

Loan and Grant Management Unit

Ministry of Finance

Project Management Course Handbook



Developed under USAID contract by BearingPoint

2004

Project Management Course Handbook

Table of Contents

<u>Session</u>	<u>Subject</u>
1.	Introduction
2.	Initiation
3.	Planning
4.	Team Management
5.	Executing
6.	Controlling
7.	Closing

كراس دورة ادارة المشاريع

جدول المحتويات

<u>الموضوع</u>	<u>الجلسة التدريبية</u>
مقدمة	1.
استهلال المشروع.	2.
التخطيط.	3.
ادارة فريق العمل .	4.
التنفيذ.	5.
السيطرة.	6.
الاعلاق او الانهاء .	7.



Project Management Basics

**A Review Of
Project Management Fundamentals**

Course Objectives



-
- Provide an overview of Project Management regarding context, processes, and knowledge areas.
 - Establish a baseline for management communications and strengthen skills.
 - Help you improve your performance.
-



Overview of Project Management Fundamentals

Context, Process, and Knowledge Areas

History of Project Management



Projects have existed since the dawn of humanity.

American project management began with the National Highway and the C & O Canal.

Modern project management began in WWI with the Manhattan Project.

Many PM tools originally developed in the defense-space sector and then disseminated more widely – e.g. PERT/CPM.

Credentials



Internationally Recognized Professional Certification Programs

- Project Management Institute
 - Project Management Professional (PMP)
 - Certified Associate in Project Management
 - Certification of Additional Qualification
- UK and Australia
- New Associations, i.e., ASAPM

Degrees and Master's Certificates

Company Certificate Programs.

Personal Professional Development efforts.

Your resume success stories.

What is PMI?



The Project Management Institute was formed in 1969

Headquartered in Newtown, PA. (Outside Philadelphia)

Over 110,000 members in over 120 countries

Over 60,000 PMPs

Basic Goal is to improve the project management body of knowledge by linking project management professionals in a professional society.

Why PMI®?



Since the late 1970's the Project Management Institute (PMI®) has focused on developing Project Management into a recognized profession.

A recognized profession requires:

- A Unique Body of Knowledge
- Supporting Educational Programs
- A Qualifying Process
- A Code of Ethics
- A Supporting Organization

For more info visit PMI® at www.pmi.org



Key Terms

What is a Project?



**An endeavor to create an *unique* product or service with a *specific beginning and end*.
(PMI® definition; A Guide to the Project Management Body of Knowledge, 2000: page 4.)**

Traits of a Project



Definite time boundaries

Progressive elaboration

Unique

Specific Objectives

Complexity

Integrated and diverse resources

Myriad of organizational structures

What is a Program?



Is larger in scope than a project.

Often comprises several interrelated projects.

Lasts longer than a project.

Has a much less definite end point in time.

What is Project Management?



“The application of knowledge, skills, tools and techniques to project activities in order to meet or exceed stake-holder’s needs and expectations.”

(PMI® definition; A Guide to the Project Management Body of Knowledge, 2000: page 6.)

Project Management is an art and a science.

General Management Skills:



A project manager can use these skills:

Leading – establishing direction, motivating and inspiring.

Communicating – exchanging information, in many ways with all project stakeholders.

Negotiating – conferring with other to come to terms or reach an agreement.

Problem-solving – combining problem definition and decision making.

Influencing the organization – able to get things done due to knowledge of organizational structures.

What is the PMBOK?



A Guide to the Project Management Body of Knowledge (PMBOK®) describes the key knowledge areas needed by all project managers.

Its objective is to establish a systematic model/framework/structure for these knowledge areas.

The PMBOK® includes 9 knowledge areas that are essential for effective project management.

PMBOK® Purpose



To organize & classify

To integrate

To correlate

To store & retrieve

To build on what already exists in the PMBOK®

PMBOK® Organization



Project Integration Management

Project Scope Management

Project Quality Management

Project Time Management

Project Cost Management

Project Risk Management

Project Human Resources Management

Project Procurement Management

Project Communications Management

PMBOK® Model



Four Core Functions

- Scope
- Quality
- Time
- Cost

Four Facilitating Functions

- Risk
- Human Resources
- Procurement
- Communications



Project Perspectives

Meaning of Projects



Management resource (capital) commitments = the future of the company

Project selections mean the future direction of the company

The strategic management questions are:

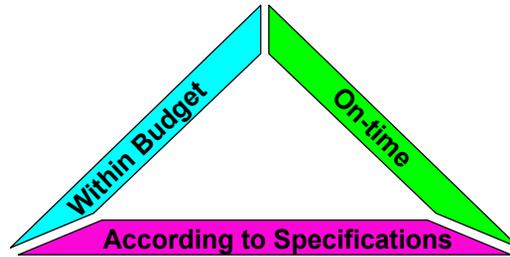
- Why do we want to invest in a project?
- How does this project fit into our overall business strategy?

Project Context



- The Triple Constraint
- Project Lifecycles
- Stakeholders
- Organizational Influences
- Socioeconomic influences
- Leadership and key management skills needed

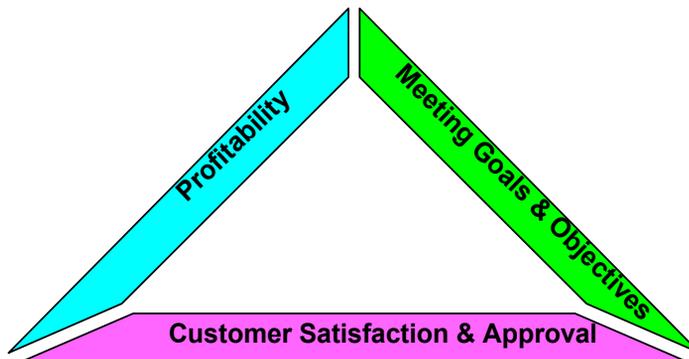
The Triple Constraint: Project Management Success



A baseline balanced between the three key project factors.

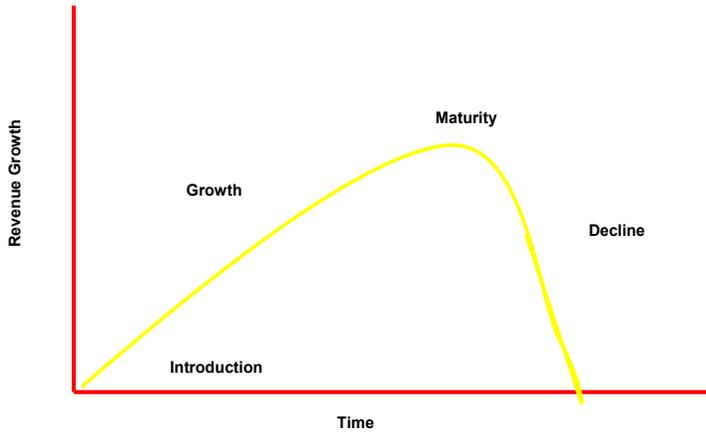
Any change to one affects either one or both of the other.

The Triple Constraint: Project Success

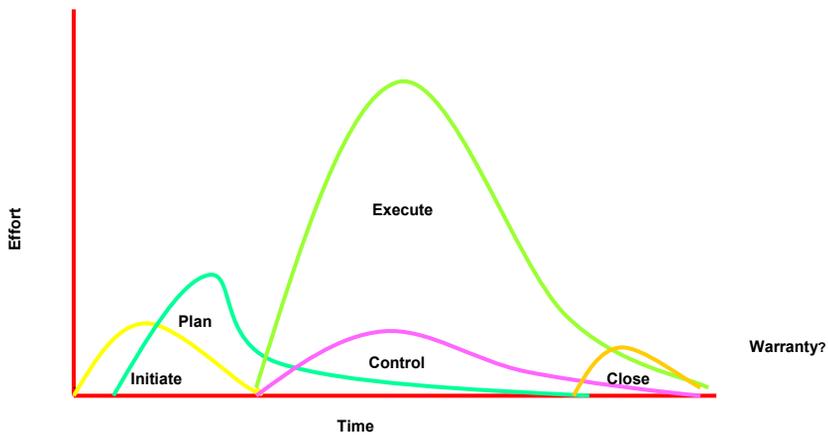


The three key overall project factors.

Product Life Cycle



Project Life Cycle



Stakeholders



Internal

- Sponsor - Corporate
- Project team-Project Manager
- Performing organization-Functional Unit

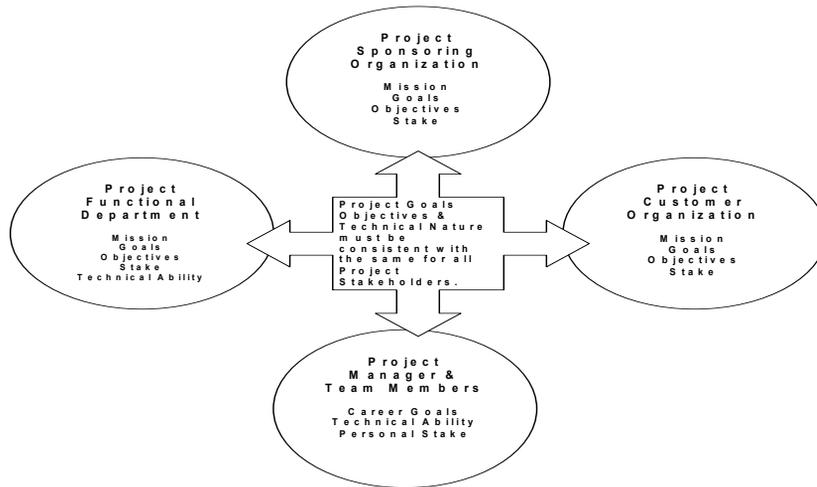
External

- Customer
- Sub-contractors

Invisible customers

- End users
- Special interest groups
- Governing agencies
- Media

Project Stakeholders



Choice of a Project Organization Structure should consider the above balance between all stakeholders. The greater an imbalance the more powerful the Project Manager should be.

Organizational Influences



Company management systems

Culture

Organizational structure

Policies

Procedures

Practices

Power structure

Socio-Economics



Legal standards

Government regulations

International influences

Multi-cultural influences

Environmental issues

Diversity

Public opinion

Key Management Skills



- Ability to lead and motivate.**
- Ability to communicate.**
- Ability to negotiate.**
- Ability to solve problems**
- Ability to influence the organization.**
- Ability to adapt to the situation**
- Ability to keep objectives in view.**

Challenges for Managers



- Managing multiple projects.**
- Team building.**
- Fulfilling expectations.**
- Managing within scope, cost, and schedule.**
- Managing risk.**
- Delivering value.**

Project Processes

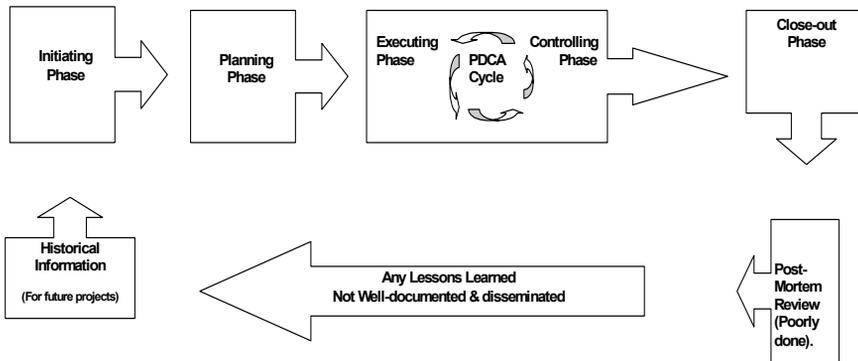


- **Initiating** –getting approval
- **Planning** – plan the work
- **Executing** – work the plan
- **Controlling** – orchestrating
- **Closing** – achieving a satisfied customer and getting paid.

