

Module 1

- **Supply Chain Management**
 - The effective and efficient integration of
 - Supplier and manufactures
 - Transport, distribution center, warehouse
 - Retailers, all other parties associated
- **Supply Chain function**
 - **Procurement** (purchasing) 採購
 - The process of acquiring services, suppliers, equipment in conformance with organizational regulation
 - Finding suppliers with best value, negotiating the terms of the purchase, placing order
 - **Operation**
 - Design, operation, improvement of production system that efficiently transform input into finished goods and services
 - Making business processes effective and efficient, create high quality products and services
 - **Logistics** 物流
 - The coordinated planning and execution of
 - Prepare of package product, movement itinerary (transport), storage itinerary (warehouse), distribution
 - Product ship from point A to point B
- **Reverse Logistics** 逆向物流
 - The management of products that flow backward in the supply chain, away from the consumer and back in the direction of manufactures
- **Global SCM**
 - When suppliers, manufactures, and other supply chain partners span across multiple countries
- **1st-tier suppliers**
 - A company's direct suppliers
- **2nd-tier suppliers**
 - A firm that provides goods and services to a company's first-tier supplier
- **Upstream supply chain**
 - The direction that points toward the suppliers (to the left)
- **Downstream supply chain**
 - The direction that points toward the end consumer (to the right)
- **Three SCM flows**
 - Materials, Money, Information
- **Business model**
 - Basic types: purchase and delivery
 - Company's plan for how it will purchase items, transform them, deliver them, and sell them in an effort to produce a profit

- McDonalds vs Zinburger
- **Supply chain visibility** (inventory visibility)
 - The ability to see what is happening with inventory upstream and downstream in a supply chain
 - Do you have enough inventory for the future?
- Profit
 - Profit = Revenue - cost
- ROI (return on investment)
 - Measure that helps evaluate the return of an investment
 - Total profit/ total investment
- Stakeholders
- **Core competencies** 核心競爭力
 - The primary advantage a company has over its competitors
 - Would be difficult
- **Productivity (organizational perspective)**
 - Company seek to maximize the amount of output that can be produced and delivered to market while minimizing the required inputs
 - “output / input”
- **Value (customer perspective)**
 - The ratio of “output purchase / inputs used to purchase”
 - “what did I buy? / what did it cost me?”
- **Seven types of waste**
 - Defects 缺陷
 - Overproduction
 - Transportation
 - Motion
 - Waiting
 - Inventory
 - Over-processing
- **Competitive priorities**
 - Cost
 - material, production, packaging, quality
 - Quality
 - design, material & production, services
 - Speed/time
 - delivery – lead time (pizza delivery), on-time delivery (airline)
 - Flexibility
 - large amount, large range, option, demand, number of order
- **Primary supply chain goals**
 - Effectiveness, Efficiency, Adaptability
 - To make high quality products and services in a timely fashion that meet the needs of the customer

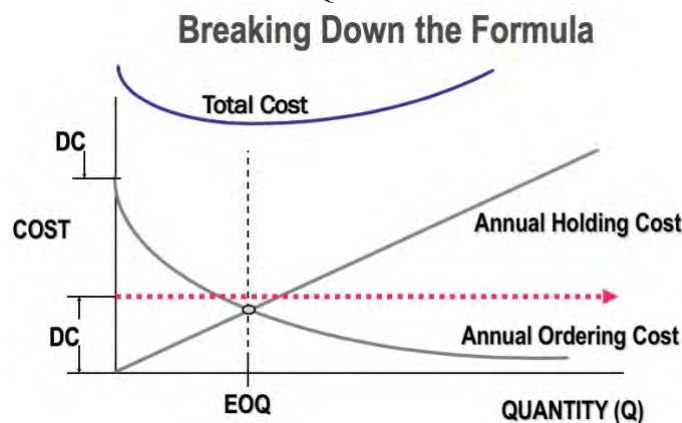
- Sustainable long-term profits & maximize return on investment
 - BY make money, be efficient, avoid waste, be different, be better
- **Keys to be a successful SC manager**
 - Satisfy the needs of the customer
 - Satisfy the need of the company
 - Be prepared of the future
- **Supply Chain Strategy**
 - Understanding the product and services and the market's desires
 - Developing a business model
 - Organizing the right group of supply chain partners
- **Supply Chain tools**
 - Supply chain metrics
 - Information technology tools
 - Relationship management skills
 - Financial resources
 - Organizational integration

