Time frame for a project should be specific

Work breakdown structure: All work has to be completed.

Activity is the smallest unit of work, major work breakdown to smaller task to activity.

Network diagram: depict the relationships between activities.

Critical path: longest time. Activity slack: LS - ES or LF - EF

Earliest, latest,start, finish time in **activity**

Project Aristotle: Believe their work matters, feel the work is personally meaningful, Have clear goals and defined roles, Know they can depend on one another, Enjoy “psychological safety”: able to show and employ one’s self without fear of negative consequences of self-image, status.

Pressure for small inventories: holding cost(cost of capital, storage and handling costs, taxes, insurance and shrinkage)

Pressure for large inventories: setup cost, labor and equipment utilization

Accounting inventories: raw materials, Work-in-process, Finished goods.

Operational inventories: how they are created. 1.cycle 2.safety stock. 3.anticipation 4.pipeline

Cycle inventory: Portion of total inventory that varies directly with lot size. (varies with the elapsed time between orders. Longer between orders, greater the cycle inventory must be) Q/2

Safety stock inventory: Surplus inventory that protects against uncertainties in demand, lead time and supply changes

Anticipation Inventory: Inventory used to absorb uneven rates of demand or supply. Uneven demand can motivate stockpiling anticipation inventory during low demand periods.

Pipeline Inventory: An order for an item is issued but not yet received. D\*L

Reduce:

Cycle inventory: Reduce lot size. Streamline the methods for placing orders and reduce ordering and setup costs. Increase repeatability.

Safety stock inventory: Improve demand forecasts, cut the lead times of purchased or produced items to reduce demand uncertainty, reduce supply uncertainties, rely more on equipment and labor buffer.

Anticipation inventory: Add new products with different demand cycles, provide off-season promotional campaigns, offer seasonal pricing plans.

Pipeline Inventory: Find more responsive suppliers, change Q in those cases where lead time depends on the lot size.

ABC analysis: Dividing SKUs into three classes, according to their dollar usage, so that managers can focus on items that have highest dollar value.

When demand and lead time is constant:

R: total demand during lead time Inventory position = OnHand + Scheduled receipt(in pipeline) – backorder

When demand is varied:

Reorder point = dL + safety stock Safety stock = sd\*Z\*sq(L)

Total Q system costs: Total cost = Annual cycle inventory holding cost + annual ordering cost + annual safety stock holding cost

C = Q/2(H) + D/Q(S) + (H)(safety stock)

Advantage of Q system

1.The review frequency of each SKU may be individualized, tailoring the review frequency can reduce total ordering and holding cost.

2.fixed lot sizes, if large enough can result in quantity discounts.

3.system requires low level of safety stock for the amount of uncertainty in demands.

Continues review(Q) system: A system designed to track the remaining inventory of a SKU each time a withdrawal is made to determine whether it is time to reorder.

Economic order quantity(EOQ): the lot size that minimizes a total annual inventory holding and ordering costs

Periodic Review System: an item’s inventory position is reviewed periodically rather than continuously.

Strategic options: linking supply chain designs to competitive priorities, mass customization and outsourcing decisions.

Logistical network options: facility locations and inventory placement in the network of material flows

Integration options: designs to mitigate supply chain dynamics and risk, supply collaboration to link major processes and supplier selection

Sustainability options: designs for environmental concerns and disaster relief

Inventory Measures supply chain performance: Average aggregate inventory value

Weeks of supply = AAIV/weekly sales (at cost)

Inventory turnover = Annual sales (at cost)/AAIV

Financial measures: Total revenue, costs of goods sold, operating expenses

net cash flow and inventory: working capital

Efficient supply chains: work in demand is highly predictable, low cost, consistent quality, on-time delivery, capacity cushion low, inventory investment low, high inventory turns.

Responsive supply chains: Unpredictable, high forecast errors, development speed, fast delivery times, customization, volume flexibility, top quality

Mass customization competitive advantages: 1.managing customer relationships 2.eliminating finished goods inventory( have everything you need to produce the order, not forecast the demand) 3.Increasing perceived value of services or products: higher value in the mind of customer than it actually costs to produce.

Supply chain design for mass customization: Assemble to order strategy, Modular design, postponement: some of the final activities in the provision of a service or product are delayed because standardized operations are separated from custom-oriented operations.

Vertical integration: Purchase the processes it needs 2directions: Backward integration: a firm’s movement upstream in the supply chain toward the sources of raw materials through acquisitions. Forward integration: the firm acquire more channels of distribution such as retail stores.

Outsourcing: paying suppliers and distributors to perform processes and needed services and materials.

Inventory turnover: the number of times inventory is sold or used in a time period.