

Chapter 1

Understanding the Supply Chain

(27)

Traditional View: Logistics in the Manufacturing Firm

- ◆ Profit 4%
- ◆ Logistics Cost 21%
- ◆ Marketing Cost 27%
- ◆ Manufacturing Cost 48%

Profit
Logistics Cost
Marketing Cost
Manufacturing Cost

Supply Chain Management: The True Magnitude

- ◆ Compaq estimates it lost \$.5 billion to \$1 billion in sales in 1995 because laptops were not available when and where needed
- ◆ When the 1 gig processor was introduced by AMD, the price of the 800 mb processor dropped by 30%
- ◆ P&G estimates it saved retail customers \$65 million by collaboration resulting in a better match of supply and demand

Outline

- ◆ What is a Supply Chain?
- ◆ Decision Phases in a Supply Chain
- ◆ Process View of a Supply Chain
- ◆ The Importance of Supply Chain Flows
- ◆ Examples of Supply Chains

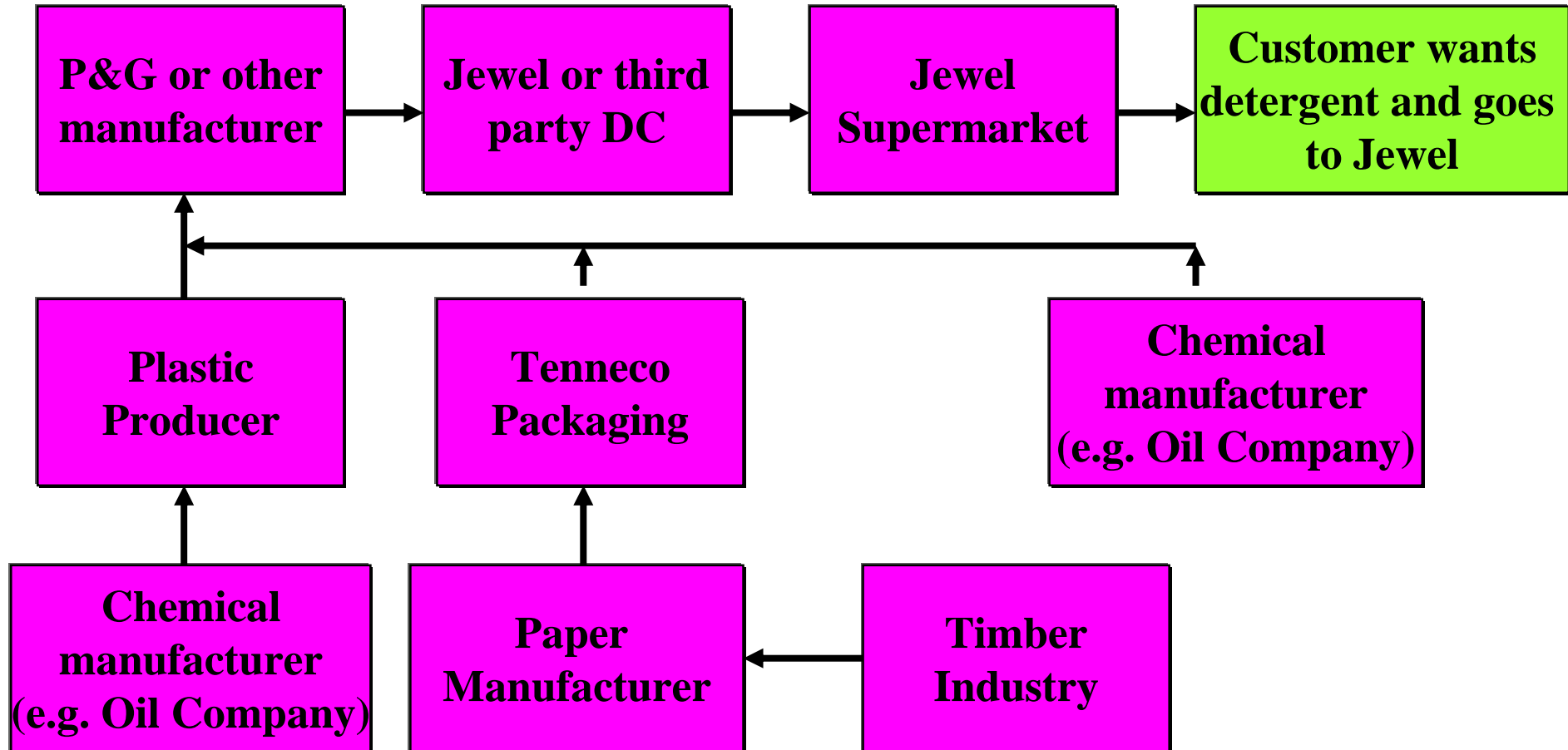
What is a Supply Chain?(I)

