MBA 511

Calculating averages

Simple moving average

$$\frac{\sum_1^n W_i}{n}$$

In other words, the average of the N most recent items

Weighted moving average

$$X_1 * W_1 + X_2 * W_2 + X_3 * W_3 + ... + X_n * W_n$$

$$Where \sum_n W_n = 1$$

Exponential Smoothing

$$F_t = F_{t-1} + \alpha(A_{t-1} - F_{t-1})$$

$F_t =$ The exponetially smoothed forecast for period t $F_{t-1} =$ The exponetially smoothed forecast made for the prior period $A_{t-1} =$ The actual demand in the prior period $\alpha =$ The desired response rate, or smoothing constant

Littles Law

$L = \lambda W$ Where L is Average number of customers in the store λ is the effective arrival rate W is Average time customer spends in store

Chapter 01

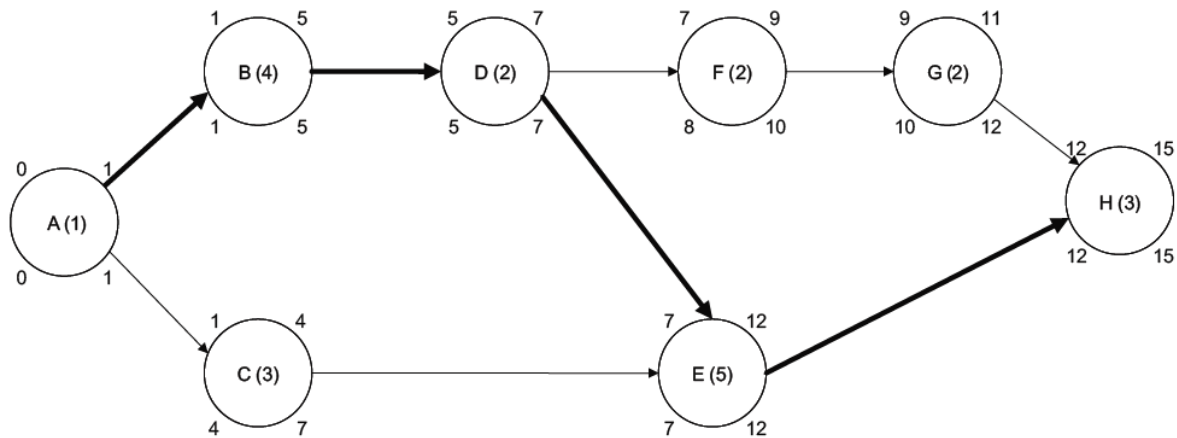$$ReceivableTurnover = \frac{AnnualCreditSales}{AverageAccountReceivable}$$

$$InventoryTurnover = \frac{CostofGoodsSold}{AverageInventoryValue}$$

$$AssetTurnover = \frac{Revenue(orSales)}{TotalAssets}$$

Quicker payments will reduce the average amount of accounts receivables, so the receivables turnover ratio will increase.
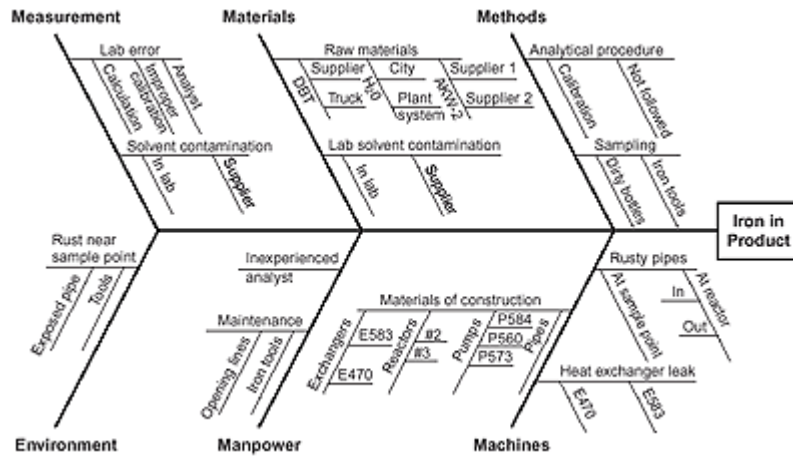
Chapter 4

Critical Path method

Chapter 12 Six Sigma

Six sigma charts

Chart examples are on page 305 of the textbook

- Flow Charts

    - Used in the define stage of a product

- Run charts

    - Depict trends over time and hepl in the define stage

- Pareto charts

    - These charts help to break down a problem into the relative contributions of its components, based on the idea that 80% of problems are caused by 20% of causes

- Checksheets

    - These are basic forms that help standardize data collections.

- Fishbone (aka Cause and Effect Diagram)

    - To construct, start with a why? question. Why are pizza deliveries late on Friday and Saturday nights?
    - The rest consists of lines drawn across the page, attached to the problem statement, and several lines or "bones" coming out vertically from the main line.

    Fishbone diagram example

Measurement — Lab error — Calculation, Incorrect Calibration, Analyst — Solvent contamination — In lab, Supplier — Rust near sample point — Exposed pipe, Tools

Materials — Raw materials — Supplier, City, Supplier 1; Truck, Plant (system), Supplier 2; DBT, H_2O, NH_3 — Lab solvent contamination — In lab, Supplier

Methods — Analytical procedure — Calibration, Not followed — Sampling — Dirty bottles, Iron tools

Environment — **Manpower** — Inexperienced analyst — Maintenance — Opening lines, Iron tools — Materials of construction — Exchangers E583 E470, Reactors #2 #3, Pumps P584 P560 P573, Pipes

Machines — Rusty pipes — In, Out, At reactor, At sample point — Heat exchanger leak — E470, E583

Iron in Product

Chapter 23 Theory of Constraints

Eli Goldratt in his book *The Goal* observed that improving flow time through a resource that was not a bottleneck would not improve over all production time.

Goldratt's Rules of Production Scheduling

1. Do not balance capacity - balance the flow
2. The level of utilzation of a nonbottleneck resource is determined not by its own potential but by some other constraint in the system.
3. Utilization and activation of a resource are not the same.
4. An hour lost at a bottleneck is an hour lost for the entire system
5. An hour saved at a nonbottleneck is a mirage.
6. Bottlenecks govern both throughput and inventory in the system.
7. The transfer batch may not, and many times should not, be equal to the process batch.
8. A process batch should be variable both along its route and in time.
9. Priorites can be set only by examining the system's constraints. Lead time is a derivative of the schedule.