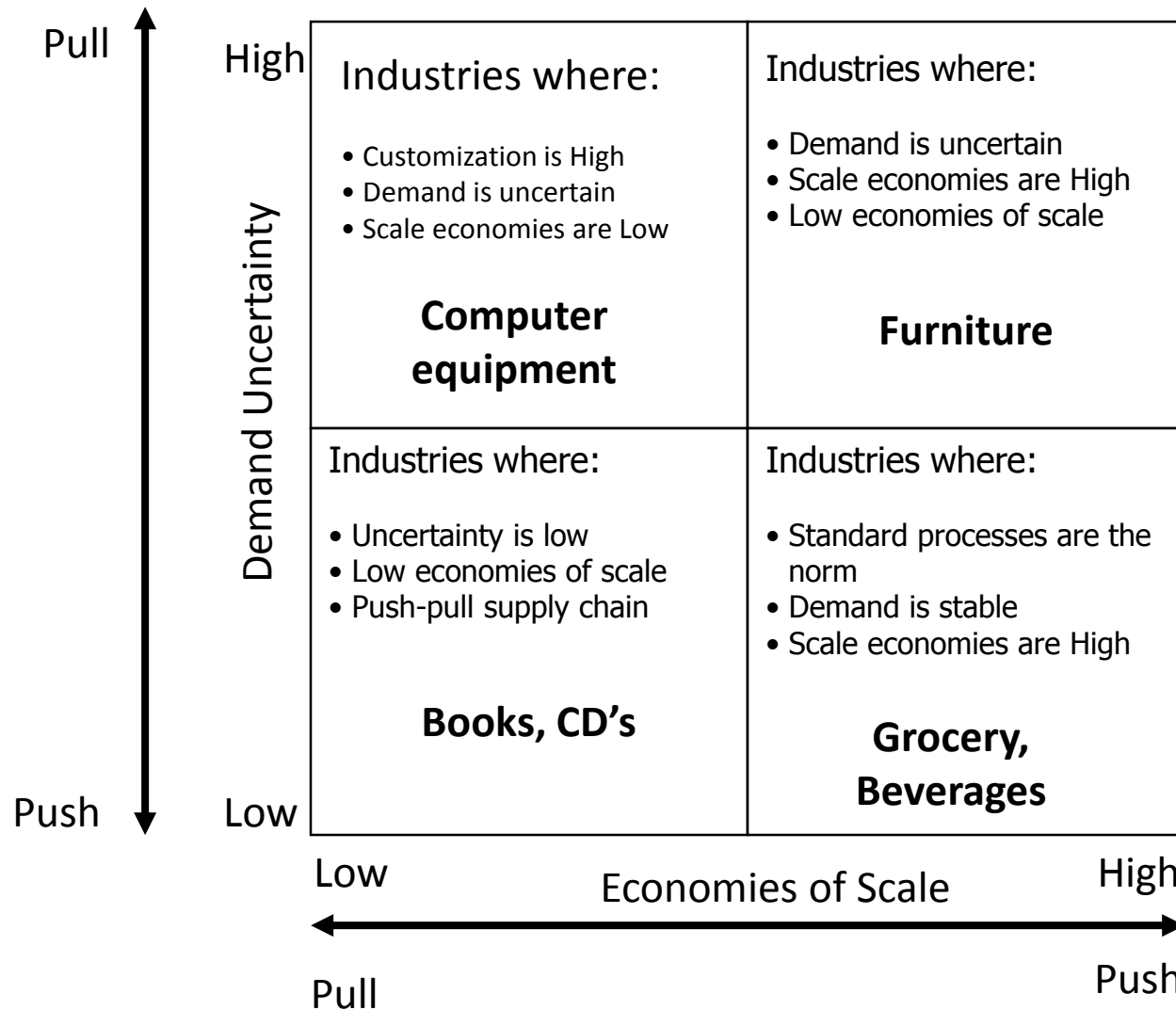
Supply Chain Integration – Push/Pull Strategies



- Hybrid of “push” and “pull” strategies to overcome disadvantages of each
- Early stages of product assembly are done in a “push” manner
 - Partial assembly of product based on aggregate demand forecasts (which are more accurate than individual product demand forecasts)
 - Uncertainty is reduced so safety stock inventory is lower
- Final product assembly is done based on customer demand for specific product configurations
- Supply chain timeline determines “push-pull boundary”



Choosing Between Push/Pull Strategies



Where do the following industries fit in this model:

- **Automobile?**
- **Aircraft?**
- **Fashion?**
- **Petroleum refining?**
- **Pharmaceuticals?**
- **Biotechnology?**
- **Medical Devices?**

Characteristics of Push, Pull and Push/Pull Strategies

	PUSH	PULL
Objective	Minimize Cost	Maximize Service Level
Complexity	High	Low
Focus	Resource Allocation	Responsiveness
Lead Time	Long	Short
Processes	Supply Chain Planning	Order Fulfillment

Source: Simchi-Levi

Drivers of supply chain performance

- Aim.. responsiveness and efficiency at lowest possible cost.
- Drivers are set to improve the supply chain performance.
- Facilities
- Inventory
- Transportation
- Information
- Sourcing
- Pricing.