- ◆ All stages involved, directly or indirectly, in fulfilling a customer request
- ◆ Includes manufacturers, suppliers, transporters, warehouses, retailers, customers
- ◆ Within each company, the supply chain includes all functions involved in fulfilling a customer request (product development, marketing, operations, distribution, finance, customer service)

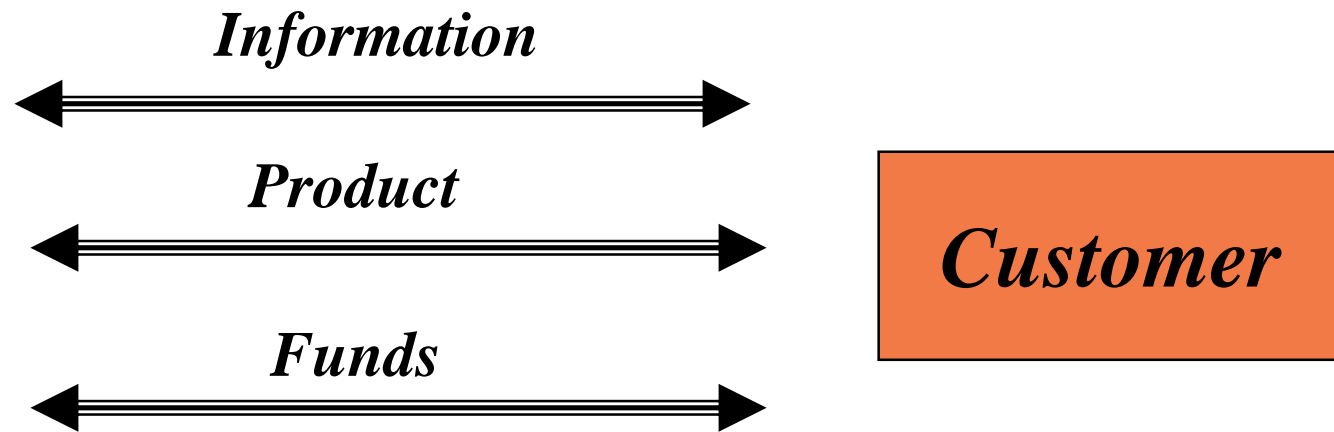
What is a Supply Chain?(II)

- ◆ Customer is an integral part of the supply chain
- ◆ Includes movement of products from suppliers to manufacturers to distributors, but also includes movement of information, funds, and products in both directions
- ◆ Probably more accurate to use the term “supply network” or “supply web”
- ◆ Typical supply chain stages: customers, retailers, distributors, manufacturers, suppliers
- ◆ All stages may not be present in all supply chains (e.g., no retailer or distributor for Dell)

What is a Supply Chain?(III)



Flows in a Supply Chain



Supply Chain

The Objective of a Supply Chain(I)

- ◆ Maximize overall value created
- ◆ Supply chain value: difference between what the final product is worth to the customer and the effort the supply chain expends in filling the customer's request
- ◆ Value is correlated to supply chain profitability (difference between revenue generated from the customer and the overall cost across the supply chain)

The Objective of a Supply Chain(II)

- ◆ Example: Dell receives \$2000 from a customer for a computer (revenue)
- ◆ Supply chain incurs costs (information, storage, transportation, components, assembly, etc.)
- ◆ Difference between \$2000 and the sum of all of these costs is the supply chain profit
- ◆ Supply chain profitability is total profit to be shared across all stages of the supply chain
- ◆ Supply chain success should be measured by total supply chain profitability, not profits at an individual stage