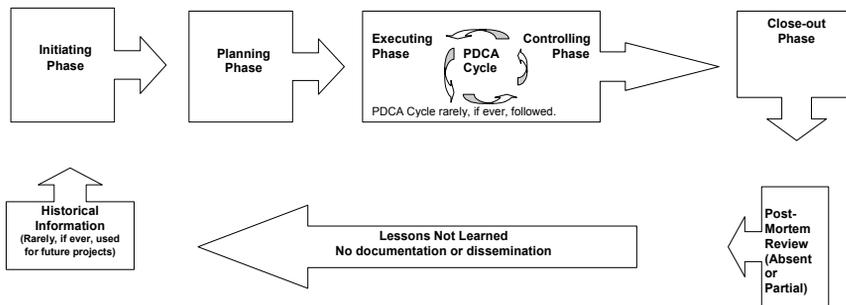


**What are the processes in
managing projects?**

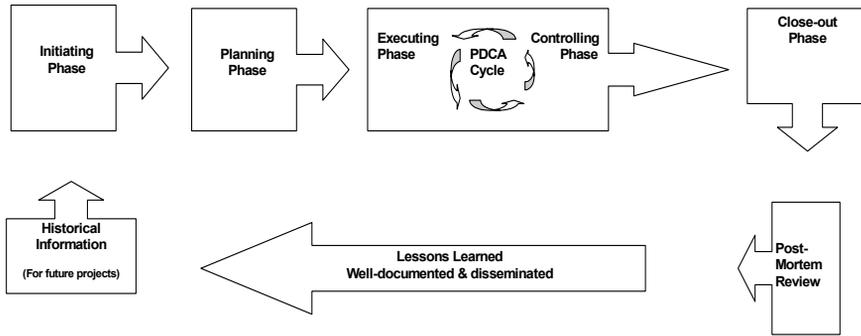
PLC - The Functional Cycle



PLC - The Vicious Cycle



PLC - The Virtuous Cycle



Initiating Process



- Formulation period**
- Feasibility studies**
- Scope parameters**
- Assumptions**
- Budget estimates (ROM)**
- Selection process**
- Approval and charter**

Planning Process



Scope definition - WBS
Schedule development
Definitive cost estimates
Risk Planning
Quality Plan
Communication Plan
Procurement Planning
HR Planning – Organize/Staff
Integration – Project Plan

Executing Process



Implement the Project Plan

- Kickoff Meeting
- Work Authorization

Begin Quality Assurance
Begin Team Development
Begin Procurement Actions
Implement the Communication Plan

Controlling Process



Performance Reporting.

Formal Change Control System.

Continuous Scope Verification and Control.

Cost and Schedule Control.

Quality Control.

Status and Change Notification.

Risk management.

Closing Process



Procurement Contract Closeout

- Procurement audits
- Formal acceptance & closure

Administrative Closeout

- Deliverables audit
- Contract review
- Formal acceptances
- Formal closure
- Closeout documentation



Business and Systems Aligned. Business Empowered.™

Session 2

Project Initiation



Initiating Process

- Formulation period
- Feasibility studies
- Scope parameters
- Assumptions
- Budget estimates (ROM)
- Selection process
- Approval and charter



Project Selection

General Selection Methods



Non-Numeric

- Delphi Method
- Peer Review Boards
- Executive Fiat

Numeric

- Benefit Measurement Methods
- Constrained Optimization
- Poor Man's Hierarchy

Numeric selection methods:



Benefit Measurement Methods:

- Benefit/Cost Ratio
- Payback period
- Economic Value Added
- Peer review
- Expert Judgment
- Net Present Value (NPV)
- Internal Rate of Return (IRR)

Constrained Optimization Methods:

- Linear/nonlinear programming
- Integer programming
- Dynamic programming
- Multi-objective programming.

Cost of Capital:



This is the cost of money (capital) to a project overtime.

There are three types of methods for calculating the cost of capital:

- **Future Value (Compound Interest)**
- **Present Value (Net Present Value)**
- **Internal Rate of Return**

Capital Rationing



This is the process of selecting the best projects with the highest overall net present value without exceeding the available budget.

Assumes projects are mutually exclusive.

Tools/Techniques:

- Capital Budgeting calculations
- NPV & IRR Calculations
- Risk Analysis

Outputs:

- Project cost levels
- Cross-comparison of project budgets
- Selection of project(s) to implement

Capital Budgeting



This is the process of identifying the prospective financial benefits of projects under consideration for funding & implementation – it is the project selection decision-making process.

Tools/Techniques:

- Payback period
- NPV & IRR Calculations
- Discounted Cash Flow
- Depreciation schedules
- Tax information
- Cash Flow

Outputs:

- Prospective project cost/profit levels
- Cross-comparison of prospective project B/C Ratios (profit potential)
- Selection of project(s) to implement

Decision Trees



There are two types of Decision (Logic) Trees:

- Probability Trees
- Decision (Expected Monetary Value Trees) that consider Decisions Point and Chance Events.

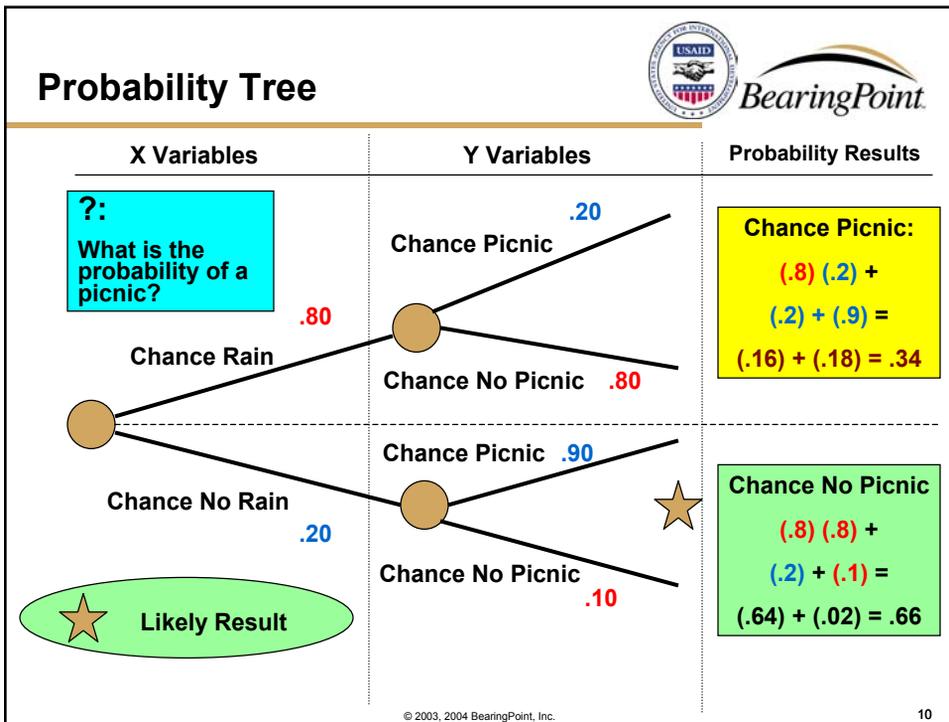
Build the tree from left to right - not mandatory.

Put the probabilities of the states of nature on all the branches thus producing the probability tree.

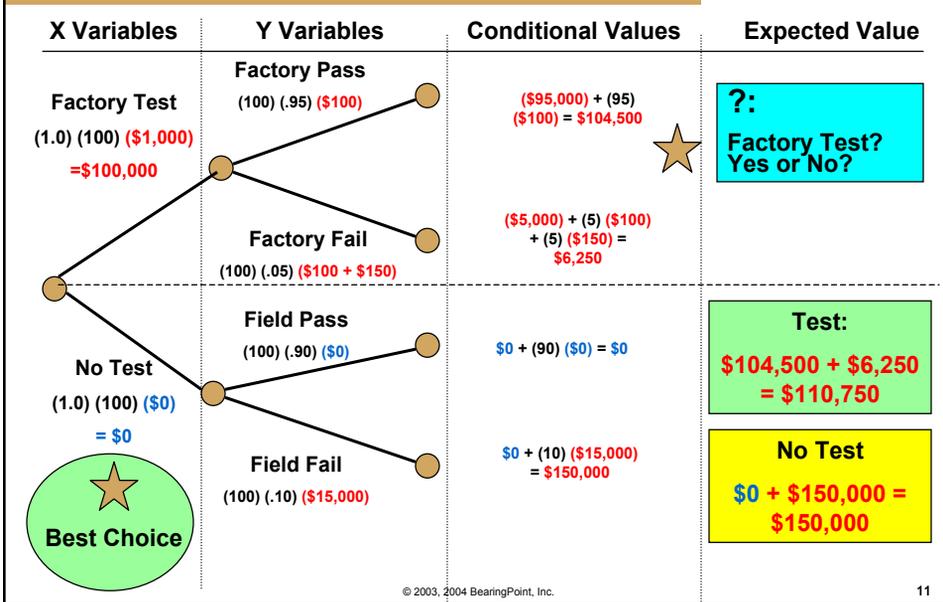
All up all the conditional payoffs to complete the tree.

The sum of all probabilities at the end of each branch of the tree must equal 1.0.

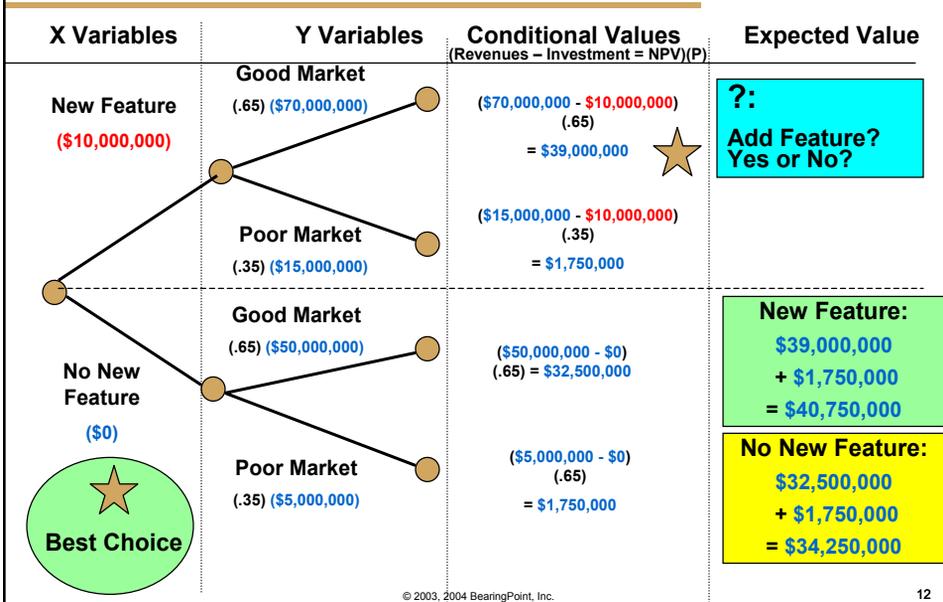
Probability Tree



Expected Value Tree (Costs)



Expected Value Tree (Profits)



Project Initiation

Scope Initiation

Inputs

- Product description, selection criteria, historical information

Tools and Techniques

- Project selection methods and expert judgment

Outputs

- Project charter, assign PM, and define constraints & assumptions.

