

# Global Production and Supply Chain Management

Chapter 15

January 29, 2019

## Some Questions

- What factors to consider while selecting a manufacturing location outside home country?
- Does improving the quality of a product a company manufactures increase its cost or decrease its cost?
- If Ruskovilla decides to expand its manufacturing operations outside Finland, e.g., in Switzerland, what options do they have?
  - What factors should they consider?

# Introduction

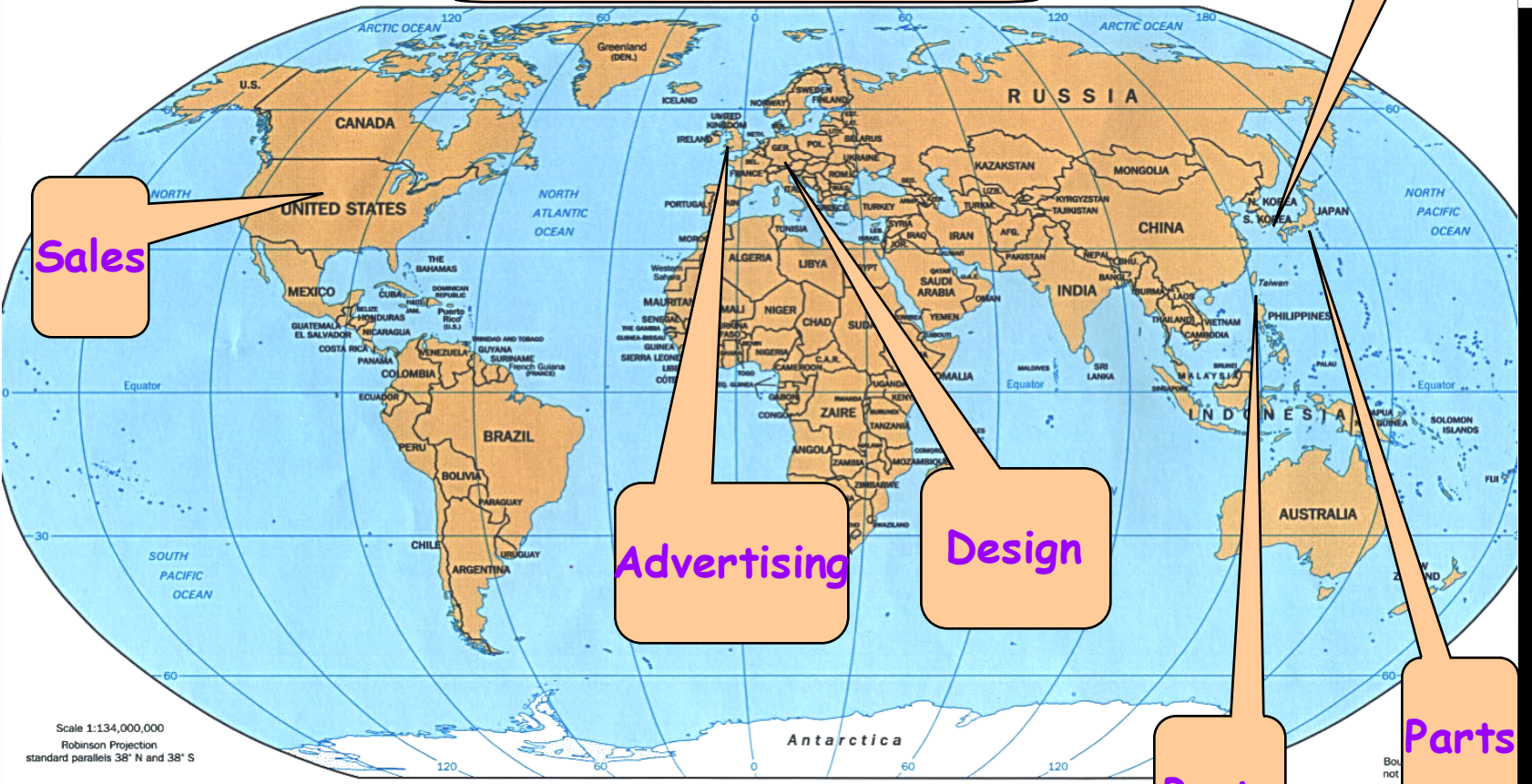
In today's global economy, firms must decide