The Objective of a Supply Chain(III)

- ◆ Sources of supply chain revenue: the customer
- ◆ Sources of supply chain cost: flows of information, products, or funds between stages of the supply chain
- ◆ *Supply chain management is the management of flows between and among supply chain stages to maximize total supply chain profitability*

Decision Phases of a Supply Chain

- ◆ Supply chain strategy or design
- ◆ Supply chain planning
- ◆ Supply chain operation

Supply Chain Strategy or Design

- ◆ Decisions about the structure of the supply chain and what processes each stage will perform
- ◆ Strategic supply chain decisions
 - Locations and capacities of facilities
 - Products to be made or stored at various locations
 - Modes of transportation
 - Information systems
- ◆ Supply chain design must support strategic objectives
- ◆ Supply chain design decisions are long-term and expensive to reverse – must take into account market uncertainty

Supply Chain Planning(1/2)

- ◆ Definition of a set of policies that govern short-term operations
- ◆ Fixed by the supply configuration from previous phase
- ◆ Starts with a forecast of demand in the coming year

Supply Chain Planning(2/2)

- ◆ Planning decisions:
 - Which markets will be supplied from which locations
 - Planned buildup of inventories
 - Subcontracting, backup locations
 - Inventory policies
 - Timing and size of market promotions
- ◆ Must consider in planning decisions demand uncertainty, exchange rates, competition over the time horizon