Module 2

- **Inventory**
 - The items that are owned by a company for the purpose for present of future sale of for use in day-to-day operations
- **Lead time**
 - The period of time between when an order is placed and when the order is received (發貨 -> 收貨)
- **Lot size**
 - Order size
- **SKU (stock keeping unit)**
 - Bar-code that used to track inventory or catalog sales
- **Inventory Strategies (Why carry inventory?)**
 - Insurance
 - Manage risk/ uncertainty
 - Market Needs/expectations
 - Prepare to meet consumer needs quickly
 - Managing cost
 - Discount, economies of scale
- **Risk's relationship to inventory**
 - Company risks: Theft or damage to inventory, late shipment from suppliers, employee sickness
 - Supplier risks: employee sickness, sudden increases in demand
 - Customer risks: sudden increase in demand, damage to customer's inventory
- **Seasonal inventory**

- Items must sell quickly
 - Christmas tree
- **Perishable inventory** (易腐爛貨品)
 - Must be sold within the day
- **Pipeline inventory (dL)**
 - Inventory in transit between two points
 - $dL = \text{Periodic demand} * \text{lead time}$
- **Safety inventory**
 - Inventory kept to account for variation/ uncertainty of demand
- **Anticipation inventory** 預期庫存
 - Inventory that is created and stored for future use
 - Uneven rates of demand like holidays, quantity discounts, seasonal demand
- **Qualitative forecasting**
 - Using queries of experts to predict future demand
- **Quantitative forecasting**
 - Using historical data to predict future demand
- **Demand forecasting**
 - A predictive analysis or estimation of consumer demand in a future period
- **Simple moving average**
 - Just an average calculation
 - Stable demand
- **Weight moving average**
 - different weight in each period
 - emphasis on the more recent statistics
- **High inventory**
 - Higher levels of customer service, quantity discounts may be possible, fewer orders will need to be placed, greater security
- **Low inventory**
 - Less storage space required, lower chance of inventory obsolescence and shrinkage, less materials handling requirements
- **4 Inventory cost**
 - Cost to purchase
 - the cost to purchase the inventory
 - Holding costs
 - cost of holding the inventory
 - Ordering cost
 - cost associated with placing an order for inventory
 - Stockout cost 缺貨成本
 - the cost associated with not having enough inventory on hand to meet customer demand
- Inventory calculations
 - **Average amount of inventory** = Lot size /2
- **Total annual inventory cost** Formula
 - $TC = DC + AHC + AOC$

- $TC = DC + (Q/2) H + (D/Q) S$
- **Lot size (Q)**
- **EOQ = Q** (economic order quantity)
 - Lot size that will minimize total annual inventory cost
 - $EOQ = \sqrt{\frac{2DS}{H}}$
- **TBO** (Time between order)
 - $(Q/D) \times 52$
 - How often will orders be placed
- Relationship between AHC, AOC, EOQ
 - AHC Annual holding cost
 - AOC order cost
 - $AHC > AOC$ – holding cost are too high, right of EOQ, decrease lot size to reduce TC
 - $AHC < AOC$ – holding cost are too low, left of EOQ, increase lot size to reduce TC
- Graph with cost curves and EOQ



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- **EOQ**
 - Examining the inputs of ...
 - Annual demand (D)
 - Cost per unit (C)
 - Cost of placing an order (S)
 - Holding cost (H)
 - Lot size (Q)
 - Limitations
 - Exact lot size may not be possible
 - Time between order (TBO) may not be allowed
 - Size of EOQ may be too large
- Steps in purchasing process
 - Requisition
 - Supplier selection
 - Place order
 - Track order
 - Receive order
- **Purchasing documents**
 - Material Requisition (MR)

