AGEC 632: AGRIBUSINESS LOGISTICS

Chapter 1.
Understanding the Supply Chain

August 25, 2021

Manhattan, Kansas

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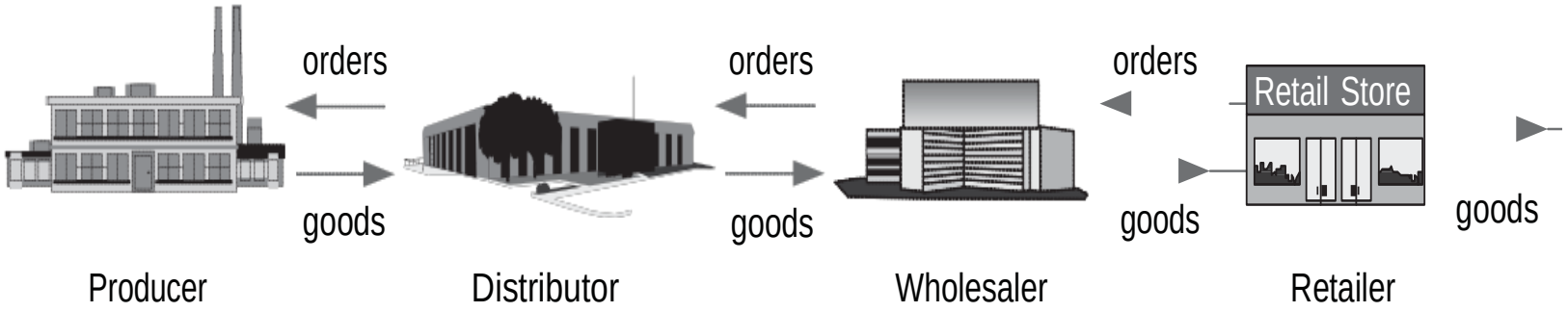
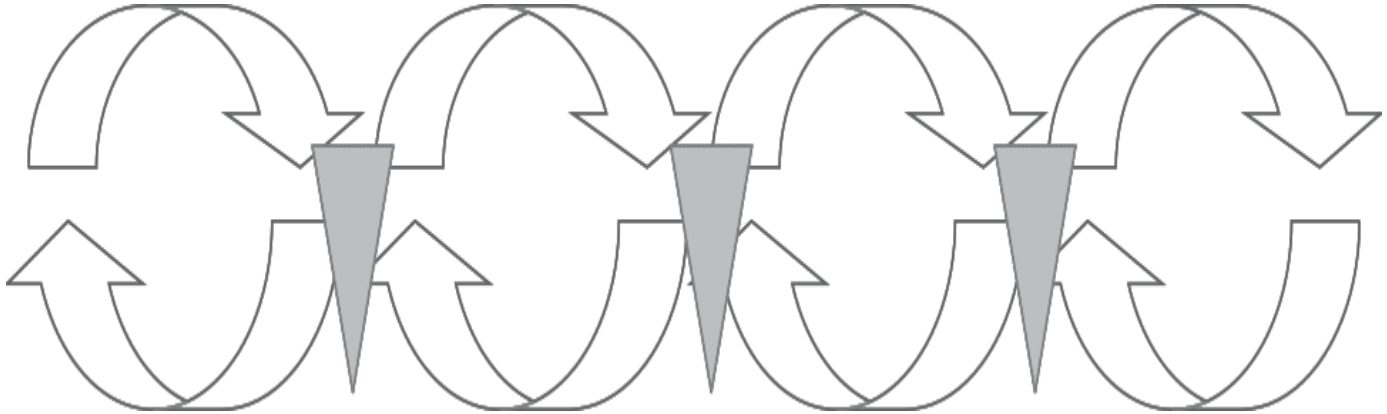
Learning Objetives

- Discuss the goal of a supply chain and explain the impact of supply chain decisions on the success of a firm.
- Identify the three key supply chain decision phases and explain the significance of each one.
- Describe the cycle & push/ pull views of the supply chain.
- Classify the supply chain macro processes in a firm.