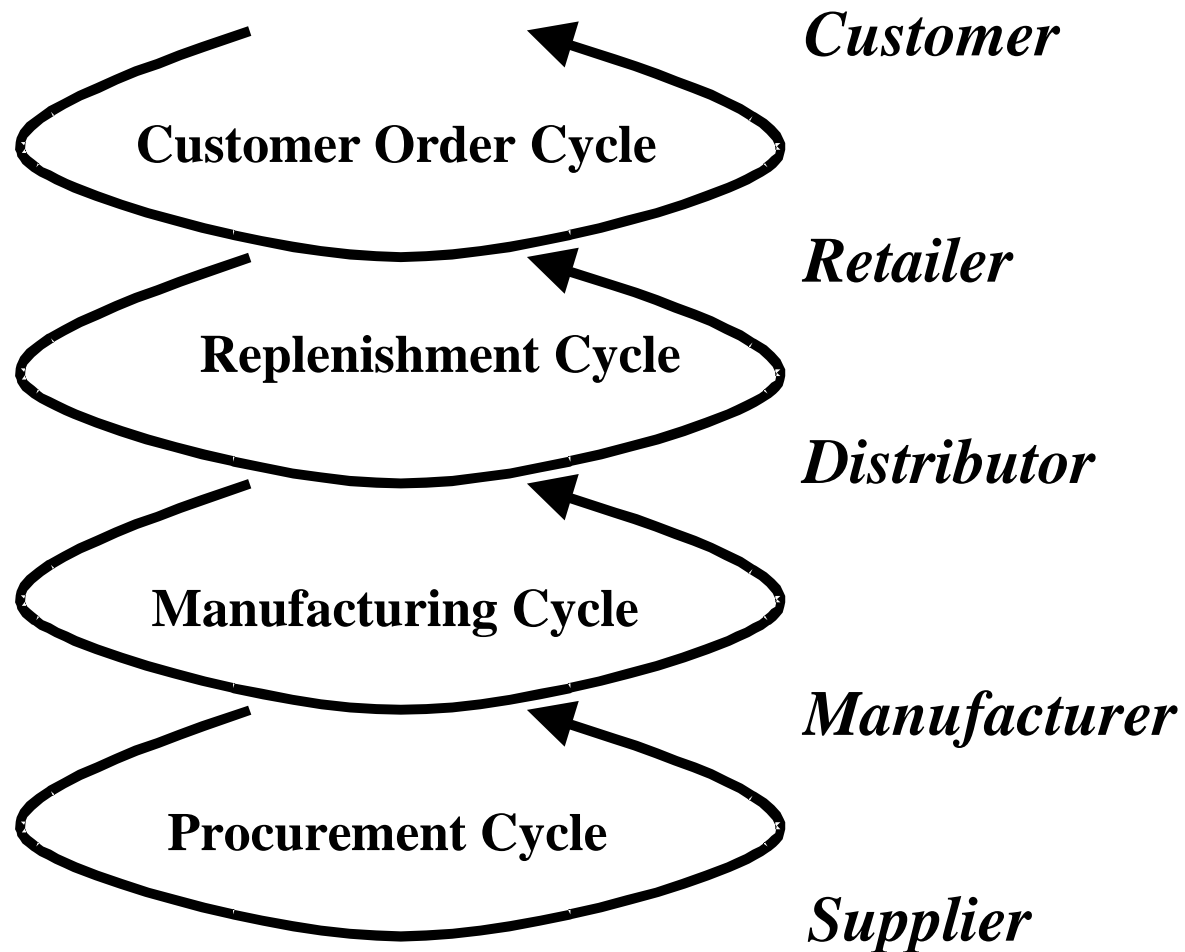
Supply Chain Operation

- ◆ Time horizon is weekly or daily
- ◆ Decisions regarding individual customer orders
- ◆ Supply chain configuration is fixed and operating policies are determined
- ◆ Goal is to implement the operating policies as effectively as possible
- ◆ Allocate orders to inventory or production, set order due dates, generate pick lists at a warehouse, allocate an order to a particular shipment, set delivery schedules, place replenishment orders
- ◆ Much less uncertainty (short time horizon)

Process View of a Supply Chain

- ◆ Cycle view: processes in a supply chain are divided into a series of cycles, each performed at the interfaces between two successive supply chain stages
- ◆ Push/pull view: processes in a supply chain are divided into two categories depending on whether they are executed in response to a customer order (pull) or in anticipation of a customer order (push)

Cycle View of Supply Chains



Cycle View of a Supply Chain

- ◆ Each cycle occurs at the interface between two successive stages
- ◆ Customer order cycle (customer-retailer)
- ◆ Replenishment cycle (retailer-distributor)
- ◆ Manufacturing cycle (distributor-manufacturer)
- ◆ Procurement cycle (manufacturer-supplier)
- ◆ Cycle view clearly defines processes involved and the owners of each process. Specifies the roles and responsibilities of each member and the desired outcome of each process.

Customer Order Cycle

- ◆ Involves all processes directly involved in receiving and filling the customer's order
- ◆ Customer arrival
- ◆ Customer order entry
- ◆ Customer order fulfillment
- ◆ Customer order receiving

Replenishment Cycle

- ◆ All processes involved in replenishing retailer inventories (retailer is now the customer)
- ◆ Retail order trigger
- ◆ Retail order entry
- ◆ Retail order fulfillment
- ◆ Retail order receiving