- ✓ Where to locate productive activities
- ✓ What the long-term strategic role of foreign production sites should be
- ✓ Whether to own foreign production activities or outsource those activities
- ✓ How to manage a globally dispersed supply chain and what the role of Internet-based information technology should be in the management of global logistics
- ✓ Whether to manage global logistics or outsource this function

The making of an America car

# Pontiac LeMans

Creating a Global Web



Scale 1:134,000,000  
Robinson Projection  
standard parallels 38° N and 38° S

Sales

Advertising

Design

Parts

Parts

Assembly

## Made in America? (Robert Reich, 1991)

Example: Pontiac Le Mans (say, @ \$20,000)

|         |   |
|---------|---|
| \$6,000 | South Korea for assembly  |
| \$3,500 | Japan for advanced components                                   |
| \$1,500 | Germany for design services                                     |
| \$800   | Taiwan, Singapore, Japan for small components                   |
| \$500   | U.K. for advertising and marketing services                     |
| \$100   | Ireland and Barbados for data processing                        |
| \$7,600 | GM Shareholders + employees + lawyers + lobbyists + bankers +++ |

# What goes in an Apple iPhone and who makes it?

| Major Components                | Supplier             | Country     |
|---------------------------------|----------------------|-------------|
| Compass                         | AKM<br>Semiconductor | Japan       |
| Accelerometer                   | Bosch Sensortech     | Germany     |
| Touchscreen Controller          | Broadcom             | U.S.        |
| Audio Chips                     | Cirrus Logic         | U.S.        |
| Gorilla Glass Screen<br>Overlay | Corning              | U.S.        |
| LCD Screen                      | LG                   | South Korea |
| LCD Screen                      | Sharp                | Japan       |
| Wi-Fi Chip                      | Murata               | U.S.        |
| Camera + Chips                  | Qualcomm             | U.S.        |
| A-Series Processor              | Samsung              | South Korea |
| Flash Memory                    | Toshiba              | Japan       |

Assembly in China:  
Foxconn and Pegatron,  
both of Taiwan

## Who shares the bounty?

| Company         | Share of Average Sale Price | %     |
|-----------------|-----------------------------|-------|
| Apple           | \$368.00                    | 65.7% |
| Foxconn         | \$14.00                     | 2.5%  |
| Other Suppliers | \$178.00                    | 31.8% |
| Total           | \$560.00                    | 100%  |

Source: The Economist and Other Sources

# Strategy, Production, and Supply Chain Management

1 of 4

- **Production:** activities involved in creating a **product** or **service**
- **Supply chain management:** the procurement and physical transmission of material through the supply chain, from suppliers to customers
  - Purchasing
  - Logistics



