

ORGANIZATIONAL INFLUENCES AND PROJECT LIFE CYCLE

Organization Types

- Functional Organization: Projects are only within each department.
- Matrix Organization: Projects involve multiple departments
 - Weak Matrix Organization: No Project Manager but Project Coordinator or Expediter from one of the departments.
 - Balanced Matrix Organization: PM from one of the departments.
 - Strong Matrix Organization: PM from PMO or PM Department.
- Projectized Organization: Projects are with dedicated staff and resources
- Composite Organization: For big projects: strong matrix, for small projects functional organization structure is applied.,

INTEGRATION MANAGEMENT

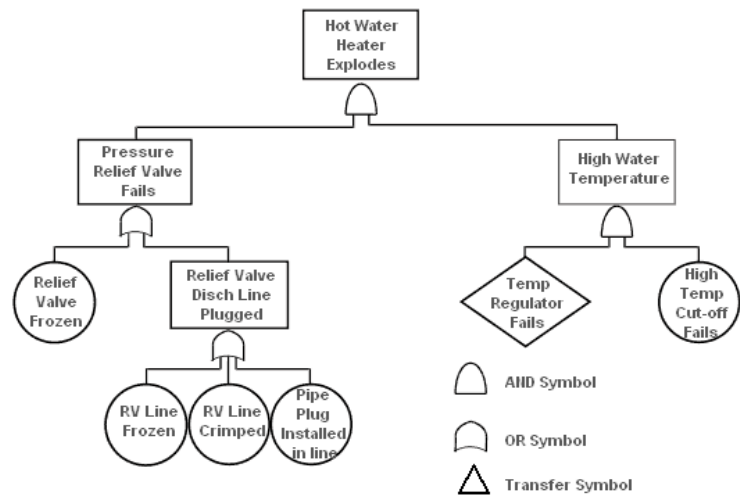
Meetings: Meetings tend to be one of three types:

- Information exchange
- Brainstorming, option evaluation, or design
- Decision making

Work Performance Data: examples can include work completed, KPIs, technical performance measures, start and finish dates of schedule activities, number of change requests, number of defects, actual costs, and actual durations, etc.

Analytical Techniques (Monitor and Control Project Work)

- **Fault Tree Analysis (FAU)**



- **Failure Mode and Effect Analysis (FMEA)**

FAILURE MODE & EFFECTS ANALYSIS (FMEA)				Date: 1/1/2000
Process Name: Left Front Seat Belt Install		Process Number: SBT 445		Revision: 1.3
Failure Mode	A) Severity Rate 1-10 10 = Most Severe	B) Probability of Occurrence Rate 1-10 10 = Highest Probability	C) Probability of Detection Rate 1 - 10 10 = Lowest Probability	Risk Preference Number (RPN) AxBxC
1) Select Wrong Color Seat Belt	5	4	3	60
2) Seat Belt Bolt Not Fully Tightened	9	2	8	144
3) Trim Cover Clip Misaligned	2	3	4	24

- Regression analysis
- Grouping methods
- Causal analysis
- Root cause analysis
- Forecasting methods (eg. simulation, scenario building, time series)
- Reserve analysis
- Trend analysis
- Earned Value Management
- Variance analysis

SCOPE MANAGEMENT

Job shadowing: Observation. Job shadowing is the name given to the opportunity for you to observe or “shadow” someone doing their job. A job shadow can be as simple as an hour-long visit with one person, to an extended week-long stay allowing interaction with numerous staff and observation of a variety of activities.

Group Creativity Techniques (Tools of “Collect Requirements” process and some other processes)

- **Brainstorming**
- **Nominal Group Technique:** A technique that enhances brainstorming with a voting process used to rank the most useful ideas for further brainstorming or for prioritization.
- **Idea/mind mapping**
- **Affinity diagram**
- **Multi-Criteria Decision Analysis:** This technique utilizes a decision matrix to provide a systematic analytical approach for establishing criteria, such as risk levels, uncertainty, and valuation, to evaluate and rank many ideas. Also tool of “Acquire Project Team” process to rate and score potential team members per such cost, experience, availability etc.

Group decision making techniques (Tools of “Collect Requirements” process and some other processes)

- **Plurality Technique:** In group decision making making, this method chooses the option with the most support, in the event there is no majority choice. Other GDMT methods are consensus, majority, dictatorship and unanimity.
- **Dictatorship:** In this method, one individual makes the decision for the group.
- **Majority:** A decision that is reached with support obtained from more than 50 % of the members of the group.
- **Unanimity:** One of the techniques is Delphi technique. The responses are only available to facilitator to maintain anonymity.

Prototyping: Storyboarding is a prototyping technique showing sequence or navigation through a series of images or illustrations.

Benchmarking: comparing with other organizations.

Context Diagram: Visually depicts the product scope by showing relationships between systems (computer, process, equipment) and people/actors.

100 Percent Rule: In WBS total of the work at lowest levels should roll-up to the higher levels so that nothing is left out and no extra work is performed. This is called the 100 percent rule.

Scope Creep: The uncontrolled expansion to product or project scope without adjustments to time, cost, and resources is referred to as scope creep.

Variance Analysis: Tool of the Control Scope process.

TIME MANAGEMENT

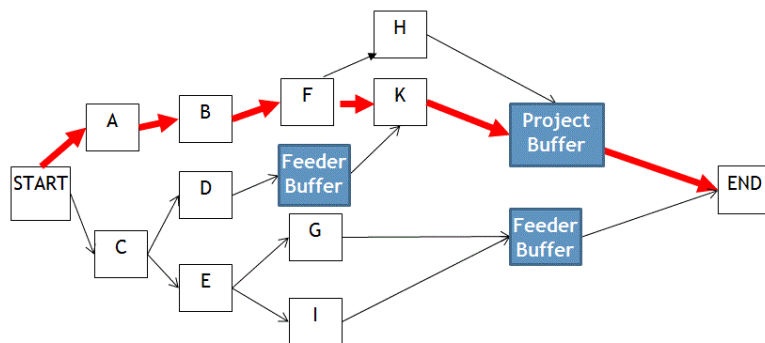
Schedule Model: is a representation of the plan for executing the project's activities including durations, dependencies and other planning information.

Precedence Diagramming Method (PDM): Activity on Node is one method represents PDM. In this method activities are represented by nodes with depending relationships. Has FS, FF, SS, SF relationships.

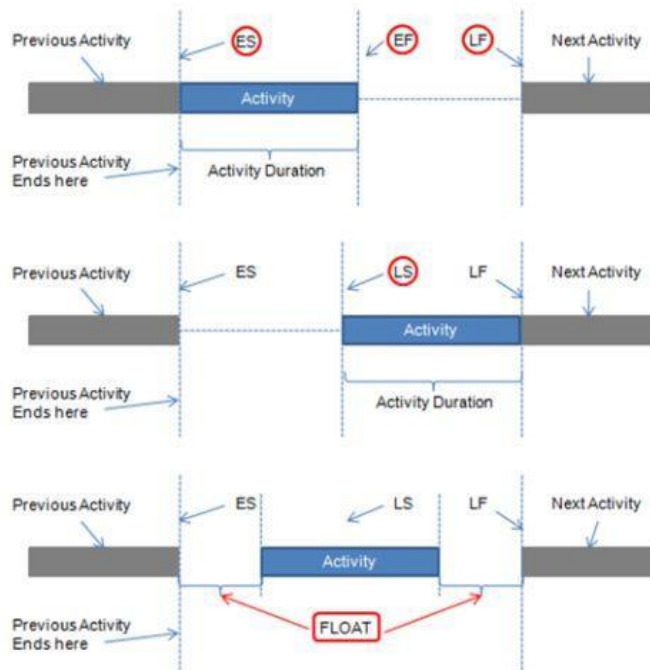
Mandatory dependencies: also known as Hard dependencies, Hard logic.

Discretionary dependencies: are sometimes referred to as preferred logic, preferential logic or soft logic. A relationship that is established based on knowledge of best practices within a particular application area or an aspect of the project where a specific sequence is desired.