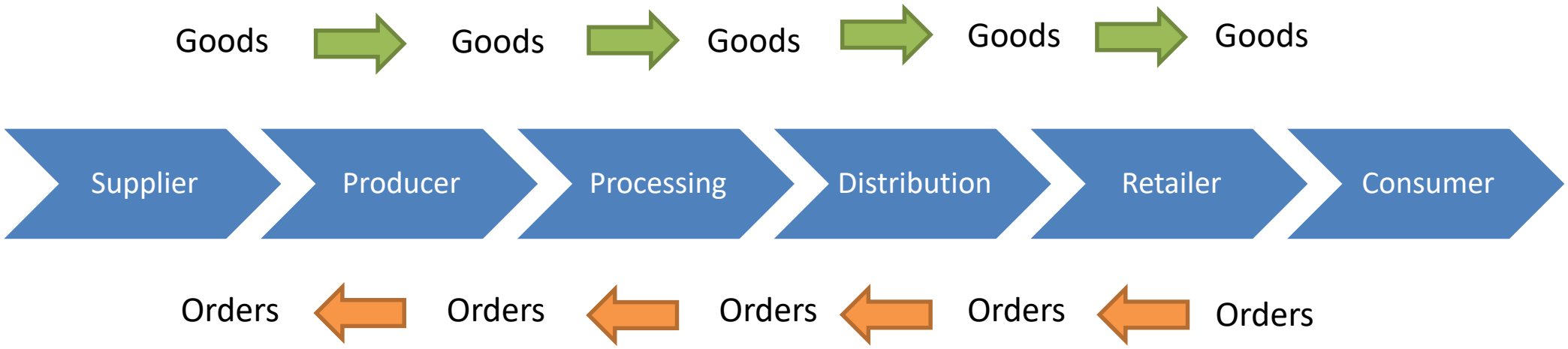
What is a Supply Chain?





Supplier Producer Processor Retailer Customer

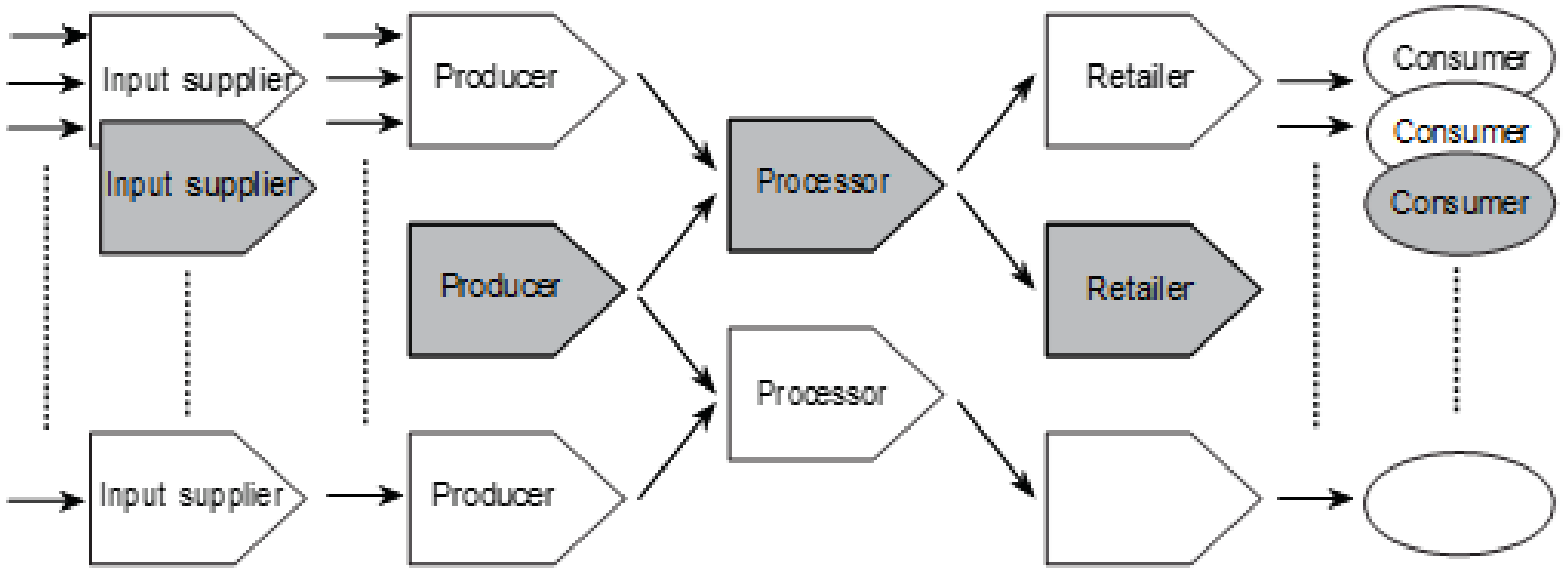
What is Supply Chain?