Example: Space Shuttle



Purpose: demonstrate U.S. space leadership and technological superiority

Mission: develop a reusable multipurpose space vehicle

Scope: a vehicle capable of holding 6-8 persons and orbiting the earth multiple times.

Objectives: develop a world-class program with associated capabilities (e.g., good launch rockets, living quarters, space ports, etc...)

Goal: achieve mission by the mid-1980's.

Scope Statement:



This is a narrative description of the project concerning its output, approach, and content. Used to provide a documented basis to help make future project decisions and help project stakeholders understand the project. Must include the following:

- Project justification;
- Project product;
- Project deliverables;
- Project objectives.

It is not a detailed technical statement.

Statement of Work (SOW):



Same as scope of work.

A narrative detailed technical description of products or services to be supplied under contract.

This is included in RFP only.

It is a detailed technical statement.

Exercise: Y2K Compliance



Purpose:

Mission:

Scope:

Objectives:

Goal

Project Charter:



The deliverable of the concept/initiation phase that establishes the project.

Issued by senior management to the project manager.

Gives authority to the project manager to use organizational resources to accomplish project activities.

Discusses the risks and constraints of the project.

Designates the organizational structure of the project.

State the business goals of the performing organization.

Details the project deliverables.

Kick-off Meeting:



**Convened at the beginning of the Planning phase.
Purpose is to:**

- Introduce project manager, players, members;
- Establish working relationships/lines of communication;
- Set team goals/objectives;
- Review project status;
- Review project plans;
- Identify problem areas;
- Establish individual and group responsibilities/accountabilities;
- Obtain individual/group commitments.



EXERCISE

Building the Basic WBS

WBS Exercise



Develop a WBS to at least 3 levels for one of these projects:

Relocating your office

Upgrading the IT hardware of the office

Paint your office a new color

Training in MS Project for office

Statement of Work (SOW)



Narrative description of goods or services to be supplied.

Stipulates specifications & other minimum requirements.

Defines quantity and quality.

Defines delivery times

Provides acceptance criteria.

Defines authority.

Managing Risk



Risk management planning

Risk identification

Qualitative risk analysis

Quantitative risk analysis

Risk response planning

Risk monitoring and control

Risk Management Planning



Inputs

- Project charter, company risk policies, defined responsibilities, stakeholder risk tolerance, WBS

Tools and Techniques

- Planning meetings, expert judgment.

Outputs

- Risk management plan.

Risk Identification



Inputs

- Risk management plan, project plan, risk categories, historical info

Tools and Techniques

- Information gathering, reviews, checklists, assumption analysis, diagramming.

Outputs

- Risk list, risk triggers, input to other risk analyses and planning.

Risk Management Goals



To recognize project risks

To develop strategies that will reduce the risk events

To take steps to avoid risk events entirely

Good Project Management is Good Risk Management and vice versa

Risk Management Classes (types)



There are three (3) classes or types of risks:

- **Known-knowns** = a certain outcome
- **Known-unknowns** = a risk as a probability can be assigned to the risk event
- **Unknown-unknowns** = an uncertainty as no probability can be assigned to the risk event

Risk Categories



There are two categories of Risk:

Business risks: Possibility of a gain/loss.

Pure/insurable risks: Only possibility is for loss.

Risk Attributes/Dimensions



Risk Attributes:

Risk Event

Risk Probability

Amount at Stake

Risk Event Status – probability x Amount at stake

Risk Dimensions:

Quality - most important to the customer

Cost

Schedule

Procurement

Risk Sources/Descriptions



Risk sources are:

- Changes in requirements
- Design errors & omissions
- Poorly defined/understood roles & responsibilities
- Poor estimates
- Insufficiently trained staff

All Risk descriptions should include:

- Probability of occurrence
- Range of possible outcomes
- Expected Timing
- Anticipated frequency

Risk/Uncertainty in the PLC



Risk & Uncertainty Within the Project Life Cycle

	Initiating	Planning	Executing	Controlling	Close-out
Risk			High		High
Uncertainty	High	Decreasing	Decreasing	Decreasing	Lowest
Amount at Stake	Lowest	Increasing	Increasing	Increasing	Highest

Analogous Estimating:



This is a method of estimating the life-cycle costs of a project. It is reliable if the following conditions must be met:

When previous projects are similar in fact – not just appearance.

When the individuals making the estimates have the needed expertise.

In addition, the following is true about analogous estimates:

- It supports top-down cost estimating.
- It is a form of expert judgement.
- It is used when there is a limited amount of detailed project information available.
- Finally, this is usually done during the initiating and planning phases of a project.



Business and Systems Aligned. Business Empowered.™

Session 3

Project Planning

Planning Process

- Scope definition - WBS
- Schedule development
- Definitive cost estimates
- Risk Planning
- Quality Plan
- Communication Plan
- Procurement Planning
- HR Planning – Organize/Staff
- Integration – Project Plan



Scope (Work) Decomposition

Statement of Work (SOW)



Narrative description of goods or services to be supplied.

Stipulates specifications & other minimum requirements.

Defines quantity and quality.

Defines delivery times

Provides acceptance criteria.

Defines authority.

WBS Perspectives



One organization's project is another organization's work package.

Projects are broken down into work packages.

Work Breakdown Structure



A hierarchical structure of project elements defining the total scope of the project.

A decomposition process where major deliverables are reduced to the lowest manageable level, i.e., the work package.

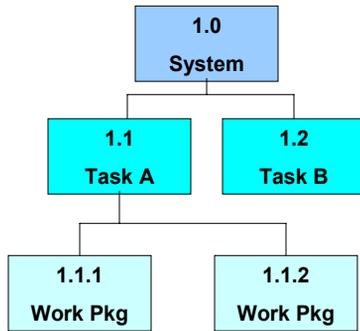
Each element has an identifier: (code of accounts)

Work package costs usually roll up to a level know as the Cost Account level (the point where budgets are tracked)

Work Breakdown Structure



Graphic



List

1.0 System

1.1 Task A

1.1.1 Work Package

1.1.2 Work Package

1.2 Task B



EXERCISE

Building the Basic WBS

WBS Exercise



Develop a WBS to at least 3 levels for one of these projects:

Relocating your office

Upgrading the IT hardware of the office

Paint your office a new color

Training in MS Project for office



Cost Management

Cost Accounts



A **Chart of Accounts** refers to the unique identifiers used for an organization's budget line items.

A **Code of Accounts** refers to the unique identifiers used for the elements of the Work Breakdown Structure.

Cost Types



Direct Costs refer to those costs of the project that are directly linked to the project itself.

Indirect Costs refer to those costs that are a part of the organization's overall operations – independent of the project being implemented.

Estimating Tools



Analogous

- Comparing work to similar projects. (Easy but at risk from bad data)

Parametric

- Industry models, rules of thumb, theory models (SEER® or Price®)

Bottom-Up

- Starts with WBS work packages and adds up the pieces.

Cost Estimates



Order of Magnitude (WBS 0-level)

- Range from -25% to +75%

Budgetary Estimate (Summary Task levels)

- Range from -10% to +25%

Definitive Estimate (Work Package level)

- Range from -5% to +10%

Statistically, a point estimate will likely be wrong (always the probability of being more or less.)

Cost Estimating Methods:



There are five types of cost estimating methods:

- Analogous estimating/top-down estimating
- Parametric estimating
- Bottom-up estimating
- Life-Cycle estimating
- 'Rolling Wave' budgeting
- Computerized tools

Analogous Estimating:



This is a method of estimating the life-cycle costs of a project. It is reliable if the following conditions must be met:

When previous projects are similar in fact – not just appearance.

When the individuals making the estimates have the needed expertise.

In addition, the following is true about analogous estimates:

- It supports top-down cost estimating.
- It is a form of expert judgement.
- It is used when there is a limited amount of detailed project information available.
- Finally, this is usually done during the initiating and planning phases of a project.

Bottom-Up Estimating:



This is the method of estimating and then summarizing the cost of individual work packages to get a project total.

There are two types:

- Budget estimates
- Definitive estimates

The accuracy of these estimates is enhanced with smaller work items. The reason for this is that the people who do the work tend to produce more accurate estimates.

Parametric Modeling:



This is a cost estimating model that uses project characteristics in a mathematical model to predict project costs. These are accurate when the following elements are present in the model:

- When the historical information is accurate.
- When the parameters are readily quantifiable.
- When the model works for both and large and small projects.

Example: PERT Estimates

Life-Cycle Cost Estimating



This cost estimating method looks at all of the costs associated with a product or project from beginning to end. The four specific stages are:

- Development Costs
- Production Costs
- Operating/Maintenance Costs
- Disposal Costs

Rolling Wave Budgeting



This is a combined 'Top-Down' and 'Bottom-Up' approach.

An 'Order of Magnitude' estimate is made at the beginning of the project.

A detailed 'Bottom-Up' estimate is made in phases (3-6 months) throughout the Project Life Cycle.

A final top-down budget is made at the end of the project.

COST ESTIMATING EXERCISE



Resource Inputs

- Laborers (100 people x \$10 hour x 1,000 hours)
- Foreman (5 people x \$100 hour x 200 hours)
- Masons (25 people x \$50 hour x 500 hours)
- Carpenters (50 people x \$50 hour x 400 hours)
- Drivers (10 people x \$40 hour x 300 hours)
- Supplies (\$1,000,000 lump sum)
- Equipment (\$500,000 lump sum for various items)

Fringe Benefits is 15% of labor inputs

Administrative Overhead is 10% of all Inputs and Benefits

What is the total cost of this project?



Quality Issues

Quality Planning



This should start with a review of:

- Company quality policy
- Customer quality policy
- Legal quality requirements
- Review of ISO Standards

ISO 9000



International Organization for Standardization

Certification implies:

- A quality system is used to produce a product/service.
- The system is implemented and consistently followed.
- The system is documented
- Granted to an organization as a whole.

(See www.iso.org for details)

Time Management

Time Management Techniques

The following are some widely-used Time Management Planning tools:

- Network-Diagramming Methods
- Arrow Diagramming Method
- Critical Path Method
- Program Evaluation and Review Technique (PERT)

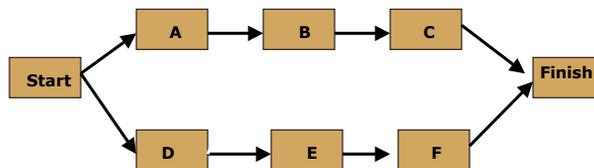
Precedence Diagramming Method



Boxes used for activity

Arrows show dependencies:

- Start to start or start to finish.
- Finish to start or finish to finish.



Arrow Diagramming Method

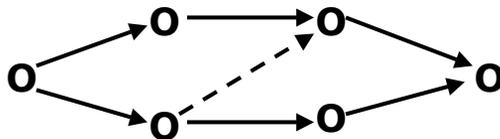


Arrows represent activity.

Arrows connect to nodes to show dependency.

Always uses “start to finish” dependencies.

Dummy activity used for logical relationships.



Critical Path Method



Based on a network diagram

Defines the earliest completion date.

The critical path should have no “float” or spare time.

When behind schedule, the effort should be devoted to those tasks on the critical path.

Dependency Relationships:



These appear on Activity-on-Arrow diagrams. There are two categories:

- Mandatory Dependencies (Hard logic)
- Discretionary Dependencies (Soft logic)

Milestones



It is an identifiable point in a project that denotes a reporting requirement.

They represent major project deliverables.

They have no duration, cost or resource requirements.