Critical Chain Project Method (CCPM)



Earliest Start (ES), Earliest Finish (EF), Latest Start (LS), Latest Finish(LF), Float

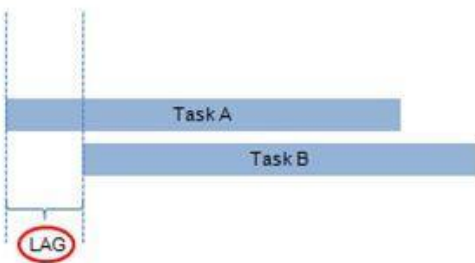


Leads and Lags

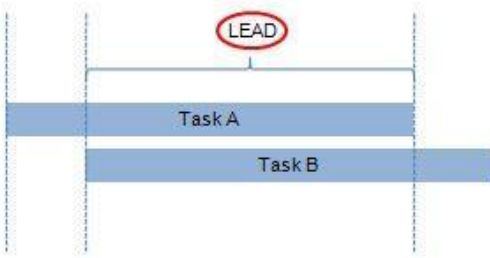
- Lead time is only FS (minus value) relationship
- Lag time with all relationships
- Lead accelerator of successor activity
- Lag is delay in successor activity

Take the scenario of building two identical walls of the same house using the same material. Let's say, building the first wall is task A and building the second one is task B. The engineer wants to delay task B for two days. This is due to the fact that the material used for both A and B are a new type, so the engineer wants to learn from A and then apply if there is anything to B. Therefore, the two tasks A and B have a SS relationship.

The time between the start dates of the two tasks can be defined as a lag (2 days in this case).



If the relationship between task A and B was Finish to Start (FS), then the 'lead' can be illustrated as:

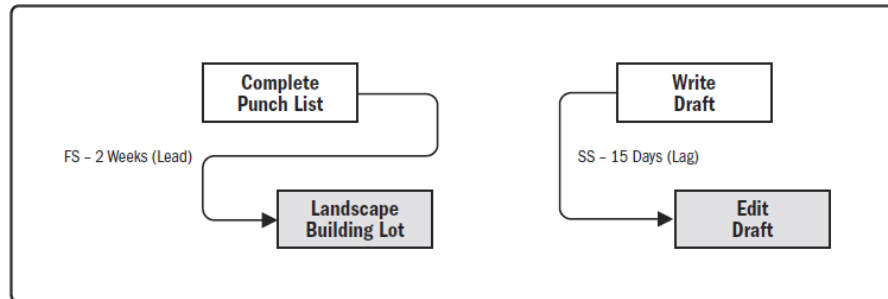


Task B started prior to Task A with a 'lead.'

Source: http://www.tutorialspoint.com/management_concepts/leads_lags_floats.htm

Lead

For example, on a project to construct a new office building, the landscaping could be scheduled to start two weeks prior to the scheduled punch list completion. This would be shown as a finish-to-start with a two-week lead as shown in Figure 6-10. Lead is often represented as a negative value for lag in scheduling software.



Lag

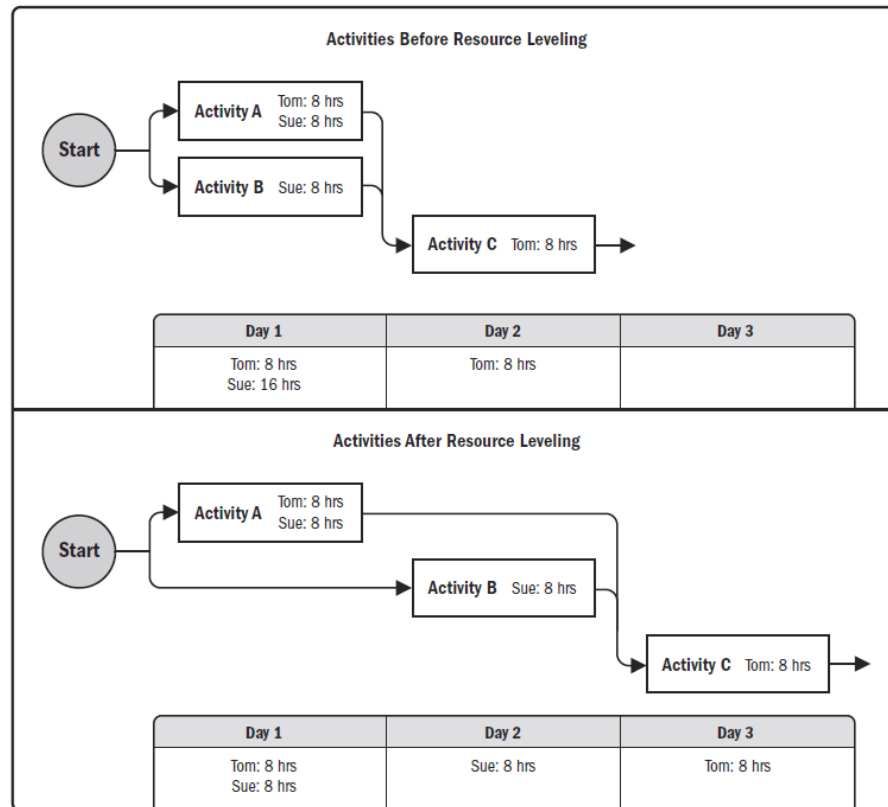
For example, a technical writing team may begin editing the draft of a large document 15 days after they begin writing it. This can be shown as a start-to-start relationship with a 15-day lag

Activity Duration Estimation Techniques:

- Expert judgment
- Analogous estimating: looking for similar project done in the past
- Parametric estimation: eg. resource is capable of installing 25m of cable per hour. 40h is required for 1000m.
- Three-Point estimating: triangular distribution, beta distribution
- Group decision making techniques
- Reserve analysis

Resource Optimization Techniques

- **Resource Leveling**: A technique in which start and finish dates are adjusted based on resource constraints with the goal of balancing demand for resources with the available supply. Resource leveling can cause the original critical path to change and can delay the project's completion date. The activities may change within their float, but that is all.



- **Resource Smoothing:** A technique that adjusts the activities of a schedule model such that the requirements for resources on the project do not exceed certain predefined resource limits. When Resource smoothing is use, the critical path and the completion date do not change.

Schedule Compression Techniques

Schedule compression techniques are used to shorten the schedule duration without reducing the project scope.

- **Crashing:** adding resources, approving overtime, paying expedite delivery to activities on the critical path. This increases cost.
- **Fast tracking:** activities or phases normally done in sequence are performed in parallel at least a portion of their duration. This can increase risk.

Hammock Activity

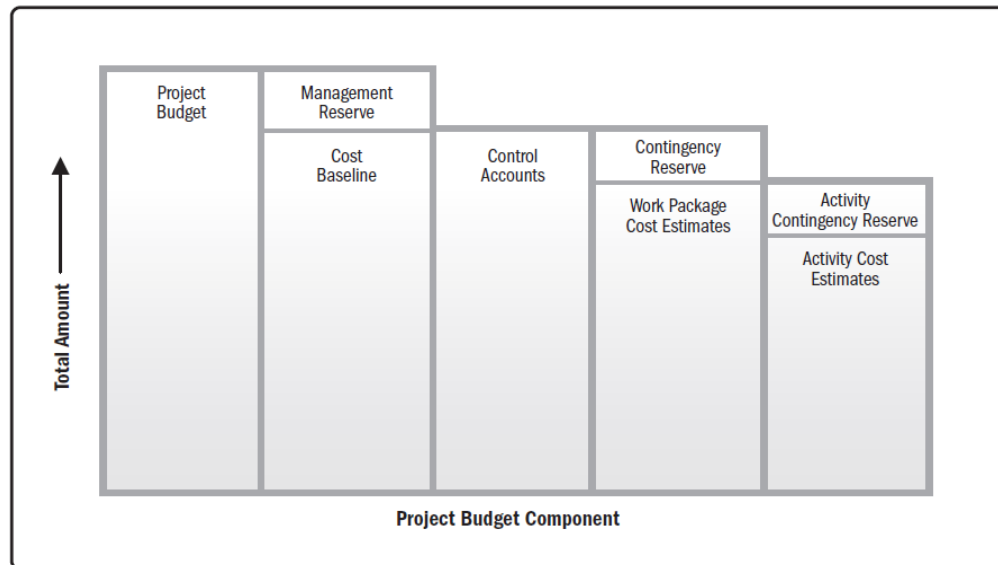
A Hammock Activity is a schedule or project planning term for grouping smaller subtasks that hang between two dates. The sub tasks are not really related in a hierarchical sense. This means that there is no fixed sequence of tasks – any of these subtasks can be done at any time, but there is no particular sequence. The objective is to group dissimilar activities that must be performed to achieve an overall goal, but their individual sequence is not important or logical.

For example, let's say you have an activity called "plan vacation". It can have multiple sub tasks like "book hotel", "get brochures", "book tickets", "find a guide", "check local attractions" etc. Any of these tasks can be done first, without the other being started or completed. But there will be an overall target to complete "plan vacation" by the third quarter of the year.