What is Supply Chain?

- The supply chain is all stages involved, directly or indirectly, in fulfilling a customer request.
- Includes: manufacturers, suppliers, transporters, warehouses, retailers, and customers.
- Within a specific company, the supply chain are all functions involved in fulfilling a customer request. Includes: product development, marketing, operations, distribution, finance, and customer service
- “Supply Network” or “Supply Web.”

Schematic Diagram of a Supply Chain (shaded) within the total Supply Chain Network



Supply Chain Stages

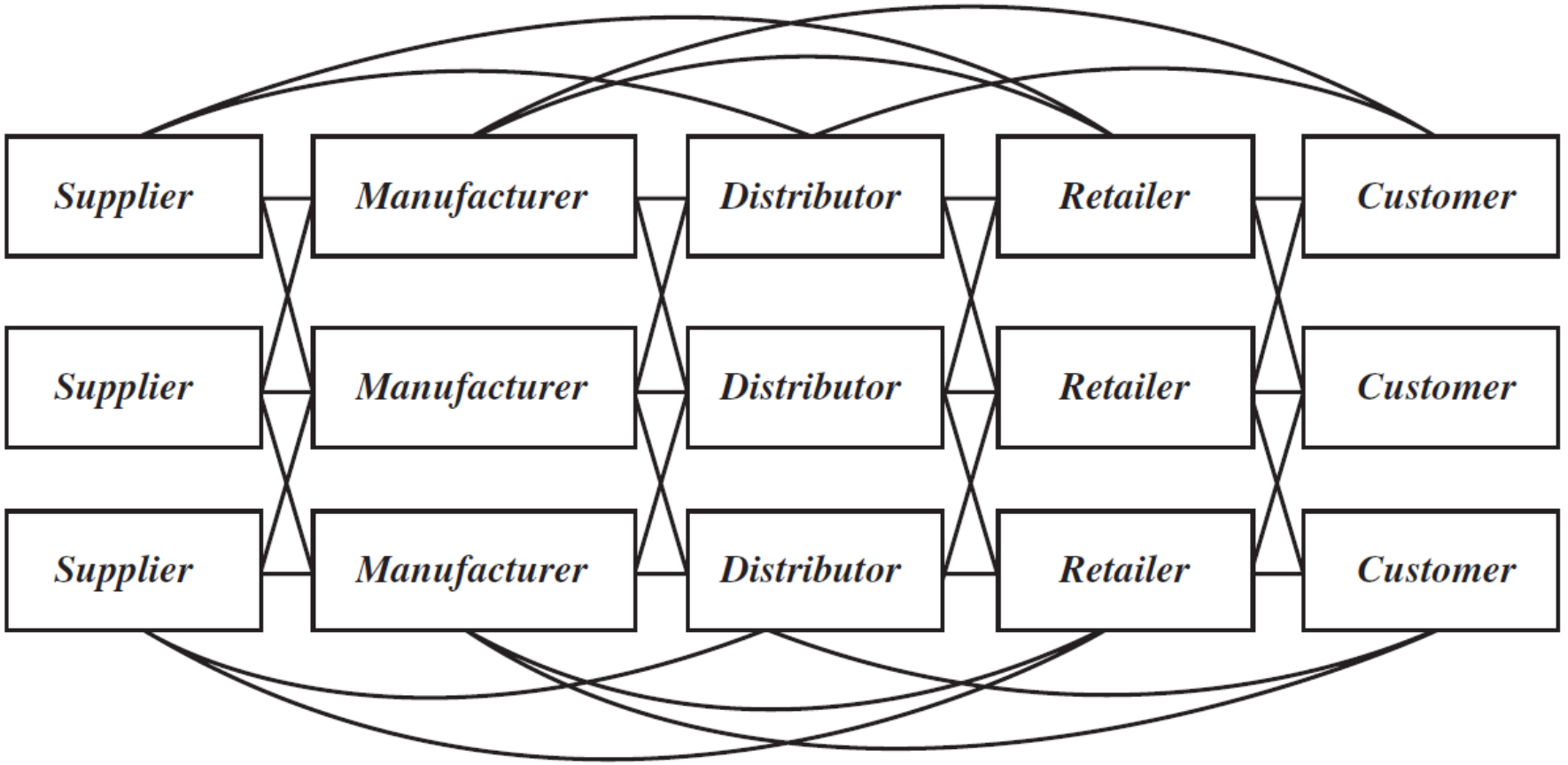


FIGURE 1-2 Supply Chain Stages

