SUPPLY CHAIN MANAGEMENT

LESSON 5: DISTRIBUTION NETWORK DESIGN

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Chapter Description

- **Aims**
  - Enable students to understand the role of distribution and the network design in supply chain.

- **Expected Outcomes**
  - Students should be able to
    - Determine the role of distribution in supply chain
    - Discuss factors related to distribution network design
    - Elaborate network design

- **References**
  - Chopra, Sunil, and Peter Meindl. (2016) Supply Chain Management: Strategy, Planning, & Operation. 6th. Ed. Upper Saddle River, NJ: Prentice Hall.
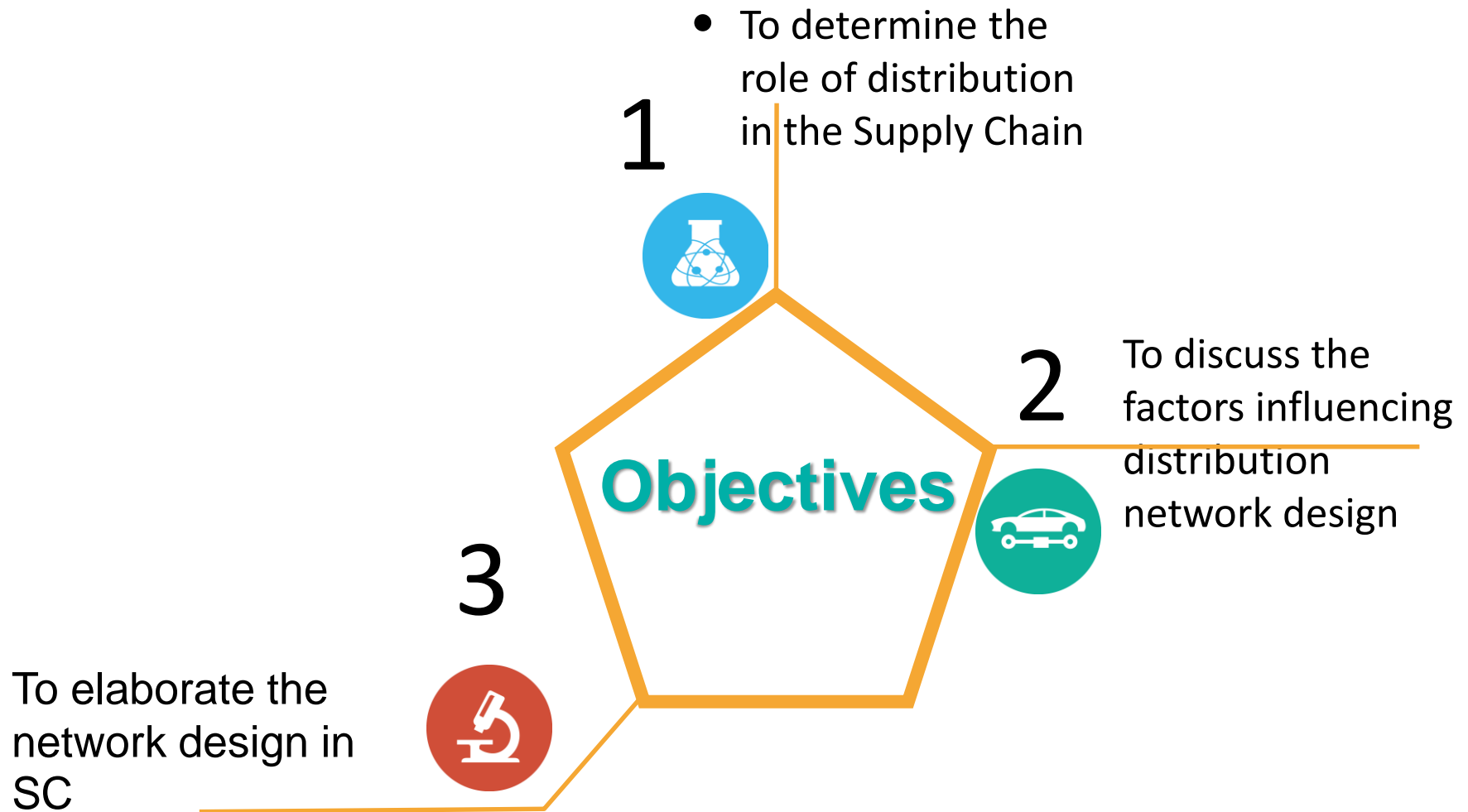
Chapter Outline