The size of the hammock, or the duration of the hammock is calculated by the start date of the earliest task, and the finish date of the last task. <http://www.pmchampion.com/do-you-know-about-hammock-activity-for-pmp-exam/>

PMBOK: Hammock Activity = Summary Activity. A group of related schedule activities aggregated and displayed as a single activity.

COST MANAGEMENT



To-Complete Performance Index (TCPI)

TCPI is a measure of **the cost performance** that is required to be achieved with the remaining resources in order to meet a specified management goal, expressed as the ratio of the cost to finish the outstanding work to the remaining budget.

Payback Period

Payback period in capital budgeting refers to the period of time required to recoup the funds expended in an investment, or to reach the break-even point. For example, a \$1000 investment which returned \$500 per year would have a two-year payback period. The time value of money is not taken into account. Payback period intuitively measures how long something takes to "pay for itself."

Internal Rate of Return

If you invest \$100 and get \$10 back then Rate of Return is 10%. But if investment returns not periodic, irregular returns like \$25 in first year and 60\$ in second year then stops etc. then we need Internal Rate of Return. IRR should be at least 0 to invest in this project. <http://mbabullshit.com/blog/2011/08/06/irr-internal-rate-of-return-explained/>

NOTE: The higher Internal Rate of Return is always the better.

Cost-Benefit Analysis

A Benefit Cost ratio of greater than 1 means the benefits are greater than the costs. A benefit cost ratio of 1 means the costs and the benefits are the same. Remember the benefit cost ratio calculation is looking at revenue not the smaller figure of profit.

Revenue = Cost + Profit

Price = Cost + Fee

Discounted cash flow

Think of discounted cash flows this way: they're a way of taking a payoff from an investment in the future, and putting it in terms of today's money. Discounted cash flows take into account the time value of money -- the fact that one dollar 10 years from now is worth less than \$1 today.

If I loan that dollar to someone, I'm costing myself all the interest or gains that I would earn if I saved or invested it. I'm also pitting 10 years of inflation against my dollar's buying power. What that means is that when all is said and done, my dollar's only worth around 51 cents (I'll get to how I calculated that in a bit), which means that I'm losing about half of my money.

Discounted cash flows take these factors into account to calculate what a reasonable valuation is today for a company's success years down the road. <http://www.thestreet.com/story/10385275/1/getting-started-with-discounted-cash-flows.html>

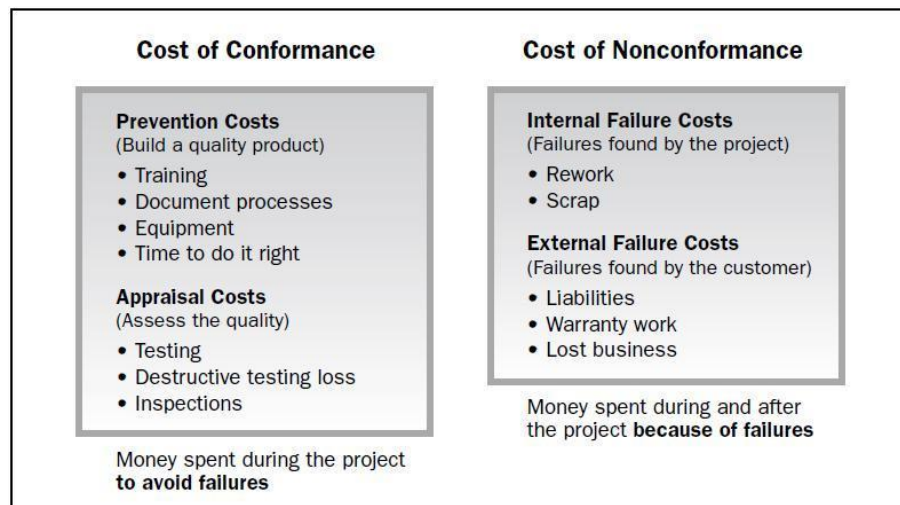
Rough Order of Magnitude (ROM) Estimate

A rough order of magnitude (ROM) estimate is the least accurate estimate. ROMs are -50% to +50% accurate, or potentially even larger. ROMs are used very early in the project when there is limited information from which to develop an accurate estimate.

Graphical Evaluation and Review Technique (GERT) is a network analysis technique that allows probabilistic treatment of both network logic and estimation of activity duration. You can think about PERT - activity network diagram.

QUALITY MANAGEMENT

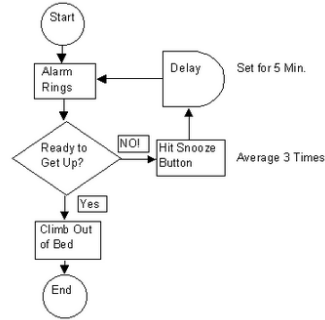
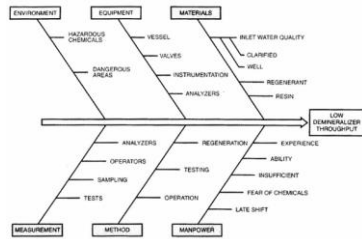
Cost of Quality (COQ)



Seven Basic Quality Tools

1. Cause and Effect Analysis also known as Ishikawa Diagrams or Fishbone Diagrams:

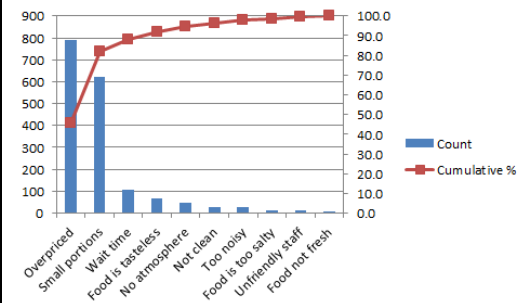
2. Flow Charts also known as Process Diagrams



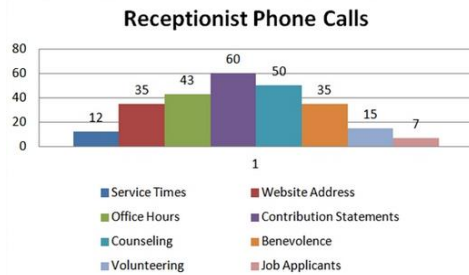
3. CheckSheets also known as tally sheets

	PART NUMBER X-1011	PART NUMBER X-2011	PART NUMBER X-3011	PART NUMBER X-4011	PART NUMBER X-5011
SAMPLES OF 1,000 SOLDER JOINTS					
COLD SOLDER	////			///	
NO SOLDER IN HOLE	///		//	//	
GRABBY SOLDER	///	/		///	
HOLE NOT PLATED THROUGH	///			///	
MASK NOT PROPERLY INSTALLED	///		////	///	
PAD LIFTED	/				

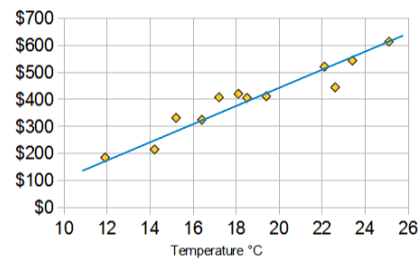
4. Pareto Diagrams: <http://www.excel-easy.com/examples/pareto-chart.html>