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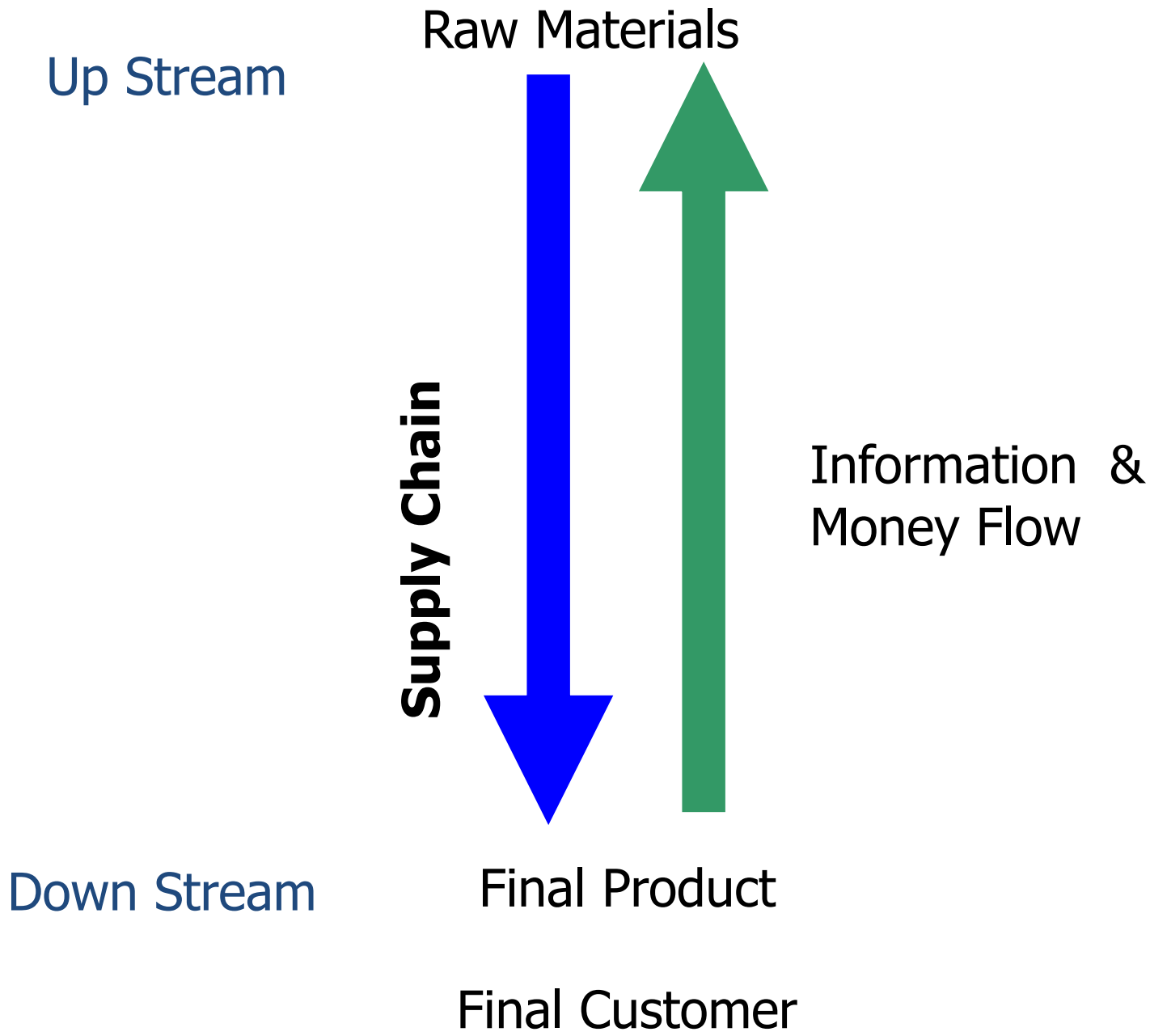
Logistics

We start with a definition of logistics that is based on the one proposed by the Council of Logistics Management, demonstrating that logistics is a part of Supply Chain Management:

> *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 from the point-of-origin to the point-of-consumption in order to meet customer requirements and satisfies the requirements imposed by other stakeholders such as the government (new rules and regulations such as the General Food Law) and the retail community (e.g. Global Food Safety Initiative)'* (Cooper *et al.*, 1997).