- Request for quotation (RFQ)
- Purchase order (PO)
- Making vs Buying
 - Reason for making
 - Proprietary technology
 - No competent supplier
 - Better quality control
 - Idle capacity
 - Control
 - Reasons for outsourcing 外判
 - Insufficient capacity
 - Lack of expertise
 - No competent supplier
 - Better use of resources
- **Centralized purchasing**
 - All corporate employees send material requisitions to a single purchasing department
 - Avoid duplication, volume discounts, consolidated shipping, specialization, consolidated
- **Decentralized purchasing**
 - Material requisition are sent to a department purchasing department
 - Closer knowledge of requirement, closer knowledge of the supplier, speed of purchase
- **Choosing a supplier**
 - Consumer needs
 - Cost, quality, speed, flexibility
 - Technological capability
 - Location
 - Information technology system
 - Ability to innovate
 - Capacity potential
 - 2nd and 3rd tier suppliers
 - Reliability
 - Services
- **Supplier Scorecards**
 - A report card that can be used to communicate desires before a sales presentation or shipment
- Supplier certifications
 - Ensure that a buyer's suppliers all meet the minimum supplier standard
- **Inventory classifications** (list of eight)
 - Raw materials
 - Work in process (WIP)
 - Finished goods (FG)
 - Maintenance, repair, operation (MRO)
 - Market inventory

- Safety stock
- Anticipation inventory
- Pipeline inventory
- **Independents demand item**
 - Item for which demand levels are not directly impacted by the demand of another related item
 - E.g.: A car is an independent demand item
- **Depends demand item**
 - Item for which demand level are directly impacted by the demand of another related item
 - E.g.: a tire is a dependent demand item
- **TCO (total cost of ownership)**
 - The cost of owning an item over the entire lifetime of the item
- **Vertical integration 整合**
 - A company taking on additional supply chain responsibilities that were formerly done by outside parties
- **Forward integration**
 - Taking over supply chain responsibilities formerly performed by downstream supply chain partner
- **Backward integration**
 - Taking over supply chain responsibilities formerly performed by upstream supply chain partner
- E-procurement system 採購
 - An electronic procurement system that can aid in submitting request for materials, making material order, negotiating with supplier, tracking shipments, receiving shipment
 - Lead a better procurement decision in the future
- Supplier base
 - Group of suppliers from which a company makes most of its purchases
- Single vs multiple suppliers
- **Strategy Choices**
 - Business strategy
 - What kind of business are we going to be?
 - Marketing Strategy
 - Who's our customer and what do they desire?
 - Operations Strategy
 - How often?
 - Manufacturing strategy
 - Where will we make it
- Question!!!!

Module 3

- **Key issues to consider in choosing a Manufacturing location**
 - Labor

- wages, technical skills, work ethic
 - Facility, infrastructure 基礎設施, utilities
 - Laws
 - Resource availability
 - Local risks
 - Climate
 - Transportation
 - Trade agreements, tariffs
- Manufacturing layout considerations
 - Financial responsibility
 - Materials, people, space
 - Information flow and communication
 - Worker safety and security
- **Established channels of distribution**
 - Help bring a product into the hand of the end user
 - Include packaging companies, delivery companies, warehouse, distribution center, suppliers
- **Established supplier base**
 - The collection of companies from which an organization presently purchases product and services
 - Has a group of companies with which they have developed a working relationship
 - Advanced relationship might imply that transactions occur regularly and perhaps more fluidly
- **Hypercompetitive markets 競爭激烈的市場**
 - Refer to an industry that is heavily concentrated in a particular region
 - Occur when technology or offering are so new that standard is rule and flux
 - This intense and concentrated competition may result in rapid innovation but short cycles of competitive advantage
- Design Decisions
 - Product/services design
 - Functional, appealing
 - Process design
 - How exactly will it be produced in large quantities
 - Supply chain network design
 - How will it move towards the customer
- Operating decision
 - Managing labor, capital, facilities
- **Line flow (Linear path)**
 - Manufacturing strategy and layout that typically works well in producing end items that have relatively high demand and that require very little customization
 - **Each work center performs the exact same task to every unit that passes through**