5.1 Role of Distribution
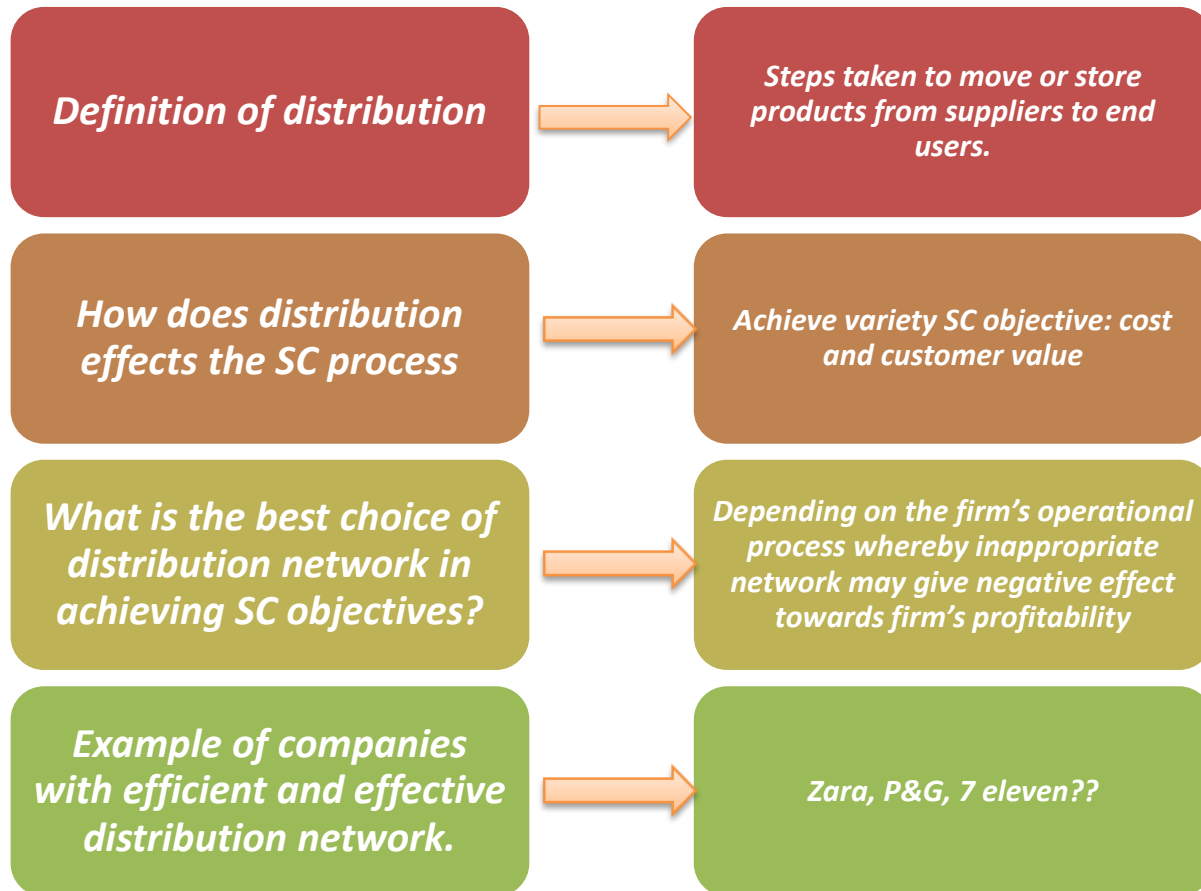
5.2 Factors Related to Designing Distribution

5.3 Network Design

LEARNING OUTCOMES

Objectives

1. • To determine the role of distribution in the Supply Chain

2. To discuss the factors influencing distribution network design

3. To elaborate the network design in SC

Distribution: Roles in a SC

Definition of distribution	→	**Steps taken to move or store products from suppliers to end users.**
How does distribution effects the SC process	→	**Achieve variety SC objective: cost and customer value**
What is the best choice of distribution network in achieving SC objectives?	→	**Depending on the firm's operational process whereby inappropriate network may give negative effect towards firm's profitability**
Example of companies with efficient and effective distribution network.	→	**Zara, P&G, 7 eleven??**