Supply Chain

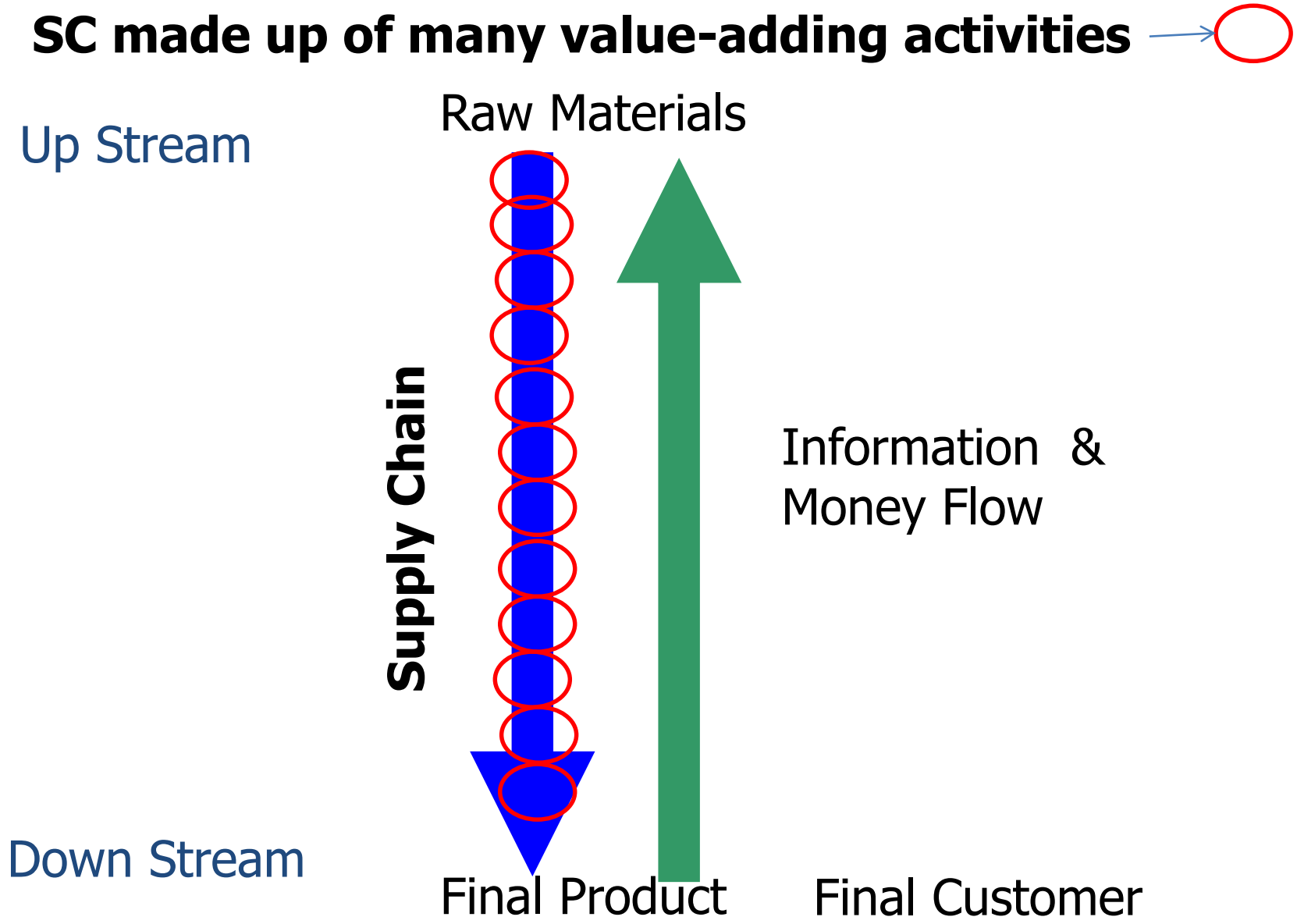
- Consists of all parties involved—directly and indirectly—in fulfilling a customers request (satisfaction/specifications).
- Think of the metaphor of a flowing river—see next slide
  - Upstream/downstream
- In reality, most supply chains are really a network.
  - Still the simplicity of a flowing river is most useful.