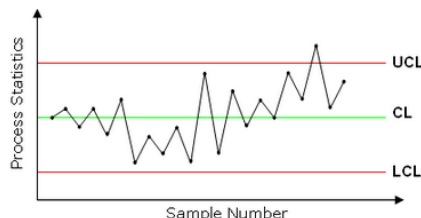
5. Histograms



6. Scatter Diagrams



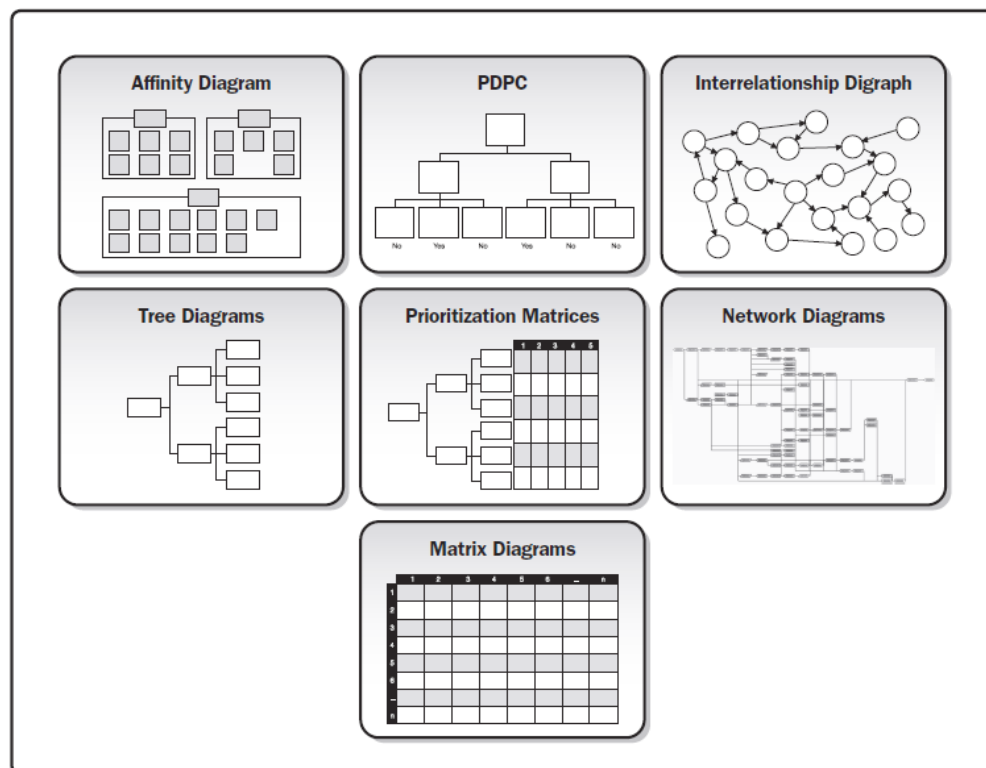
7 Control Charts



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Design of Experiments (DOE): Method for identifying which factors may influence specific variables of a product in development/production. Eg. which combination of suspension and tyres will produce most comfortable drive.

Quality Management & Control Tools



HUMAN RESOURCES MANAGEMENT

Staff Turnover Rate

In human resources context, turnover or staff turnover or labour turnover is the rate at which an employer loses and gains employees. When employees leave a company and have to be replaced, that's called turnover. A certain amount of turnover is unavoidable, but too much can ruin a company.

Organizational Theory (Tool of Plan HR Management): Organizational theory provides information regarding the way in which people, teams, and organizational units behave. Effective use of common themes identified in organizational theory can shorten the

amount of time, cost, and effort needed to create the Plan Human Resource Management process outputs and improve planning efficiency.

Tuckman Ladder (Forming, Storming, Norming, and Performing)

Whenever we put together a team, they go through the following 5 distinct phases which may be gathered by their behaviour and performance.

1. **Forming** - When the team has just been formed. Every one trying to put their best foot forward and are generally polite pretending to get along with other team members
2. **Storming** - Very soon the "best foot" posture is forgotten and contentions and conflicts arise. This is the period of least productivity
3. **Norming** - Individuals learn to work with others and conflicts are lesser
4. **Performing** - High level of trust is visible amongst the team member and this is the period of maximum performance to achieve common project/work objectives
5. **Adjourning or Mourning** - This happens during the dissolution or break-up of the team

Human Resource Networking - Luncheon Networking: Having a meeting while having a lunch.

Conflict Resolution Techniques

- **Withdraw/Avoid.** Retreating from an actual or potential conflict situation; postponing the issue to be better prepared or to be resolved by others.
- **Smooth/Accommodate.** Emphasizing areas of agreement rather than areas of difference; conceding one's position to the needs of others to maintain harmony and relationships.
- **Compromise/Reconcile.** Searching for solutions that bring some degree of satisfaction to all parties in order to temporarily or partially resolve the conflict.
- **Force/Direct.** Pushing one's viewpoint at the expense of others; offering only win-lose solutions, usually enforced through a power position to resolve an emergency.
- **Collaborate/Problem Solve.** Incorporating multiple viewpoints and insights from differing perspectives; requires a cooperative attitude and open dialogue that typically leads to consensus and commitment.

COMMUNICATION MANAGEMENT

Communication Models

- Encode
- Transmit Message
- Decode
- Acknowledge
- Feedback/Response

Communication Methods

- Interactive communication
- Push communication
- Pull communication

Note: Project Progress reports, forecasts, deliverables status, cost incurred and other types of performance reporting is done in Manage Communications process.

RISK MANAGEMENT

Risk appetite, which is the degree of uncertainty an entity is willing to take on in anticipation of a reward.

Risk tolerance, which is the degree, amount, or volume of risk that an organization or individual will withstand.

Risk threshold, which refers to measures along the level of uncertainty or the level of impact at which a stakeholder may have a specific interest. Below that risk threshold, the organization will accept the risk. Above that risk threshold, the organization will not tolerate the risk. Help identify those risks for which specific **responses are needed**. You can think Risk thresholds like Risk Impact (low, moderate, high), Risk thresholds help identify those risks for which specific responses are needed. Risk thresholds is part of Risk Management Plan i.e. you document Risk thresholds (impact) for those activities where you anticipate risk to happen.

Note: Potential Risk Responses can be planned during Risk Identification process.

Sensitivity analysis: Sensitivity analysis helps to determine which risks have the most potential impact on the project. It helps to understand how the variations in project's objectives correlate with variations in different uncertainties. Conversely, it examines the extent to which the uncertainty of each project element affects the objective being studied when all other uncertain elements are held at their baseline values.

Tornado Diagram: <http://8020world.com/2009/05/tornado-charts-in-excel-2007-update/>

Expected Monetary Value analysis (EMV): Expected monetary value (EMV) analysis is a statistical concept that calculates the average outcome when the future includes scenarios that may or may not happen (i.e., analysis under uncertainty). The EMV of opportunities are generally expressed as positive values, while those of threats are expressed as negative values. EMV requires a risk-neutral assumption—neither risk averse nor risk seeking. EMV for a project is calculated by multiplying the value of each possible outcome by its probability of occurrence and adding the products together. A common use of this type of analysis is a decision tree analysis.

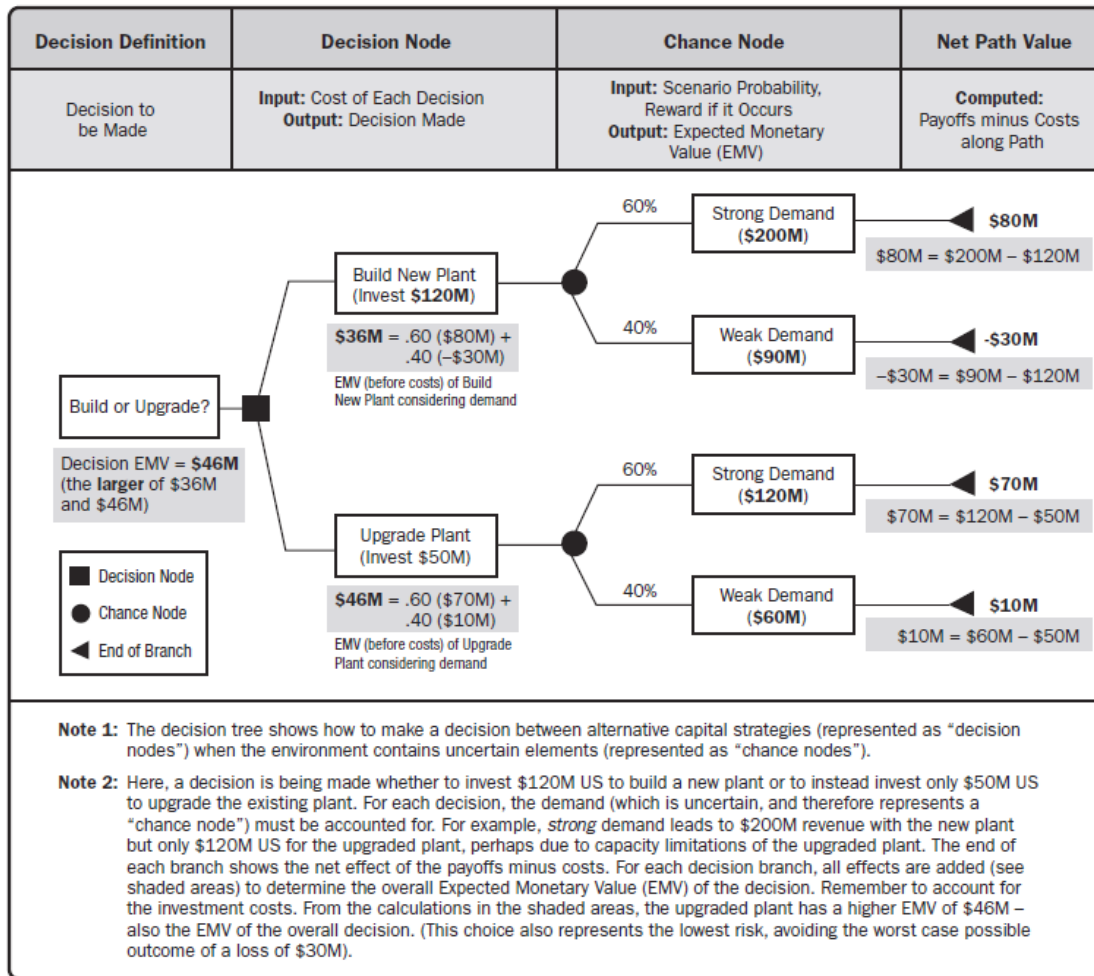


Figure 11-16. Decision Tree Diagram

- Fallback plans:** Fallback plans include an alternative set of actions and tasks available in the event that the primary plan needs to be abandoned because of issues, risks, or other causes.
- Residual risks:** A risk that remains after risk responses have been implemented.
- Secondary risks:** A risk that arises as a direct result of implementing a risk response.

