Weekly presentation SCM research

1st presentation: general introduction and inventory management

Summary

1)Personnal background

2)General presentation of the SCM

3)Inventory Management

4)Next steps

1)Personnal background

- Studies
  - *General engineering*
  - *Working toward a SCM master*
  - *Gap year in Japan*

- Knowledge on SCM
  - *Operations management,???*
  - *Operations rules, Simchi-Levi*
  - *Seminars (Rolex, l'Oréal, Casino…)*
  - *Internship at P&G in Inventory*

2)SCM general presentation

- Definition

  « A set of approaches utilized to efficiently integrate all its facilities so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time »

- Strategy
  - *Minimize systemwide costs*
  - *Improve service level*

2)SCM general presentation

- Importance
  - *Operations strategy directly linked to the company value and sucess*
  - *A single stage approach is not enough anymore*
- Issues
  - *Complex network*
  - *Conflicting objectives*
  - *Dynamic system*

  FLEXIBILITY necessary to compensate uncertainty

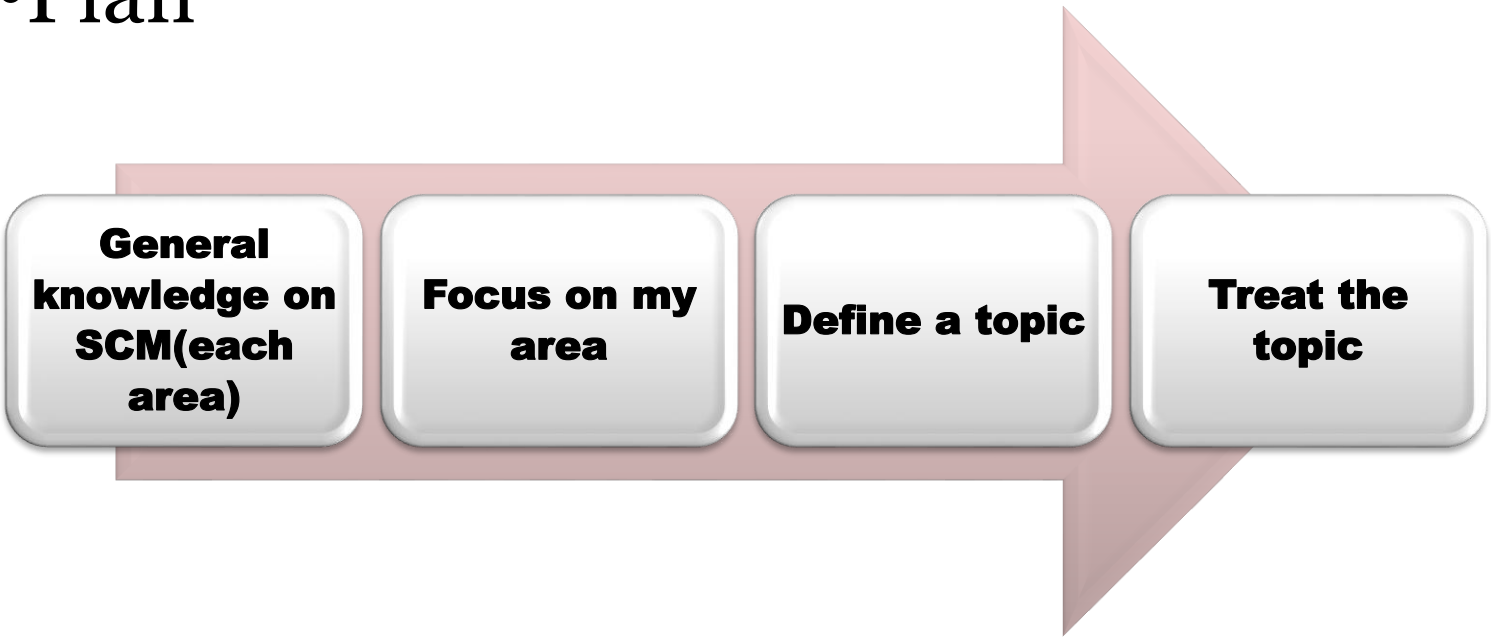
2)SCM general presentation

- Different areas:
  - *Inventory management*
  - *Network planning and SC design*
  - *SC strategies*
  - *Distribution*
  - *Procurement and supply contracts*
  - ***Risk management***
  - *Pricing*
  - *Technology*
  - *Forecasts and planning*