Raw Materials
Up Stream
Supply Chain
Information &
Money Flow
Down Stream
Final Product
Final Customer

Supply Chain/Value Chain

- Think of a supply chain as a value chain
  - A chain of all value-adding activities involved in a supply chain.
  - Not confined just to the activities of the firm
    - Supply chain goes beyond the firm to encompass all value-adding activities involved in producing and delivering, no matter where they take place.
    - The supply chain includes movement of products between suppliers to manufacturers to distributors; and information, funds, and products flow in both directions.

SC made up of many value-adding activities



Explanation of previous slide

- Added circles to represent activities.
  - A supply chain can be divided into major activities, and those activities can be divided into smaller activities and so forth.
  - Analogy of a stream of water from a faucet
    - It appear continuous, but if one puts a strobe light on the stream we will see that is only an illusion.
    - In fact the stream is made up of many droplets (activities).

Further Explanation

- Each activity is an economic activity that adds value.
  - Any economic activity is done only because the product of the activity is more valuable than the resources that were used in the activity.
  - Suppose the activity is not value adding, either
    - Do not do the activity
    - If the product of the activity is really needed, the price of the product must rise to the point that the activity adds value—is worth doing.

The Objective of a Supply Chain

The Objetive

Maximize the net value generated

Supply Chain Surplus (net) = Customer Value - Supply Chain Cost

The objetive

- The customer is the only source of revenue
- Success of the supply chain should be measured by total chain profitability, not individual stages
- Effective Supply Chain Management is the management of supply chain assets and product, information, and fund flows to grow the total supply surplus

The Costumer

- The customer is an **integral part** of any supply chain

- The supply chain satisfy the needs of the customers, and through that, generate profit for itself.

Customer Satisfaction

- Purpose of the supply chain is to satisfy customer needs
  - **Final customer** is the one who buys the final product from the supply chain.
  - The buying customer is the sole source of revenue to the supply chain.
  - That revenue is distributed back up the supply chain when more final product need be produced.
    - Transactions that proceed back up the supply chain

Customer Focus

- Note:

customer requirements = customer service = customer satisfaction

- Only exception is when there are government subsidies to some member(s) of the supply chain, e.g., farm subsidies and ethanol subsidies.

How Do Supply Chains Evolve?

- Each firm chooses the business strategy that is most profitable.
  - That strategy will include decisions on how to interact with the larger supply chain.
  - Some firms have more options than others when it comes to how to interact.
    - Especially true for supply chain captains

- Process will tend towards increasing value to the customer and profit in the supply chain
  - Value to customer (Revenue from customer) – cost of resources expended
    - Total profit shared across the SC through bargaining

Why the rise of Logistics and Supply Chain Focus?

Rise of centralized production separated from either input supply or consumer demand, e.g.,

- Industrial plants
- Commercial feedlots

Reduced cost of logistics functions, e.g.,

- Unit trains
- Automated warehousing
- Electronic information handling

Centralized production

Economies of scale

- Labor specialization
  - Routine processes are more productive than creative ones
  - Skills are easier to train, use cheaper labor
  - Standardized parts, provides for interchangeability

- Rise of capital and information as inputs
  - Capital and information can make labor more productive and lowers per unit labor costs
  - Information can economically replace certain physical capital and labor

- Fixed Cost higher portion of total cost
  - Invest in research and development to reduce production cost or improve product and that investment is a sunk cost.
  - New technology and/or information can reduce marginal production cost and/or increase product value, but is a sunk cost and thus cost to use is independent of output volume.

Reduced Cost of Logistics Functions

- Improved, cheaper transport: Larger trucks, unit trains, shipping containers, larger ships.
- Computerized warehousing.
- Improved communications—Low-cost long-distance calling, cell phone, email.
- Information technology—web services, mathematical optimization, simulations, mgt. info system.
- Modern management techniques to compliment those developments above.

The 3 Decision Phases in a Supply Chain

The 3 Decision Phases in a Supply Chain

Supply chain strategy or design

- How to structure the supply chain over the next several years

Supply chain planning

- Decisions over the next quarter or year

Supply chain operation

- Daily or weekly operational decisions

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Supply Chain Strategy or Design

- Decisions about the configuration of the supply chain, allocation of resources, and what processes each stage will perform over the next several years

  - Strategic supply chain decisions:
    i. Outsource supply chain functions
    ii. Locations and capacities of facilities
    iii. Products to be made or stored at various locations
    iv. Modes of transportation
    v. 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

Planning decisions:

- Which markets will be supplied from which locations
- Planned buildup of inventories
- Subcontracting
- Inventory policies
- Timing and size of market promotions

Must consider demand uncertainty, exchange rates, competition over the time horizon in planning decisions. Commodity Markets.