Distribution Network Design: Factors involved

Two main dimension need to be focused:

- Value delivered towards customer needs
- Cost involved in meeting customer needs

Distribution Network Design: Factors involved

Elements of customer value influenced by network structure:

- Response time
- Product variety
- Product availability
- Customer experience
- Time to market
- Order visibility
- Returnability

Supply chain costs affected by network structure:

- Inventories
- Transportation
- Facilities and handling
- Information

Facilities & Costs, Inventories Cost, Response Time & Transportation Cost

Higher number of facilities → Higher facilities costs → Higher inventory costs, → Shorter response time for the customers → Lower total transportation costs
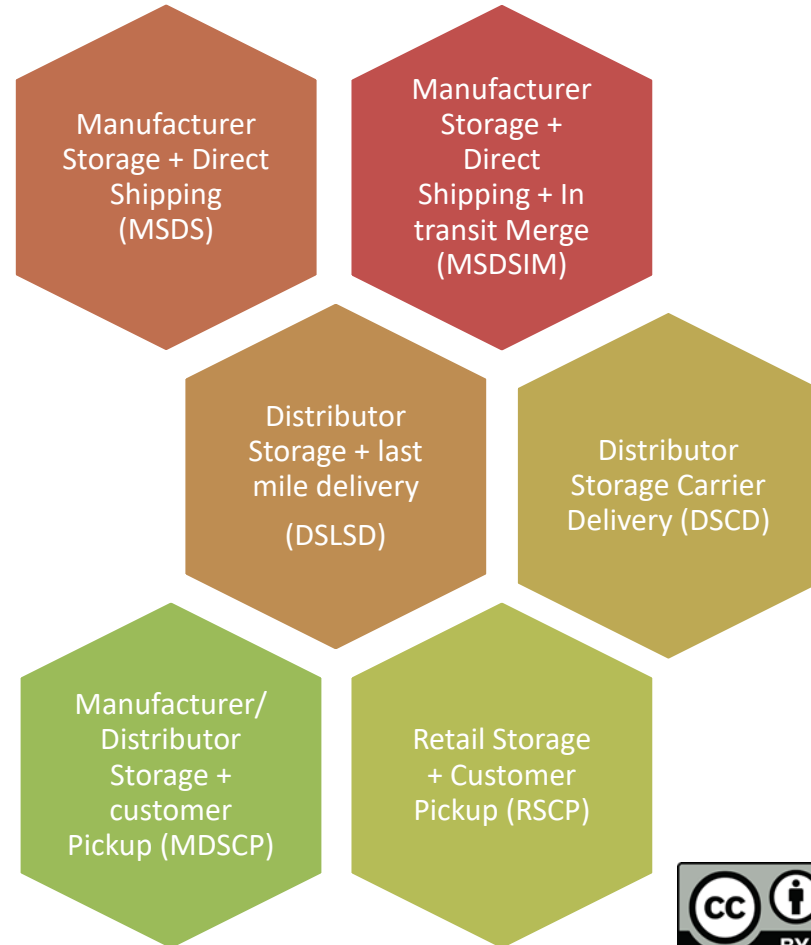
Communitising Technology

Network Design

In designing a distribution network, an organization needs to emphasize on TWO (2) important decisions