# Strategy, Production, and Supply Chain Management

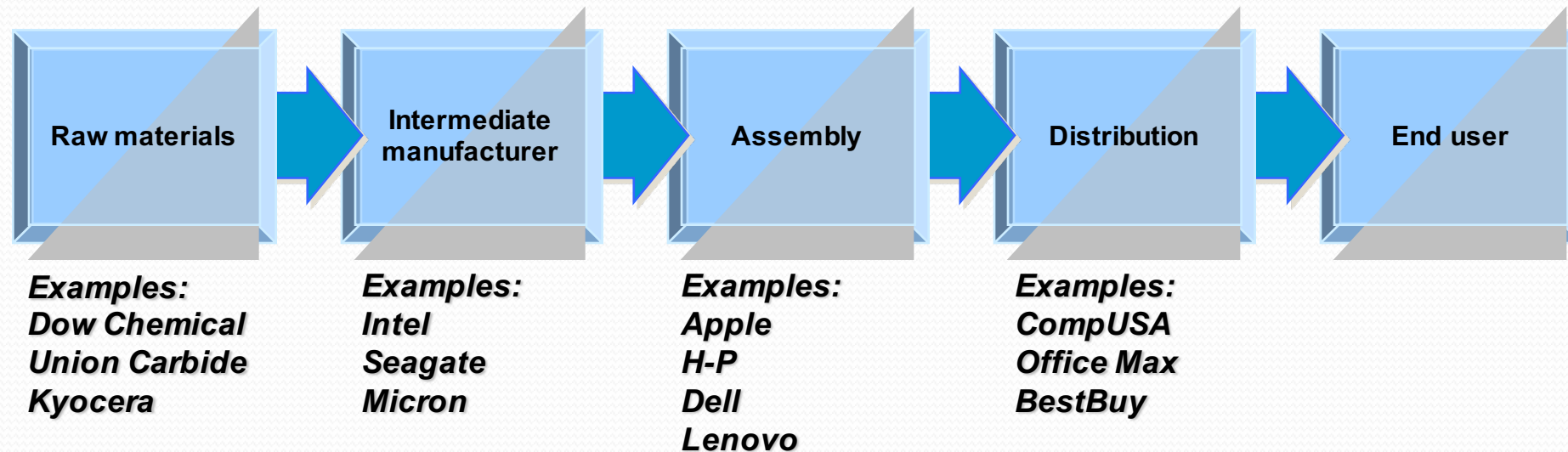
2 of 4

The strategic objectives of the production and logistics functions are

- ✓ to lower costs
- ✓ to better serve customer needs by offering them quality products, i.e., by eliminating defectives from the **upstream** and **downstream** supply chain and manufacturing process

These two objectives are interrelated

# The Vertical Chain from Raw Materials to the Consumer (PC Industry)



Which of these functions do these companies perform?

- Dell
- BestBuy

# Strategy, Production, and Supply Chain Management

3 of 4

The **Six Sigma** quality improvement program aims to reduce defects, boost productivity, eliminate waste, and cut costs throughout a company

- ✓ Six Sigma is a direct descendant of **total quality management (TQM)**
  - First adopted by Japanese companies
- ✓ In addition, some countries have also promoted specific quality guidelines like the EU's **ISO 9000**

# Strategy, Production, and Supply Chain Management

4 of 4

Two other objectives are important for international companies

1. Production and logistics functions must be able to accommodate demands for local responsiveness
2. Production and supply chain management must be able to respond quickly to shifts in customer demand

# Where to Produce

- Country factors
- Technological factors
- Production factors

# Where to Produce 1 of 8

## Country Factors

- ✓ Location Economies
  - Firms should locate manufacturing activities where economic, political, and cultural conditions, including relative factor costs, are most conducive to the performance of that activity
- ✓ Location Externalities
  - Presence of global concentrations of activities
- ✓ Formal and informal trade barriers
- ✓ Transportation costs
- ✓ Regulations affecting FDI
- ✓ Expected future movements in exchange rates