Supply Chain Operation

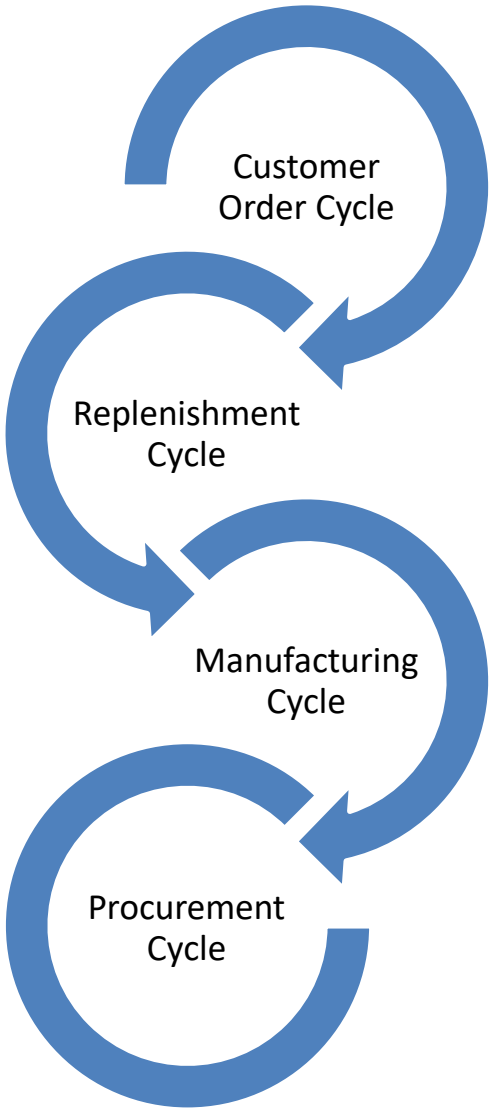
- Time horizon is weekly or daily
- Decisions regarding individual customer orders
- Supply chain configuration is fixed and planning policies are defined
- Goal is to handle incoming customer orders as effectively as possible
- Much less uncertainty (short time horizon).

Process Views of a Supply Chain:

Cycle / Push View

Cycle View

Cycle View: The processes in a supply chain are divided into a series of cycles, each performed at the interface between two successive stages of the supply chain.



Customer

Retailer

Distributor

Manufacturer

Supplier

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Push View

Push/Pull View: The processes in a supply chain are divided into two categories, depending on whether they are executed in response to a customer order or in anticipation of customer orders.

- ***Pull* processes** are initiated by a customer order.
- ***Push* processes** are initiated and performed in anticipation of customer orders.