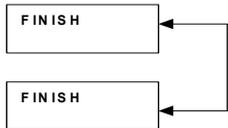
Precedence Relationships



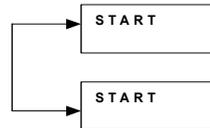
FINISH-TO-START: This is the most common precedence relationship.



FINISH-TO-FINISH:



START-TO-START:



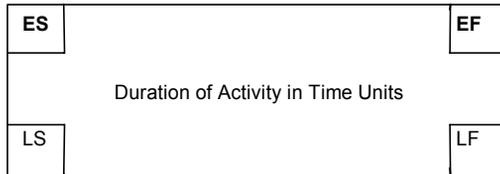
START-TO-FINISH: This is the least common precedence relationship.



Node Construction



Node construction on a Full Precedence Diagram:



ES = Early Start
EF = Early Finish

LS = Late Start
LF = Late Finish

Lead vs. Lag



Lead:

- Appear only on Activity-on-Node Diagrams.
- It allows for the acceleration of a successor task.
- In a Finish-to-Start relationship, a successor activity can begin before the predecessor task has finished.

Lag:

- Appear only on Activity-on-Node Diagrams.
- It is the waiting time between activities in the network.
- It allows for the delay of a successor activity.

Backward vs. Forward Passes



Backward Passes:

- Gives the latest time that an event can be start/finish without extending the establish project completion time.
- Calculated as $LF - AD = LS$ date for any given activity.

Forward Passes:

- Gives the earliest time that an event can start/finish.
- Calculated as $ES + AD = EF$ date for any given activity.
- Gives us the Float/Slack available.

Float vs. Free Float:



Float:

- AKA Slack.
- The amount of time that an activity can be delayed without delaying the project.
- It is not Lag.
- $LF - EF = \text{Float}$
- $LS - ES = \text{Float}$
- All critical path tasks have zero (0) float

Free Float:

- The amount of time that an activity can be delayed without delaying the early start of any immediately following activities.

Risk Analysis

Estimating Risks

- Inaccurate/inapplicable data.**
- Inaccurate historical data**
- Incomplete stakeholder analysis.**
- Unclear SOWs.**
- Haste and/or inexperience.**
- Invalid assumptions/constraints.**
- Lapsed vendor quotations.**
- Customer mistakes/oversights.**

Qualitative Risk Analysis

(Assessing the likelihood and impact of identified risks)



Key Qualitative Risk Analysis tools include:

- Risk probability/impact rating matrix
- Delphi Method
- Cause and Effect Diagram
- Strengths-Weaknesses-Opportunities-Threats (SWOT) Analysis

Risk Impact Matrix



P R O B A B I L I T Y	High Probability	High Probability	High Probability
	Low Impact	Medium Impact	High Impact
	Medium Probability	Medium Probability	Medium Probability
	Low Impact	Medium Impact	High Impact
	Low Probability	Low Probability	Low Probability
	Low Impact	Medium Impact	High Impact (Catastrophic)
	I M P A C T		

Quantitative Risk Analysis

(Analyzing the numerical probability of each risk & its consequence plus overall risk)



Key Quantitative Risk Tools include:

- Histograms with Standard Deviation
- PERT Analysis
- Z-Table Analysis
- Monte Carlo Analysis
- Decision Trees
 - Probability
 - Expected Value

Risk Attributes/Dimensions



Risk Attributes:

Risk Event

Risk Probability

Amount at Stake

Risk Event Status – probability x Amount at stake

Risk Dimensions:

Quality - most important to the customer

Cost

Schedule

Procurement

Risk Sources/Descriptions



Risk sources are:

Changes in requirements
Design errors & omissions
Poorly defined/understood roles & responsibilities
Poor estimates
Insufficiently trained staff

All Risk descriptions should include:

Probability of occurrence
Range of possible outcomes
Expected Timing
Anticipated frequency

Risk Response Strategies/Tools



Strategies:

Avoidance
Reduction
Acceptance (Retention)
Risk Deflection (Transfer)

Tools to use:

Insurance
Warrantees
Guarantees
Performance Bonds
Payment Bonds
Sub-contractors

Management Reserve

vs. Contingency Funds



Management Reserve:

Controlled by Sponsor or Senior Management

Set aside for unknown unknowns (uncertainties).

Contingency Funds:

Controlled by Project Manager

Set aside for known unknowns (risks).

Risk/Uncertainty in the PLC



Risk & Uncertainty Within the Project Life Cycle

	Initiating	Planning	Executing	Controlling	Close-out
Risk			High		High
Uncertainty	High	Decreasing	Decreasing	Decreasing	Lowest
Amount at Stake	Lowest	Increasing	Increasing	Increasing	Highest

PERT: Expected Time/Cost



Beta Distribution

$$\frac{a + 4b + c}{6}$$

$$SD = \frac{c - a}{6}$$

Triangular Distribution

$$\frac{a + b + c}{3}$$

$$SD = \frac{c - a}{5}$$

Z-Value Calculation



Z-Value:

$\frac{\text{Desired Time} - \text{Critical (Expected) Time}}{\text{Standard Deviation for E.T. Critical Path}}$

Standard Deviation for E.T. Critical Path

Critical Path Standard Deviation:

Square Root of Sum of Critical Path Tasks Variances

Calculating Probability



Use the following formula:

$$\frac{\text{Desired Outcome (Critical Path)} - \text{Expected Outcome (Critical Path)}}{\text{Expected Outcome Standard Deviation (Critical Path)}}$$

Look up Z value on Z table to determine the probability.

Risk Analysis protocol



1. Collect Relevant Historical Data
2. Organize Historical Data by type (e.g., cost, time, resource)
3. Determine: mean, mode, median, range
4. Calculate all individual standard deviations
5. Calculate all individual variances (this is the standard deviation squared)
6. Sum all individual variances to get the critical path variance (use only critical path tasks)
7. Calculate the critical path standard deviation by obtaining the square root of the critical path variance
8. Decide on your Desired Time
9. Calculate the z-value and look-up on the Z-table
10. If negative, subtract from 1 to get actual value.
11. Multiply by 100 to get probability of success

NETWORK DIAGRAM EXERCISE



On an individual basis please do the following:

- Construct a simple precedence diagram
- Calculate the project duration
- Identify the critical path
- Determine float
- Determine the project cost
- What tasks would you crash first? second?

PERT/BETA Exercise



Calculate the 'expected time' for all tasks.

Using the critical path identified in the earlier exercise, calculate the new 'expected time' critical path. Is it still the same?

Calculate the critical path variances.

Calculate the critical path standard deviation.

Calculate the Z-value using the most likely time as the 'desired time'.

Using the Table of Normal Distributions, determine the probability for completing this project within the 'desired time'.

Network Diagramming Exercise



Task	Duration	Cost	Predecessors
A	2 days	\$100/day	-
B	3 days	\$200/day	A
C	3 days	\$300/day	A
D	5 days	\$400/day	B
E	4 days	\$250/day	C
F	3 days	\$100/day	B
G	2 days	\$50/day	D,E,F
H	5 days	\$300/day	G
Total			-

PERT/CPM Exercise



PERT/BETA Exercise



Task	Opt.	M.L.	Pess.	Expected Time	Standard Deviation	Variance
A	1 days	2 days	6 days			
B	2 days	3 days	9 days			
C	2 days	3 days	9 days			
D	3 days	5 days	12 days			
E	2 days	4 days	10 days			
F	2 days	3 days	9 days			
G	1 days	2 days	6 days			
H	2 days	5 days	12 days			
Total						

Z-Value Exercise



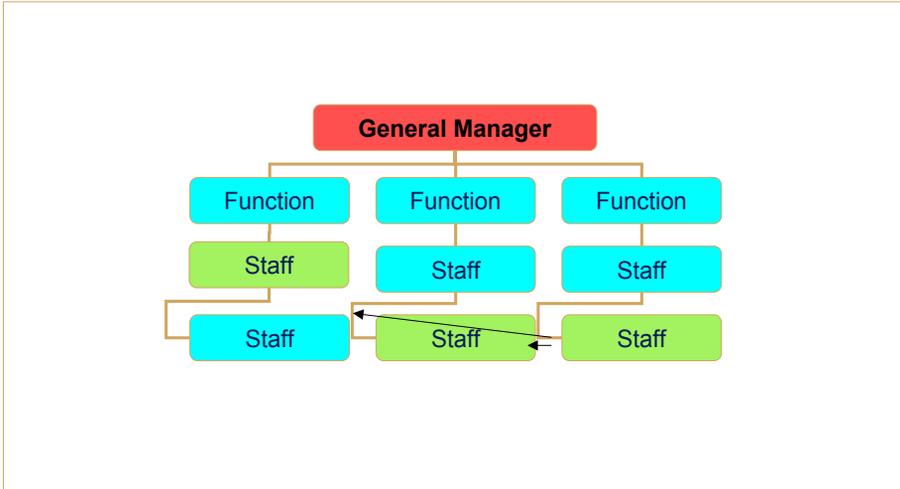
Human Resource Management

Managing Human Resources

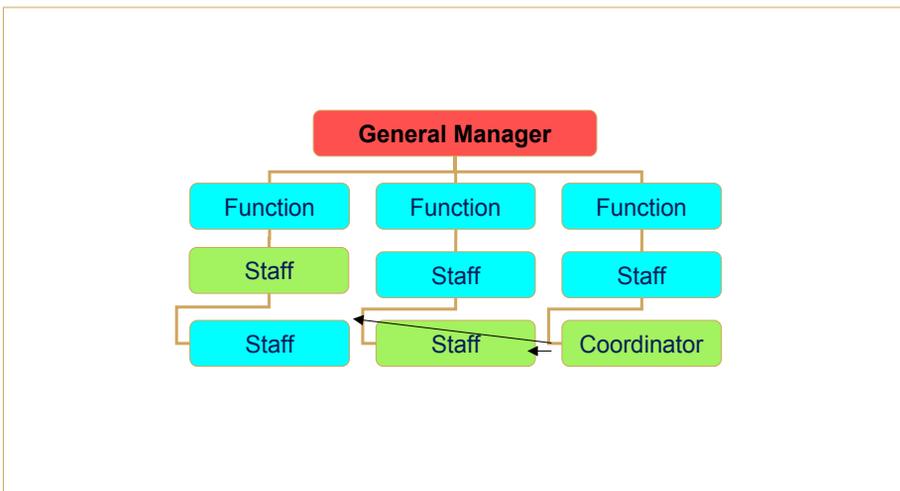
Key factors in Human Resource Planning are:

- Organizational structure
 - Functional
 - Matrix
 - Projectized
- Staff acquisition
- Team Development