PROCUREMENT MANAGEMENT

Disputes = Claims = Appeals

Alternative Dispute Resolution

- **Mediation** is a form of alternative dispute resolution in which a neutral third person helps the parties reach a voluntary resolution of a dispute. Mediation is an informal, confidential, and flexible process in which the mediator helps the parties to understand the interests of everyone involved, and their practical and legal choices.
- **Arbitration** is less formal than a trial and the rules of evidence are often relaxed. A neutral person, called an "arbitrator," hears the evidence and arguments of the parties and then makes a written decision. Private arbitrators are allowed to charge for their time.

STAKEHOLDER MANAGEMENT

Stakeholders engagement levels

- Unaware
- Resistant
- Neutral
- Supportive
- Leading

Some of Stakeholder classification models

- Power/Interest grid
- Power/Influence grid
- Influence/Impact grid
- Salience model (Power/Urgency/Legitimacy)

Stakeholder Engagement Assessment Matrix: is a table with Stakeholder X Engagement Level as rows and columns which shows their Current (C) and Desired (D) engagement levels.

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder 1	C			D	
Stakeholder 2			C	D	
Stakeholder 3				D C	

Figure 13-7. Stakeholders Engagement Assessment Matrix

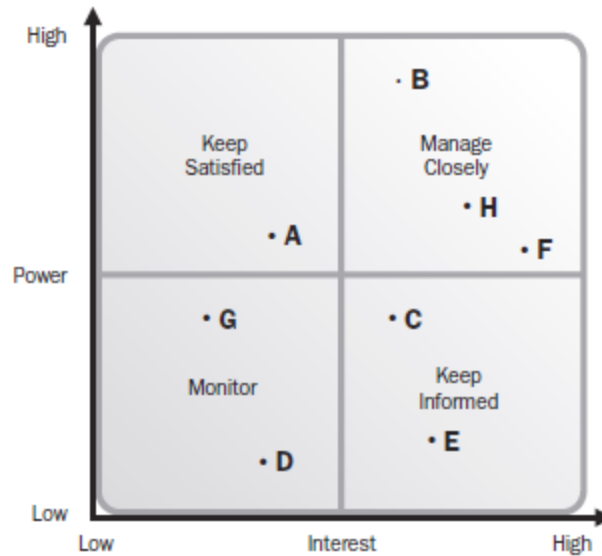


Figure 13-4. Example Power/Interest Grid with Stakeholders

Notes from PMPEP

INTEGRATION MANAGEMENT

Depreciation

Large assets (eg. equipment) purchased by a company lose value over time. Accounting standards call this depreciation. There are two forms of depreciations:

- **Straight Line Depreciation:** The same amount of depreciation is taken each year. Eg. \$1000 item with 10-year useful life and no salvage value (how much the item is worth at the end of its life) would be depreciated at \$100 per year.
- **Accelerated Depreciation:** This depreciates faster than straight line depreciation. Eg. A \$1000 item with a 10-year useful life and no salvage value would be depreciated at \$180 the first year, \$150 the second \$130 the next etc. There are two forms of accelerated depreciation:
 - **Double declining balance**
 - **Sum of the years digits**

Salvage value = how much the item is worth at the end of its life

SCOPE MANAGEMENT

Process/Steps for making changes

Example: A functional manager wants to make a change to the project. What is the FIRST thing a project manager should do?

In such questions remember following steps:

- **Evaluate the impact** (eg. costs extra 50000 Euro)
- **Identify options** (eg. fast tracking schedule, remove other activities)
- **Get the CR approved internally**

- **Get customer buy-in** (if required)

Project Decomposition = Project Deconstruction

Project Selection Methods

1. Benefit measurement methods (comparative approach)

- Murder board
- Peer review
- Scoring models
- Economic Models
 - > Present Value
 - > Net Present Value
 - > Internal Rate of Return
 - > Payback period
 - > Cost-Benefit analysis

2. Constrained optimization methods (mathematical approach)

- Linear programming
- Integer programming
- Dynamic programming
- Multi-objective programming

Project Performance Baselines

- **Scope Baseline:** approved version of (approved after planning and before work begins)
 - Project Scope Statement (like detailed version of Project Charter)
 - WBS
 - WBS Dictionary
- **Schedule Baseline**
- **Cost Baseline**

TIME MANAGEMENT

WBS is created with Work Packages (deliverables) in Scope Management. Activities are identified in Time Management.

Note: In its pure form, Network diagram shows just dependencies (logical relationships). If activity duration estimates are added to the diagram, it can also show the Critical Path. If plotted against the time (or placed against a calendar-based scale), the network diagram is a time-scaled schedule network diagram.

Float (Slack)

$$\text{Float} = \text{LS} - \text{ES} \text{ or } \text{Float} = \text{LF} - \text{EF}$$

Types of Floats

- Total Float
- Free Float
- Project Float

Path Convergence: Path convergence occurs when a project task has more than one dependent task. The arrows representing the paths between tasks converge from multiple tasks into one.

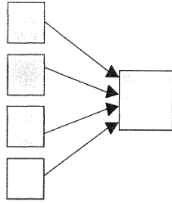


Figure 6.13: Path Convergence

Accuracy of Estimates

- Rough Order of Magnitude (ROM) estimate (-25/+75%)
- Budget Estimate (-10/+25%)
- Definitive Estimate (-10/+10% or -5/+10%)

Marginal Analysis: An examination of the additional benefits of an activity compared to the additional costs of that activity.

COST MANAGEMENT

Cost Types:

- **Fixed** (eg. Bulldozer, Rent, setup)
- **Variable** (eg. Fuel for bulldozer, supplies, wages)
- **Direct** (eg. materials used to build, team travel, team training, team wages)
- **Indirect** (eg. taxes, fringe benefits, manager's salary)

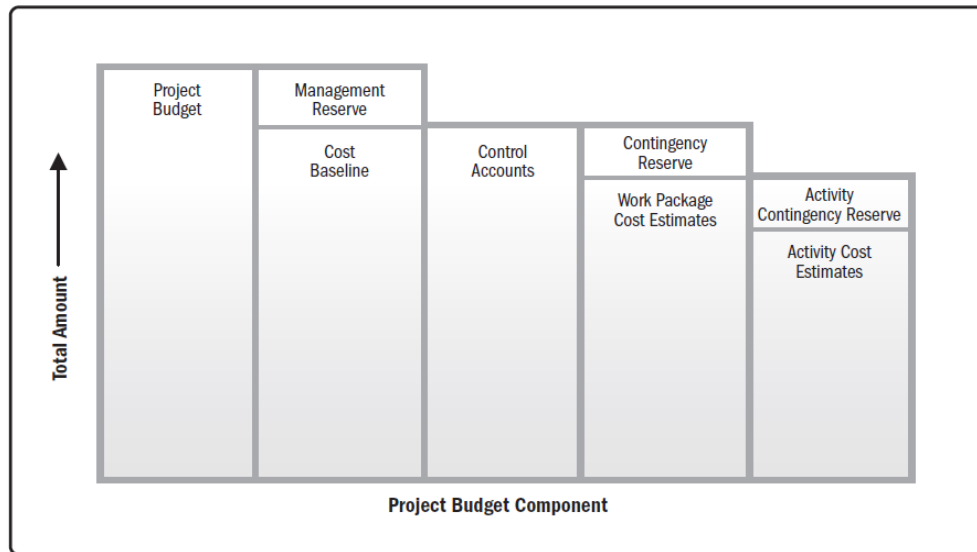
WBS components

- **Control Account:** A higher level above Work Package
- **Work Package:** A deliverable or project work at the lowest level of each branch of the WBS
- **Planning Package:** A WBS component below Control Account with known work content but without detailed schedule activities.