# Where to Produce 2 of 8

## Technological Factors

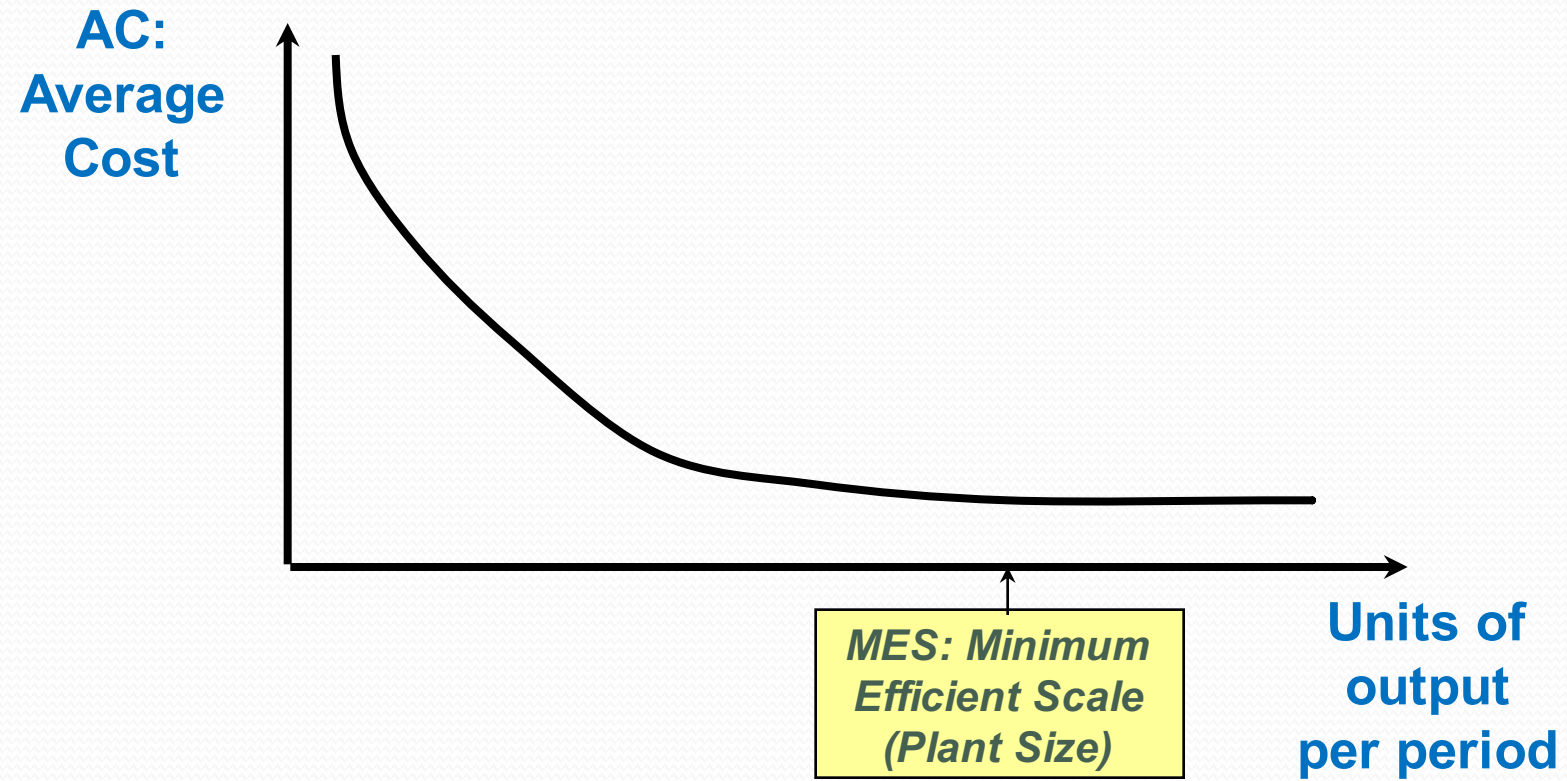
- ✓ Fixed Costs

- If they are very high, it could make sense for the firm to serve the world market from a single location or from a very few locations

- ✓ Minimum efficient scale

- The larger the **minimum efficient scale** (the level of output at which most plant-level scale economies are exhausted) of a plant, the more likely centralized production makes sense

# Economies of Scale





# Where to Produce 3 of 8

## Technological Factors continued

- ✓ Flexible Manufacturing and Mass Customization
  - Enable firms to produce a wide variety of end products at a unit cost that traditionally would require mass production of a standardized output
  - Reduce set up times for complex equipment, e.g., using CNC machines
  - Increase the utilization of individual machines through better scheduling
  - Improve quality control at all stages of the manufacturing process
  - **Mass customization**

# CNC Machine 4 of 8



# Where to Produce 5 of 8

## Production Factors

- Product features
  - Value-to-weight ratio
  - Universal needs
- Locating production facilities
  - Centralized location
    - Fixed costs are substantial
    - The minimum efficient scale of production is high
    - Flexible manufacturing technologies are available
  - Decentralizing close to major markets
    - Both fixed costs and the minimum efficient scale of production are relatively low
    - Appropriate flexible manufacturing technologies are not available

# Where to Produce 6 of 6

## The Potential Hidden Costs of Foreign Locations

- ✓ High employee turnover
- ✓ Shoddy workmanship
- ✓ Poor product quality
- ✓ Low productivity

