

Overview

Procurement	Production	Distribution
Supplier	Manufacturer	Retailer
Transportation Activity	Manufacturing Activity	Warehousing activity

Distribution System

Retailers
Distributor/ Warehouse
Cross Docking
Multipick- Multidrop
Internet

Flow Management

MTO	MTS
Low reactivity	High reactivity
Low risk/ cost	Risk of non sold product Inventory cost
Long customer lead time	Zero customer lead time

Holding inventory cost

Cost
Financial cost
Physical storage cost
Obsolescence cost

Exponential Smoothing

Exponential smoothing: Example			Exponential smoothing: Example		
Month	Demand	Forecast	Month	Demand	Forecast
January	45		January	45	
February	35		February	35	
March	25		March	25	
April	35	37.33	April	35	37.33
May	35	37.1	May	35	37.1
June	35	37.1	June	35	37.1

Supply Chain with Single Unit

Supply Chain with Single Unit – Deterministic Case



T : Processing time of a product in the unitchain (including loading and unloading operations)

- Cycle time: $T_c = T$
- Capacity of the chain : $P_c = 1/T$

SC decision & temporal horizon

	Procurement	Production	Distribution
Long term		Supply Chain design	
Mid term		Supply chain planning	
Short term		Production Planning & flow management	
Very Short term		Detailed management of physical flow	

Inventory?

Economic of scale stocks
Seasonal stock
Safety Stock
Speculative stock & Merchandising stock

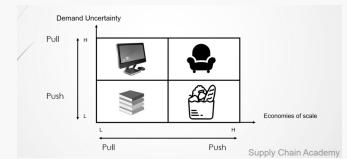
Pressure of inventory

Small inventory	Large inventory
WACC	Customer Service
Storage & handling cost	Ordering cost
Insurance cost	Set up cost
Taxes	Labor or equipment utilization
	Transportation cost
	Payment to suppliers

Inventory performance measure

Inventory performance measures (KPIs)			
Inventory costs, already discussed			
Period	Order	Stock-out	
1	100	0	
2	75	0	
3	255	45	
4	140	0	
5	100	0	
6	200	10	
7	100	0	
8	90	0	
9	100	0	
10	40	0	
Total	1480	55	

How to choose Push or Pull



Push & Pull Comparison

Push Strategy	Pull Strategy
Base on Historical Data	Base on Customer Order
High level inventory & transportation cost HIGH	Make final production quick (push & pull combine)
Long time require for manufacturing process	Flexible supply in dynamic market
Target Cost reduction	

VMI, CMI, CPFR			
	VMI	CMI	CPFR
Disturbance of pro order	Customer follow S	C can edit/ submit orderr	Order generated jointly
Visibility	Sharing level	Storeself	
Role of customer	Information provider	Data are shared Invisible to supplier	Joint inventory

Other stock KPIs

- Turnover Rate (TR)
 - > It shows the speed of the renewal of the stock over a certain period
 - > Can be calculated as follows: $TR = \text{Total Demand (over a period)} / \text{Average Stock}$
- Coverage (C)
 - > It shows the period covered on average by the stock (in months)
 - > Can be calculated as follows: $CR = \text{Average Stock (per month)} / \text{Average Monthly Demand}$