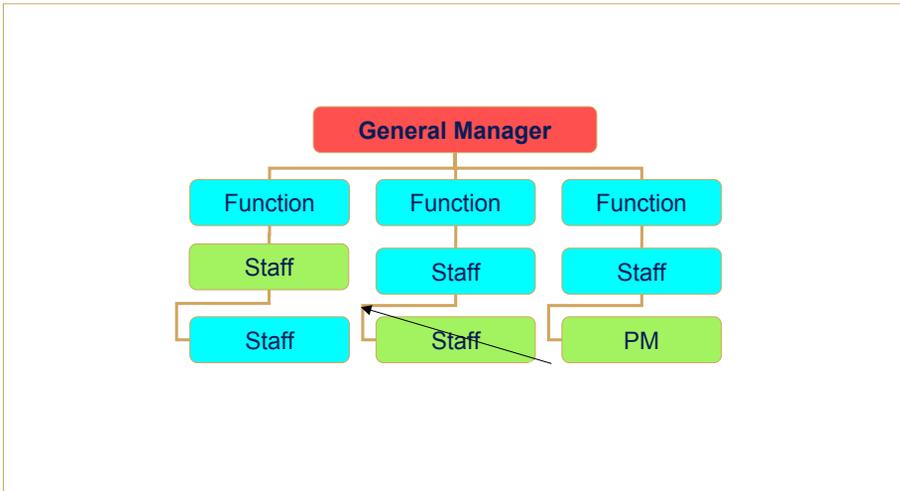
Functional



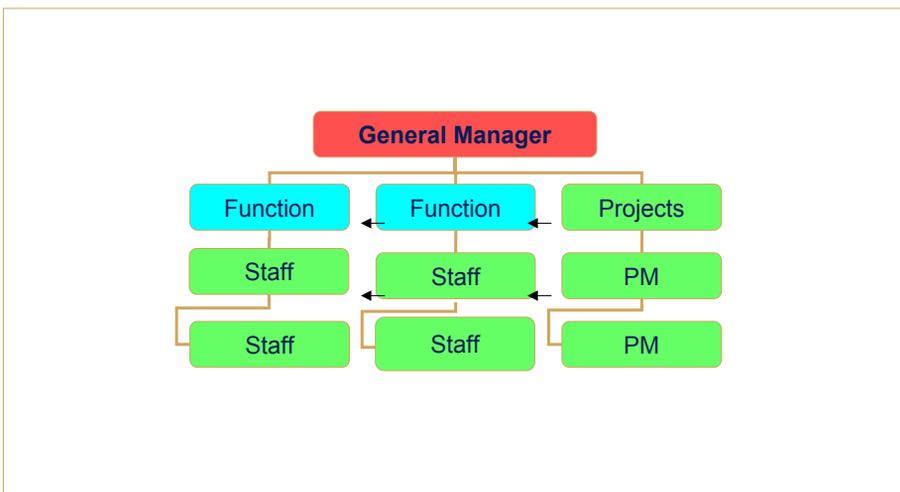
Weak Matrix



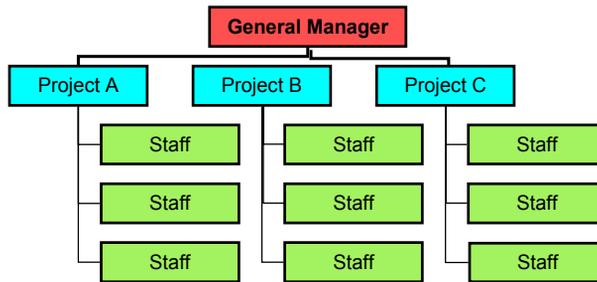
Balanced Matrix



Strong Matrix



Projectized Organization



Business and Systems Aligned. Business Empowered.™

Session 4

Team Management

Management Styles

- Autocratic
- Democratic
- Laissez-faire

Management Styles



Autocratic

- Strengths:
 - Can be effective in a mature, well defined projects.
 - Effective where decisiveness is needed.
- Weaknesses:
 - Limits buy-in leading to low moral.
 - Leads to arbitrary decisions.

Management Style



Democratic

- Strength:
 - Efficient in building consensus and high morale.
 - Works for many PM situations.
- Weakness:
 - Can lead to group isolation & low morale.
 - Tough to get quick decisions.

Management Style



Laissez-Faire

- Strength:
 - May enhance state-of-the-art projects
 - High morale of self-motivated staff
- Weakness:
 - Project misdirection - “what’s our objective?”
 - Inability to get quick and hard decisions.

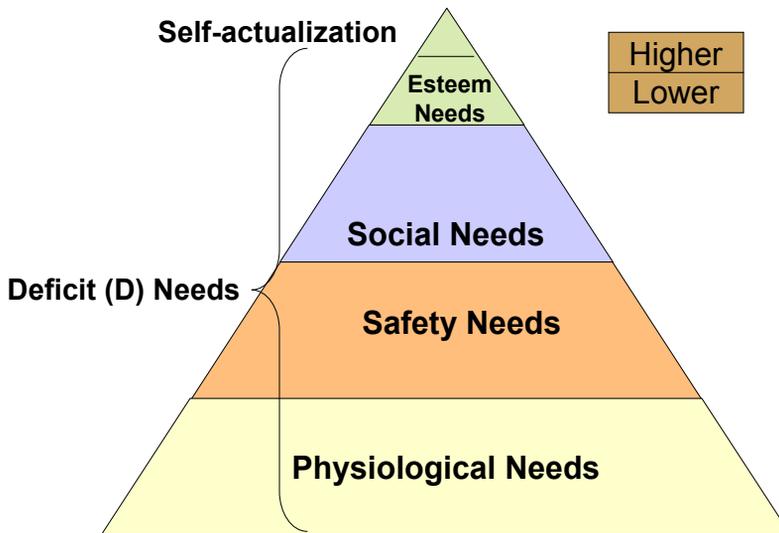
Behavior Theory



KEY THEORIES YOU NEED TO KNOW

- Maslow’s Hierarchy of Human Needs.
- McGregor’s Theory X and Y.
- Herzberg’s Theory of Motivation.
- Expectancy Theory

The Pyramid of Human Needs



© 2003, 2004 BearingPoint, Inc.

7

Maslow's Hierarchy of Needs



1. Physiological - health, food and shelter.
2. Safety - Physical harm or deprivation.
3. Social - friends, family for friendship and love.
4. Self Esteem - peer group, associates for respect and status.
5. Self fulfillment - realizing one's self-worth and contributions - being creative.

It is difficult to reach higher levels until lower needs are satisfied. Fluctuations often occur.

© 2003, 2004 BearingPoint, Inc.

8

McGregor's Theory



Theory X

Traditional view of management - Top-down

Managers organize the work, control the people, money and equipment to achieve economic results.

Workers are viewed as inherently self-centered, lazy.

Theory Y

Workers are willing and eager to accept responsibility. Focused on self-growth and self-fulfillment.

Managers create environment for workers to achieve their goals through self-direction toward organizational objectives.

Hertzberg's Motivation Theory



Hygiene Factors

- Pay, working conditions, perks, bonuses, expense accounts, special offices, memberships, etc .
- Poor hygiene factors will impact motivation but improving them does not increase long-term motivation.

Motivator Factors

- Security, recognition, belonging, and opportunity.
- Motivators lead to self-fulfillment and loyalty.

Expectancy Theory



People are usually motivated when the two following conditions are expected to be satisfied:

- Their efforts will lead to satisfactory results and success on the project.
- Their successful efforts will be recognized and rewarded.

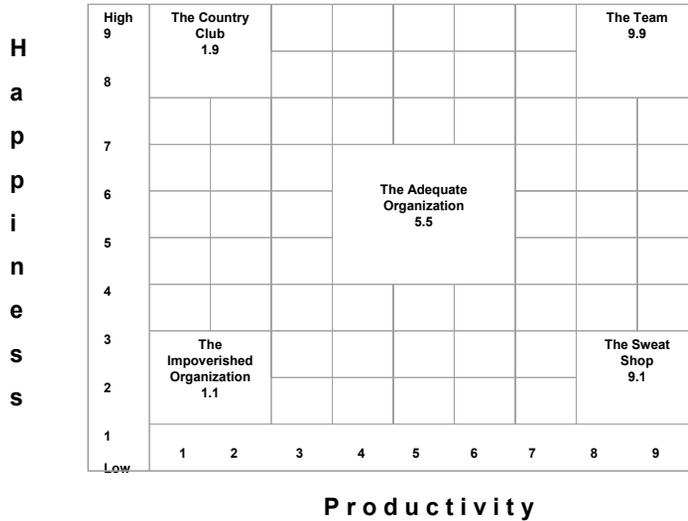
The Blake-Mouton Managerial Grid



Five main types of managerial styles:

- The Impoverished Organization
- The Sweat Shop
- The Adequate Organization
- The Team
- The Country Club

Blake-Mouton Managerial Grid (Visual)



Definitions



GROUP:

Two or more persons who are interacting with one another in such a manner that each person influences and is influenced by each other person.

(Shaw 1976, p.11 & Ellis & Fisher, 1994, p.5)

TEAM:

A small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable.

(Katzenbach & Smith, 1994, p. 45).

Project Team Structure



- **Product Team**
 - Resembles the product to be deliverable.
- **Matrix Team**
 - A variant of the matrix structure
- **Consensus Team**
 - No obvious leader - consensus oriented
- **Orchestrated Team**
 - Centered on the leader (the expert)

Basic Steps in Building a Team



- **Selecting the right team members.**
- **Kickoff Meeting:**
 - Goals and responsibilities: get buy in and commitment.
 - Establish identity with the project.
- **Stakeholder assessment - their needs.**
- **Continuous team building efforts.**

The Tuckman Model (1965)



Forming highlighted by testing & independence and attempts at identifying the task.

Storming highlighted by the development of intragroup conflicts and emotional responses to task demands.

Norming highlighted by the development of group cohesion and the expression of opinions.

Performing highlighted by functional role-relatedness and the emergence solutions.

Adjourning (Re-Forming) the close-out of group activities and the dispersal of group members.

The Katzenbach & Smith Team Model



Working Group members see no significant incremental performance need to become a team.

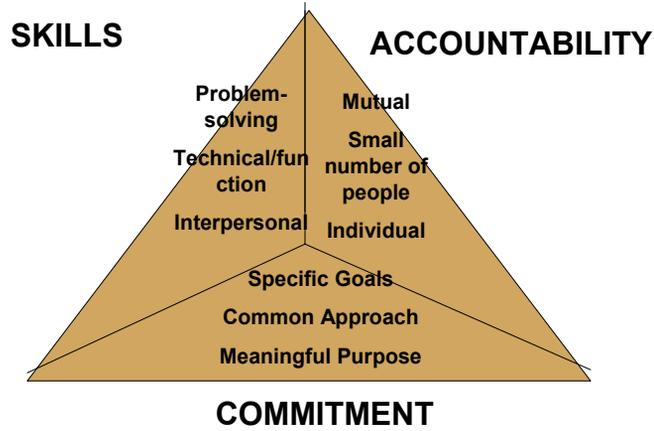
Pseudo-team members have not focused on collective performance and are not trying to achieve it.

Potential team members are really trying to improve their performance impact.

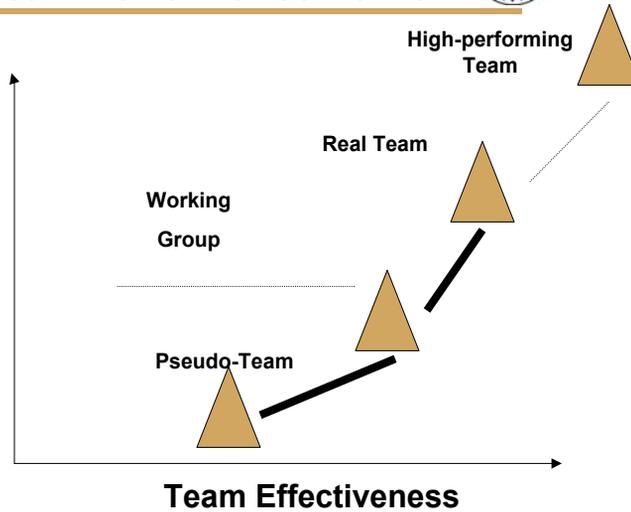
Real team members have complementary skills & are equally committed to a common purpose, goals, and working approach for which they hold themselves mutually accountable.