- Where should the customer pick up their goods?
  - *at the designated location* or
  - *directly to the customer's location*
- Should the products go through
  - *the middleman* or
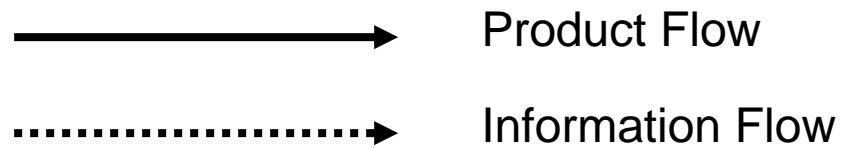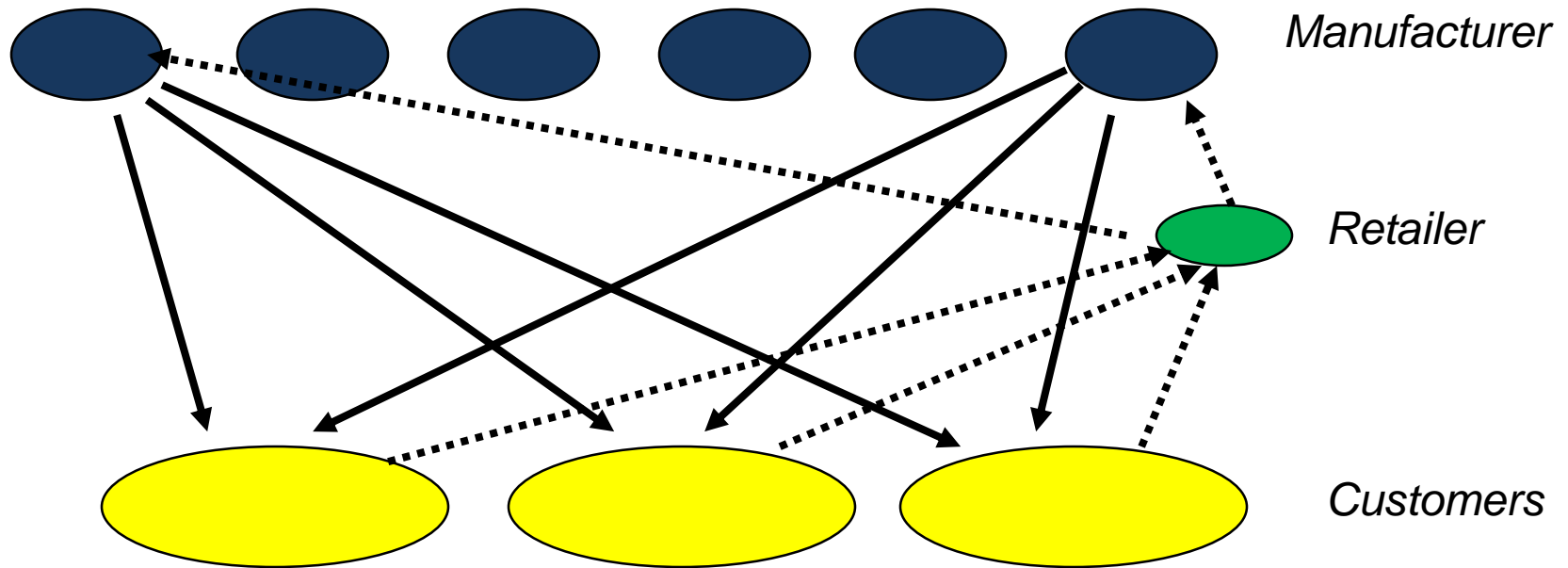 - *intermediate location*