Cost Management Plan = Budget Management Plan = Budget Plan

Estimation Techniques

- One Point Estimating
- Analogous Estimating (type of expert judgement)
- Parametric Estimating
- Three-Point Estimating



Economic Value Added (EVA):

Opportunity Cost: Is the value of the project not selected. Eg. Project B with NPV of \$85000 is selected against Project A with NPV \$45000. Opportunity Cost of selecting Project B is \$45000.

Sunk Cost: Expended costs. \$2mln spent where \$1mln was planned. see. PMPEP p.123

Law of Diminishing Returns: Adding additional resources (eg. programmer) does not increase productivity after some point. see. PMPEP p.123

Working Capital: is money available to a company for day-to-day operations.

Depreciation: Large assets (eg.equipment) purchased by a company lose value over the time. This is called depreciation.

1. Straight Line Depreciation (p.123)
2. Accelerated Depreciation
 - 2.1. Double declining balance
 - 2.2. Some of the years digit

Salvage Value: how much the item is worth at the end of its life.

QUALITY MANAGEMENT

Total Quality Management (TQM): This philosophy encourages companies and their employees to focus on finding ways to continuously improve the quality of their products and their business practices at every level of the organization.

HUMAN RESOURCES MANAGEMENT

HR Management Plan

Some of the components of HR Management Plan are:

- Roles and responsibilities
- Project organization chart
- Staff management plan

Some Leadership and Management Styles

- **Directing**
- **Autocratic:** PM may coach or delegate but everyone does what manager wants them to do.
- **Consultative-Autocratic:** PM solicits inputs from team but makes decision himself.
- **Laissez-faire:** means 'allow to act', 'leave alone', 'allow to do'. Appropriate for PM with skilled team.

Halo Effect: is the assumption that because the person is good at a technology, he will be good as a project manager.

Group Creativity Techniques (see Scope management - Collect requirements)

Group Decision Making Techniques (see Scope management - Collect requirements)

Seven sources of conflicts in order of frequency:

1. Schedule
2. Project Priority
3. Resources
4. Technical opinions
5. Administrative procedures
6. Cost
7. Personality

Main conflict resolution techniques:

- Collaborating (Problem solving/Confrontation) win-win
- Compromising (Reconciling) lose-lose
- Withdrawal (Avoidance) postpone
- Smoothing (Accommodating) agreement
- Forcing (Directing) win-lose

Arbitration: Arbitration is a faster, simpler, and less expensive alternative to litigation. Disputes are brought before a neutral third party (the arbitrator) who, after carefully reviewing all of the relevant information, issues a final decision in favor of one of the parties.

Power of Project Manager:

According to French and Raven there are five power of project managers:

- Formal (Legitimate) (d)
- Reward (b,d)
- Penalty (Coercive) (d)
- Expert (b)
- Referent

b: best form of power

d: derived from position

Expectancy Theory - People expect to be rewarded for their efforts. This is a motivation factor. People put in more efforts because they expect to be rewarded for their efforts.

Motivation Theories

- **McGregor's Theory of X and Y**
- **Maslow's Hierarchy of Needs**
 - Physiological (Air) > Safety (Stability) > Social (Love) > Esteem (Respect) > Self Actualization (Growth)
- **David McClelland's Theory of Needs (aka. Achievement Theory)**
 - Achievement (These people recognition)
 - Affiliation (These people work best when cooperating)

- Power (These people like to organize and influence others, power)
- **Herzberg's Theory (Hygiene Theory)**
 - Hygiene Factors
 - Motivating Agents (Responsibility, Self-actualization, Professional growth, Recognition)
- **Contingency Theory**
 - Leadership style
 - Situational favourableness (later called situational control)

COMMUNICATION MANAGEMENT

Communication factors:

- Nonverbal (body language)
- Paralingual (tone of voice)
- Words (phrases, structure of sentences)

Types of communications	When Used
Formal written	Complex problems, project management plan, project charter, communicating over long distances
Formal verbal	Presentations, speeches
Informal written	E-mail, handwritten notes, text messages, instant messaging
Informal verbal	Meetings conversations

Question: What percentage of the project manager's time is spent for communication?

Answer: About 90%

RISK MANAGEMENT

Pure risk: An insurable risk of a loss (e.g. fire, theft, etc.)

Risk Averse: Not willing to take any risk

Risk Response Strategies

<i>For Threats</i>	<i>For Opportunities</i>
<u>Avoid</u> (eliminating cause. eg. Removing work package)	<u>Exploit</u> (make sure opportunity occurs)
<u>Mitigate</u> (reducing impact or probability)	<u>Enhance</u> (increase impact or probability)
<u>Transfer</u> /Deflect/Allocate (make another company responsible. eg. insurance company, outsource)	<u>Share</u> (eg. joint venture, partnership)

<i>For both Threats and Opportunities</i>
--

Accept:

- active acceptance: creation of contingency plans, allocation of time, cost reserves
- passive acceptance: leaves actions to be determined as needed if (after) the risk occurs

Workaround: workaround is an unplanned responses developed to deal with the occurrence of unanticipated events or problems on a project (or to deal with the risks that had been accepted because of unlikelihood of occurrence and/or minimal impact).

Monte Carlo Analysis (Simulation Technique): uses the network diagram and estimates to “perform” the project many times and to simulate the cost or schedule results of the project.

- It evaluates overall risk in the project.
- Determines probability of any activity actually being on the critical path
- Determines probability of completing the project on any specific day, or for any specific cost
- Can be used to assess cost and schedule impacts
- Takes into account path convergence (places in the network diagram where many paths converge into one activity)

Monte Carlo is one of the Modeling>Simulation technique of Develop Schedule and Qualitative Risk Analysis

PROCUREMENT MANAGEMENT

CONTRACT TYPES

1. Fixed Price Contracts (FP, Lump Sum, Firm Fixed Price)
2. Time and Material (T&M) or Unit Price Contracts
3. Cost Reimbursable Contracts (RC)

1. Fixed Price Contracts (FP)

- Firm Fixed Price (FFP) Contracts
- Fixed Price Incentive Fee (FPIF) Contracts
- Fixed Price Award Fee (FPAF) Contracts
- Fixed Price Economic Price Adjustment (FP-EPA) (Fixed Price with Prospective Price Redetermination)
- Purchase Order (PO)

2. Time and Material Contracts

3. Cost Reimbursable (CR) Contracts

- Cost Contract (Cost without profit - appropriate for non-profit organizations)
- Cost Plus Fee (CPF) or Cost Plus Percentage of Cost (CPPC)
- Cost Plus Fixed Fee (CPFF) Contracts
- Cost Plus Incentive Fee (CPIF) Contracts
- Cost Plus Award Fee (CPAW) Contracts

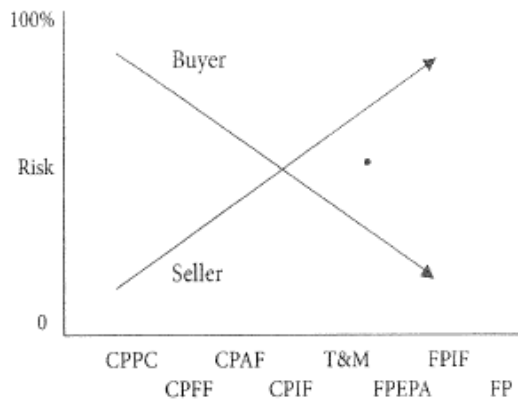


Figure 12.1: Risk to Buyer and Seller According to Contract Types

Point of Total Assumption (PTA)

This only relates to Fixed Price Incentive Fee (FPIF) contract types and refers to the amount above which the seller bears all the loss of a cost overrun. Costs that go above the PTA are assumed to be due to missmanagement.

$$PTA = \frac{(\text{Ceiling price} - \text{Target price})}{\text{Buyer's share ratio}} + \text{Target cost}$$

Price = Cost + Fee (Profit)

Ceiling Price: Highest price the buyer will make

Target Price: Expected/Estimated Price

Target Cost: Expected/Estimated Cost

Privity: Contractual relationships. Company A>B>C relationships

Force Majeure: Considered as "Act of Nature" such as fire, earthquake etc.

Indemnification = Liability

Noncompetitive forms of Procurement

- Single source
- Sole source

Terms

- Agent: Who is authorized representative of buyer and seller.
- Breach/Default: This occurs when obligation of the contract is not met.
- Force majeure: Act of nature such as fire, earthquake.
- Indemnification (liability): Who is liable for personal damage, injury or accident.
- Liquidated damages: These are estimated damages for specific defaults, described in advance.