High-performance team where the members are deeply committed to one another's personal growth & success

Focusing on Team Basics



The Team Performance Curve



Team-building Techniques



Create a 'War Room'

Hold a 'Kick-off Meeting'

Create a team name

Regular (not frequent) meetings with a concrete agenda and output goal

Open communication

Freely-distributed documents & Information to team members.

Obstacles to Building a Team



Lack of leadership

Lack of purpose or identity

Lack of energy or enthusiasm

Sense of helplessness

Lack of candor

Unproductive meetings

Destructive intragroup competition and conflict

Shifting the blame for mistakes and failures from the group(team) to senior management.

(Katzenbach & Smith, 1994, p.84)

Power of Stakeholders



Coercive: the element of fear.

Legitimate: power of position.

Reward and penalty: can give and take away.

Expertise: esteemed for knowledge

Referent: higher authority support.

Purse String: golden rule.

Bureaucratic: backed by policy.

Team Management Risks



Peter Principle

Murphy's Law

Parkinson's Law

Learning Curve Theory

Law of Diminishing Returns

Multi-tasking

Student Syndrome

Conflict Management

Learning Curve Theory

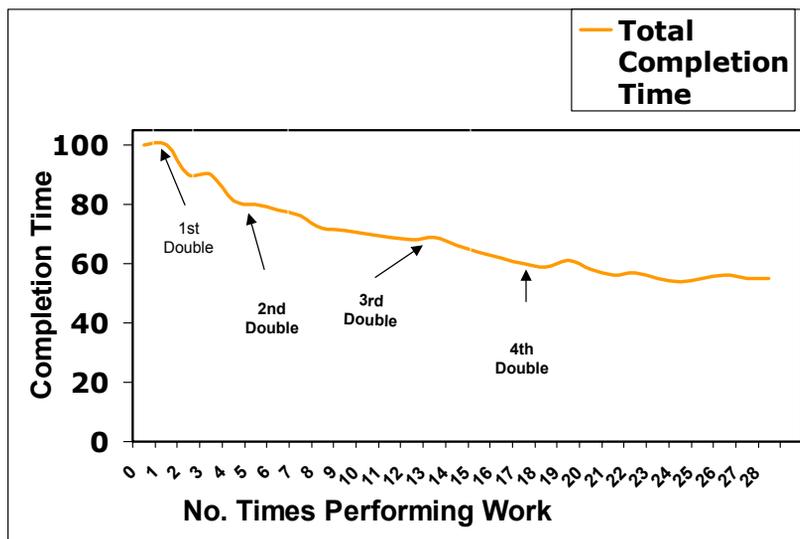


Each time we double the number times we have done something, there is a decrease in the time it takes us to perform the task. This occurs in a regular pattern.

Also:

This is referred to as a graphical or numerical relationship between the average cost or unit cost of an item and the quantity produced.

Learning Curve Theory



Law of Diminishing Returns

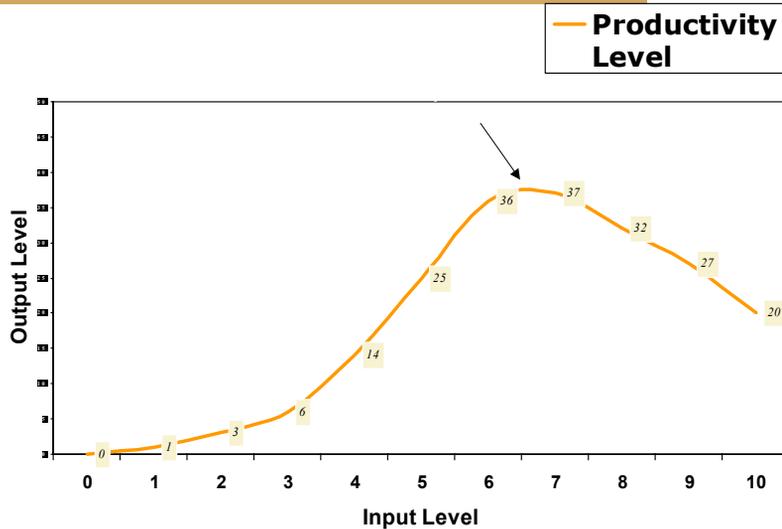


After a certain point, the more and more inputs invested in a project, the less the output received for every additional unit of investment.

The Goal:

The goal of resource allocation is to find the optimum point where the ratio between inputs and outputs is greatest.

Law of Diminishing Returns



What are the Causes of Conflicts?



- **Stress of work**
- **Ambiguity in responsibility**
- **Changing goals and objectives**
- **Competing Stakeholders & bosses**
- **Technology advances**
- **Unreasonable expectations.**

Options For Deal With Conflicts



- **Confront (collaborating)** - meet, find alternatives, and get buy-in.
- **Compromise (sharing)** - search for common ground, bargain.
- **Smooth (accommodating)** – de-emphasize differences, find temporary solution.
- **Withdrawal. (avoiding)** - Backing away. Waiting for a better opportunity.
- **Force (competing)** - win/lose, all or nothing.

Common Conflicts:



Top common conflicts in each phase of the project life-cycle are:

Initiating Phase – Project priorities.

Planning Phase – Project priorities.

Executing Phase – Schedules.

Controlling Phase – Schedules.

Close-out Phase – Schedules.



Business and Systems Aligned. Business Empowered.™



Session 5

Project Executing

Executing Process



Implement the Project Plan

- Kickoff Meeting
- Work Authorization

Begin Quality Assurance

Begin Team Development

Begin Procurement Actions

Implement the Communication Plan



Procurement Management

Managing Project Procurements



- Procurement planning**
- Solicitation planning**
- Solicitation**
- Source selection**
- Contract administration**
- Contract closeout**

Contract Organization Types



Centralized:

One office in executing organization is responsible for all contract work.

De-centralized:

Project managers have control of contract work.

Single project customized

Contract manager supervised by project manager

Project manager controls contract award

Contract Types



The following are the types of contracts that exist:

- Fixed-Price
 - Firm Fixed Price
 - Fixed-Price Incentive Fee
- Cost-Plus
 - Cost Plus Fixed Fee
 - Cost Plus Award Fee
 - Cost Plus Incentive Fee
 - Cost Plus Percentage Fee
- Time and Materials (Unit) Price (e.g., casual labor, rent)
- Uni-lateral (e.g., store receipts)

Contract Uses on Projects



USE OF CONTRACTS ON A PROJECT BASIS

CONTRACT TYPE	PROJECT USAGE
Firm-Fixed Price	Used when uncertainty is within commercially acceptable limits. Risk is totally borne by the seller
Fixed-Price Plus Incentive	Used to improve contractor cost, schedule, and quality performance.
Cost Plus Incentive Fee	Use when cost uncertainties are high enough on R&D, construction, and government contracts.
Cost Plus Fixed Fee	All costs reimbursed plus a fixed fee. The fee does not change whether actual costs were higher or lower than the estimated costs.
Cost Plus % Fee	All costs reimbursed plus a percentage of the fee should costs exceed the Target level.
Cost Plus Award Fee	Costs are reimbursed plus a subjective award provided by the buyer. The most risky form of contract for the buyer as there is little, if any incentive, for sellers to control costs. These contracts are illegal in the public sector. They are rarely used in the private sector –usually on construction projects.
Cost Plus % of Costs	

Risk Level by Contract Type



CONTRACT TYPES AND RISK

Risk Assignment By Contract Type

Scope of Work	Very Little	Partial	Complete		
Information	High	Medium	Low		
Uncertainty Level	High	Medium	Low		
Risk Level	High	Medium	Low		
Risk Allocation	Buyer = 100% Seller = 0%	To be Negotiated	Buyer = 0% Seller = 100%		
Contract Types:	CPPF	CPIF	CPFF	FPPI	FFP

- CPPF = Cost Plus % Fee
- CPIF = Cost Plus Incentive Fee
- CPFF = Cost Plus Fixed Fee
- FPPI = Fixed Price Plus Incentive
- FFP = Firm Fixed Price

Key Factors For a Statement of Work (SOW)



Complete Administrative input.

Description of work to be performed (what, where, when, and sometimes why) Leave the “how” up to the vendor where possible (allows inventiveness).

Description of acceptance criteria.

Describe incentives associated with the task & conditions for payment.

Identify contacts (task owners)

Contract Elements



The following are the elements of a legally-binding contract:

Offer – Request for Proposal

Acceptance – Initial Contract Award

Consideration – Negotiating the contract details

Legality of purpose – Signing a legally-binding contract

Negotiation Phases



Protocol - making introductions

Probing - ID main issues & strengths/weaknesses of partner

Scratch Bargaining - actual bargaining & making concessions

Closure - Summing of positions/making final concessions

Agreement - Documenting the final agreement

Contractual Precedence



Words	Take Precedence Over	Speech
Words	Take Precedence Over	Numbers
Specifications	Take Precedence Over	Generalizations
Express Guarantees & Warrantees	Take Precedence Over	Implied Guarantees & Warrantees
Unilateral Agreements	Take Precedence Over	Bi-lateral Agreements
Executed Work	Take Precedence Over	Executory Work



Business and Systems Aligned. Business Empowered.™



Session 6

Project Controlling

Controlling Process



- Performance Reporting.**
- Formal Change Control System.**
- Continuous Scope Verification and Control.**
- Cost and Schedule Control.**
- Quality Control.**
- Status and Change Notification.**
- Risk management.**

Change Control Processes



Change Control Board (used on SOW-based projects)

- Board of Experts
- Standard Forms
- Process cycle
- Approval process
- Distribution of approved change information

Rapid Prototyping (used on SOO-based projects)

- Iterative Process (Alpha, Beta, etc...)
- Process cycle

Duration Compressing:



This is a mathematical analysis that looks for ways to shorten the project schedule without changing the project scope.

There are two main techniques used in this analysis:

- Crashing
- Fast Tracking
- Concurrent Engineering (Sometimes)

Crashing Rules:



There are two rules for crashing:

- Always crash tasks on the Critical Path
- Select those critical tasks that are the least costly to accelerate.

Fast Tracking:



This is a Duration Compression technique. Main points:

It overlaps project activities in order to expedite the completion of project activities to save time.

It is doing work in parallel.

It increases the risk to the project.