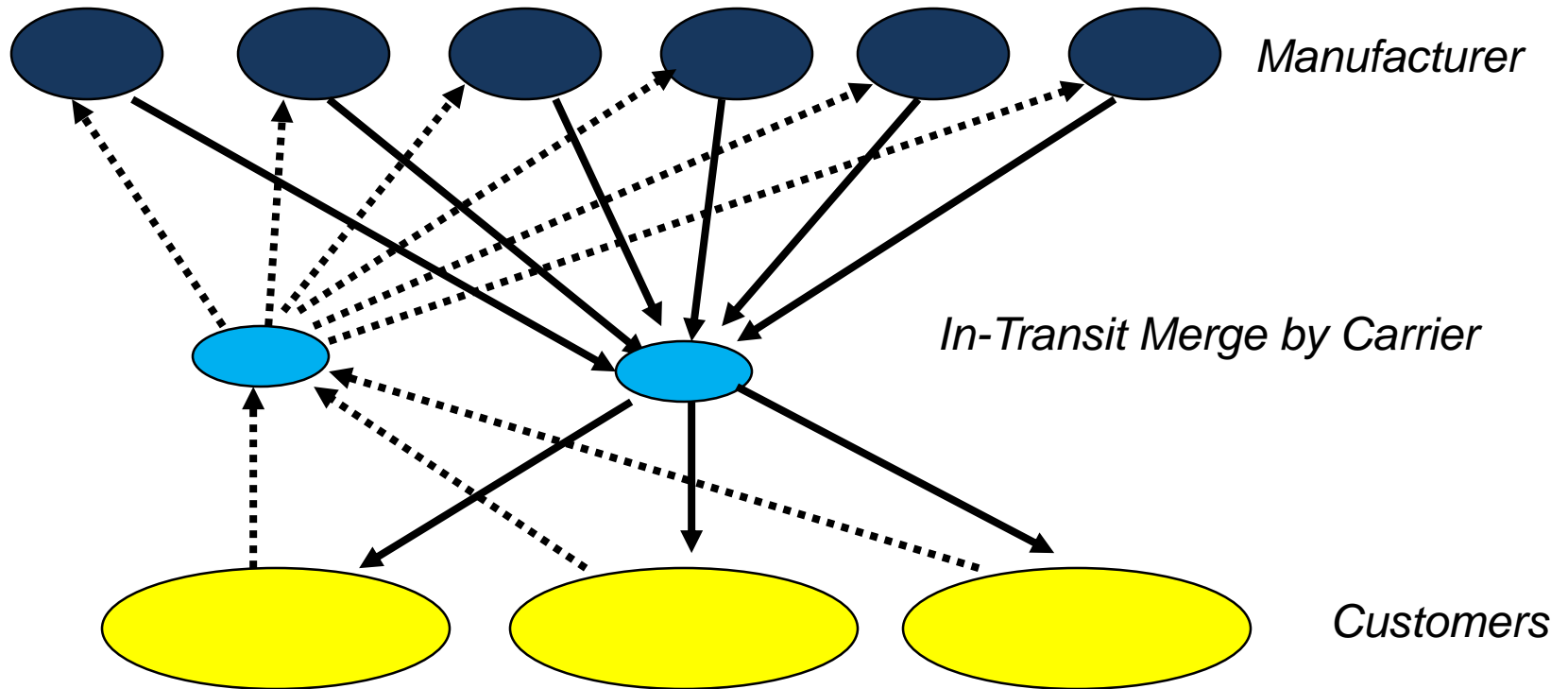# Network Design Option

Source : Maxpixel, Wikipedia, Pixabay

Performance for all networks design are characterized by cost and service factor

Manufacturer Storage + Direct Shipping (MSDS)
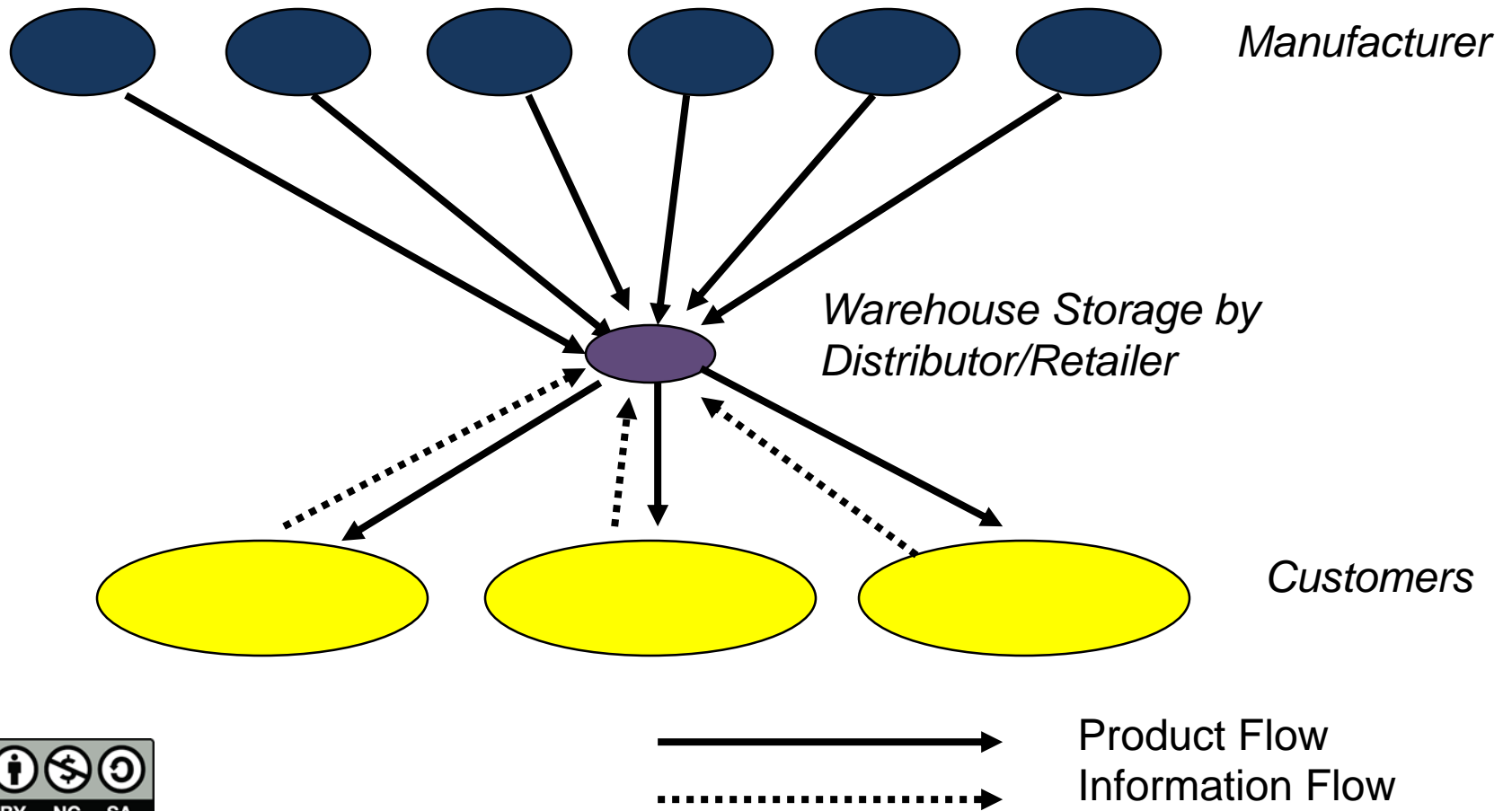
Manufacturer Storage + Direct Shipping + In transit Merge (MSDSIM)

Distributor Storage + last mile delivery (DSLSD)

Distributor Storage Carrier Delivery (DSCD)

Manufacturer/ Distributor Storage + customer Pickup (MDSCP)

Retail Storage + Customer Pickup (RSCP)