# Where in the world to locate operations?

## Arguments for a Centralized Location

- Factor costs have substantial impact on total cost
- Low trade barriers
- Externalities favor certain locations
- Stable exchange rates
- High fixed costs, high minimum efficient scale relative to global demand, or availability of flexible manufacturing technologies
- The product's value-to-weight ratio is high
- Product serves universal needs, i.e., there are no significant differences between tastes/preferences in different markets

# Where in the world to locate operations?

## Arguments for a Decentralized Location

- Factor costs do not have substantial impact
- High trade barriers
- Location externalities not important
- Exchange rates volatile
- Low fixed costs, low minimum efficient scale
- Flexible manufacturing technology not available
- The product's value-to-weight ratio is low
- Significant differences in consumer tastes and preferences exist between nations

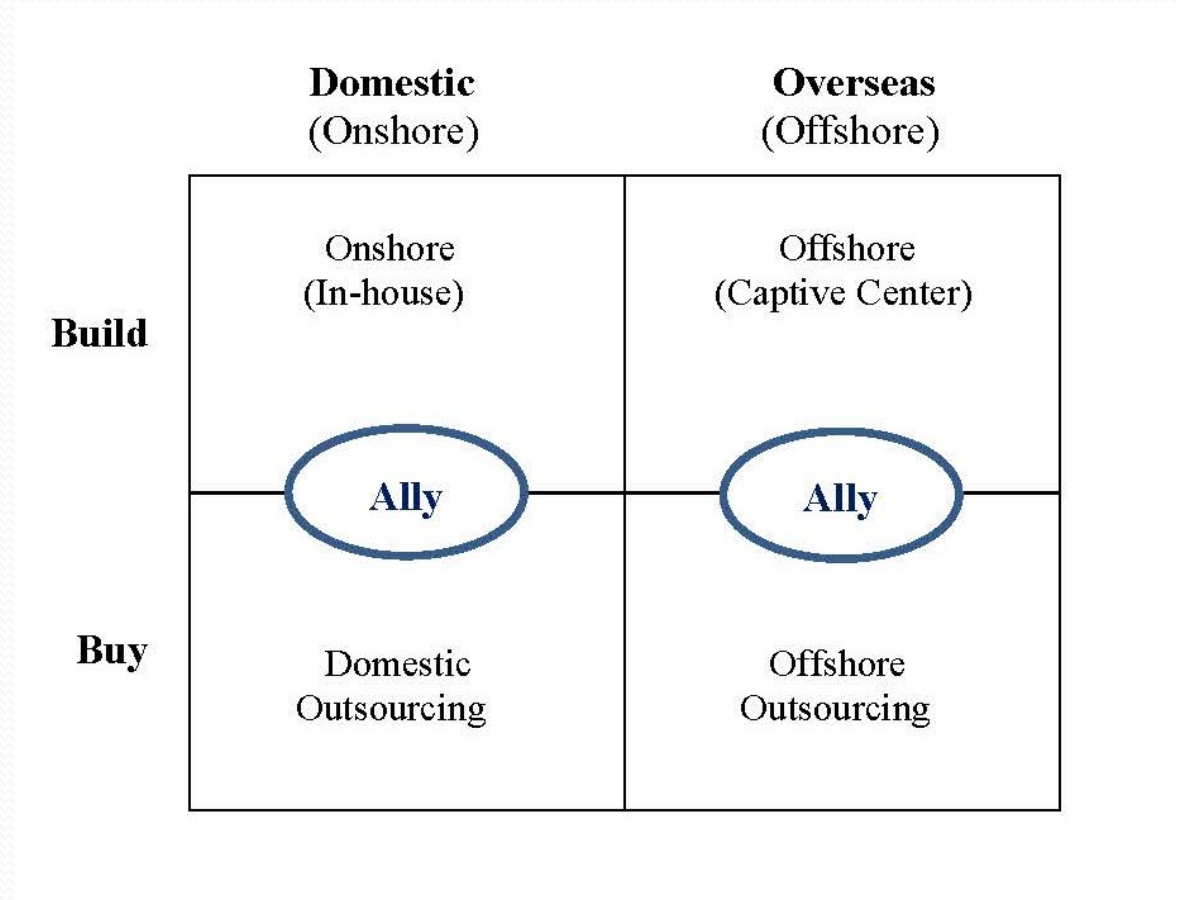
# Make-or-Buy Decisions

## Make-or-buy decisions

- ✓ Decisions about whether to perform a certain value-creation activity in-house or outsource it to another firm, are important to a firm's manufacturing strategy
- ✓ Factors in the decision
  - Product success
  - Specialized knowledge
  - Strategic fit
  - Cost and production capacity
  - Supplier competencies
  - Inventory planning