Resource Allocation Techniques:



These are ways of organizing and displaying the allocation of project resource:

Responsibility Assignment Matrix

Resource Loading Chart

Resource Gantt Chart

Resource Histogram

Resource S-Curve

Responsibility Matrix Exercise



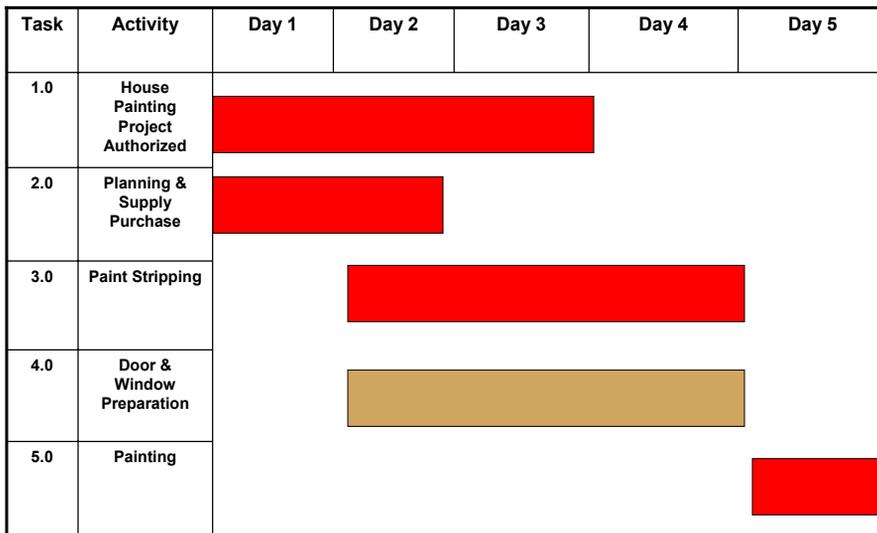
Task	Activity	Customer	Master Painter	Apprentice	Journeyman
1.0	House Painting Project Authorized	A			
2.0	Planning & Supply Purchase		A, P, I		
3.0	Paint Stripping		A, I	P, R, S	P
4.0	Door & Window Preparation		A, I	P, R, S	P
5.0	Painting	A, I	P, R, S, I		
Total					
P = Perform, A = Approve, R = Report, I = Inspect, S = Supervise					

Resource Loading Chart Exercise

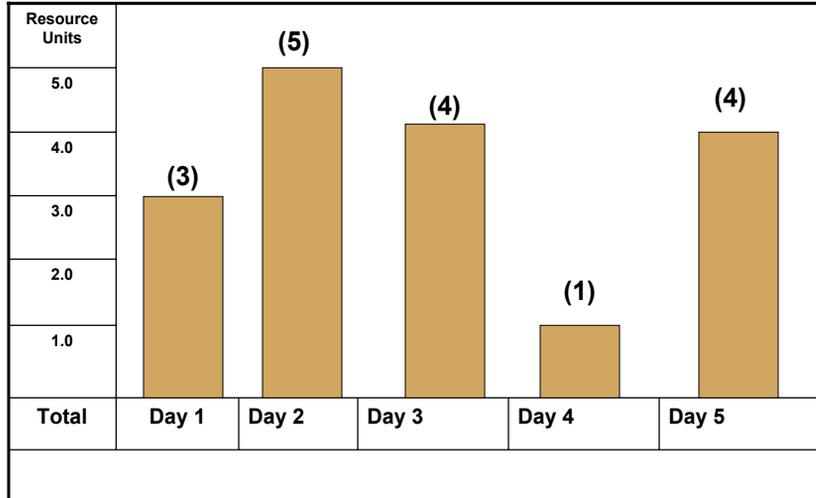


Task	Activity	Day 1	Day 2	Day 3	Day 4	Day 5
1.0	House Painting Project Authorized	0				
2.0	Planning & Supply Purchase	3				
3.0	Paint Stripping		3	2	1	
4.0	Door & Window Preparation		2	2		
5.0	Painting					4
Total		3	5	3	1	3

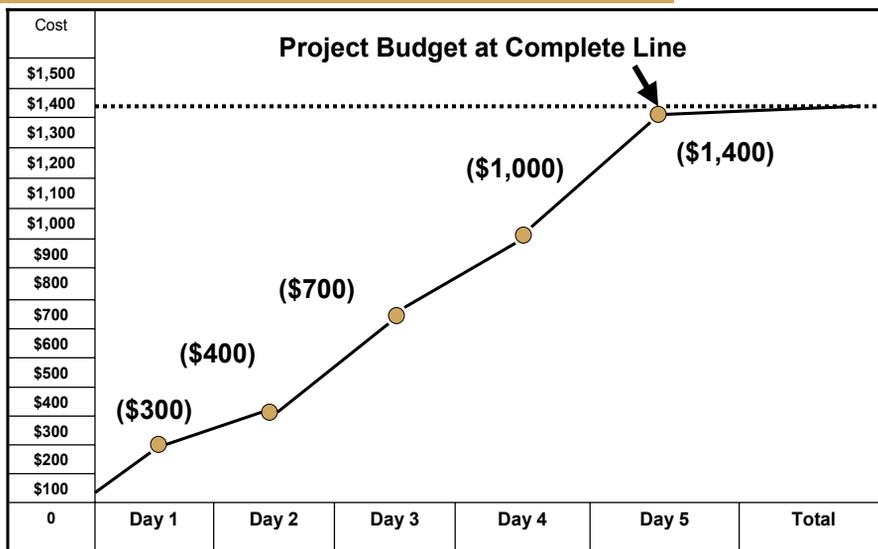
Resource Gantt Chart Exercise



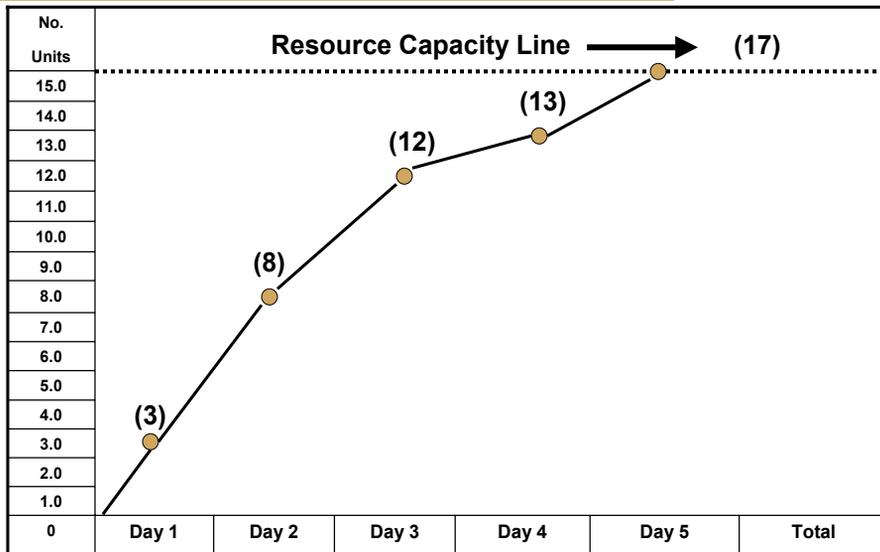
Resource Histogram Exercise



Cost S-curve Exercise



Resource S-curve Exercise



© 2003, 2004 BearingPoint, Inc.

13

Resource Management Exercises



Calculate the critical path for the House Painting project.

Calculate the project cost.

Which tasks would you crash first? second? third?

Assuming resource inputs are used full-time on each assigned task day, prepare these: Responsibility Matrix, Resource Loading Chart, Resource Gantt Chart, Cost S-curve, Resource S-curve, Resource Histogram.

Do you have any under-utilized resources? over-allocated resources?

How can you level the resources in this project?

Prepare a new 'leveled' resource histogram.

What is the 'leveled' project duration? cost?

© 2003, 2004 BearingPoint, Inc.

14

Resource Loading Exercise



Task	Activity	Duration	Resource	Level of Effort	Cost	Predecessors
1.0	House Painting Project Authorized	0 days	Customer	0 inputs x 0 days	\$0	-
2.0	Planning & Supply Purchase	1 day	Master Painter	1 input x 1 day	\$500/day	1.0
3.0	Paint Stripping	3 days	Journeyman	1 input x 3 days	\$150/day	2.0
4.0	Door & Window Preparation	2 days	Apprentice, Journeyman	2 inputs x 2 days	\$450/day	2.0
5.0	Painting	1 day	Master Painter, Apprentice, Journeyman	3 inputs x 1 day	\$950/day	3.0, 4.0
Total						-

PERT/CPM Exercise



Responsibility Matrix Exercise



Task	Activity	Customer	Master Painter	Apprentice	Journeyman
1.0	House Painting Project Authorized				
2.0	Planning & Supply Purchase				
3.0	Paint Stripping				
4.0	Door & Window Preparation				
5.0	Painting				
Total					
P = Perform, A = Approve, R = Report, S = Supervise					

Resource Loading Chart Exercise



Task	Activity	Day 1	Day 2	Day 3	Day 4	Day 5
1.0	House Painting Project Authorized					
2.0	Planning & Supply Purchase					
3.0	Paint Stripping					
4.0	Door & Window Preparation					
5.0	Painting					
Total						

Resource Gantt Chart Exercise



Task	Activity	Day 1	Day 2	Day 3	Day 4	Day 5
1.0	House Painting Project Authorized					
2.0	Planning & Supply Purchase					
3.0	Paint Stripping					
4.0	Door & Window Preparation					
5.0	Painting					

Resource S-curve Exercise



No.		Day 1	Day 2	Day 3	Day 4	Day 5	Total
Units							
15.0							
14.0							
13.0							
12.0							
11.0							
10.0							
9.0							
8.0							
7.0							
6.0							
5.0							
4.0							
3.0							
2.0							
1.0							
0							

Resource Histogram Exercise



Resource Units					
5.0					
4.0					
3.0					
2.0					
1.0					
Total	Day 1	Day 2	Day 3	Day 4	Day 5
MP = Master Printer, A = Apprentice, J = Journeyman					

Resource Leveling Exercise



Resource Units							
5.0							
4.0							
3.0							
2.0							
1.0							
Total	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
MP = Master Printer, A = Apprentice, J = Journeyman							

Resource Leveling Exercise



Resource Units							
5.0							
4.0							
3.0							
2.0							
1.0							
Total	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
MP = Master Printer, A = Apprentice, J = Journeyman							



Earned Value Analysis

Earned Value Management System



Three Key values:

- The Budget allocated over life of the project = Planned Value: (PV)
- Value of work completed relative to planning = Earned Value (EV).
- Expenditure to date = Actual Cost of Work Performed (ACWP)
- Budget at complete (BAC) = budget costs
- Estimate at complete (ETC) = est. cost.

Earned Value Formulas



Cost Variance (CV) = EV - ACWP.

Schedule Variance (SV) = EV - PV

Cost Performance Index (CPI) = EV ÷ ACWP

Schedule Performance Index (SPI) = EV ÷ PV

Estimate at Completion (EAC) = BAC ÷ CPI

Work Completion Rules:



These are the three rules for credited the completion of work for earned value computation. The three rules most commonly used are:

Zero/100: Full credit only when work finished.

20/80: 20% credit once work starts, remaining 80% once work finished.

50/50: 50% credit once work starts, remaining 50% once work finished.

All Earned Value Equations



BCWP = Earned Value

BCWS = Performance Measurement Baseline

CV = BCWP – ACWP

CV% = CV/BCWP

SV = BCWP – BCWS

SV% = SV/BCWS

CPI = BCWP/ACWP

SPI = BCWP/BCWS

EAC = BAC/CPI

ETC = EAC – ACWP

VAC = BAC – EAC

%VAC = VAC/BAC

BAC = Sum of all BCWS allocated to the project or
the project baseline.

Cum. CPI = $\frac{\sum BCWP}{\sum ACWP}$

Earned Value Analysis protocol



Review Planned (BCWS) Costs

Study WBS for work completed or in-progress

Determine your work completion rule

Determine amount of WBS work completed as of reporting date

Calculate Earned Value (BCWP)

Calculate SV (BCWP – BCWS)

Tabulate Actual Costs (ACWS)

Calculate CV (BCWP – ACWP)

Calculate: CPI, SPI, EAC, ETC, VAC, %VAC

Interpret meaning of EV Results

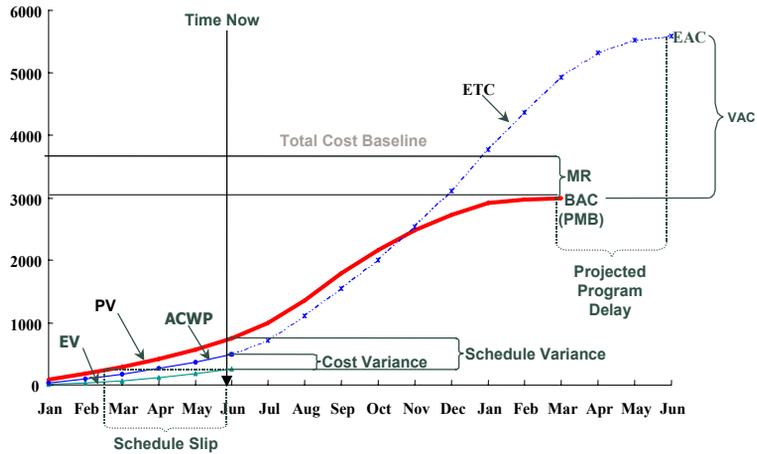
Discuss remedial action (if in trouble) – eg. Crashing, fast-tracking.