- Retainage: This is an amount of money usually 5-10% withheld from each payment to ensure work is complete. It is paid when all the final work is complete.
- Material breach: This breach is so large that it may not be possible to complete the or under the contract.
- Time is of the essence: Delivery dates are strictly binding. The seller is on notice that time is very important and that any delay is a material breach.
- Work for hire: The work provided under the contract will be owned by the buyer.

STAKEHOLDER MANAGEMENT

Salience Model: describing classes of stakeholders based on their power (ability to impose their will), urgency (need for immediate attention), and legitimacy (their involvement is appropriate).

Fringe Benefits: Standard benefits formally given to all employees, such as education benefits, insurance, and profit sharing.

CODE OF ETHICS AND PROFESSIONAL CONDUCT

- Responsibility
- Respect
- Fairness
- Honesty

Notes from other sources and practice tests

Oliverlehmann Assessment Test

<http://www.oliverlehmann.com/pmp-self-test/75-free-questions.htm>

- Allower Path (Q28)
- Whistleblowing (Q33)
- Liquidated Damages (Q47)
- Constructive Change (Q52)
- Journey to Abilene (Q63)

Notes from Andy Crowe

INTEGRATION MANAGEMENT

Opportunity Cost: For the project selection purposes, the smaller the opportunity cost, the better, because it is not desirable to miss out on a great opportunity.

Return of Invested Capital (ROIC): $ROIC = \text{Net Income (after tax) from Project} / \text{Total Capital Invested}$

Project Baselines

Scope Baseline - output of Create WBS

Schedule Baseline - output of Develop Schedule

Cost Baseline - output of Determine Budget

TIME MANAGEMENT

Analogous estimation is also known as Top-Down estimating.

COST MANAGEMENT

Value Engineering: Value engineering is the practice of trying to get more out of the project in every possible way. It tries to increase the bottom line, decrease costs, improve quality, shorten the schedule, and generally squeeze more benefit and value out of each aspect of the project. The key to value engineering is that the scope of work is not reduced by these other efforts.

Old Terms:

PV = Budgeted Cost of Work Scheduled (BCWS)

EV = Budgeted Cost of Work Performed (BCWP)

AC = Actual Cost of Work Performed (ACWP)

QUALITY MANAGEMENT

Total Quality Management (TQM): Everyone in the company is responsible for quality and applies improvements in processes and in results. TQM includes statistical process control.

Kaizen = Continuous Improvement: A philosophy that stress constant process improvement, in the form of small changes in products or services.

1 Sigma = 68,25%

2 Sigma = 95,46%

3 Sigma = 99,73%

6 Sigma = 99,99%

Very nice article with examples about Standard Deviation:

<http://www.mathsisfun.com/data/standard-normal-distribution.html>

Attribute Sampling vs. Variable Sampling

Attribute sampling: Result of the test is Fail or Pass

Variable sampling: How well the result conforms to quality.

Special Causes vs. Common Causes

Special Causes: unusual and preventable by process improvement

Common Causes: usual and generally accepted

Quality Check Sheets: Tools and Technique (one of Seven Basic Quality Tools) of Plan Quality Management and Control Quality (eg. for counting defects by type)

Quality Checklist: is Output of Plan Quality Management. Input to Control Quality

Tree-diagrams = Systematic diagrams (decision tree diagrams, wbs, rbs etc.)

Quality Auditing is in Executing process group (Perform Quality Assurance)

Inspection=Testing=Walkthrough is in Monitoring and Controlling (Control Quality)

Product failures are categorized as "**Internal**" (found through inspection or testing) and "**External**" (found by the customer)

Statistical Independent: If the result of Activity A have no bearing on the result of Activity B, the two activities would be considered as statistically independent.

Cause-effect diagram = Ishikawa: is used in Control Quality to anticipate problems in advance.

In Control Chart, Control Limits are 3 standard deviations far from the Mean.

HR MANAGEMENT

Motivation Theories - Contingency Theory (CT)

CT is a class of behavioral theory that claims that there is no best way to organize a corporation, to lead a company, or to make decisions. Instead, the optimal course of action is contingent (dependent) upon the internal and external situation. A contingent leader effectively applies their own style of leadership to the right situation. Developed by Fred E. Fiedler, states that leader's effectiveness is contingent upon two sets of factors. The first set of factors measures whether the leader is task-oriented or relationship-oriented - "leadership style". The second set evaluates situational factors in the workplace, such as how stressful the environment is - "situational favorableness" (later called "situational control").

COMMUNICATION MANAGEMENT

Paralingual Communication: is VOCAL but NOT VERBAL. For example, tone of voice, volume or pitch.

Notes from Kim Heldman

Assessment Test

Projects come to an end in one of four ways:

- **addition**
- **starvation**
- **integration**
- **extinction**

Addition is when projects evolve into their own business unit. Starvation happens because the project is starved of its resources. Integration occurs when resources are taken from the existing project and dispersed back into the organization or assigned to other projects. Extinction is the best ending because the project was completed, accepted, and closed.

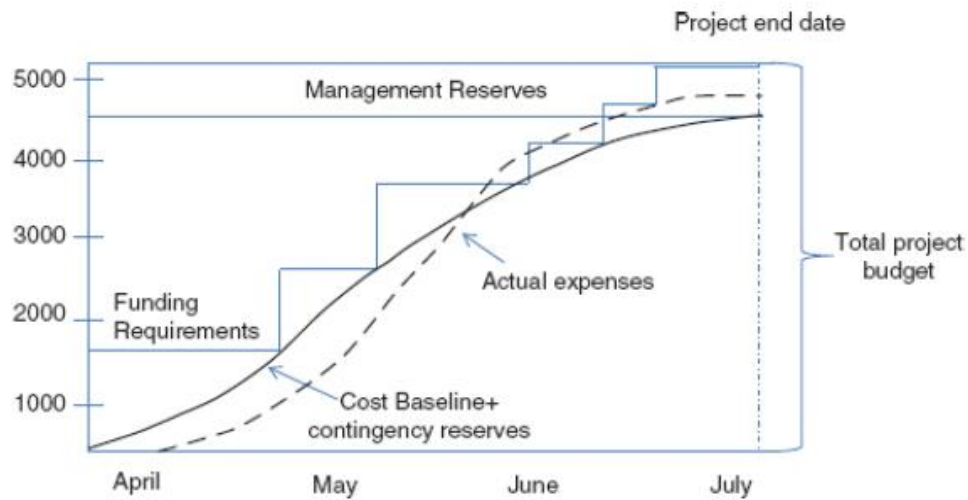
- **Analogous estimating**—also called **top-down estimating** —is a form of expert judgment.
- **Independent estimates** are also known as **should cost estimates**.
- According to the PMBOK® Guide, the project manager should be assigned during the development of the project charter, which occurs in the Develop Project Charter process.
- **Conflict of interest:** Conflict of interest occurs when personal interests are put above the interests of the project. It also occurs when personal influence is used to cause others to make decisions in favor of the influencer without regard for the project outcome.
- Common characteristic of projects during closing is that weak matrix organizations tend to experience the least amount of stress during the Closing processes.
- Perform Quality Assurance is the process where project managers have the greatest amount of influence over quality.
- Risk occurrence is lowest during the Closing processes because you've completed the work of the project at this point. However, risk impacts are the greatest in the Closing process because you have much more at stake.
- The arrow diagramming method (ADM)—also called activity on arrow (AOA)

Know the difference between leaders and managers, the motivational and leadership theories, and the types of power for the PMP® exam. Here's a summary to help you memorize them:

- ❖ **Leaders** motivate, inspire, and create buy-ins for the organization's strategic vision. Leaders use power and politics to accomplish the vision.
- ❖ **Managers** are task-oriented and concerned with satisfying stakeholder needs.
- ❖ **Theory Z** – A management theory that was developed by Dr. William Ouchi. This theory results in increased productivity, it puts an emphasis on the well-being of the employees both at work and outside of work, it encourages steady employment, and it leads to high employee satisfaction and morale.
- ❖ **Contingency Theory** - People are motivated to achieve levels of competency and will continue to be motivated after competency is reached.

- ❖ **Tannenbaum and Schmidt Continuum Management Theory** - You use seven levels of delegated freedom when working with the team.
- ❖ **Situational Leadership Theory** - Hersey and Blanchard developed this theory, which states that different situations call for different leadership styles. Blanchard describes the styles in the Situational Leadership II Model as directive, coaching, supportive, and delegating.