# Make-or-Buy

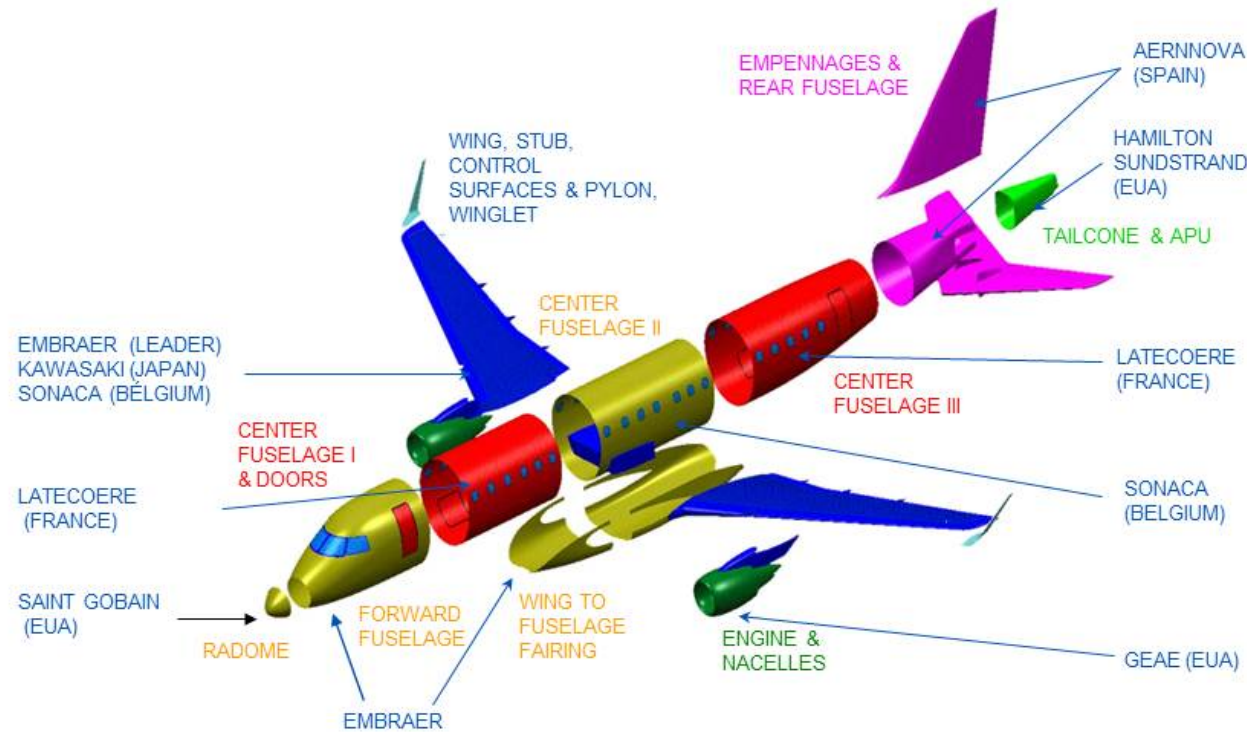
## The build | buy | ally framework





# Where does Embraer of Brazil get the parts and components for its airplanes?

## A Worldwide Partnership Project EMBRAER 170/175 Suppliers



# Global Supply Chain Functions 1 of 5

## Core Activities

1. Global distribution center management
2. Inventory management
3. Packaging and materials handling
4. Transportation
5. Reverse logistics

# Global Supply Chain Functions 2 of 5

## Global Logistics continued

### ✓ **Global distribution center**

- A facility that positions and allows customization of products for delivery to worldwide wholesalers or retailers or directly to consumers anywhere in the world
- The foundation of a global supply network