Outline

- Drivers of supply chain performance
- A framework for structuring drivers

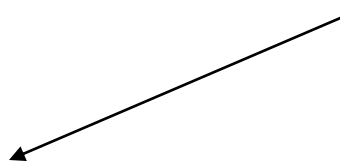
- Facilities
- Inventory
- Transportation

Logistical drivers



- Information
- Sourcing
- Pricing

Cross-functional drivers



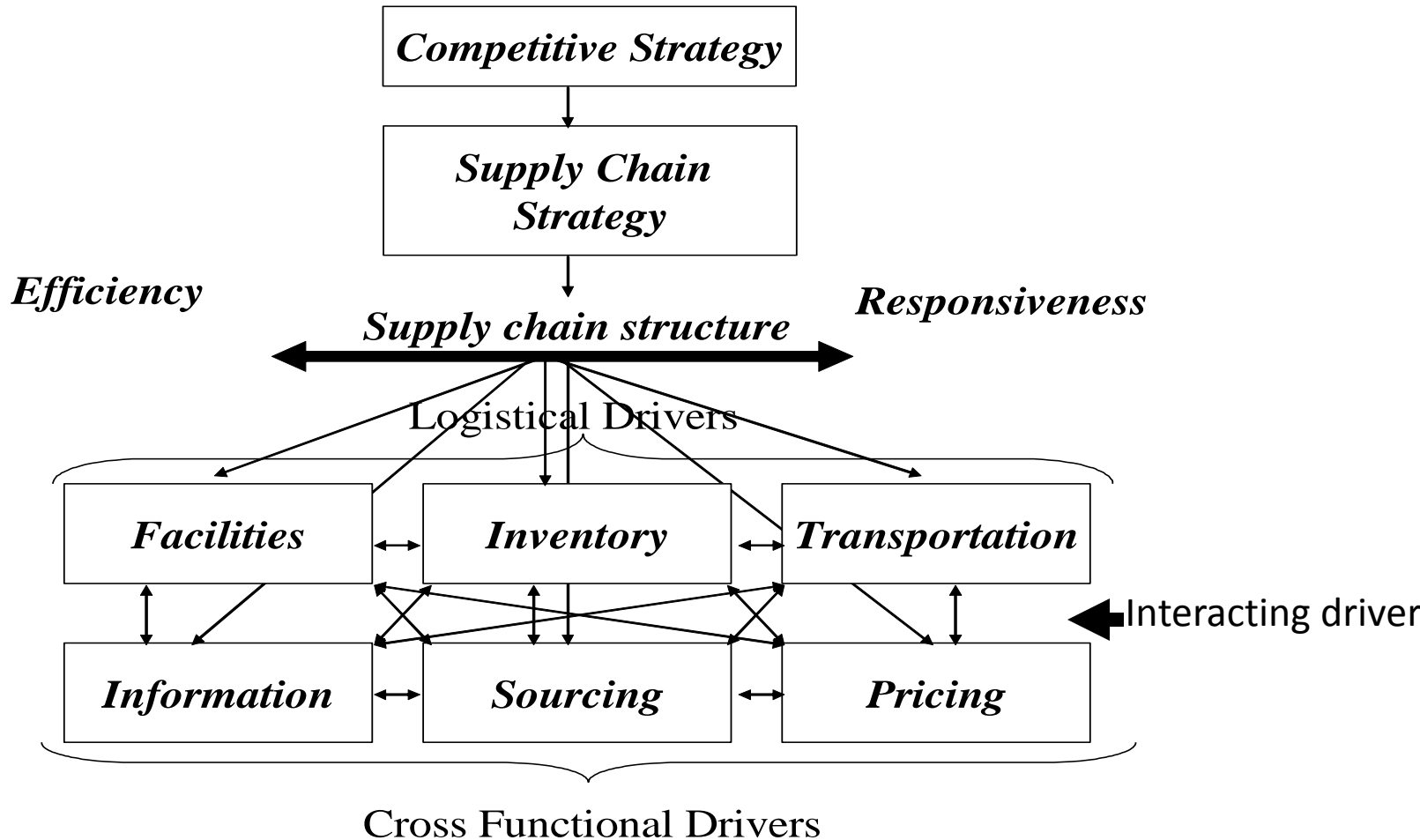
Drivers of Supply Chain Performance

- Facilities
 - places where inventory is stored, assembled, or fabricated
 - production sites and storage sites (distribution facilities (DC))
 - Location, capacity, flexibility
 - Responsive – several DC close to customer v.s. Efficiency- central few DCs
- Inventory
 - raw materials, WIP, finished goods within a supply chain
 - inventory policies
 - Responsiveness – Large inventories, Efficiency – low inventories
- Transportation
 - moving inventory from point to point in a supply chain
 - combinations of transportation modes and routes
 - Transportation choices make big impact on responsiveness

Drivers of Supply Chain Performance

- Information
 - data and analysis and sharing regarding inventory, transportation, facilities, costs, prices, supplier performance, demand forecast throughout the supply chain
 - potentially **the biggest driver of supply chain performance**, affects all other drivers directly.
- Sourcing
 - Sourcing functions that are outsourced, like production, storage, management of information etc.
 - Motorola suffered from responsiveness after outsourcing production to contract manufacturers in china because of long distances, started flying in some of its cellular phones.
- Pricing
 - Price associated with goods and services provided by a firm to the supply chain
 - Affects the behavior of the buyer.
 - Transportation company charging based on lead time provided by customer. Efficiency customers will order early. If the price is not dependent on lead time early orders are very unlikely.

A Framework for Structuring Drivers



Structuring Drivers; Wal-Mart example

- Competitive strategy; every-day-low-price, reliable product availability, wide-variety.
- Supply chain must be efficient with adequate level of responsiveness
- Inventory – low levels of inventories, cross-docking (no storage at DCs) (efficiency)
- Transportation – owns its fleet of trucks (responsiveness)
- Facilities – Centrally located DCs. Won't open stores until demand justifies several of them and a DC to support them.
- Information – High investment on information technology, sharing sales data directly and timely with its suppliers
- Sourcing – finding efficient suppliers, feeding them with large orders
- Pricing – Every day low price (no sales season), assuring steady demand