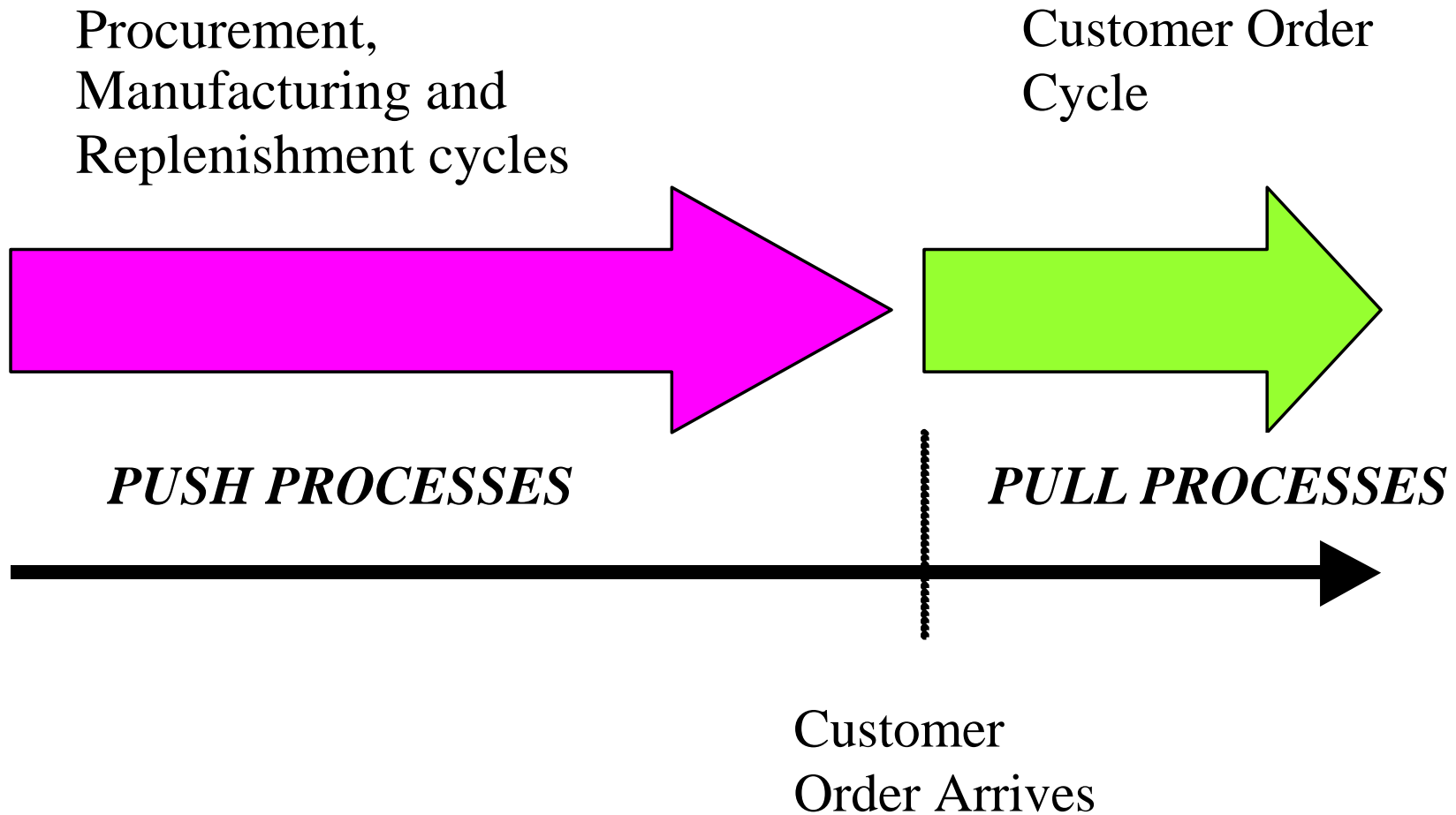
Manufacturing Cycle

- ◆ All processes involved in replenishing distributor (or retailer) inventory
- ◆ Order arrival from the distributor, retailer, or customer
- ◆ Production scheduling
- ◆ Manufacturing and shipping
- ◆ Receiving at the distributor, retailer, or customer

Procurement Cycle

- ◆ All processes necessary to ensure that materials are available for manufacturing to occur according to schedule
- ◆ Manufacturer orders components from suppliers to replenish component inventories
- ◆ However, component orders can be determined precisely from production schedules (different from retailer/distributor orders that are based on uncertain customer demand)
- ◆ Important that suppliers be linked to the manufacturer's production schedule

Push/Pull View of Supply Chains



Push/Pull View of Supply Chain Processes

- ◆ Supply chain processes fall into one of two categories depending on the timing of their execution relative to customer demand
- ◆ Pull: execution is initiated in response to a customer order (reactive)
- ◆ Push: execution is initiated in anticipation of customer orders (speculative)
- ◆ Push/pull boundary separates push processes from pull processes

The Importance of Supply Chain Flows

- ◆ Close connection between design and management of supply chain flows (product, information, and cash) and supply chain success
- ◆ Dell: success
- ◆ Supply chain decisions can play a significant role in the success or failure of a firm

7-Eleven

- ◆ What factors influence decisions of opening and closing stores?
Location of stores?
- ◆ Why has 7-Eleven chosen off-site preparation of fresh food?
- ◆ Why does 7-Eleven discourage direct store delivery from vendors?
- ◆ Where are distribution centers located and how many stores does each center serve? How are stores assigned to distribution centers?
- ◆ Why does 7-Eleven combine fresh food shipments by temperature?
- ◆ What point of sale data does 7-Eleven gather and what information is made available to store managers? How should information systems be structured?