MSDS

Manufacturer

Retailer

Customers

Product Flow

Information Flow

MSDSIM

Manufacturer

In-Transit Merge by Carrier

Customers

Product Flow

Information Flow

DSCD

Manufacturer

Warehouse Storage by Distributor/Retailer

Customers

Product Flow
Information Flow

DSLMD

Manufacturer

Distributor/Retailer Warehouse

Customers

Product Flow

Information Flow

MSCP

Manufacturer

Cross-Dock DC

Retailer

Pickup Sites

Customers

Customer Flow
Product Flow
Information Flow

Communitising Technology
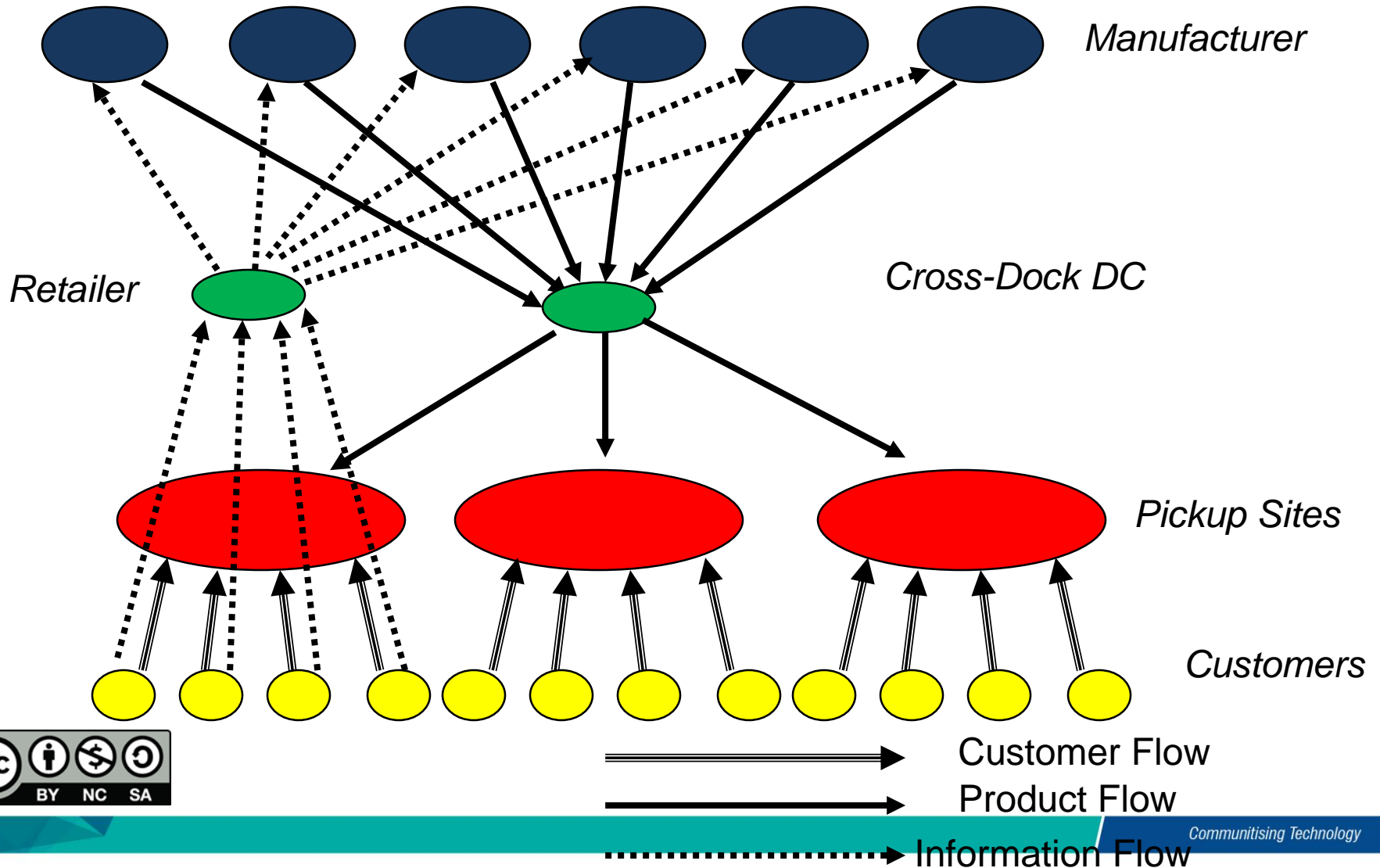
RSCP

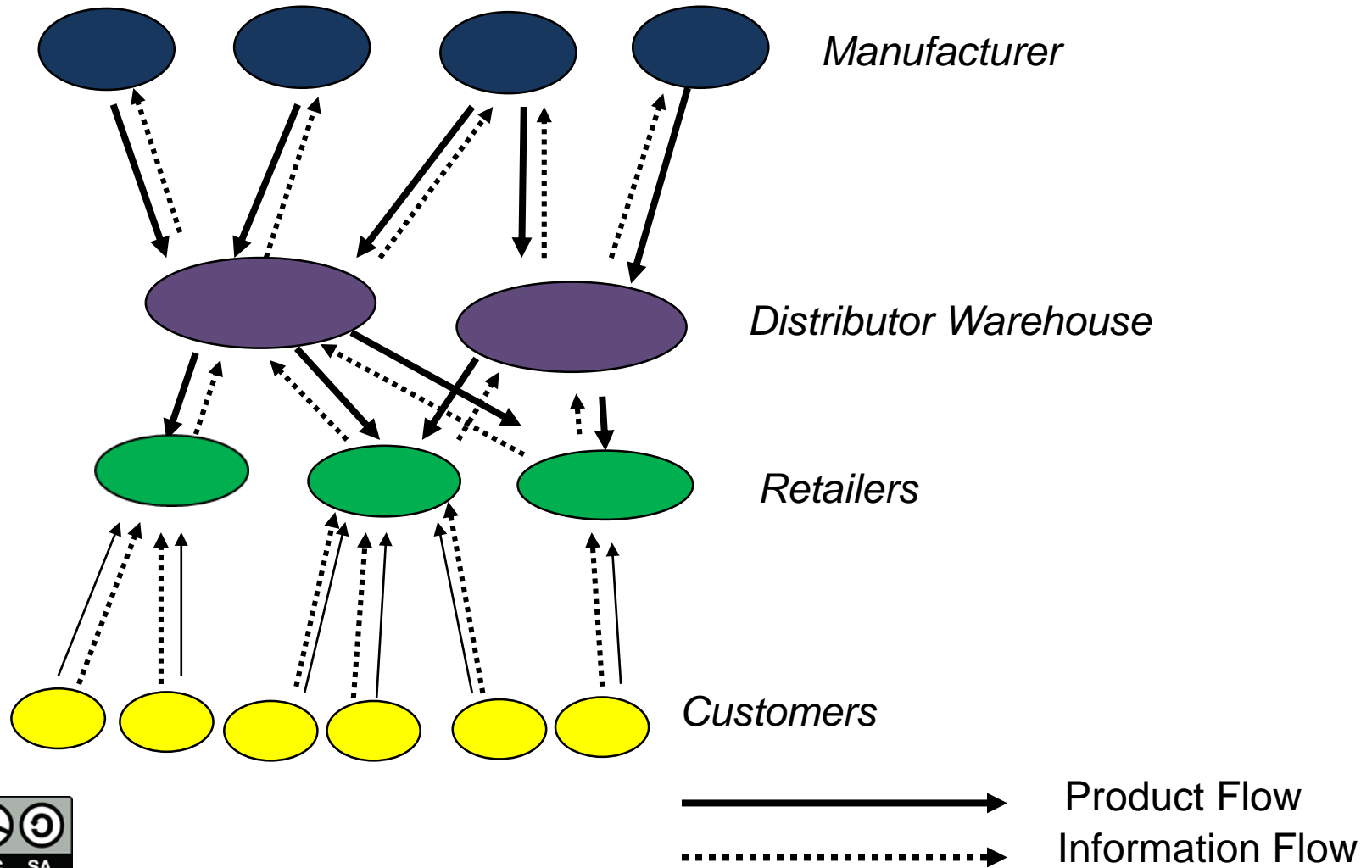*Manufacturer*

Distributor Warehouse

Retailers

Customers

Product Flow

Information Flow

Conclusion of The Chapter

- **Conclusion #1**
  - Generally, distribution is the movement of products from the supplier to the end user.
    - Elaborate network design

- **Conclusion #2**

  - Decision related to distribution network design will effect the customer value as well as the SC cost.

- **Conclusion #3**

  - Distribution network design enable a firm to operate effectively and efficiently through the identification of nature of the business and how responsive they are to their customers.