IMPORTANT: For the exam, remember that cost baselines are displayed as an S curve.



Notes from Practice Tests

Simplilearn.com Trial Test

A method used for making decisions includes the following steps: a. List your options as rows on a table and the factors you need to consider as columns b. You score each option/factor combination and weight this score by the relative importance of the factor. Add these scores up to give an overall score for each option. Some of these tools are:

- Grid Analysis
- Decision Matrix Analysis
- Pugh Matrix Analysis or Multi-Attribute Utility Theory (MAUT).

Note that Paired Comparison Analysis is an estimation tool.

Marginal cost is another term for **variable cost**. The marginal cost is applied to the variable cost of a unit of product or service.

Someone who doesn't want to take risks is called **risk averse**. **Risk neutral** describes a person/or an organization which is indifferent to the risk and **risk seeker** suggests an aptitude to take risks with an opportunity for higher returns.

Two closing procedures in project lifecycle known contract close out and administrative closure.

PM Prepcast

EV = BAC x % complete

Cause and Effect Diagrams are also called **Why-Why** diagrams or **Fishbone Diagrams**

Quality Audits

A quality audit is a structured, independent process to determine if project activities comply with organizational and project policies, processes, and procedures. The objectives of a quality audit may include:

- Identify all good and best practices being implemented;
- Identify all nonconformity, gaps, and shortcomings;
- Share good practices introduced or implemented in similar projects in the organization and/or industry;
- Proactively offer assistance in a positive manner to improve implementation of processes to help the team raise productivity;
- Highlight contributions of each audit in the lessons learned repository of the organization.

Beta Triangular Distribution = Weighted Average = $O+4M+P / 6$

Free Exam 4

Joseph M. Huran: cultural resistance or resistance to change is the primary reason for quality problems.

Philip Crosby proposed the zero defects theory.

Philip Crosby considered the following to be the Absolutes of Quality Management:

- Quality is conformance to requirements
- Defect prevention is preferable to quality inspection and correction
- Zero Defects is the quality standard
- Quality is measured in monetary terms – the Price of Nonconformance (PONC)

Depreciation

There are a number of ways to depreciate an asset. You need to know three of them for the PMP exam: Straight-Line Depreciation, the Double-Declining-Balance Method and the Sum-of-Year's Digits Method. But let's start at the beginning... what's depreciation?

Depreciation is a term used in accounting, economics and finance with reference to the fact that assets with finite lives lose value over time. For instance if your company purchases a machine at 500,000 that has a 10 year life-span, the simplest form of depreciation is to assume that it loses 10% of its value every year.

In some cases, depreciation is much faster. For instance, after you purchase your new car and drive off the dealership's parking lot, your car immediately depreciates by about 33%. And your new computer that was delivered to you yesterday has just lost 100% of its value because a newer, faster model has come on the market. But of course I am only joking in both examples. Or am I...?

Let's now take a closer look at the three methods that you need to know:

Straight-Line Depreciation

The Straight-Line Depreciation is simple: You depreciate the same percentage every year based on the life-span of the asset. Just as in the example above where we depreciate 10% every year for a 10-year life-span. Here is how:

Year 1: $500,000 - (10\% \text{ of } 500,000) = 450,000$
Year 2: $450,000 - (10\% \text{ of } 500,000) = 400,000$
Year 3: $400,000 - (10\% \text{ of } 500,000) = 350,000$
Year 4: etc.

So you see that the depreciation is always 10% or 50,000. After 10 years you will have depreciated 10 * 50,000 and the asset has no book value left.

Double-Declining-Balance Method

The Double-Declining-Balance Method uses twice the Straight-Line percentage. (That's why we call it "Double-Declining" - because we double the percentage.) This doubled percentage is then applied to the book value that the asset has at the beginning of the year. Let me show you how:

In our example above we determined that the straight-line depreciation rate is 10%. So we double that and we will now depreciate 20% every year from the balance. So in the first year we would depreciate 20% of 500,000. That is a 100,000 depreciation, and we have 400,000 left. This is the new book value for the second year. At the end of the second year we would depreciate 20% of these 400,000. That is 80,000 and we are left with a new book value of 320,000 for year 3. Etc.

Year 1: $500,000 - (20\% \text{ of } 500,000) = 400,000$

Year 2: $400,000 - (20\% \text{ of } 400,000) = 320,000$

Year 3: $320,000 - (20\% \text{ of } 320,000) = 256,000$

Year 4: etc.

As you can see, the depreciation in this method is much greater in the first years and becomes less over time. Just as in real life, where an asset loses more value early on in its life.

Sum-of-Year's Digits Method

Sum-of-Years' Digits is a depreciation method that results in a more accelerated write-off than straight line, but less than declining-balance method. Under this method annual depreciation is determined by multiplying the Depreciable Cost by a schedule of fraction based on the useful life of the asset.

That sounds complicated. So let's do an example.

Let's assume that we have an asset that is worth 150,000 and that it has a useful life of 5 years. To apply the Sum-of-Year's Digits Method means that you first have to calculate the depreciation ratio in two steps:

Step 1: Calculate the "sum of the years" based on the year digits: The useful life is 5 years, so we have the digits 5, 4, 3, 2, 1 and we now have to calculate their sum which is $5 + 4 + 3 + 2 + 1 = 15$

Step 2: Determine the depreciation rate for each year: 5/15 for the 1st year, 4/15 for the 2nd year, 3/15 for the 3rd year, 2/15 for the 4th year, and 1/15 for the 5th year.

And this would be the depreciation in our example:

Year 1: $150,000 - 50,000$ (5/15th of 150,000) = New book value of 100,000

Year 2: $100,000 - 40,000$ (4/15th of 150,000) = New book value of 60,000

Year 3: $60,000 - 30,000$ (3/15th of 150,000) = New book value of 30,000

Year 4: $30,000 - 20,000$ (2/15th of 150,000) = New book value of 10,000

Year 5: $10,000 - 10,000$ (1/15th of 150,000) = end of life = value of 0

As so often, practice makes perfect. And once you have applied these formulas to 2 or 3 samples you will feel a lot more comfortable with them.

Costs of quality or quality costs

Costs of quality or quality costs does not mean the use of expensive or very highly quality materials to manufacture a product. The term refers to the costs that are incurred to prevent, detect and remove defects from products. Quality costs are categorized into four main types. These are:

1. Prevention costs
2. Appraisal costs
3. Internal failure costs and
4. External failure costs.

These four types of quality costs are briefly explained below:

Prevention costs:

It is much better to prevent defects rather than finding and removing them from products. The costs incurred to avoid or minimize the number of defects at first place are known as **prevention costs**. Some examples of prevention costs are improvement of manufacturing processes, workers training, quality engineering, statistical process control etc.

Appraisal costs:

Appraisal costs (also known as **inspection costs**) are those cost that are incurred to identify defective products before they are shipped to customers. All costs associated with the activities that are performed during manufacturing processes to ensure required quality standards are also included in this category. Identification of defective products involve the maintaining a team of inspectors. It may be very costly for some organizations.

Internal failure costs:

Internal failure costs are those costs that are incurred to remove defects from the products before shipping them to customers. Examples of internal failure costs include cost of rework, rejected products, scrap etc.

External failure costs:

If defective products have been shipped to customers, external failure costs arise. External failure costs include warranties, replacements, lost sales because of bad reputation, payment for damages arising from the use of defective products etc. The shipment of defective products can dissatisfy customers, damage goodwill and reduce sales and profits.

Typical quality costs incurred by organizations are shown below:

Costs of Quality or Quality Costs			
Prevention costs	Appraisal costs	Internal failure costs	External failure costs
• System development • Quality engineering • Quality training • Quality circles • Statistical process control • Supervision of prevention • Quality improvement projects • Technical support to suppliers • Quality data gathering, analysis and reporting • Audits of the quality system	• Test and inspection of incoming materials • Final product testing and inspection • Supplies used in testing in testing and inspection • Supervision of testing and inspection activities • Depreciation of test equipment • Maintenance of test equipment • Plant utilities in inspection area • Field testing and appraisal at customer site	• Net cost of scrap • Net cost of spoilage • Rework labor and overhead • Reinspection of reworked products • Disposal of defective products • Downtime caused by quality problems • Analysis of the cause of defects in production • Retesting of reworked products • Re-entering data because of keying • Debugging software errors	• Cost of field servicing and handling complaints • Warranty repairs and replacement costs • Liability arising from defective products • Lost sales arising from a reputation for poor quality • Returns and allowances arising from quality problems • Product recalls • Repairs and replacements beyond the warranty period