### ✓ **Global inventory management**

- The decision-making process regarding the raw materials, work-in-process, and finished goods inventory for an MNC

# Global Supply Chain Functions 3 of 5

## Global Logistics continued

- ✓ **Packaging:** three different categories
  - Primary packaging holds the product itself
  - Secondary packaging is designed to contain several primary packages
  - Transit packaging is used when primary and secondary packages are assembled for transportation
  - Packaging is intended to perform, protect, and inform

### 3 stages of packaging



# Managing a Global Supply Chain 4 of 5

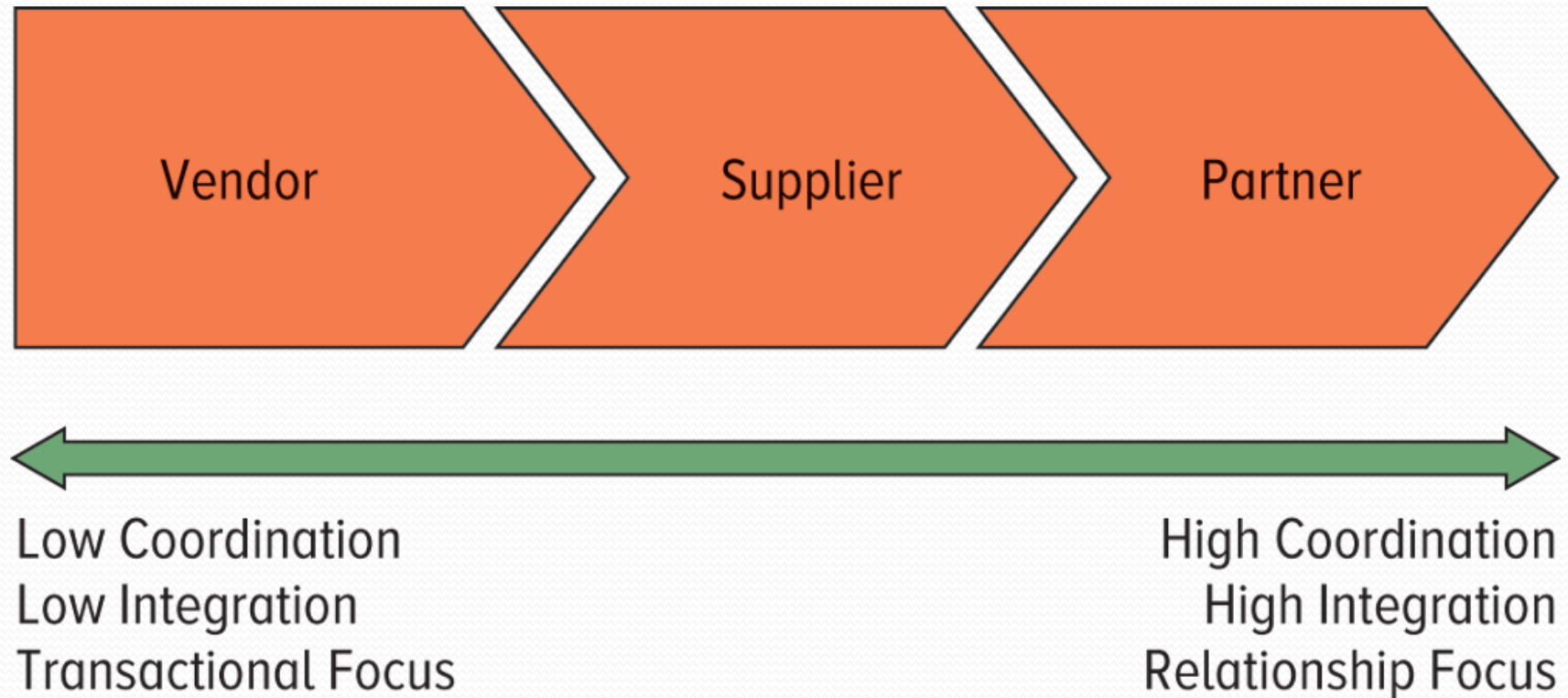
- **Global supply chain coordination**
  - Shared decision-making opportunities and operational collaboration of key global supply chain activities
  - Helps to create a more integrated, coherent, efficient, and effective global supply chain
  - Operational objectives
    - Responsiveness
    - Variance reduction
    - Inventory reduction
    - Shipment consolidation
    - Quality
    - Life-cycle support