Personnal strategy

- *Designing and Managing the Supply Chain*, Simchi-Levi and Kaminsky

- Plan



3)Inventory management

- Inventory is held due to:
  - *Unexpected changes in customer demand*
  - *Compensate uncertainty*
  - *Delivery lead times*
  - *Economies of scale offered by transportation companies*

- Challenge

  Reduce inventory while keeping a good customer service

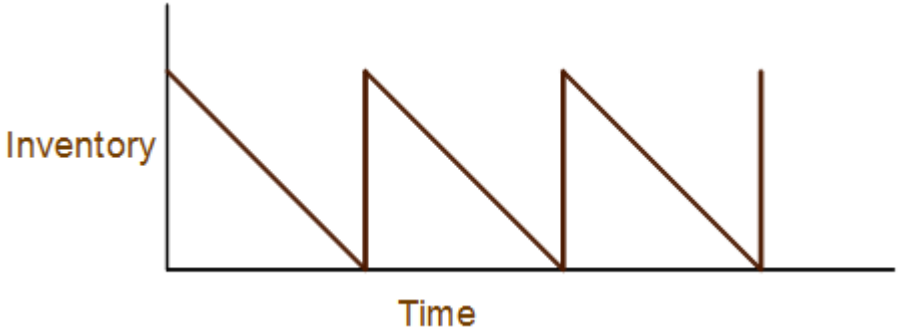
- Service level= *probability of not working out during lead times*

- 2 kind of costs:
  - *Holding costs*
  - *Fixed costs*

3)Inventory management

Simple model (one single stage)

- *Demand D is constant*
- *K fixed costs*
- *h holding costs*
- *Q fixed order quantities*
- *No lead time*
- *Initial inventory is 0*



Limits : *demand uncertainty and lead time*

Q=TD

$$C = K + h * T * \frac{Q}{2}$$

➢ ***Optimal order quantity***

$$Q^* = \sqrt{\frac{2KD}{h}}$$

3)Inventory management

Simple period model

How much to stock to meet the demand?

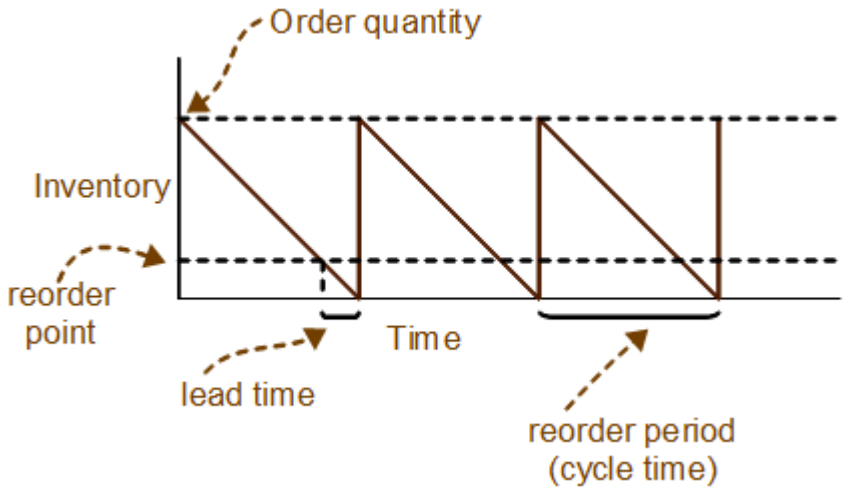
- *Calculating probability of each demand scenario*
- *Q* depends on the relationship between Marginal Profit and Marginal Cost*
- *Risk increases with production quantities*
- *Fixed costs have only an impact on the decision to produce or not (initial inventory)*

3)Inventory management

Multiple order opportunities (distributor level)

2 policies:

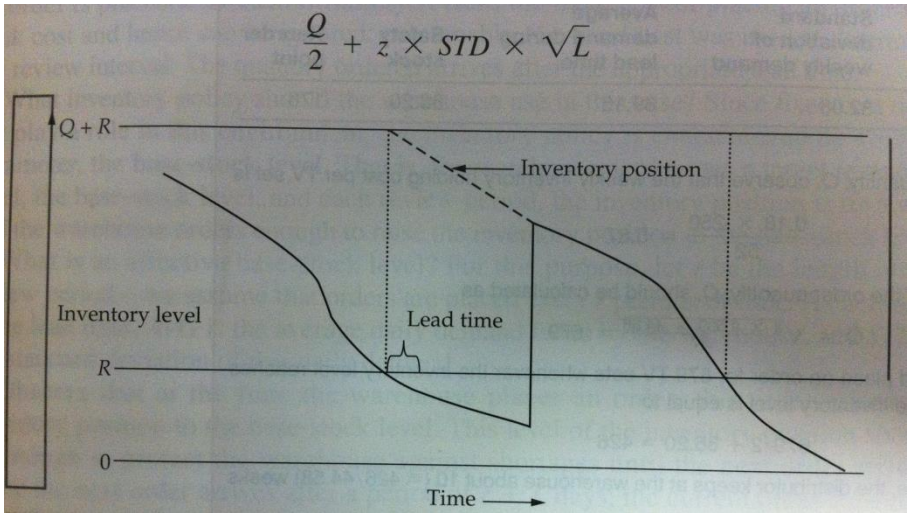
- *Continious review (reorder point, more responsive)*
- *Periodic review (regular intervals, more flexible)*



3)Inventory management

Continious review

- *AVG Daily demand follows a normal distribution*
- *α Service level*
- *L lead time*



➢*(Q,R) policy*

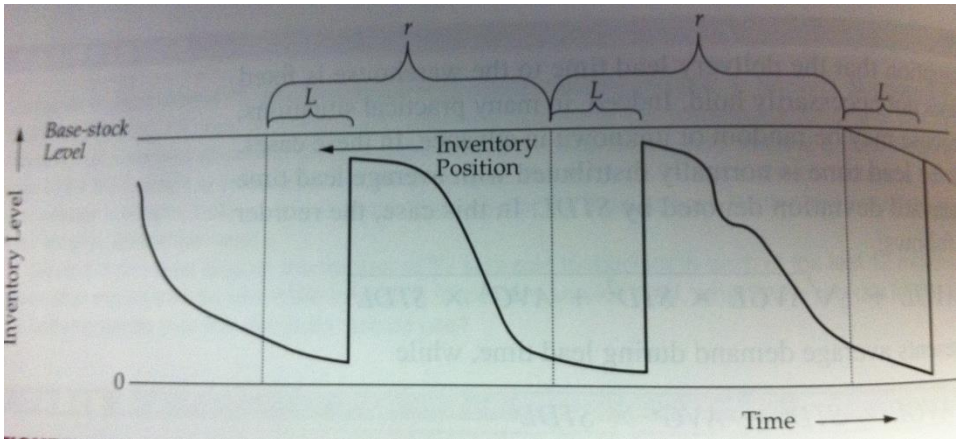
$$R = L * AVG + z * STD * \sqrt{L}$$

$$Q = \sqrt{\frac{2KAVG}{h}}$$

3)Inventory management

Periodic review

- *(s,S) policy equivalent to (Q,R) policy with s=R and S=R+Q*
- *Fixed costs are not considered*
- *r length of the review period*



base-stock level $s = (r + L) * AVG + z * STD * \sqrt{r + L}$

3)Inventory management

Application: P&G internship(Wella)

- *Product Supply function*
  - *Inventory*
  - *Service*
  - *Initiatives*
- *3 main plants in Europe, 2 main DC*
- *weekly inventory review with the plants*
- *Inventory buckets:*
  - ***Safety stock***
  - *Anticipation stock*
  - *Cycle stock*
  - *Frozen stock*
  - ***UPI*** *(excess, remnants, to be scrapped)*

4)Next steps

- Network Planning
- *Supply Chain strategies and Design*

Thank you for your attention!