Earned Value Results



MEANING OF EARNED VALUE RESULTS ON PROJECT DELIVERY			
Equation	+ (Positive) or >1	Zero (0) or = 1	- (Negative) or <1
SV (+0-)	Ahead schedule	On Time	Behind Schedule
SV% (+0-)	Ahead schedule	On Time	Behind Schedule
SPI (>=<1)	Ahead schedule	On Time	Behind Schedule
CV (+0-)	Under Budget	On budget	Over Budget
CV% (+0-)	Under Budget	On budget	Over Budget
CPI (>=<1)	Under Budget	On budget	Over Budget

Earned Value Data Elements



© 2003, 2004 BearingPoint, Inc.

31



Applying EVMS Principles

An Exercise

Earned Value Exercise



Project Reporting Date is end of Activity H

**Calculate the BCWP under both the 0-100 and 50-50 rules.
Which approach is the most accurate reflection of the real state of work completion?**

**Calculate the overall Schedule Variance, Cost Variance,
Schedule Performance Index, Cost Performance Index,
Estimate-to-complete, Estimate-at-completion.**

Earned Value Method Exercise



Task	Duration	BCWS	ACWP	% Complete	BCWP (0 – 100 Rule)	BCWP (50 – 50 Rule)
A	2 days	\$200	\$200	100%		
B	3 days	\$600	\$800	100%		
C	3 days	\$900	\$750	100%		
D	5 days	\$2,000	\$2,000	50%		
E	4 days	\$1,000	\$1,200	90%		
F	3 days	\$300	\$100	25%		
G	2 days	\$100	\$100	10%		
H	5 days	\$1,500	\$0	0%		
Total						

Earned Value Method Exercise



Task	BCWS	ACWP	SV	CV	CPI	SPI
A	\$200	\$200				
B	\$600	\$800				
C	\$900	\$750				
D	\$2,000	\$2,000				
E	\$1,000	\$1,200				
F	\$300	\$100				
G	\$100	\$100				
H	\$1,500	\$0				
Total						

Managing Quality



Quality planning.

Quality assurance.

Quality control

The 7 Quality Management Tools



Control/Run Charts

Cause and Effect Diagram

Flow Chart

Pareto Chart

Scatter Diagram

Histograms

Checklists/CheckSheets

Quantitative Tools And Techniques



Standard Deviations:

$1\sigma = 68.3\%$

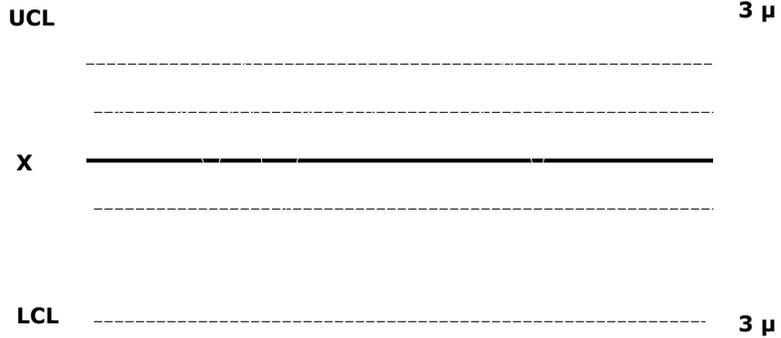
$2\sigma = 95.5\%$

$3\sigma = 99.7\%$

$6\sigma = 99.99\%$

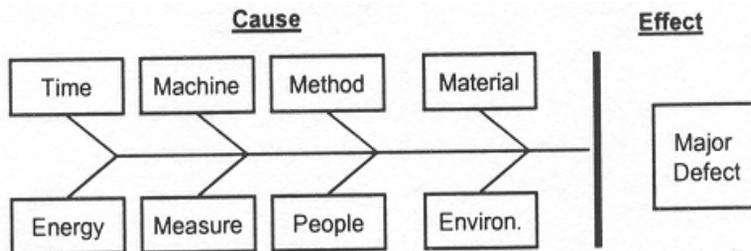
Control Chart

Rule of Seven



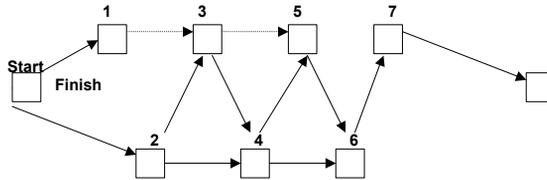
UCL = Upper Control Limit X = Spec. LCL Lower Control Limit

Ishikawa Fish Bone

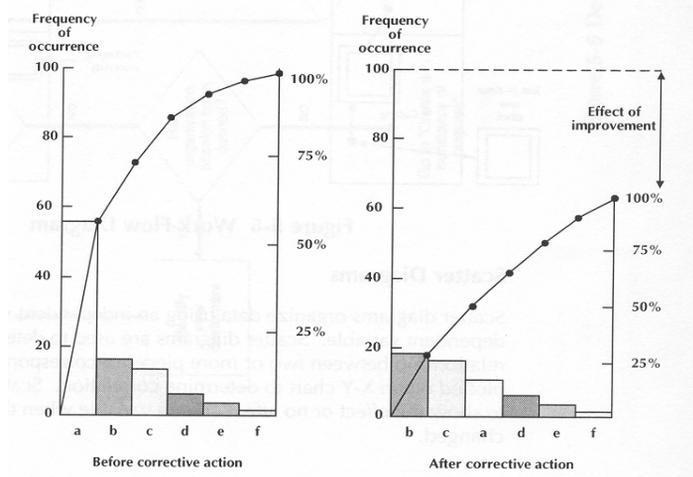


- ✦ Identify major and minor causes for the defect
- ✦ Classify in related groups
- ✦ Visualize the group with the most causes

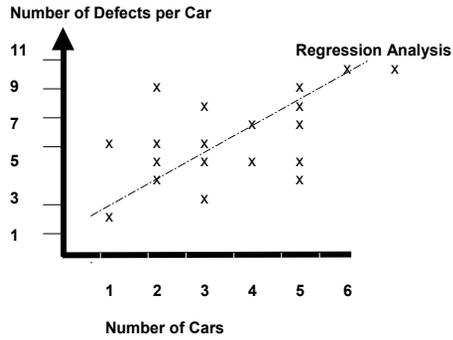
Flow Charts (Process Description)



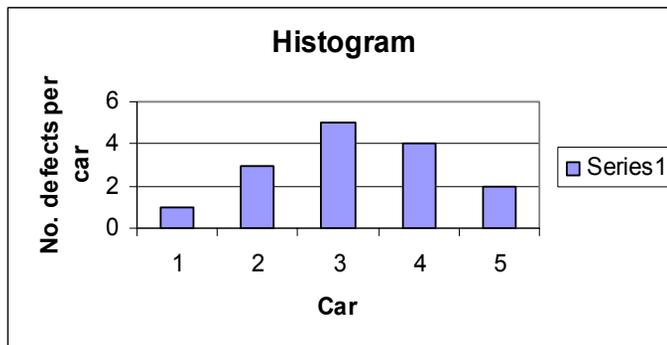
Pareto Chart



Scatter Diagram



Histogram



Checklists/Checksheets



Number of Cars with problem	Work Shift			
	1	2	3	4
1. Painting	///	////	//	-###
2. Chrome	/	///	-###	//
3. Glass	////	//	///	/



Business and Systems Aligned. Business Empowered.™

Session 7

Project Closing

Closing Process

Procurement Contract Closing

- Procurement audits
- Formal acceptance & closure

Administrative Closing

- Deliverables audit
- Contract review
- Formal acceptances
- Formal closure
- Closeout documentation

Project Closing

Administrative Closing

Key actions during the administrative closure of a project:

- Collect all project data
- Collect all project documents
- Ensure all project staff properly administered
- Ensure all project facilities, furnishings, equipment, and supplies to be disposed of or handed over.
- Ensure steps taken to cover – at least – initial operating and maintenance costs of the project deliverable(s)
- Prepare for and hold a Post-project Review
- Identify and document all lessons learned
- Circulate project lessons learned to key project stakeholders.

Contract Closing



Key actions during contract closing:

- Ensure all deliverables have been completed
- Use a punch list to ensure all contract clauses, audits, by-laws have been adhered to
- Ensure all terminal project documentation and paper work is handled properly
- Ensure legal departure of all project staff, facilities, furnishings, equipment, and supplies
- Obtain formal written sub-contractor approval and clearance of all pending issues and payments.
- Obtain formal written customer approval and acceptance of project deliverable(s).



Post-Project Reviews

Post-Project Review Process



Also known as a Post-Mortem Review. Should take place after a project has been either terminated or completed and the deliverable(s) handed over to the customer.

Is an essentially internal (*i.e.*, project team and, perhaps, performing organization and project sponsor) activity.

The following slide describes the key actors, factors, and outputs from a complete and thorough Post-Project Review.

Post-Project Review Process (2)



Timing: Once a project has been terminated or completed.

Participants: Project Manager, Key project sector/team leads, project sponsor representative, performing organization representative.

Perhaps: project customer or sub-contractor representatives - depends on the project nature (internal or external).

Agenda: Review all project assumptions, constraints, baseline data, achievements, failures, successes, and surprises.

Required Inputs: Project data; documentation; reports; original SOW, charter, contract, change requests; and, periodic status reports.

Requisite Outputs: Formal document including all lessons learned; actual risk register; and, final cost, time, and resource use along with the final WBS.

Follow-up: Circulate to key organization managers; and, archive for future project selection boards, project teams, and other project managers.



Project Manager Competencies

Meeting Expectations?
Understanding Applications?
Recognizing Challenges?

Project Manager Styles:



Authoritarian – gives specific guidance, expects obedience.

Combative – disagreeable over any situation.

Conciliatory – attempts to unite staff into a team.

Disruptive – tends to cause disorder and disrupt team unity.

Ethical – Seeks fair and by-the-book solutions.

Facilitating – Does not interfere with daily work, available for guidance.

Intimidating – takes a tough approach to staff through reprimands.

Judicial – applies sound judgement.

Promotional – cultivates team spirit, rewards good work.

Secretive – not open or outgoing with staff.

Management Styles:



This refers to the manner in which managers interact with their organizational members. The three common methods are:

Autocratic – a dictatorial managerial style.

Laissez-Faire – a hands-off management style.

Democratic – a participatory management style.

LEVELS OF PROJECT MANAGEMENT



Rules: Company policy, practices, procedures and culture.

Methods: Standard tools, customized processes, templates.

Objectives: manipulating rules and methods to achieve the project objective.

Values: manipulate and evolve the objective during a project appropriate to corporate values.

Characteristics of an Effective Project Manager



Creative problem solver

Tolerance for uncertainty & ambiguity.

Flexible in management style.

An effective communicator

Dedicated to the overall goal

Conclusion



Project Management is a science.

Project Management is an art.

Effective project management requires constant professional development.

Understand the context, then follow the processes and use the knowledge as it applies.



Business and Systems Aligned. Business Empowered.™