## Managing a Global Supply Chain 5 of 5

### Interorganizational Relationships

- ✓ Trust and commitment between interacting organizations are important to an efficient and effective global supply chain

# Figure 15.5 Upstream/Inbound Relationships



# Figure 15.6 Downstream/Outbound Relationship

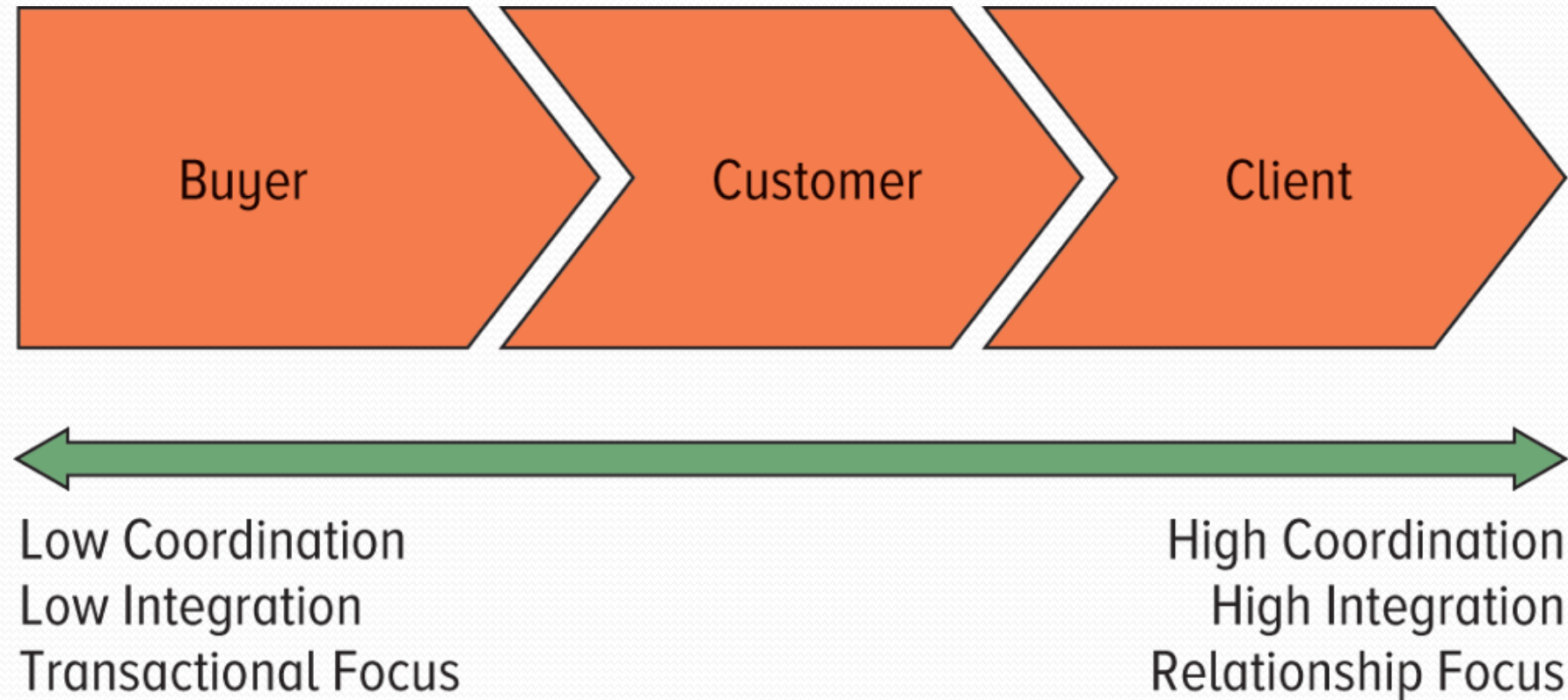




Figure 15.1 The Relationship Between Quality and Costs