Push View

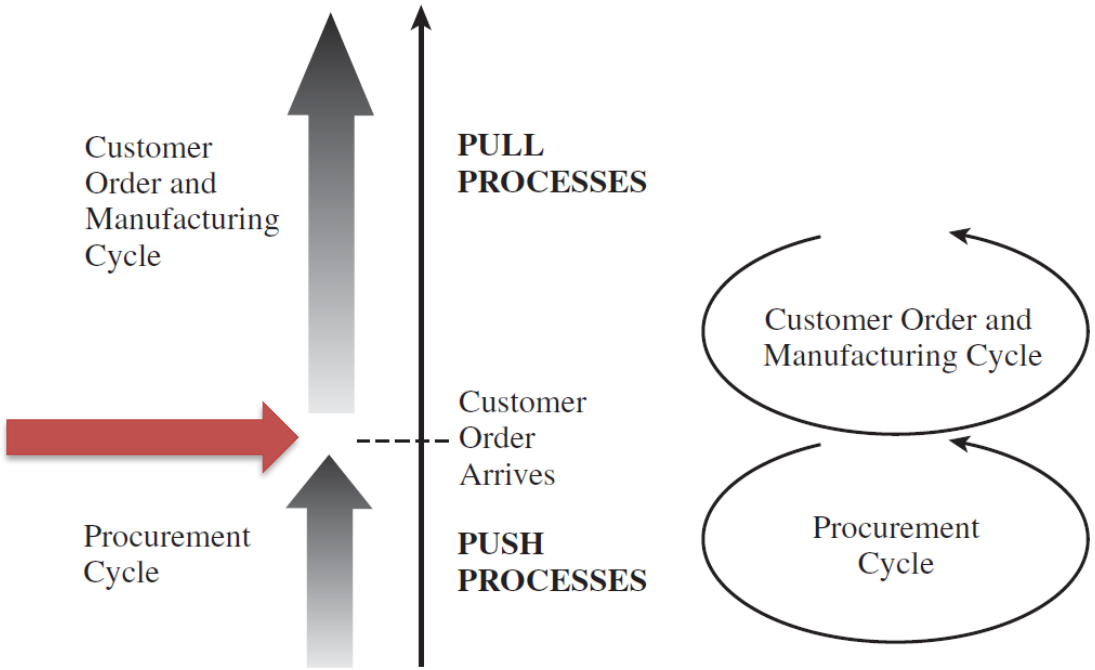

FIGURE 1-7 Push/Pull Processes for Ethan Allen Supply Chain for Customized Furniture

- ***Pull* processes** are initiated by a customer order. (Reactive Process, Demand is known).
- ***Push* processes** are initiated and performed in anticipation of customer orders. (Speculative Process, Demand is unknown)

Supply Chain Macro Processes

Supply Chain Macro Processes

Supply chain processes discussed in the two views can be classified into

1. **Customer Relationship Management (CRM):**
   - All processes at the interface between the firm and its customers

2. **Internal Supply Chain Management (ISCM):**
   - All processes that are internal to the firm

3. **Supplier Relationship Management (SRM):**
   - All processes at the interface between the firm and its suppliers

Supply Chain Macro Processes

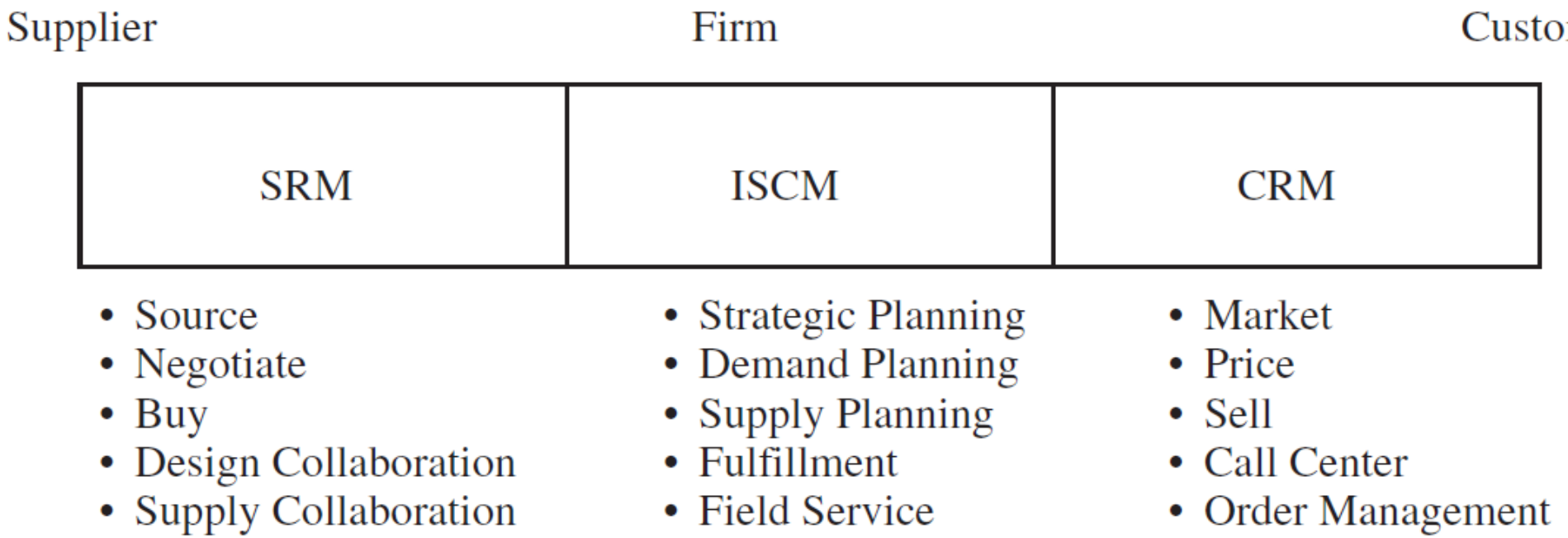

FIGURE 1-8 Supply Chain Macro Processes

Figure 1-8

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Examples of Supply Chains

- Smithfield Foods
- John Deere
- Tyson Foods
- Bunge

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