

## 21511 Global Operations and Supply Chain Management

### Lecture 2 – Strategy & Design Of Product, Service And Capacity

#### Operations and Supply Chain Management – Chapter 1

##### Strategy, Processes, and Analytics

##### Operations and supply chain management involves

- Product design
- Purchasing
- Manufacturing
- Service operations
- Logistics
- Distribution

##### Success depends upon

- Strategy
- Processes to deliver products and services
- Analytics to support the decisions needed to manage the firm

##### What are Operations and Supply Chain Management?

The design, operation, and improvement of the systems that create and delivery the firm's primary products and services.

##### Operations and supply chain management (OSCM) is:

- Concerned with the management of entire production/delivery system

##### Operations and Supply Chain Processes

<b>Operations</b>	Manufacturing and service processes used to transform resources into products.
<b>Supply Chain</b>	Processes that move information and material to and from the firm.

##### Process Activities

**Planning** – processes needed to operate existing supply chain.

**Sourcing** – selection of suppliers that will deliver the goods/services needed to create firm's product.

**Making** – producing the major product/service.

**Delivering** – logistics processes such as selecting carriers, coordinating movement of goods/information, and collecting payments from customers.

**Returning** – receiving worn-out, excess, and/or defective products back from customers.

##### Efficiency, Effectiveness, and Value

##### *Efficiency*

- Doing the things right
- Doing something at the lowest possible cost

## **Effectiveness**

- Doing the right things
- Create the most value for your customer

## **Value**

- The attractiveness of a product relative to its cost
- Quality divided by price

## **Strategy – Chapter 2**

### **Sustainable strategy – Triple Bottom Line**

Evaluating firm activities against **social**, **economic** and **environmental** criteria.

- **Social:** fair and beneficial business practices toward labour, community and region.
  - E.g. no child labour, fair salary.
- **Economic:** competitive return on investment – should promote growth and long-term value in the form of profit.
  - E.g. profit, long last economic.
- **Environmental:** impact on environment. Company should **protect environment** as much as possible.
  - E.g. reducing carbon emission and waste.

### **Operations and Supply Chain Strategy – Competitive Dimensions**

**Price** → Make the product or deliver the service cheap

**Quality** → Make a great product or delivery a great service

**Delivery Speed** → Make the product or deliver the service quickly

**Delivery Reliability** → Deliver it when promised

**Coping with Changes in Demand** → Change its volume

**Flexibility and New-Product Introduction Speed** → Change it

#### **Supply Chain Risk Examples**

in 2018, recall in Australia due to defective airbag

In 1996 General Motors experienced an 18-day labor strike at a brake supplier factory.

- This strike idled workers at 26 assembly plants and led to an estimated \$900 million reduction in earnings.

In 1997 a Boeing supplier's failure to deliver two critical parts led to a loss of \$2.6 billion.

In 2000, a 10-minute fire at Phillips plant that supplied integrated circuits led to a \$400 million loss to the Ericsson.

Japanese Tsunami (March 2011)

- 2010 Toyota recalls
- Recent Australian cases
  - 2015 – Tuna Fish food poisoning

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| <ul style="list-style-type: none"><li>○ 2016 Frozen Blue Berries</li><li>○ 2018 Australian Strawberry needle scare</li></ul> |
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### Risk Mitigation Framework

Identify the sources of potential disruptions and assess a type of vulnerability.

- Focus on highly unlikely events that would cause a significant disruption to normal operations.

Assess the potential impact of the risk. Here the goal is to quantify the probability and the potential impact of the risk.

- Could be based on financial impact, environmental impact, ongoing business viability;
- Brand image/reputation, potential human lives, and so on.

Develop plans to mitigate the risk. A detailed strategy for minimizing the impact of the risk could take many different forms, depending on the nature of the problem.

### Productivity Measurement

Productivity is a measure of how well resources are used.

**Productivity = outputs / inputs**

Partial productivity measures compare output to a single input

Multifactor productivity measures compare output to a group of inputs

Total productivity measures compare output to all inputs

### Design Of Products And Services – Chapter 3

#### Product Design Process

Companies often outsource major functions

- **Contract manufacturer:** an organization capable of manufacturing and/or purchasing all the components needed to produce a finished product

#### 6 Phases of the Generic Development Process (Formal Process)

- **Phase 0: Planning**
  - Assessment of technology development and market objectives
- **Phase 1: Concept development**
  - Target market, alternative products
  - Define form, function and features
- **Phase 2: System-level design**
  - Product architecture, decomposition of product into subsystems and subcomponents
  - Geometric layout
- **Phase 3: Design detail**
  - Specification of product, parts required
  - Drawing describing the geometry of each part

- **Phase 4: Testing and refinement**
  - Construction and evaluation of multiple preproduction versions (prototypes)
- **Phase 5: Production ramp-up**
  - Product is made and launched

## Strategic Capacity Management – Chapter 5

### Capacity Management in Operations

**Capacity** – the ability to hold, receive, store, or accommodate.

- In business, viewed as the **amount of output** that a **system** is **capable of achieving over a specific period of time**.

**Capacity management** needs to consider both inputs and outputs.

### Capacity Planning Time Durations

- **Long range**
  - Greater than one year – buildings, equipment or facilities
- **Intermediate range**
  - Monthly or quarterly plans covering the next 6 to 18 months – hiring, minor equipment
- **Short range**
  - Less than one month – overtime, personnel transfer.

### Strategic Capacity Planning

Approach for determining the **overall level of capacity-intensive resources** that best supports the **company's long-range competitive strategy**.

- Facilities
- Equipment
- Labor force size

### Capacity Planning Concepts

**Capacity utilization rate** – a **measure** of how **close the firm** is to its **best possible operating level**.

$$\text{Capacity utilization rate} = \frac{\text{Capacity used}}{\text{Best operating level}}$$

**Economies of scale** – the idea that as a plant gets larger and volume increases, the average cost per unit tends to drop.

**Diseconomies of scale** – at some point, the plant becomes too large and average cost per unit begins to increase.

**Capacity focus** – the idea that a production facility works best when it is concentrated on a limited set of production objectives

- Focused factory or plant within a plant (PWP) concept.